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**Department of Defense
Fiscal Year (FY) 2019 Budget Estimates**

February 2018



Air Force

Justification Book Volume 3a of 3

Research, Development, Test & Evaluation, Air Force

Vol-III Part 1

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Air Force • Budget Estimates FY 2019 • RDT&E Program

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Department of Defense
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

01 Feb 2018

Appropriation -----	FY 2017	FY 2018	FY 2018	FY 2018	FY 2018
	(Base + OCO)	PB Request with CR Adj Base	Total PB Requests* with CR Adj Base	PB Request with CR Adj OCO	Total PB Requests+ with CR Adj OCO
Research, Development, Test & Eval, AF	28,381,681	27,577,477	27,577,477	365,205	365,205
Total Research, Development, Test & Evaluation	28,381,681	27,577,477	27,577,477	365,205	365,205

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Department of Defense
 FY 2019 President's Budget
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 Total Obligational Authority
 (Dollars in Thousands)

01 Feb 2018

Appropriation	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	
	Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	Remaining Req with CR Adj Base + OCO + Emergency
Research, Development, Test & Eval, AF	255,744	-255,744		28,198,426	-255,744	27,942,682
Total Research, Development, Test & Evaluation	255,744	-255,744		28,198,426	-255,744	27,942,682

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Department of Defense
FY 2019 President's Budget
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Total Obligational Authority
(Dollars in Thousands)

01 Feb 2018

Appropriation -----	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Research, Development, Test & Eval, AF	39,892,149	600,465	40,492,614
Total Research, Development, Test & Evaluation	39,892,149	600,465	40,492,614

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Department of Defense
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01 Feb 2018

Summary Recap of Budget Activities	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Basic Research	521,594	505,259	505,259		
Applied Research	1,314,271	1,284,114	1,284,114		
Advanced Technology Development	792,497	794,017	794,017		
Advanced Component Development & Prototypes	2,822,781	4,605,030	4,605,030	13,200	13,200
System Development & Demonstration	3,983,019	4,476,762	4,476,762		
Management Support	1,690,840	2,663,875	2,663,875		
Operational Systems Development	17,256,679	20,585,302	20,585,302	122,158	122,158
Undistributed		-7,336,882	-7,336,882	229,847	229,847
Total Research, Development, Test & Evaluation	28,381,681	27,577,477	27,577,477	365,205	365,205

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01 Feb 2018

Summary Recap of Budget Activities	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	
	Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	Remaining Req with CR Adj Base + OCO + Emergency
Basic Research				505,259		505,259
Applied Research				1,284,114		1,284,114
Advanced Technology Development				794,017		794,017
Advanced Component Development & Prototypes	90,500	-90,500		4,708,730	-90,500	4,618,230
System Development & Demonstration				4,476,762		4,476,762
Management Support				2,663,875		2,663,875
Operational Systems Development	165,244	-165,244		20,872,704	-165,244	20,707,460
Undistributed				-7,107,035		-7,107,035
Total Research, Development, Test & Evaluation	255,744	-255,744		28,198,426	-255,744	27,942,682

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(Dollars in Thousands)

01 Feb 2018

Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-----	-----	-----	-----
Basic Research	517,819		517,819
Applied Research	1,312,342		1,312,342
Advanced Technology Development	814,797		814,797
Advanced Component Development & Prototypes	6,529,943	13,495	6,543,438
System Development & Demonstration	5,272,191		5,272,191
Management Support	2,839,511		2,839,511
Operational Systems Development	22,605,546	586,970	23,192,516
Undistributed			
Total Research, Development, Test & Evaluation	39,892,149	600,465	40,492,614

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	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Summary Recap of FYDP Programs					
Strategic Forces	658,404	825,038	825,038		
General Purpose Forces	2,060,061	2,962,365	2,962,365	9,750	9,750
Intelligence and Communications	2,048,032	1,466,925	1,466,925	5,400	5,400
Mobility Forces	476,577	602,629	602,629		
Research and Development	10,034,179	10,713,989	10,713,989	7,800	7,800
Central Supply and Maintenance	93,625	109,419	109,419		
Training Medical and Other	3,251	3,615	3,615		
Administration and Associated Activities	31,237	-7,214,983	-7,214,983	229,847	229,847
Support of Other Nations	4,626	4,569	4,569		
Space		3,165,909	3,165,909		
Classified Programs	12,971,689	14,938,002	14,938,002	112,408	112,408
Total Research, Development, Test & Evaluation	28,381,681	27,577,477	27,577,477	365,205	365,205

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	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
Summary Recap of FYDP Programs						
Strategic Forces				825,038		825,038
General Purpose Forces				2,972,115		2,972,115
Intelligence and Communications	90,500	-90,500		1,562,825	-90,500	1,472,325
Mobility Forces				602,629		602,629
Research and Development				10,721,789		10,721,789
Central Supply and Maintenance				109,419		109,419
Training Medical and Other				3,615		3,615
Administration and Associated Activities				-6,985,136		-6,985,136
Support of Other Nations				4,569		4,569
Space				3,165,909		3,165,909
Classified Programs	165,244	-165,244		15,215,654	-165,244	15,050,410
Total Research, Development, Test & Evaluation	255,744	-255,744		28,198,426	-255,744	27,942,682

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	FY 2019 Base	FY 2019 OCO	FY 2019 Total

Summary Recap of FYDP Programs			

Strategic Forces	1,064,875		1,064,875
General Purpose Forces	3,287,655	53,049	3,340,704
Intelligence and Communications	1,394,674	54,600	1,449,274
Mobility Forces	916,041		916,041
Research and Development	12,027,571		12,027,571
Central Supply and Maintenance	97,134		97,134
Training Medical and Other	3,578		3,578
Administration and Associated Activities	130,882		130,882
Support of Other Nations	3,998		3,998
Space	4,717,811	18,495	4,736,306
Classified Programs	16,247,930	474,321	16,722,251
Total Research, Development, Test & Evaluation	39,892,149	600,465	40,492,614

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	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Summary Recap of Budget Activities					

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01 Feb 2018

	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO

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Summary Recap of FYDP Programs					

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01 Feb 2018

	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
Summary Recap of Budget Activities						

Summary Recap of FYDP Programs						

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Space				3,165,909		3,165,909
Classified Programs	165,244	-165,244		15,215,654	-165,244	15,050,410
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 (Dollars in Thousands)

01 Feb 2018

Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total

Summary Recap of FYDP Programs			

Strategic Forces	1,064,875		1,064,875
General Purpose Forces	3,287,655	53,049	3,340,704
Intelligence and Communications	1,394,674	54,600	1,449,274
Mobility Forces	916,041		916,041
Research and Development	12,027,571		12,027,571
Central Supply and Maintenance	97,134		97,134
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Administration and Associated Activities	130,882		130,882
Support of Other Nations	3,998		3,998
Space	4,717,811	18,495	4,736,306
Classified Programs	16,247,930	474,321	16,722,251
Total Research, Development, Test & Evaluation	39,892,149	600,465	40,492,614

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01 Feb 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests* with CR Adj OCO	S e c
1	0601102F	Defense Research Sciences	01	370,595	342,919	342,919			U
2	0601103F	University Research Initiatives	01	137,775	147,923	147,923			U
3	0601108F	High Energy Laser Research Initiatives	01	13,224	14,417	14,417			U
		Basic Research		521,594	505,259	505,259			
4	0602102F	Materials	02	158,243	124,264	124,264			U
5	0602201F	Aerospace Vehicle Technologies	02	130,923	124,678	124,678			U
6	0602202F	Human Effectiveness Applied Research	02	110,012	108,784	108,784			U
7	0602203F	Aerospace Propulsion	02	192,583	192,695	192,695			U
8	0602204F	Aerospace Sensors	02	160,339	152,782	152,782			U
9	0602298F	Science and Technology Management - Major Headquarters Activities	02		8,353	8,353			U
10	0602601F	Space Technology	02	119,670	116,503	116,503			U
11	0602602F	Conventional Munitions	02	110,074	112,195	112,195			U
12	0602605F	Directed Energy Technology	02	127,365	132,993	132,993			U
13	0602788F	Dominant Information Sciences and Methods	02	165,517	167,818	167,818			U
14	0602890F	High Energy Laser Research	02	39,545	43,049	43,049			U
15	1206601F	Space Technology	02						U
		Applied Research		1,314,271	1,284,114	1,284,114			

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16 0603112F	Advanced Materials for Weapon Systems	03	54,095	37,856	37,856	U
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01 Feb 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S
1	0601102F	Defense Research Sciences	01				342,919		342,919	U
2	0601103F	University Research Initiatives	01				147,923		147,923	U
3	0601108F	High Energy Laser Research Initiatives	01				14,417		14,417	U
		Basic Research					505,259		505,259	
4	0602102F	Materials	02				124,264		124,264	U
5	0602201F	Aerospace Vehicle Technologies	02				124,678		124,678	U
6	0602202F	Human Effectiveness Applied Research	02				108,784		108,784	U
7	0602203F	Aerospace Propulsion	02				192,695		192,695	U
8	0602204F	Aerospace Sensors	02				152,782		152,782	U
9	0602298F	Science and Technology Management - Major Headquarters Activities	02				8,353		8,353	U
10	0602601F	Space Technology	02				116,503		116,503	U
11	0602602F	Conventional Munitions	02				112,195		112,195	U
12	0602605F	Directed Energy Technology	02				132,993		132,993	U
13	0602788F	Dominant Information Sciences and Methods	02				167,818		167,818	U
14	0602890F	High Energy Laser Research	02				43,049		43,049	U
15	1206601F	Space Technology	02							U
		Applied Research					1,284,114		1,284,114	

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16 0603112F Advanced Materials for Weapon 03
Systems

37,856

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01 Feb 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
1	0601102F	Defense Research Sciences	01	348,322		348,322	U
2	0601103F	University Research Initiatives	01	154,991		154,991	U
3	0601108F	High Energy Laser Research Initiatives	01	14,506		14,506	U
		Basic Research		517,819		517,819	
4	0602102F	Materials	02	125,373		125,373	U
5	0602201F	Aerospace Vehicle Technologies	02	130,547		130,547	U
6	0602202F	Human Effectiveness Applied Research	02	112,518		112,518	U
7	0602203F	Aerospace Propulsion	02	190,919		190,919	U
8	0602204F	Aerospace Sensors	02	166,534		166,534	U
9	0602298F	Science and Technology Management - Major Headquarters Activities	02	8,288		8,288	U
10	0602601F	Space Technology	02				U
11	0602602F	Conventional Munitions	02	112,841		112,841	U
12	0602605F	Directed Energy Technology	02	141,898		141,898	U
13	0602788F	Dominant Information Sciences and Methods	02	162,420		162,420	U
14	0602890F	High Energy Laser Research	02	43,359		43,359	U
15	1206601F	Space Technology	02	117,645		117,645	U
		Applied Research		1,312,342		1,312,342	

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16 0603112F	Advanced Materials for Weapon Systems	03	34,426	34,426	U
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17	0603199F	Sustainment Science and Technology (S&T)	03	19,994	22,811	22,811			U
18	0603203F	Advanced Aerospace Sensors	03	39,854	40,978	40,978			U
19	0603211F	Aerospace Technology Dev/Demo	03	128,358	115,966	115,966			U
20	0603216F	Aerospace Propulsion and Power Technology	03	104,695	104,499	104,499			U
21	0603270F	Electronic Combat Technology	03	64,591	60,551	60,551			U
22	0603401F	Advanced Spacecraft Technology	03	69,338	58,910	58,910			U
23	0603444F	Maui Space Surveillance System (MSSS)	03	11,493	10,433	10,433			U
24	0603456F	Human Effectiveness Advanced Technology Development	03	25,784	33,635	33,635			U
25	0603601F	Conventional Weapons Technology	03	105,487	167,415	167,415			U
26	0603605F	Advanced Weapons Technology	03	47,358	45,502	45,502			U
27	0603680F	Manufacturing Technology Program	03	62,272	46,450	46,450			U
28	0603788F	Battlespace Knowledge Development and Demonstration	03	52,274	49,011	49,011			U
29	0303467F	SENSR Spectrum Pipeline SRF	03	6,904					U
		Advanced Technology Development		792,497	794,017	794,017			
30	0603260F	Intelligence Advanced Development	04	5,598	5,652	5,652			U
31	0603438F	Space Control Technology	04	8,506			7,800	7,800	U

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32 0603742F	Combat Identification Technology	04	23,551	24,397	24,397	U
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17	0603199F	Sustainment Science and Technology (S&T)	03				22,811		22,811	U
18	0603203F	Advanced Aerospace Sensors	03				40,978		40,978	U
19	0603211F	Aerospace Technology Dev/Demo	03				115,966		115,966	U
20	0603216F	Aerospace Propulsion and Power Technology	03				104,499		104,499	U
21	0603270F	Electronic Combat Technology	03				60,551		60,551	U
22	0603401F	Advanced Spacecraft Technology	03				58,910		58,910	U
23	0603444F	Maui Space Surveillance System (MSSS)	03				10,433		10,433	U
24	0603456F	Human Effectiveness Advanced Technology Development	03				33,635		33,635	U
25	0603601F	Conventional Weapons Technology	03				167,415		167,415	U
26	0603605F	Advanced Weapons Technology	03				45,502		45,502	U
27	0603680F	Manufacturing Technology Program	03				46,450		46,450	U
28	0603788F	Battlespace Knowledge Development and Demonstration	03				49,011		49,011	U
29	0303467F	SENSR Spectrum Pipeline SRF	03							U
		Advanced Technology Development					794,017		794,017	
30	0603260F	Intelligence Advanced Development	04				5,652		5,652	U
31	0603438F	Space Control Technology	04				7,800		7,800	U

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32 0603742F Combat Identification Technology 04

24,397

24,397 U

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17	0603199F	Sustainment Science and Technology (S&T)	03	15,150		15,150	U
18	0603203F	Advanced Aerospace Sensors	03	39,968		39,968	U
19	0603211F	Aerospace Technology Dev/Demo	03	121,002		121,002	U
20	0603216F	Aerospace Propulsion and Power Technology	03	115,462		115,462	U
21	0603270F	Electronic Combat Technology	03	55,319		55,319	U
22	0603401F	Advanced Spacecraft Technology	03	54,895		54,895	U
23	0603444F	Maui Space Surveillance System (MSSS)	03	10,674		10,674	U
24	0603456F	Human Effectiveness Advanced Technology Development	03	36,463		36,463	U
25	0603601F	Conventional Weapons Technology	03	194,981		194,981	U
26	0603605F	Advanced Weapons Technology	03	43,368		43,368	U
27	0603680F	Manufacturing Technology Program	03	42,025		42,025	U
28	0603788F	Battlespace Knowledge Development and Demonstration	03	51,064		51,064	U
29	0303467F	SENSR Spectrum Pipeline SRF	03				U
		Advanced Technology Development		814,797		814,797	
30	0603260F	Intelligence Advanced Development	04	5,568		5,568	U
31	0603438F	Space Control Technology	04				U

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32 0603742F Combat Identification Technology 04 18,194 18,194 U

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33	0603790F	NATO Research and Development	04	4,174	3,851	3,851			U
34	0603830F	Space Security and Defense Program	04	32,399					U
35	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	99,949	10,736	10,736			U
36	0603859F	Pollution Prevention - Dem/Val	04	3,500	2	2			U
37	0604015F	Long Range Strike - Bomber	04	1,290,307	2,003,580	2,003,580			U
38	0604201F	Integrated Avionics Planning and Development	04		65,458	65,458			U
39	0604257F	Advanced Technology and Sensors	04	34,818	68,719	68,719			U
40	0604288F	National Airborne Ops Center (NAOC) Recap	04		7,850	7,850			U
41	0604317F	Technology Transfer	04	8,080	3,295	3,295			U
42	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	52,706	17,365	17,365			U
43	0604414F	Cyber Resiliency of Weapon Systems-ACS	04		32,253	32,253			U
44	0604422F	Weather System Follow-on	04	82,506					U
45	0604425F	Space Situation Awareness Systems	04	9,901					U
46	0604776F	Deployment & Distribution Enterprise R&D	04	25,890	26,222	26,222			U
47	0604857F	Operationally Responsive Space	04	17,976					U

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48 0604858F	Tech Transition Program	04	378,126	840,650	840,650	U
49 0605230F	Ground Based Strategic Deterrent	04	109,260	215,721	215,721	U

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				Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Remaining Req Emergency	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs		Remaining Req with CR Adj Base + OCO + Emergency
33	0603790F	NATO Research and Development	04				3,851		3,851	U
34	0603830F	Space Security and Defense Program	04							U
35	0603851F	Intercontinental Ballistic Missile - Dem/Val	04				10,736		10,736	U
36	0603859F	Pollution Prevention - Dem/Val	04				2		2	U
37	0604015F	Long Range Strike - Bomber	04				2,003,580		2,003,580	U
38	0604201F	Integrated Avionics Planning and Development	04				65,458		65,458	U
39	0604257F	Advanced Technology and Sensors	04				68,719		68,719	U
40	0604288F	National Airborne Ops Center (NAOC) Recap	04				7,850		7,850	U
41	0604317F	Technology Transfer	04				3,295		3,295	U
42	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04				17,365		17,365	U
43	0604414F	Cyber Resiliency of Weapon Systems-ACS	04				32,253		32,253	U
44	0604422F	Weather System Follow-on	04							U
45	0604425F	Space Situation Awareness Systems	04							U
46	0604776F	Deployment & Distribution Enterprise R&D	04				26,222		26,222	U
47	0604857F	Operationally Responsive Space	04							U

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48 0604858F	Tech Transition Program	04	840,650	840,650 U
49 0605230F	Ground Based Strategic Deterrent	04	215,721	215,721 U

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33	0603790F	NATO Research and Development	04	2,305		2,305	U
34	0603830F	Space Security and Defense Program	04				U
35	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	41,856		41,856	U
36	0603859F	Pollution Prevention - Dem/Val	04				U
37	0604015F	Long Range Strike - Bomber	04	2,314,196		2,314,196	U
38	0604201F	Integrated Avionics Planning and Development	04	14,894		14,894	U
39	0604257F	Advanced Technology and Sensors	04	34,585		34,585	U
40	0604288F	National Airborne Ops Center (NAOC) Recap	04	9,740		9,740	U
41	0604317F	Technology Transfer	04	12,960		12,960	U
42	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	71,501		71,501	U
43	0604414F	Cyber Resiliency of Weapon Systems-ACS	04	62,618		62,618	U
44	0604422F	Weather System Follow-on	04				U
45	0604425F	Space Situation Awareness Systems	04				U
46	0604776F	Deployment & Distribution Enterprise R&D	04	28,350		28,350	U
47	0604857F	Operationally Responsive Space	04				U

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48	0604858F	Tech Transition Program	04	1,186,075	1,186,075	U
49	0605230F	Ground Based Strategic Deterrent	04	345,041	345,041	U

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50	0207110F	Next Generation Air Dominance	04	22,272	294,746	294,746			U
51	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	47,166	10,645	10,645			U
52	0208099F	Unified Platform (UP)	04						U
53	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04	297,975					U
54	0305236F	Common Data Link Executive Agent (CDL EA)	04	40,293	41,509	41,509			U
55	0305601F	Mission Partner Environments	04						U
56	0306250F	Cyber Operations Technology Development	04	205,048	226,287	226,287	5,400	5,400	U
57	0306415F	Enabled Cyber Activities	04	15,842	16,687	16,687			U
58	0408011F	Special Tactics / Combat Control	04		4,500	4,500			U
59	0901410F	Contracting Information Technology System	04	6,938	15,867	15,867			U
60	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04		253,939	253,939			U
61	1203710F	EO/IR Weather Systems	04		10,000	10,000			U
62	1206422F	Weather System Follow-on	04		112,088	112,088			U
63	1206425F	Space Situation Awareness Systems	04		34,764	34,764			U
64	1206434F	Midterm Polar MILSATCOM System	04		63,092	63,092			U

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65 1206438F	Space Control Technology	04	7,842	7,842	U
66 1206730F	Space Security and Defense Program	04	41,385	41,385	U

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50	0207110F	Next Generation Air Dominance	04				294,746		294,746	U
51	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04				10,645		10,645	U
52	0208099F	Unified Platform (UP)	04							U
53	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04							U
54	0305236F	Common Data Link Executive Agent (CDL EA)	04				41,509		41,509	U
55	0305601F	Mission Partner Environments	04							U
56	0306250F	Cyber Operations Technology Development	04	90,500	-90,500		322,187	-90,500	231,687	U
57	0306415F	Enabled Cyber Activities	04				16,687		16,687	U
58	0408011F	Special Tactics / Combat Control	04				4,500		4,500	U
59	0901410F	Contracting Information Technology System	04				15,867		15,867	U
60	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04				253,939		253,939	U
61	1203710F	EO/IR Weather Systems	04				10,000		10,000	U
62	1206422F	Weather System Follow-on	04				112,088		112,088	U
63	1206425F	Space Situation Awareness Systems	04				34,764		34,764	U
64	1206434F	Midterm Polar MILSATCOM System	04				63,092		63,092	U

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65 1206438F	Space Control Technology	04	7,842	7,842 U
66 1206730F	Space Security and Defense Program	04	41,385	41,385 U

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50	0207110F	Next Generation Air Dominance	04	503,997		503,997	U
51	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	40,326		40,326	U
52	0208099F	Unified Platform (UP)	04	29,800		29,800	U
53	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04				U
54	0305236F	Common Data Link Executive Agent (CDL EA)	04	41,880		41,880	U
55	0305601F	Mission Partner Environments	04	10,074		10,074	U
56	0306250F	Cyber Operations Technology Development	04	253,825		253,825	U
57	0306415F	Enabled Cyber Activities	04	16,325		16,325	U
58	0408011F	Special Tactics / Combat Control	04				U
59	0901410F	Contracting Information Technology System	04	17,577		17,577	U
60	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04	286,629		286,629	U
61	1203710F	EO/IR Weather Systems	04	7,940		7,940	U
62	1206422F	Weather System Follow-on	04	138,052		138,052	U
63	1206425F	Space Situation Awareness Systems	04	39,338		39,338	U
64	1206434F	Midterm Polar MILSATCOM System	04	383,113		383,113	U

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65	1206438F	Space Control Technology	04	91,018	1,100	92,118	U
66	1206730F	Space Security and Defense Program	04	45,542		45,542	U

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67	1206760F	Protected Tactical Enterprise Service (PTES)	04		18,150	18,150			U
68	1206761F	Protected Tactical Service (PTS)	04		24,201	24,201			U
69	1206855F	Protected SATCOM Services (PSCS) - Aggregated	04		16,000	16,000			U
70	1206857F	Operationally Responsive Space	04		87,577	87,577			U
		Advanced Component Development & Prototypes		2,822,781	4,605,030	4,605,030	13,200	13,200	
71	0604200F	Future Advanced Weapon Analysis & Programs	05		5,100	5,100			U
72	0604201F	Integrated Avionics Planning and Development	05		101,203	101,203			U
73	0604222F	Nuclear Weapons Support	05		3,009	3,009			U
74	0604270F	Electronic Warfare Development	05	4,986	2,241	2,241			U
75	0604281F	Tactical Data Networks Enterprise	05	78,167	38,250	38,250			U
76	0604287F	Physical Security Equipment	05	63,101	19,739	19,739			U
77	0604329F	Small Diameter Bomb (SDB) - EMD	05	37,603	38,979	38,979			U
78	0604421F	Counterspace Systems	05	32,618					U
79	0604425F	Space Situation Awareness Systems	05	25,540					U
80	0604426F	Space Fence	05	162,510					U
81	0604429F	Airborne Electronic Attack	05	8,589	7,091	7,091			U

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82 0604441F Space Based Infrared System (SBIRS) 05 161,966
High EMD

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67	1206760F	Protected Tactical Enterprise Service (PTES)	04				18,150		18,150	U
68	1206761F	Protected Tactical Service (PTS)	04				24,201		24,201	U
69	1206855F	Protected SATCOM Services (PSCS) - Aggregated	04				16,000		16,000	U
70	1206857F	Operationally Responsive Space	04				87,577		87,577	U
		Advanced Component Development & Prototypes		90,500	-90,500		4,708,730	-90,500	4,618,230	
71	0604200F	Future Advanced Weapon Analysis & Programs	05				5,100		5,100	U
72	0604201F	Integrated Avionics Planning and Development	05				101,203		101,203	U
73	0604222F	Nuclear Weapons Support	05				3,009		3,009	U
74	0604270F	Electronic Warfare Development	05				2,241		2,241	U
75	0604281F	Tactical Data Networks Enterprise	05				38,250		38,250	U
76	0604287F	Physical Security Equipment	05				19,739		19,739	U
77	0604329F	Small Diameter Bomb (SDB) - EMD	05				38,979		38,979	U
78	0604421F	Counterspace Systems	05							U
79	0604425F	Space Situation Awareness Systems	05							U
80	0604426F	Space Fence	05							U
81	0604429F	Airborne Electronic Attack	05				7,091		7,091	U

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82 0604441F Space Based Infrared System (SBIRS) 05
High EMD

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Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
67	1206760F	Protected Tactical Enterprise Service (PTES)	04	51,419		51,419	U
68	1206761F	Protected Tactical Service (PTS)	04	29,776		29,776	U
69	1206855F	Protected SATCOM Services (PSCS) - Aggregated	04	29,379		29,379	U
70	1206857F	Operationally Responsive Space	04	366,050	12,395	378,445	U
		Advanced Component Development & Prototypes		6,529,943	13,495	6,543,438	
71	0604200F	Future Advanced Weapon Analysis & Programs	05	39,602		39,602	U
72	0604201F	Integrated Avionics Planning and Development	05	58,531		58,531	U
73	0604222F	Nuclear Weapons Support	05	4,468		4,468	U
74	0604270F	Electronic Warfare Development	05	1,909		1,909	U
75	0604281F	Tactical Data Networks Enterprise	05	207,746		207,746	U
76	0604287F	Physical Security Equipment	05	14,421		14,421	U
77	0604329F	Small Diameter Bomb (SDB) - EMD	05	73,158		73,158	U
78	0604421F	Counterspace Systems	05				U
79	0604425F	Space Situation Awareness Systems	05				U
80	0604426F	Space Fence	05				U
81	0604429F	Airborne Electronic Attack	05	7,153		7,153	U

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82 0604441F Space Based Infrared System (SBIRS) 05
High EMD

U

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83	0604602F	Armament/Ordnance Development	05	21,507	46,540	46,540			U
84	0604604F	Submunitions	05	2,503	2,705	2,705			U
85	0604617F	Agile Combat Support	05	49,005	31,240	31,240			U
86	0604618F	Joint Direct Attack Munition	05	9,901					U
87	0604706F	Life Support Systems	05	8,710	9,060	9,060			U
88	0604735F	Combat Training Ranges	05	57,200	87,350	87,350			U
89	0604800F	F-35 - EMD	05	433,903	292,947	292,947			U
90	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05	381,360					U
91	0604932F	Long Range Standoff Weapon	05	102,350	451,290	451,290			U
92	0604933F	ICBM Fuze Modernization	05	172,946	178,991	178,991			U
93	0605030F	Joint Tactical Network Center (JTNC)	05	1,131	12,736	12,736			U
94	0605031F	Joint Tactical Network (JTN)	05		9,319	9,319			U
95	0605213F	F-22 Modernization Increment 3.2B	05	67,717	13,600	13,600			U
96	0605214F	Ground Attack Weapons Fuze Development	05	903					U
97	0605221F	KC-46	05	211,509	93,845	93,845			U
98	0605223F	Advanced Pilot Training	05	7,107	105,999	105,999			U
99	0605229F	Combat Rescue Helicopter	05	263,327	354,485	354,485			U

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100 0605278F	HC/MC-130 Recap RDT&E	05	8,707	U
101 0605431F	Advanced EHF MILSATCOM (SPACE)	05	221,584	U

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83	0604602F	Armament/Ordnance Development	05				46,540		46,540	U
84	0604604F	Submunitions	05				2,705		2,705	U
85	0604617F	Agile Combat Support	05				31,240		31,240	U
86	0604618F	Joint Direct Attack Munition	05							U
87	0604706F	Life Support Systems	05				9,060		9,060	U
88	0604735F	Combat Training Ranges	05				87,350		87,350	U
89	0604800F	F-35 - EMD	05				292,947		292,947	U
90	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05							U
91	0604932F	Long Range Standoff Weapon	05				451,290		451,290	U
92	0604933F	ICBM Fuze Modernization	05				178,991		178,991	U
93	0605030F	Joint Tactical Network Center (JTNC)	05				12,736		12,736	U
94	0605031F	Joint Tactical Network (JTN)	05				9,319		9,319	U
95	0605213F	F-22 Modernization Increment 3.2B	05				13,600		13,600	U
96	0605214F	Ground Attack Weapons Fuze Development	05							U
97	0605221F	KC-46	05				93,845		93,845	U
98	0605223F	Advanced Pilot Training	05				105,999		105,999	U
99	0605229F	Combat Rescue Helicopter	05				354,485		354,485	U

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100 0605278F HC/MC-130 Recap RDT&E 05

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101 0605431F Advanced EHF MILSATCOM (SPACE) 05

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Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
83	0604602F	Armament/Ordnance Development	05	58,590		58,590	U
84	0604604F	Submunitions	05	2,990		2,990	U
85	0604617F	Agile Combat Support	05	20,028		20,028	U
86	0604618F	Joint Direct Attack Munition	05	15,787		15,787	U
87	0604706F	Life Support Systems	05	8,919		8,919	U
88	0604735F	Combat Training Ranges	05	35,895		35,895	U
89	0604800F	F-35 - EMD	05	69,001		69,001	U
90	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05				U
91	0604932F	Long Range Standoff Weapon	05	614,920		614,920	U
92	0604933F	ICBM Fuze Modernization	05	172,902		172,902	U
93	0605030F	Joint Tactical Network Center (JTNC)	05				U
94	0605031F	Joint Tactical Network (JTN)	05				U
95	0605213F	F-22 Modernization Increment 3.2B	05				U
96	0605214F	Ground Attack Weapons Fuze Development	05				U
97	0605221F	KC-46	05	88,170		88,170	U
98	0605223F	Advanced Pilot Training	05	265,465		265,465	U
99	0605229F	Combat Rescue Helicopter	05	457,652		457,652	U

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100 0605278F HC/MC-130 Recap RDT&E 05 U

101 0605431F Advanced EHF MILSATCOM (SPACE) 05 U

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102	0605432F	Polar MILSATCOM (SPACE)	05	44,306					U
103	0605433F	Wideband Global SATCOM (SPACE)	05	73,901					U
104	0605458F	Air & Space Ops Center 10.2 RDT&E	05	21,109	119,745	119,745			U
105	0605830F	Acq Workforce- Global Battle Mgmt	05						U
106	0605931F	B-2 Defensive Management System	05	278,437	194,570	194,570			U
107	0101125F	Nuclear Weapons Modernization	05	131,063	91,237	91,237			U
108	0207171F	F-15 EPAWSS	05	241,495	209,847	209,847			U
109	0207328F	Stand In Attack Weapon	05		3,400	3,400			U
110	0207423F	Advanced Communications Systems	05						U
111	0207701F	Full Combat Mission Training	05	10,809	16,727	16,727			U
112	0303267F	Auctioned Spectrum Relocation Fund	05	54,499					U
113	0303367F	Spectrum Access Research and Development	05	62,053					U
114	0305176F	Combat Survivor Evader Locator	05	30,282					U
115	0307581F	JSTARS Recap	05	113,334	417,201	417,201			U
116	0401310F	C-32 Executive Transport Recapitalization	05		6,017	6,017			U
117	0401319F	Presidential Aircraft Recapitalization (PAR)	05	311,252	434,069	434,069			U
118	0701212F	Automated Test Systems	05	14,029	18,528	18,528			U

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119 1203176F	Combat Survivor Evader Locator	05	24,967	24,967	U
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102	0605432F	Polar MILSATCOM (SPACE)	05							U
103	0605433F	Wideband Global SATCOM (SPACE)	05							U
104	0605458F	Air & Space Ops Center 10.2 RDT&E	05				119,745		119,745	U
105	0605830F	Acq Workforce- Global Battle Mgmt	05							U
106	0605931F	B-2 Defensive Management System	05				194,570		194,570	U
107	0101125F	Nuclear Weapons Modernization	05				91,237		91,237	U
108	0207171F	F-15 EPAWSS	05				209,847		209,847	U
109	0207328F	Stand In Attack Weapon	05				3,400		3,400	U
110	0207423F	Advanced Communications Systems	05							U
111	0207701F	Full Combat Mission Training	05				16,727		16,727	U
112	0303267F	Auctioned Spectrum Relocation Fund	05							U
113	0303367F	Spectrum Access Research and Development	05							U
114	0305176F	Combat Survivor Evader Locator	05							U
115	0307581F	JSTARS Recap	05				417,201		417,201	U
116	0401310F	C-32 Executive Transport Recapitalization	05				6,017		6,017	U
117	0401319F	Presidential Aircraft Recapitalization (PAR)	05				434,069		434,069	U
118	0701212F	Automated Test Systems	05				18,528		18,528	U

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119 1203176F Combat Survivor Evader Locator 05

24,967

24,967 U

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102	0605432F	Polar MILSATCOM (SPACE)	05				U
103	0605433F	Wideband Global SATCOM (SPACE)	05				U
104	0605458F	Air & Space Ops Center 10.2 RDT&E	05				U
105	0605830F	Acq Workforce- Global Battle Mgmt	05	3,617		3,617	U
106	0605931F	B-2 Defensive Management System	05	261,758		261,758	U
107	0101125F	Nuclear Weapons Modernization	05	91,907		91,907	U
108	0207171F	F-15 EPAWSS	05	137,095		137,095	U
109	0207328F	Stand In Attack Weapon	05	43,175		43,175	U
110	0207423F	Advanced Communications Systems	05	14,888		14,888	U
111	0207701F	Full Combat Mission Training	05	1,015		1,015	U
112	0303267F	Auctioned Spectrum Relocation Fund	05				U
113	0303367F	Spectrum Access Research and Development	05				U
114	0305176F	Combat Survivor Evader Locator	05				U
115	0307581F	JSTARS Recap	05				U
116	0401310F	C-32 Executive Transport Recapitalization	05	7,943		7,943	U
117	0401319F	Presidential Aircraft Recapitalization (PAR)	05	673,032		673,032	U
118	0701212F	Automated Test Systems	05	13,653		13,653	U

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119 1203176F Combat Survivor Evader Locator 05 939 939 U

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120	1203269F	GPS IIIC	05						U
121	1203940F	Space Situation Awareness Operations	05		10,029	10,029			U
122	1206421F	Counterspace Systems	05		66,370	66,370			U
123	1206425F	Space Situation Awareness Systems	05		48,448	48,448			U
124	1206426F	Space Fence	05		35,937	35,937			U
125	1206431F	Advanced EHF MILSATCOM (SPACE)	05		145,610	145,610			U
126	1206432F	Polar MILSATCOM (SPACE)	05		33,644	33,644			U
127	1206433F	Wideband Global SATCOM (SPACE)	05		14,263	14,263			U
128	1206441F	Space Based Infrared System (SBIRS) High EMD	05		311,844	311,844			U
129	1206442F	Evolved SBIRS	05		71,018	71,018			U
130	1206853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05		297,572	297,572			U
		System Development & Demonstration		3,983,019	4,476,762	4,476,762			
131	0604256F	Threat Simulator Development	06	21,377	35,405	35,405			U
132	0604759F	Major T&E Investment	06	64,538	82,874	82,874			U
133	0605101F	RAND Project Air Force	06	33,373	34,346	34,346			U
134	0605502F	Small Business Innovation Research	06	407,570					U
135	0605712F	Initial Operational Test & Evaluation	06	13,829	15,523	15,523			U

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136 0605807F	Test and Evaluation Support	06	676,417	678,289	678,289	U
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120	1203269F	GPS IIIC	05							U
121	1203940F	Space Situation Awareness Operations	05				10,029		10,029	U
122	1206421F	Counterspace Systems	05				66,370		66,370	U
123	1206425F	Space Situation Awareness Systems	05				48,448		48,448	U
124	1206426F	Space Fence	05				35,937		35,937	U
125	1206431F	Advanced EHF MILSATCOM (SPACE)	05				145,610		145,610	U
126	1206432F	Polar MILSATCOM (SPACE)	05				33,644		33,644	U
127	1206433F	Wideband Global SATCOM (SPACE)	05				14,263		14,263	U
128	1206441F	Space Based Infrared System (SBIRS) High EMD	05				311,844		311,844	U
129	1206442F	Evolved SBIRS	05				71,018		71,018	U
130	1206853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05				297,572		297,572	U
		System Development & Demonstration		-----	-----	-----	4,476,762	-----	4,476,762	
131	0604256F	Threat Simulator Development	06				35,405		35,405	U
132	0604759F	Major T&E Investment	06				82,874		82,874	U
133	0605101F	RAND Project Air Force	06				34,346		34,346	U
134	0605502F	Small Business Innovation Research	06							U
135	0605712F	Initial Operational Test & Evaluation	06				15,523		15,523	U

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136 0605807F Test and Evaluation Support

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678,289

678,289 U

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Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
120	1203269F	GPS IIIC	05	451,889		451,889	U
121	1203940F	Space Situation Awareness Operations	05	46,668		46,668	U
122	1206421F	Counterspace Systems	05	20,676		20,676	U
123	1206425F	Space Situation Awareness Systems	05	134,463		134,463	U
124	1206426F	Space Fence	05	20,215		20,215	U
125	1206431F	Advanced EHF MILSATCOM (SPACE)	05	151,506		151,506	U
126	1206432F	Polar MILSATCOM (SPACE)	05	27,337		27,337	U
127	1206433F	Wideband Global SATCOM (SPACE)	05	3,970		3,970	U
128	1206441F	Space Based Infrared System (SBIRS) High EMD	05	60,565		60,565	U
129	1206442F	Evolved SBIRS	05	643,126		643,126	U
130	1206853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05	245,447		245,447	U
		System Development & Demonstration		5,272,191		5,272,191	
131	0604256F	Threat Simulator Development	06	34,256		34,256	U
132	0604759F	Major T&E Investment	06	91,844		91,844	U
133	0605101F	RAND Project Air Force	06	34,614		34,614	U
134	0605502F	Small Business Innovation Research	06				U
135	0605712F	Initial Operational Test & Evaluation	06	18,043		18,043	U

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136 0605807F Test and Evaluation Support 06 692,784 692,784 U

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137	0605826F	Acq Workforce- Global Power	06		219,809	219,809			U
138	0605827F	Acq Workforce- Global Vig & Combat Sys	06		223,179	223,179			U
139	0605828F	Acq Workforce- Global Reach	06		138,556	138,556			U
140	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06		221,393	221,393			U
141	0605830F	Acq Workforce- Global Battle Mgmt	06		152,577	152,577			U
142	0605831F	Acq Workforce- Capability Integration	06		196,561	196,561			U
143	0605832F	Acq Workforce- Advanced Prgm Technology	06		28,322	28,322			U
144	0605833F	Acq Workforce- Nuclear Systems	06		126,611	126,611			U
145	0605860F	Rocket Systems Launch Program (SPACE)	06	10,899					U
146	0605864F	Space Test Program (STP)	06	40,507					U
147	0605898F	Management HQ - R&D	06		9,154	9,154			U
148	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	134,111	135,507	135,507			U
149	0605978F	Facilities Sustainment - Test and Evaluation Support	06	28,091	28,720	28,720			U
150	0606017F	Requirements Analysis and Maturation	06	45,134	35,453	35,453			U

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151 0606116F Space Test and Training Range
Development

06

17,912

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137	0605826F	Acq Workforce- Global Power	06				219,809		219,809	U
138	0605827F	Acq Workforce- Global Vig & Combat Sys	06				223,179		223,179	U
139	0605828F	Acq Workforce- Global Reach	06				138,556		138,556	U
140	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06				221,393		221,393	U
141	0605830F	Acq Workforce- Global Battle Mgmt	06				152,577		152,577	U
142	0605831F	Acq Workforce- Capability Integration	06				196,561		196,561	U
143	0605832F	Acq Workforce- Advanced Prgm Technology	06				28,322		28,322	U
144	0605833F	Acq Workforce- Nuclear Systems	06				126,611		126,611	U
145	0605860F	Rocket Systems Launch Program (SPACE)	06							U
146	0605864F	Space Test Program (STP)	06							U
147	0605898F	Management HQ - R&D	06				9,154		9,154	U
148	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06				135,507		135,507	U
149	0605978F	Facilities Sustainment - Test and Evaluation Support	06				28,720		28,720	U
150	0606017F	Requirements Analysis and Maturation	06				35,453		35,453	U

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151 0606116F Space Test and Training Range 06
Development

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Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
137	0605826F	Acq Workforce- Global Power	06	233,924		233,924	U
138	0605827F	Acq Workforce- Global Vig & Combat Sys	06	263,488		263,488	U
139	0605828F	Acq Workforce- Global Reach	06	153,591		153,591	U
140	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06	232,315		232,315	U
141	0605830F	Acq Workforce- Global Battle Mgmt	06	169,868		169,868	U
142	0605831F	Acq Workforce- Capability Integration	06	226,219		226,219	U
143	0605832F	Acq Workforce- Advanced Prgm Technology	06	38,400		38,400	U
144	0605833F	Acq Workforce- Nuclear Systems	06	125,761		125,761	U
145	0605860F	Rocket Systems Launch Program (SPACE)	06				U
146	0605864F	Space Test Program (STP)	06				U
147	0605898F	Management HQ - R&D	06	10,642		10,642	U
148	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	162,216		162,216	U
149	0605978F	Facilities Sustainment - Test and Evaluation Support	06	28,888		28,888	U
150	0606017F	Requirements Analysis and Maturation	06	35,285		35,285	U

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152	0606392F	Space and Missile Center (SMC) Civilian Workforce	06	171,666					U
153	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	4,265	29,049	29,049			U
154	0702806F	Acquisition and Management Support	06	14,168	14,980	14,980			U
155	0804731F	General Skill Training	06	1,353	1,434	1,434			U
156	0909999F	Financing for Cancelled Account Adjustments	06	1,004					U
157	1001004F	International Activities	06	4,626	4,569	4,569			U
158	1206116F	Space Test and Training Range Development	06		25,773	25,773			U
159	1206392F	Space and Missile Center (SMC) Civilian Workforce	06		169,887	169,887			U
160	1206398F	Space & Missile Systems Center - MHA	06		9,531	9,531			U
161	1206860F	Rocket Systems Launch Program (SPACE)	06		20,975	20,975			U
162	1206864F	Space Test Program (STP)	06		25,398	25,398			U
		Management Support		1,690,840	2,663,875	2,663,875			
163	0603423F	Global Positioning System III - Operational Control Segment	07	376,645					U
164	0604222F	Nuclear Weapons Support	07		27,579	27,579			U
165	0604233F	Specialized Undergraduate Flight Training	07	17,754	5,776	5,776			U

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166 0604445F	Wide Area Surveillance	07	50,486	16,247	16,247	U
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152	0606392F	Space and Missile Center (SMC) Civilian Workforce	06							U
153	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06				29,049		29,049	U
154	0702806F	Acquisition and Management Support	06				14,980		14,980	U
155	0804731F	General Skill Training	06				1,434		1,434	U
156	0909999F	Financing for Cancelled Account Adjustments	06							U
157	1001004F	International Activities	06				4,569		4,569	U
158	1206116F	Space Test and Training Range Development	06				25,773		25,773	U
159	1206392F	Space and Missile Center (SMC) Civilian Workforce	06				169,887		169,887	U
160	1206398F	Space & Missile Systems Center - MHA	06				9,531		9,531	U
161	1206860F	Rocket Systems Launch Program (SPACE)	06				20,975		20,975	U
162	1206864F	Space Test Program (STP)	06				25,398		25,398	U
		Management Support					2,663,875		2,663,875	
163	0603423F	Global Positioning System III - Operational Control Segment	07							U
164	0604222F	Nuclear Weapons Support	07				27,579		27,579	U
165	0604233F	Specialized Undergraduate Flight Training	07				5,776		5,776	U

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166 0604445F Wide Area Surveillance

07

16,247

16,247 U

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152	0606392F	Space and Missile Center (SMC) Civilian Workforce	06				U
153	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	20,545		20,545	U
154	0702806F	Acquisition and Management Support	06	12,367		12,367	U
155	0804731F	General Skill Training	06	1,448		1,448	U
156	0909999F	Financing for Cancelled Account Adjustments	06				U
157	1001004F	International Activities	06	3,998		3,998	U
158	1206116F	Space Test and Training Range Development	06	23,254		23,254	U
159	1206392F	Space and Missile Center (SMC) Civilian Workforce	06	169,912		169,912	U
160	1206398F	Space & Missile Systems Center - MHA	06	10,508		10,508	U
161	1206860F	Rocket Systems Launch Program (SPACE)	06	19,721		19,721	U
162	1206864F	Space Test Program (STP)	06	25,620		25,620	U
		Management Support		2,839,511		2,839,511	
163	0603423F	Global Positioning System III - Operational Control Segment	07				U
164	0604222F	Nuclear Weapons Support	07				U
165	0604233F	Specialized Undergraduate Flight Training	07	11,344		11,344	U

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166 0604445F Wide Area Surveillance

07

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167	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	9,956	21,915	21,915			U
168	0605024F	Anti-Tamper Technology Executive Agency	07	32,646	33,150	33,150			U
169	0605117F	Foreign Materiel Acquisition and Exploitation	07	58,360	66,653	66,653			U
170	0605278F	HC/MC-130 Recap RDT&E	07		38,579	38,579			U
171	0606018F	NC3 Integration	07		12,636	12,636			U
172	0606942F	Assessments and Evaluations Cyber Vulnerabilities	07						U
173	0101113F	B-52 Squadrons	07	74,550	111,910	111,910			U
174	0101122F	Air-Launched Cruise Missile (ALCM)	07	437	463	463			U
175	0101126F	B-1B Squadrons	07	4,562	62,471	62,471			U
176	0101127F	B-2 Squadrons	07	122,973	193,108	193,108			U
177	0101213F	Minuteman Squadrons	07	173,718	210,845	210,845			U
178	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07	39,120	25,736	25,736			U
179	0101316F	Worldwide Joint Strategic Communications	07	5,876	6,272	6,272			U
180	0101324F	Integrated Strategic Planning & Analysis Network	07		11,032	11,032			U

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181 0101328F	ICBM Reentry Vehicles	07				U
183 0102110F	UH-1N Replacement Program	07	86,856	108,617	108,617	U

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167	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07				21,915		21,915	U
168	0605024F	Anti-Tamper Technology Executive Agency	07				33,150		33,150	U
169	0605117F	Foreign Materiel Acquisition and Exploitation	07				66,653		66,653	U
170	0605278F	HC/MC-130 Recap RDT&E	07				38,579		38,579	U
171	0606018F	NC3 Integration	07				12,636		12,636	U
172	0606942F	Assessments and Evaluations Cyber Vulnerabilities	07							U
173	0101113F	B-52 Squadrons	07				111,910		111,910	U
174	0101122F	Air-Launched Cruise Missile (ALCM)	07				463		463	U
175	0101126F	B-1B Squadrons	07				62,471		62,471	U
176	0101127F	B-2 Squadrons	07				193,108		193,108	U
177	0101213F	Minuteman Squadrons	07				210,845		210,845	U
178	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07				25,736		25,736	U
179	0101316F	Worldwide Joint Strategic Communications	07				6,272		6,272	U
180	0101324F	Integrated Strategic Planning & Analysis Network	07				11,032		11,032	U

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181 0101328F	ICBM Reentry Vehicles	07		U
183 0102110F	UH-1N Replacement Program	07	108,617	108,617 U

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167	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	47,287		47,287	U
168	0605024F	Anti-Tamper Technology Executive Agency	07	32,770		32,770	U
169	0605117F	Foreign Materiel Acquisition and Exploitation	07	68,368		68,368	U
170	0605278F	HC/MC-130 Recap RDT&E	07	32,574		32,574	U
171	0606018F	NC3 Integration	07	26,112		26,112	U
172	0606942F	Assessments and Evaluations Cyber Vulnerabilities	07	99,100		99,100	U
173	0101113F	B-52 Squadrons	07	280,414		280,414	U
174	0101122F	Air-Launched Cruise Missile (ALCM)	07	5,955		5,955	U
175	0101126F	B-1B Squadrons	07	76,030		76,030	U
176	0101127F	B-2 Squadrons	07	105,561		105,561	U
177	0101213F	Minuteman Squadrons	07	156,047		156,047	U
178	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07				U
179	0101316F	Worldwide Joint Strategic Communications	07	10,442		10,442	U
180	0101324F	Integrated Strategic Planning & Analysis Network	07	22,833		22,833	U

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181 0101328F	ICBM Reentry Vehicles	07	18,412	18,412	U
183 0102110F	UH-1N Replacement Program	07	288,022	288,022	U

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184	0102326F	Region/Sector Operation Control Center Modernization Program	07	10,868	3,347	3,347			U
185	0105921F	Service Support to STRATCOM - Space Activities	07	8,381					U
186	0205219F	MQ-9 UAV	07	167,239	201,394	201,394			U
187	0205671F	Joint Counter RCIED Electronic Warfare	07						U
188	0207131F	A-10 Squadrons	07	11,353	17,459	17,459			U
189	0207133F	F-16 Squadrons	07	132,113	246,578	246,578			U
190	0207134F	F-15E Squadrons	07	344,184	320,271	320,271			U
191	0207136F	Manned Destructive Suppression	07	12,697	15,106	15,106			U
192	0207138F	F-22A Squadrons	07	364,691	610,942	610,942			U
193	0207142F	F-35 Squadrons	07	73,905	334,530	334,530			U
194	0207161F	Tactical AIM Missiles	07	51,499	34,952	34,952			U
195	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	53,320	61,322	61,322			U
196	0207227F	Combat Rescue - Pararescue	07	350	693	693			U
197	0207247F	AF TENCAP	07	28,412					U
198	0207249F	Precision Attack Systems Procurement	07	625	1,714	1,714			U
199	0207253F	Compass Call	07	13,723	14,040	14,040			U

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200 0207268F	Aircraft Engine Component Improvement Program	07	106,049	109,243	109,243	U
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184	0102326F	Region/Sector Operation Control Center Modernization Program	07				3,347		3,347	U
185	0105921F	Service Support to STRATCOM - Space Activities	07							U
186	0205219F	MQ-9 UAV	07				201,394		201,394	U
187	0205671F	Joint Counter RCIED Electronic Warfare	07							U
188	0207131F	A-10 Squadrons	07				17,459		17,459	U
189	0207133F	F-16 Squadrons	07				246,578		246,578	U
190	0207134F	F-15E Squadrons	07				320,271		320,271	U
191	0207136F	Manned Destructive Suppression	07				15,106		15,106	U
192	0207138F	F-22A Squadrons	07				610,942		610,942	U
193	0207142F	F-35 Squadrons	07				334,530		334,530	U
194	0207161F	Tactical AIM Missiles	07				34,952		34,952	U
195	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07				61,322		61,322	U
196	0207227F	Combat Rescue - Pararescue	07				693		693	U
197	0207247F	AF TENCAP	07							U
198	0207249F	Precision Attack Systems Procurement	07				1,714		1,714	U
199	0207253F	Compass Call	07				14,040		14,040	U

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200 0207268F Aircraft Engine Component
Improvement Program

07

109,243

109,243 U

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184	0102326F	Region/Sector Operation Control Center Modernization Program	07	9,252		9,252	U
185	0105921F	Service Support to STRATCOM - Space Activities	07				U
186	0205219F	MQ-9 UAV	07	115,345	4,500	119,845	U
187	0205671F	Joint Counter RCIED Electronic Warfare	07		4,000	4,000	U
188	0207131F	A-10 Squadrons	07	26,738	1,000	27,738	U
189	0207133F	F-16 Squadrons	07	191,564		191,564	U
190	0207134F	F-15E Squadrons	07	192,883		192,883	U
191	0207136F	Manned Destructive Suppression	07	15,238		15,238	U
192	0207138F	F-22A Squadrons	07	603,553		603,553	U
193	0207142F	F-35 Squadrons	07	549,501		549,501	U
194	0207161F	Tactical AIM Missiles	07	37,230		37,230	U
195	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	61,393		61,393	U
196	0207227F	Combat Rescue - Pararescue	07	647		647	U
197	0207247F	AF TENCAP	07				U
198	0207249F	Precision Attack Systems Procurement	07	14,891		14,891	U
199	0207253F	Compass Call	07	13,901		13,901	U

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200 0207268F	Aircraft Engine Component Improvement Program	07	121,203	121,203	U
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201	0207277F	ISR Innovations	07				5,750	5,750	U
202	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	23,108	29,932	29,932			U
203	0207410F	Air & Space Operations Center (AOC)	07	29,916	26,956	26,956			U
204	0207412F	Control and Reporting Center (CRC)	07	12,854	2,450	2,450			U
205	0207417F	Airborne Warning and Control System (AWACS)	07	85,727	151,726	151,726			U
206	0207418F	Tactical Airborne Control Systems	07	2,353	3,656	3,656			U
208	0207431F	Combat Air Intelligence System Activities	07	15,461	13,420	13,420			U
209	0207444F	Tactical Air Control Party-Mod	07	11,437	10,623	10,623			U
210	0207448F	C2ISR Tactical Data Link	07	1,406	1,754	1,754			U
211	0207452F	DCAPES	07	13,286	17,382	17,382			U
212	0207573F	National Technical Nuclear Forensics	07		2,307	2,307			U
213	0207581F	Joint Surveillance/Target Attack Radar System (JSTARS)	07						U
214	0207590F	Seek Eagle	07	28,204	25,397	25,397			U
215	0207601F	USAF Modeling and Simulation	07	14,828	10,175	10,175			U
216	0207605F	Wargaming and Simulation Centers	07	4,090	12,839	12,839			U
217	0207610F	Battlefield Abn Comm Node (BACN)	07						U

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218 0207697F	Distributed Training and Exercises	07	4,241	4,190	4,190	U
219 0208006F	Mission Planning Systems	07	69,104	85,531	85,531	U

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201	0207277F	ISR Innovations	07				5,750		5,750	U
202	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07				29,932		29,932	U
203	0207410F	Air & Space Operations Center (AOC)	07				26,956		26,956	U
204	0207412F	Control and Reporting Center (CRC)	07				2,450		2,450	U
205	0207417F	Airborne Warning and Control System (AWACS)	07				151,726		151,726	U
206	0207418F	Tactical Airborne Control Systems	07				3,656		3,656	U
208	0207431F	Combat Air Intelligence System Activities	07				13,420		13,420	U
209	0207444F	Tactical Air Control Party-Mod	07				10,623		10,623	U
210	0207448F	C2ISR Tactical Data Link	07				1,754		1,754	U
211	0207452F	DCAPES	07				17,382		17,382	U
212	0207573F	National Technical Nuclear Forensics	07				2,307		2,307	U
213	0207581F	Joint Surveillance/Target Attack Radar System (JSTARS)	07							U
214	0207590F	Seek Eagle	07				25,397		25,397	U
215	0207601F	USAF Modeling and Simulation	07				10,175		10,175	U
216	0207605F	Wargaming and Simulation Centers	07				12,839		12,839	U
217	0207610F	Battlefield Abn Comm Node (BACN)	07							U

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218 0207697F	Distributed Training and Exercises	07	4,190	4,190 U
219 0208006F	Mission Planning Systems	07	85,531	85,531 U

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Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
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201	0207277F	ISR Innovations	07				U
202	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	60,062		60,062	U
203	0207410F	Air & Space Operations Center (AOC)	07	106,102		106,102	U
204	0207412F	Control and Reporting Center (CRC)	07	6,413		6,413	U
205	0207417F	Airborne Warning and Control System (AWACS)	07	120,664		120,664	U
206	0207418F	Tactical Airborne Control Systems	07	2,659		2,659	U
208	0207431F	Combat Air Intelligence System Activities	07	10,316		10,316	U
209	0207444F	Tactical Air Control Party-Mod	07	6,149		6,149	U
210	0207448F	C2ISR Tactical Data Link	07	1,738		1,738	U
211	0207452F	DCAPES	07	13,297		13,297	U
212	0207573F	National Technical Nuclear Forensics	07	1,788		1,788	U
213	0207581F	Joint Surveillance/Target Attack Radar System (JSTARS)	07	14,888		14,888	U
214	0207590F	Seek Eagle	07	24,699		24,699	U
215	0207601F	USAF Modeling and Simulation	07	17,078		17,078	U
216	0207605F	Wargaming and Simulation Centers	07	6,141		6,141	U
217	0207610F	Battlefield Abn Comm Node (BACN)	07		42,349	42,349	U

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218 0207697F	Distributed Training and Exercises	07	4,225	4,225	U
219 0208006F	Mission Planning Systems	07	63,653	63,653	U

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220	0208007F	Tactical Deception	07		3,761	3,761			U
221	0208087F	AF Offensive Cyberspace Operations	07	24,109	35,693	35,693	4,000	4,000	U
222	0208088F	AF Defensive Cyberspace Operations	07	38,035	20,964	20,964			U
223	0208097F	Joint Cyber Command and Control (JCC2)	07						U
224	0208099F	Unified Platform (UP)	07						U
228	0208288F	Intel Data Applications	07						U
229	0301017F	Global Sensor Integrated on Network (GSIN)	07	3,296	3,549	3,549			U
230	0301112F	Nuclear Planning and Execution System (NPES)	07	3,926	4,371	4,371			U
236	0301400F	Space Superiority Intelligence	07	12,380					U
237	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07		3,721	3,721			U
238	0302015F	E-4B National Airborne Operations Center (NAOC)	07	25,104	35,467	35,467			U
239	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07	50,071					U
240	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	40,099	48,841	48,841			U
241	0303133F	High Frequency Radio Systems	07						U

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242	0303140F	Information Systems Security Program	07	36,074	42,973	42,973	U
243	0303141F	Global Combat Support System	07	50	105	105	U

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220	0208007F	Tactical Deception	07				3,761		3,761	U
221	0208087F	AF Offensive Cyberspace Operations	07				39,693		39,693	U
222	0208088F	AF Defensive Cyberspace Operations	07				20,964		20,964	U
223	0208097F	Joint Cyber Command and Control (JCC2)	07							U
224	0208099F	Unified Platform (UP)	07							U
228	0208288F	Intel Data Applications	07							U
229	0301017F	Global Sensor Integrated on Network (GSIN)	07				3,549		3,549	U
230	0301112F	Nuclear Planning and Execution System (NPES)	07				4,371		4,371	U
236	0301400F	Space Superiority Intelligence	07							U
237	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07				3,721		3,721	U
238	0302015F	E-4B National Airborne Operations Center (NAOC)	07				35,467		35,467	U
239	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07							U
240	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07				48,841		48,841	U
241	0303133F	High Frequency Radio Systems	07							U

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242 0303140F	Information Systems Security Program 07	42,973	42,973 U
243 0303141F	Global Combat Support System 07	105	105 U

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220	0208007F	Tactical Deception	07	6,949		6,949	U
221	0208087F	AF Offensive Cyberspace Operations	07	40,526		40,526	U
222	0208088F	AF Defensive Cyberspace Operations	07	24,166		24,166	U
223	0208097F	Joint Cyber Command and Control (JCC2)	07	13,000		13,000	U
224	0208099F	Unified Platform (UP)	07	28,759		28,759	U
228	0208288F	Intel Data Applications	07		1,200	1,200	U
229	0301017F	Global Sensor Integrated on Network (GSIN)	07	3,579		3,579	U
230	0301112F	Nuclear Planning and Execution System (NPES)	07	29,620		29,620	U
236	0301400F	Space Superiority Intelligence	07				U
237	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07	6,633		6,633	U
238	0302015F	E-4B National Airborne Operations Center (NAOC)	07	57,758		57,758	U
239	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07				U
240	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	99,088		99,088	U
241	0303133F	High Frequency Radio Systems	07	51,612		51,612	U

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242	0303140F	Information Systems Security Program 07	34,612	34,612	U
243	0303141F	Global Combat Support System	07		U

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244	0303142F	Global Force Management - Data Initiative	07	1,851	2,147	2,147			U
246	0304260F	Airborne SIGINT Enterprise	07	95,284	121,948	121,948			U
247	0304310F	Commercial Economic Analysis	07		3,544	3,544			U
250	0305015F	C2 Air Operations Suite - C2 Info Services	07						U
251	0305020F	CCMD Intelligence Information Technology	07	1,507	1,542	1,542			U
252	0305099F	Global Air Traffic Management (GATM)	07	4,219	4,453	4,453			U
253	0305110F	Satellite Control Network (SPACE)	07	14,099					U
254	0305111F	Weather Service	07	24,193	26,654	26,654			U
255	0305114F	Air Traffic Control, Approach, and Landing System (ATCAL)	07	17,732	6,306	6,306			U
256	0305116F	Aerial Targets	07	2,981	21,295	21,295			U
259	0305128F	Security and Investigative Activities	07	405	415	415			U
260	0305145F	Arms Control Implementation	07	4,667					U
261	0305146F	Defense Joint Counterintelligence Activities	07	339	3,867	3,867			U
264	0305173F	Space and Missile Test and Evaluation Center	07	4,250					U
265	0305174F	Space Innovation, Integration and	07	6,233					U

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266 0305179F Integrated Broadcast Service (IBS) 07 8,833

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244	0303142F	Global Force Management - Data Initiative	07				2,147		2,147	U
246	0304260F	Airborne SIGINT Enterprise	07				121,948		121,948	U
247	0304310F	Commercial Economic Analysis	07				3,544		3,544	U
250	0305015F	C2 Air Operations Suite - C2 Info Services	07							U
251	0305020F	CCMD Intelligence Information Technology	07				1,542		1,542	U
252	0305099F	Global Air Traffic Management (GATM)	07				4,453		4,453	U
253	0305110F	Satellite Control Network (SPACE)	07							U
254	0305111F	Weather Service	07				26,654		26,654	U
255	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07				6,306		6,306	U
256	0305116F	Aerial Targets	07				21,295		21,295	U
259	0305128F	Security and Investigative Activities	07				415		415	U
260	0305145F	Arms Control Implementation	07							U
261	0305146F	Defense Joint Counterintelligence Activities	07				3,867		3,867	U
264	0305173F	Space and Missile Test and Evaluation Center	07							U
265	0305174F	Space Innovation, Integration and	07							U

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Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
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244	0303142F	Global Force Management - Data Initiative	07	2,170		2,170	U
246	0304260F	Airborne SIGINT Enterprise	07	106,873		106,873	U
247	0304310F	Commercial Economic Analysis	07	3,472		3,472	U
250	0305015F	C2 Air Operations Suite - C2 Info Services	07	8,608		8,608	U
251	0305020F	CCMD Intelligence Information Technology	07	1,586		1,586	U
252	0305099F	Global Air Traffic Management (GATM)	07	4,492		4,492	U
253	0305110F	Satellite Control Network (SPACE)	07				U
254	0305111F	Weather Service	07	26,942	3,000	29,942	U
255	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07	6,271		6,271	U
256	0305116F	Aerial Targets	07	8,383		8,383	U
259	0305128F	Security and Investigative Activities	07	418		418	U
260	0305145F	Arms Control Implementation	07				U
261	0305146F	Defense Joint Counterintelligence Activities	07	3,845		3,845	U
264	0305173F	Space and Missile Test and Evaluation Center	07				U
265	0305174F	Space Innovation, Integration and	07				U

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267	0305182F	Spacelift Range System (SPACE)	07	21,082					U
268	0305202F	Dragon U-2	07	37,217	34,486	34,486			U
269	0305205F	Endurance Unmanned Aerial Vehicles	07	50,000					U
270	0305206F	Airborne Reconnaissance Systems	07	13,465	4,450	4,450			U
271	0305207F	Manned Reconnaissance Systems	07	20,975	14,269	14,269			U
272	0305208F	Distributed Common Ground/Surface Systems	07	18,898	27,501	27,501			U
273	0305220F	RQ-4 UAV	07	244,807	214,849	214,849			U
274	0305221F	Network-Centric Collaborative Targeting	07	18,088	18,842	18,842			U
275	0305238F	NATO AGS	07	38,904	44,729	44,729			U
276	0305240F	Support to DCGS Enterprise	07	23,084	26,349	26,349			U
277	0305265F	GPS III Space Segment	07	165,794					U
278	0305600F	International Intelligence Technology and Architectures	07	2,360	3,491	3,491			U
279	0305614F	JSPOC Mission System	07	76,467					U
280	0305881F	Rapid Cyber Acquisition	07	4,123	4,899	4,899			U
281	0305906F	NCCM - TW/AA System	07	4,951					U
282	0305913F	NUDET Detection System (SPACE)	07	21,093					U
283	0305940F	Space Situation Awareness Operations	07	92,482					U

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284 0305984F	Personnel Recovery Command & Ctrl (PRC2)	07	2,445	2,445	U
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267	0305182F	Spacelift Range System (SPACE)	07							U
268	0305202F	Dragon U-2	07				34,486		34,486	U
269	0305205F	Endurance Unmanned Aerial Vehicles	07							U
270	0305206F	Airborne Reconnaissance Systems	07				4,450		4,450	U
271	0305207F	Manned Reconnaissance Systems	07				14,269		14,269	U
272	0305208F	Distributed Common Ground/Surface Systems	07				27,501		27,501	U
273	0305220F	RQ-4 UAV	07				214,849		214,849	U
274	0305221F	Network-Centric Collaborative Targeting	07				18,842		18,842	U
275	0305238F	NATO AGS	07				44,729		44,729	U
276	0305240F	Support to DCGS Enterprise	07				26,349		26,349	U
277	0305265F	GPS III Space Segment	07							U
278	0305600F	International Intelligence Technology and Architectures	07				3,491		3,491	U
279	0305614F	JSPOC Mission System	07							U
280	0305881F	Rapid Cyber Acquisition	07				4,899		4,899	U
281	0305906F	NCCM - TW/AA System	07							U
282	0305913F	NUDET Detection System (SPACE)	07							U
283	0305940F	Space Situation Awareness Operations	07							U

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284 0305984F Personnel Recovery Command & Ctrl 07
(PRC2)

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Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
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267	0305182F	Spacelift Range System (SPACE)	07				U
268	0305202F	Dragon U-2	07	48,518	22,100	70,618	U
269	0305205F	Endurance Unmanned Aerial Vehicles	07				U
270	0305206F	Airborne Reconnaissance Systems	07	175,334		175,334	U
271	0305207F	Manned Reconnaissance Systems	07	14,223		14,223	U
272	0305208F	Distributed Common Ground/Surface Systems	07	24,554	29,500	54,054	U
273	0305220F	RQ-4 UAV	07	221,690		221,690	U
274	0305221F	Network-Centric Collaborative Targeting	07	14,288		14,288	U
275	0305238F	NATO AGS	07	51,527		51,527	U
276	0305240F	Support to DCGS Enterprise	07	26,579		26,579	U
277	0305265F	GPS III Space Segment	07				U
278	0305600F	International Intelligence Technology and Architectures	07	8,464		8,464	U
279	0305614F	JSPOC Mission System	07				U
280	0305881F	Rapid Cyber Acquisition	07	4,303		4,303	U
281	0305906F	NCCM - TW/AA System	07				U
282	0305913F	NUDET Detection System (SPACE)	07				U
283	0305940F	Space Situation Awareness Operations	07				U

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284 0305984F Personnel Recovery Command & Ctrl 07 2,466 2,466 U
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285	0307577F	Intelligence Mission Data (IMD)	07		8,684	8,684			U
286	0308699F	Shared Early Warning (SEW)	07	6,154					U
287	0401115F	C-130 Airlift Squadron	07	15,599	10,219	10,219			U
288	0401119F	C-5 Airlift Squadrons (IF)	07	65,057	22,758	22,758			U
289	0401130F	C-17 Aircraft (IF)	07	12,021	34,287	34,287			U
290	0401132F	C-130J Program	07	16,199	26,821	26,821			U
291	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	5,011	5,283	5,283			U
292	0401218F	KC-135s	07		9,942	9,942			U
293	0401219F	KC-10s	07	3,500	7,933	7,933			U
294	0401314F	Operational Support Airlift	07	13,332	6,681	6,681			U
295	0401318F	CV-22	07	27,704	22,519	22,519			U
296	0401840F	AMC Command and Control System	07		3,510	3,510			U
297	0408011F	Special Tactics / Combat Control	07	6,902	8,090	8,090			U
298	0702207F	Depot Maintenance (Non-IF)	07	1,507	1,528	1,528			U
299	0708055F	Maintenance, Repair & Overhaul System	07		31,677	31,677			U
300	0708610F	Logistics Information Technology (LOGIT)	07	53,369	33,344	33,344			U
301	0708611F	Support Systems Development	07	10,552	9,362	9,362			U

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302 0804743F	Other Flight Training	07	1,841	2,074	2,074	U
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285	0307577F	Intelligence Mission Data (IMD)	07				8,684		8,684	U
286	0308699F	Shared Early Warning (SEW)	07							U
287	0401115F	C-130 Airlift Squadron	07				10,219		10,219	U
288	0401119F	C-5 Airlift Squadrons (IF)	07				22,758		22,758	U
289	0401130F	C-17 Aircraft (IF)	07				34,287		34,287	U
290	0401132F	C-130J Program	07				26,821		26,821	U
291	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07				5,283		5,283	U
292	0401218F	KC-135s	07				9,942		9,942	U
293	0401219F	KC-10s	07				7,933		7,933	U
294	0401314F	Operational Support Airlift	07				6,681		6,681	U
295	0401318F	CV-22	07				22,519		22,519	U
296	0401840F	AMC Command and Control System	07				3,510		3,510	U
297	0408011F	Special Tactics / Combat Control	07				8,090		8,090	U
298	0702207F	Depot Maintenance (Non-IF)	07				1,528		1,528	U
299	0708055F	Maintenance, Repair & Overhaul System	07				31,677		31,677	U
300	0708610F	Logistics Information Technology (LOGIT)	07				33,344		33,344	U
301	0708611F	Support Systems Development	07				9,362		9,362	U

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302 0804743F Other Flight Training

07

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285	0307577F	Intelligence Mission Data (IMD)	07	4,117		4,117	U
286	0308699F	Shared Early Warning (SEW)	07				U
287	0401115F	C-130 Airlift Squadron	07	105,988		105,988	U
288	0401119F	C-5 Airlift Squadrons (IF)	07	25,071		25,071	U
289	0401130F	C-17 Aircraft (IF)	07	48,299		48,299	U
290	0401132F	C-130J Program	07	15,409		15,409	U
291	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	4,334		4,334	U
292	0401218F	KC-135s	07	3,493		3,493	U
293	0401219F	KC-10s	07	6,569		6,569	U
294	0401314F	Operational Support Airlift	07	3,172		3,172	U
295	0401318F	CV-22	07	18,502		18,502	U
296	0401840F	AMC Command and Control System	07	1,688		1,688	U
297	0408011F	Special Tactics / Combat Control	07	2,541		2,541	U
298	0702207F	Depot Maintenance (Non-IF)	07	1,897		1,897	U
299	0708055F	Maintenance, Repair & Overhaul System	07	50,933		50,933	U
300	0708610F	Logistics Information Technology (LOGIT)	07	13,787		13,787	U
301	0708611F	Support Systems Development	07	4,497		4,497	U

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302 0804743F	Other Flight Training	07	2,022	2,022	U
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303	0808716F	Other Personnel Activities	07	57	107	107			U
304	0901202F	Joint Personnel Recovery Agency	07	3,556	2,006	2,006			U
305	0901218F	Civilian Compensation Program	07	2,878	3,780	3,780			U
306	0901220F	Personnel Administration	07	4,968	7,472	7,472			U
307	0901226F	Air Force Studies and Analysis Agency	07	1,415	1,563	1,563			U
308	0901538F	Financial Management Information Systems Development	07	10,478	91,211	91,211			U
309	1201921F	Service Support to STRATCOM - Space Activities	07		14,255	14,255			U
310	1202247F	AF TENCAP	07		31,914	31,914			U
311	1203001F	Family of Advanced BLoS Terminals (FAB-T)	07		32,426	32,426			U
312	1203110F	Satellite Control Network (SPACE)	07		18,808	18,808			U
314	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	07		10,029	10,029			U
315	1203173F	Space and Missile Test and Evaluation Center	07		25,051	25,051			U
316	1203174F	Space Innovation, Integration and Rapid Technology Development	07		11,390	11,390			U
317	1203179F	Integrated Broadcast Service (IBS)	07		8,747	8,747			U
318	1203182F	Spacelift Range System (SPACE)	07		10,549	10,549			U

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319 1203265F	GPS III Space Segment	07	243,435	243,435	U
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303	0808716F	Other Personnel Activities	07				107		107	U
304	0901202F	Joint Personnel Recovery Agency	07				2,006		2,006	U
305	0901218F	Civilian Compensation Program	07				3,780		3,780	U
306	0901220F	Personnel Administration	07				7,472		7,472	U
307	0901226F	Air Force Studies and Analysis Agency	07				1,563		1,563	U
308	0901538F	Financial Management Information Systems Development	07				91,211		91,211	U
309	1201921F	Service Support to STRATCOM - Space Activities	07				14,255		14,255	U
310	1202247F	AF TENCAP	07				31,914		31,914	U
311	1203001F	Family of Advanced BLoS Terminals (FAB-T)	07				32,426		32,426	U
312	1203110F	Satellite Control Network (SPACE)	07				18,808		18,808	U
314	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	07				10,029		10,029	U
315	1203173F	Space and Missile Test and Evaluation Center	07				25,051		25,051	U
316	1203174F	Space Innovation, Integration and Rapid Technology Development	07				11,390		11,390	U
317	1203179F	Integrated Broadcast Service (IBS)	07				8,747		8,747	U
318	1203182F	Spacelift Range System (SPACE)	07				10,549		10,549	U

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319 1203265F GPS III Space Segment

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303	0808716F	Other Personnel Activities	07	108		108	U
304	0901202F	Joint Personnel Recovery Agency	07	2,023		2,023	U
305	0901218F	Civilian Compensation Program	07	3,772		3,772	U
306	0901220F	Personnel Administration	07	6,358		6,358	U
307	0901226F	Air Force Studies and Analysis Agency	07	1,418		1,418	U
308	0901538F	Financial Management Information Systems Development	07	99,734		99,734	U
309	1201921F	Service Support to STRATCOM - Space Activities	07	14,161		14,161	U
310	1202247F	AF TENCAP	07	26,986	5,000	31,986	U
311	1203001F	Family of Advanced BLoS Terminals (FAB-T)	07	80,168		80,168	U
312	1203110F	Satellite Control Network (SPACE)	07	17,808		17,808	U
314	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	07	8,937		8,937	U
315	1203173F	Space and Missile Test and Evaluation Center	07	59,935		59,935	U
316	1203174F	Space Innovation, Integration and Rapid Technology Development	07	21,019		21,019	U
317	1203179F	Integrated Broadcast Service (IBS)	07	8,568		8,568	U
318	1203182F	Spacelift Range System (SPACE)	07	10,641		10,641	U

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319 1203265F GPS III Space Segment 07 144,543 144,543 U

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320	1203400F	Space Superiority Intelligence	07		12,691	12,691			U
321	1203614F	JSpOC Mission System	07		99,455	99,455			U
322	1203620F	National Space Defense Center	07		18,052	18,052			U
323	1203699F	Shared Early Warning (SEW)	07		1,373	1,373			U
324	1203906F	NCMC - TW/AA System	07		5,000	5,000			U
325	1203913F	NUDET Detection System (SPACE)	07		31,508	31,508			U
326	1203940F	Space Situation Awareness Operations	07		99,984	99,984			U
327	1206423F	Global Positioning System III - Operational Control Segment	07		510,938	510,938			U
9999	9999999999	Classified Programs		12,971,689	14,938,002	14,938,002	112,408	112,408	U
		Operational Systems Development		17,256,679	20,585,302	20,585,302	122,158	122,158	
328	0901560F	Continuing Resolution Programs	20		-7,336,882	-7,336,882	229,847	229,847	U
		Undistributed			-7,336,882	-7,336,882	229,847	229,847	
Total Research, Development, Test & Eval, AF				28,381,681	27,577,477	27,577,477	365,205	365,205	

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320	1203400F	Space Superiority Intelligence	07				12,691		12,691	U
321	1203614F	JSpOC Mission System	07				99,455		99,455	U
322	1203620F	National Space Defense Center	07				18,052		18,052	U
323	1203699F	Shared Early Warning (SEW)	07				1,373		1,373	U
324	1203906F	NCMC - TW/AA System	07				5,000		5,000	U
325	1203913F	NUDET Detection System (SPACE)	07				31,508		31,508	U
326	1203940F	Space Situation Awareness Operations	07				99,984		99,984	U
327	1206423F	Global Positioning System III - Operational Control Segment	07				510,938		510,938	U
9999	9999999999	Classified Programs		165,244	-165,244		15,215,654	-165,244	15,050,410	U
		Operational Systems Development					20,872,704		20,707,460	
328	0901560F	Continuing Resolution Programs	20				-7,107,035		-7,107,035	U
		Undistributed					-7,107,035		-7,107,035	
Total Research, Development, Test & Eval, AF				255,744	-255,744		28,198,426	-255,744	27,942,682	

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320	1203400F	Space Superiority Intelligence	07	16,278		16,278	U
321	1203614F	JSpOC Mission System	07	72,256		72,256	U
322	1203620F	National Space Defense Center	07	42,209		42,209	U
323	1203699F	Shared Early Warning (SEW)	07				U
324	1203906F	NCMC - TW/AA System	07				U
325	1203913F	NUDET Detection System (SPACE)	07	19,778		19,778	U
326	1203940F	Space Situation Awareness Operations	07	19,572		19,572	U
327	1206423F	Global Positioning System III - Operational Control Segment	07	513,235		513,235	U
9999	9999999999	Classified Programs		16,247,930	474,321	16,722,251	U
		Operational Systems Development		22,605,546	586,970	23,192,516	
328	0901560F	Continuing Resolution Programs	20				U
		Undistributed					
Total Research, Development, Test & Eval, AF				39,892,149	600,465	40,492,614	

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**Fiscal Year (FY) 2019 Budget Estimates
RDT&E Descriptive Summaries
Budget Activities
February 2018**

INTRODUCTION AND EXPLANATION OF CONTENTS

1. (U) GENERAL

A. This document has been prepared to provide information on the United States Air Force (USAF) Research, Development, Test and Evaluation (RDT&E) program elements and projects in the FY 2019 President's Budget (PB).

1) All exhibits in this document have been assembled in accordance with DoD 7000.14R, Financial Management Regulation, Volume 2B, Chapter 5, Section 050402. Exception:

a) Exhibit R-1, RDT&E Program, which was distributed under a separate cover due to classification.

2) Other comments on exhibit contents in this document:

a) Exhibits R-2/2a and R-3 provide narrative information for all RDT&E program elements and projects within the USAF FY 2019 RDT&E program with the exception of classified program elements. The format and contents of this document are in accordance to the guidelines and requirements of the Congressional committees in so far as possible.

b) The "Other Program Funding Summary portion of the R-2 includes, in addition to RDT&E funds, Procurement funds and quantities, Military Construction appropriation funds on specific development programs, Operations and Maintenance appropriation funds where they are essential to the development effort described, and where appropriate, Department of Energy (DOE) costs.

2. (U) CLASSIFICATION

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

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In the Fiscal Year (FY) 2019 President's Budget

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 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0603423F / <i>Global Positioning System III - Operational Control Segment</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	376.645	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A021: OCX	-	316.931	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A025: <i>GPS Enterprise Integrator</i>	-	59.714	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

In FY2018, PE 0603423F, Global Positioning System III - Operational Control Segment efforts were transferred to PE 1206423F, Global Positioning System III - Operational Control Segment, due to the creation of a new Major Force Program for Space. FY2017 funding is documented in the exhibits for PE 1206423F.

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	513.268	0.000	0.000	0.000	0.000
Current President's Budget	376.645	0.000	0.000	0.000	0.000
Total Adjustments	-136.623	0.000	0.000	0.000	0.000
• Congressional General Reductions	-2.907	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	-13.716	0.000			
• Other Adjustments	-120.000	0.000		0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0603423F / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A021 / OCX
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
67A021: OCX	-	316.931	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission Description not provided.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0603423F / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A025 / <i>GPS Enterprise Integrator</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>67A025: GPS Enterprise Integrator</i>	-	59.714	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission Description not provided.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0604222F / <i>Nuclear Weapons Support</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	27.579	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	27.579
674237: <i>EMP Certification</i>	-	0.000	27.579	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	27.579

A. Mission Description and Budget Item Justification

This program executes and provides technical and programmatic support to the testing, evaluation, and mitigation of effects of nuclear weapon employment that impact Air Force systems with initial emphasis on existing nuclear weapons, their delivery systems, and associated communications systems. It includes facilities and equipment required to perform testing, risk assessments, survivability/vulnerability studies, and effectiveness evaluation of various mitigation strategies. It includes modeling and simulation efforts for systems of systems analysis where assessments are not possible through testing alone. This program will recommend upgrades to existing/fielded systems as well as informing requirements for future (modernization/recapitalization) 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.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	27.579	0.000	0.000	0.000
Current President's Budget	0.000	27.579	0.000	0.000	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

No Significant Changes

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0604222F / Nuclear Weapons Support				Project (Number/Name) 674237 / EMP Certification			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
674237: EMP Certification	-	0.000	27.579	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	27.579
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program executes and provides technical and programmatic support to the testing, evaluation, and mitigation of effects of nuclear weapon employment that impact Air Force systems with initial emphasis on existing nuclear weapons, their delivery systems, and associated communications systems. It includes facilities and equipment required to perform testing, risk assessments, survivability/vulnerability studies, and effectiveness evaluation of various mitigation strategies. It includes modeling and simulation efforts for systems of systems analysis where assessments are not possible through testing alone. This program will recommend upgrades to existing/fielded systems as well as informing requirements for future (modernization/recapitalization) systems.

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019
Title: Electronic Magnetic Pulse (EMP)	0.000	27.579	0.000
Description: Provide technical and programmatic support required to test, evaluate, and mitigate Electromagnetic Pulse (EMP) impacts across all Air Force systems with initial emphasis on existing nuclear weapons, their delivery systems, and associated communications systems			
FY 2018 Plans: Begin technical and programmatic support required to test, evaluate, and mitigate Electromagnetic Pulse (EMP) impacts across all Air Force systems with initial emphasis on existing nuclear weapons, their delivery systems, and associated communications systems. It includes facilities and equipment required to perform EMP testing, risk assessments, survivability/vulnerability studies, and effectiveness evaluation of various mitigation strategies. It includes modeling and simulation efforts for systems of systems analysis where assessments are not possible through testing alone. This program will recommend upgrades to existing systems as well as informing requirements for future systems.			
FY 2019 Plans: N/A			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease due to higher Air Force priorities.			
Accomplishments/Planned Programs Subtotals	0.000	27.579	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604222F / <i>Nuclear Weapons Support</i>	Project (Number/Name) 674237 / <i>EMP Certification</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 05 64222F/654236: <i>Engineering Analysis</i>	-	3.009	3.001	-	3.001	4.002	4.500	4.511	4.592	0.000	23.615
• RDTE 05 64222F/655708: <i>Weapon Storage Facility</i> <i>Material Handling System</i>	-	-	1.500	-	1.500	2.000	12.000	7.000	2.000	0.000	24.500

Remarks

D. Acquisition Strategy

Funds will be MIPR'd to Navy at Patuxent River to perform testing of AF aircraft/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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604222F / Nuclear Weapons Support	Project (Number/Name) 674237 / EMP Certification
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NWC, Pax River	MIPR	US Navy : Patuxent River, MD	-	-		25.579	Mar 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	-		25.579		-		-		-	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support (PMA)	TBD	Various : Various	-	-		2.000	Mar 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	-		2.000		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	27.579	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604222F / Nuclear Weapons Support	Project (Number/Name) 674237 / EMP Certification
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
EMP Certification																												
Award and MIPR acceptance																												
Survivability and vulnerability studies																												
Testing and Analysis																												
Final Reports																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604222F / <i>Nuclear Weapons Support</i>	Project (Number/Name) 674237 / <i>EMP Certification</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>EMP Certification</i>				
Award and MIPR acceptance	1	2018	1	2018
Survivability and vulnerability studies	1	2018	4	2018
Testing and Analysis	2	2018	2	2019
Final Reports	3	2019	3	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	17.754	5.776	11.344	0.000	11.344	3.243	2.173	2.413	2.458	Continuing	Continuing
674101: <i>Undergraduate Remotely Piloted Aircraft Training</i>	-	3.598	0.758	0.771	0.000	0.771	0.796	0.810	0.827	0.842	Continuing	Continuing
676035: <i>T-6 Operational System Development</i>	-	1.745	3.008	1.776	0.000	1.776	1.280	0.175	0.376	0.384	Continuing	Continuing
676037: <i>T-38 Operational System Development</i>	-	12.411	2.010	8.797	0.000	8.797	1.167	1.188	1.210	1.232	Continuing	Continuing

Note
This program, BA 7, PE 0604233F, project 676035, Crash Survivable Recorder (CSR), is a new start.

A. Mission Description and Budget Item Justification

Supports Air Education and Training Command's implementation of Specialized Undergraduate Pilot Training and the Department of Defense initiative for joint pilot training.

Undergraduate Remotely Piloted Aircraft Training supports Air Education and Training Command's implementation of Undergraduate Remotely Piloted Aircraft Training. This program provides and maintains the currency of Predator Reaper Integrated Mission Environment Desktop Training System.

T-6 Operational System Development continues follow on development activities to JPATS including studies & development efforts to support future ACAT III Engineering Change Proposals (ECPs) to the T-6 Aircraft, instructional courseware, and logistics support to include Diminishing Manufacturing Sources and Material Shortages (DMSMS) and development activities related to DMSMS. Included is development for the FAA mandated ACAT III program for Automatic Dependent Surveillance - Broadcast (ADS-B) Out and associated upgrades.

T-38 program will continue development of a replacement Mission Display Processor, refurbishment of the existing Heads-Up Display, development and integration of an Automatic Dependent Surveillance-Broadcast solution, as well as replacement of the Very High Frequency Communication radio system and the Very High Frequency Navigation system. Developmental Testing is projected to begin in the 2nd quarter of FY18. Production and deployment of the replacement systems is projected to begin in 2QFY2019.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Specialized Undergraduate Flight Training 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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>
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This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	15.427	5.776	10.992	0.000	10.992
Current President's Budget	17.754	5.776	11.344	0.000	11.344
Total Adjustments	2.327	0.000	0.352	0.000	0.352
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	3.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.673	0.000			
• Other Adjustments	0.000	0.000	0.352	0.000	0.352

Change Summary Explanation

The \$3.000M Congressional add in FY17 was to support Remotely Piloted Aircraft training.
The -\$0.673M is due to the Small Business Innovative Research tax.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>				Project (Number/Name) 674101 / <i>Undergraduate Remotely Piloted Aircraft Training</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
674101: <i>Undergraduate Remotely Piloted Aircraft Training</i>	-	3.598	0.758	0.771	0.000	0.771	0.796	0.810	0.827	0.842	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This effort supports Air Education and Training Command's (AETC) implementation of Undergraduate Remotely Piloted Aircraft (RPA) Training (URT). URT produces RPA pilots and Sensor Operators from accession sources to man RPA squadrons. Success of the program is heavily dependent on Predator Reaper Integrated Mission Environment (PRIME) Desktop Training System to prepare undergraduate students for entry in RPA Formal Training Units (FTU). PRIME has completed six Phases of development and is now at baseline functionality. PRIME is a desktop trainer similar to the Reaper training system now in use to train undergraduate RPA pilots and sensor operators. PRIME currently emulates the MQ-9 Reaper and needs to keep pace with that baseline system and expand to other RPAs in order to maintain concurrency and relevancy. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortage (DMSMS) issues. Diminishing Manufacturing Sources efforts 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. Implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Predator Reaper Integrated Mission Environment (PRIME) support	3.598	0.758	0.771	-	0.771
Description: Add Phase 7 operational capabilities.					
FY 2018 Plans: Continue to extend and enhance interoperability between PRIME and Modern Air Combat Environment (MACE) software incorporated in Phase 7 for instructor operations and entity generation. Add additional instrumentation functionality. Add multiple emergency missions. Add additional entity functionality. Phase 8 planning that was originally planned to occur has been pushed out awaiting completion of Phase 7.					
FY 2019 Base Plans: Continue to extend and enhance interoperability between PRIME and Modern Air Combat Environment (MACE) software incorporated in Phase 7 for instructor operations and entity generation. Add additional instrumentation functionality. Add multiple emergency missions. Add additional entity functionality. Phase 8 planning that was originally planned to occur has been pushed out awaiting completion of Phase 7.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 674101 / <i>Undergraduate Remotely Piloted Aircraft Training</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Inflation adjustment					
Accomplishments/Planned Programs Subtotals	3.598	0.758	0.771	-	0.771

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

N/A

Remarks

D. Acquisition Strategy

Contract via Training Systems Acquisition III (TSA III) to Cubic Corporation, parent company of PRIME software data rights owner (Intific).

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 674101 / <i>Undergraduate Remotely Piloted Aircraft Training</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Undergraduate Remotely Piloted Aircraft Training Phased planning, design, and development of software updates	SS/FFP	Cubic Corporation : NV	-	3.528	Mar 2017	0.688	Mar 2018	0.707	Mar 2019	-		0.707	Continuing	Continuing	-
Subtotal			-	3.528		0.688		0.707		-		0.707	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Undergraduate Remotely Piloted Aircraft Training PMA	SS/CPFF	Program Office : WPAFB, OH	-	0.070	Oct 2016	0.070	Oct 2017	0.064	Oct 2018	-		0.064	Continuing	Continuing	-
Subtotal			-	0.070		0.070		0.064		-		0.064	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.598	0.758	0.771	-	0.771	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 674101 / <i>Undergraduate Remotely Piloted Aircraft Training</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Predator Reaper Integrated Mission Environment (PRIME) Support</i>	
Phase 7 Design/Development follow on	██████████
Phase 7 Design/Development continued	██████████
Phase 8 Planning	██████████
Phase 8 Design/Development	██████████
Phase 8 Design/Development continued	██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 674101 / <i>Undergraduate Remotely Piloted Aircraft Training</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Predator Reaper Integrated Mission Environment (PRIME) Support</i>				
Phase 7 Design/Development follow on	3	2017	2	2018
Phase 7 Design/Development continued	2	2018	1	2019
Phase 8 Planning	1	2019	1	2020
Phase 8 Design/Development	2	2020	4	2021
Phase 8 Design/Development continued	2	2021	1	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>				Project (Number/Name) 676035 / <i>T-6 Operational System Development</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676035: <i>T-6 Operational System Development</i>	-	1.745	3.008	1.776	0.000	1.776	1.280	0.175	0.376	0.384	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0604233F, project 676035, Crash Survivable Recorder (CSR), is a new start.

A. Mission Description and Budget Item Justification

T-6 Operational System Development continues follow on development activities to JPATS including but not limited to studies & development efforts to support future ACAT III Engineering Change Proposals (ECPs) to the T-6 Aircraft, instructional courseware, and logistics support to include Diminishing Manufacturing Sources and Material Shortages (DMSMS) and development activities related to DMSMS. Included is development for the FAA mandated ACAT III program for Automatic Dependent Surveillance - Broadcast (ADS-B) Out and associated upgrades. Other ACAT III development activities include Crash Survivable Recorder (CSR).

Funding contained in this platform's documentation directly aids Air Education Training Command flying training enterprise to continue its overall pilot production increase starting in FY2020 thus reducing the USAF Pilot Shortage.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: T-6 (JPATS) Studies	0.000	0.209	1.576	-	1.576
Description: T-6 studies and development activities to support engine upgrades and future ACAT III Engineering Change Proposals (ECPs) to the T-6 (JPATS) aircraft and engine. Includes engineering and contractor support/services and PMA costs.					
FY 2018 Plans: T-6 Aircraft studies and development activities including but not limited to: the T-6 parachute surveillance study, safe/arm handle development, Electronic Flight Bag and Engine Preservation.					
FY 2019 Base Plans: T-6 Aircraft studies and development activities including but not limited to: the T-6 parachute surveillance study, safe/arm handle development, Electronic Flight Bag and Engine Preservation.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676035 / <i>T-6 Operational System Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funds increased \$1.3M supporting T-6 studies and development activities.					
<p>Title: Crash Survivable Recorder (CSR)</p> <p>Description: Crash Survivable Recorder (CSR) will provide the aircraft with a system that will meet the minimum crash survivable data collection capability as outlined in Air Force Instruction 63-133 Aircraft Information Program (Change 1, 4 November 2010) and SECDEF Memo of 22 June 06, Reducing Preventable Accidents. Includes engineering and contractor support/services and PMA costs.</p> <p>FY 2018 Plans: Crash Survivable Recorder (CSR) is a new start program and will begin RDT&E activities FY19.</p> <p>FY 2019 Base Plans: Begin RDT&E activities to include but not limited to: development, integration, test and certification of the Crash Survivable Recorder (CSR) to comply with the minimum crash survivable data collection capability as outlined in AFI 63-133 Aircraft Information Program 6 February 2001 Incorporating Change 1, 4 November 2010, and the Secretary of Defense Memo of 22 June 06, Reducing Preventable Accidents.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Crash Survivable Recorder (CSR) is a new start program with the acquisition lifecycle beginning in Fiscal Year 2019. Therefore, the increase in required funding from FY18 to FY19 is a direct result of the program initiating RDT&E activities.</p>	-	0.000	0.200	-	0.200
<p>Title: T-6 Avionics Upgrades for FAA (Federal Aviation Administration) Compliance</p> <p>Description: The T-6 Automatic Dependent Surveillance Broadcast (ADS-B) Out program includes but is not limited to the component selection, integration, test and certification of ADS-B Out capability for the T-6A aircraft and Ground Based Training System (GBTS) to meet FAA compliance. Includes engineering and contractor support/services and PMA costs.</p> <p>FY 2018 Plans: Continued development, integration, test, and certification of the Automatic Dependent Surveillance Broadcast (ADS-B Out) capability in the T-6 Training System to comply with the January 1, 2020 Federal Aviation Administration (FAA) ADS-B Out mandate.</p> <p>FY 2019 Base Plans:</p>	1.745	2.799	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676035 / <i>T-6 Operational System Development</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

The Automatic Dependent Surveillance Broadcast (ADS-B Out) program will begin full rate production in FY19. As such, RDT&E activities for ADS-B Out is planned to conclude after FY18 which would result in a zero dollar requirement for FY19.

FY 2018 to FY 2019 Increase/Decrease Statement:

The Automatic Dependent Surveillance Broadcast (ADS-B Out) program will begin full rate production in FY19. As such, RDT&E activities for ADS-B Out is planned to conclude after FY18 which would result in a zero dollar requirement for FY19.

FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Accomplishments/Planned Programs Subtotals	1.745	3.008	1.776	-

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 06 Line Item 000999: <i>Initial Spares/Repair Parts</i>	0.000	2.046	0.590	-	0.590	1.215	3.034	1.854	1.882	Continuing	Continuing
• APAF 05 Line Item JPAT00: <i>T-6</i>	12.765	35.706	22.550	-	22.550	11.609	26.749	14.161	14.417	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Air Force is lead service for the T-6 Operational Systems Development program and currently manages upgrades to the entire family of systems for both the Air Force and Navy. T-6 Operational Systems Development acquisition strategy for satisfying emerging software and hardware requirements is designed to enable competition and control cost. Development resulting from Diminishing Manufacturing Sources and Material Shortages requirement will be evaluated and implemented incrementally to efficiently deliver required capabilities to AETC.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676035 / <i>T-6 Operational System Development</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
T-6 Operational System Development T-6 (JPATS) Studies	Various	Various : Various	-	-		0.137	Mar 2018	1.412	Mar 2019	-		1.412	Continuing	Continuing	-
T-6 Operational System Development Avionics Upgrades for FAA Compliance	C/FFP	Scientific Research Corp : Atlanta, GA	-	1.745	Aug 2017	2.209	Mar 2018	-		-		-	Continuing	Continuing	3.536
T-6 Operational System Development Crash Survivable Recorder	C/CPAF	TBD : TBD	-	-		-		0.200	Sep 2019	-		0.200	Continuing	Continuing	-
Subtotal			-	1.745		2.346		1.612		-		1.612	Continuing	Continuing	N/A

Remarks
The first piece of the Automatic Surveillance Broadcast Out (ADS-B Out) RDT&E effort was awarded in 4Q FY17. The second piece of the ADS-B Out RDT&E effort was awarded in 1Q FY18. The System development efforts are planned to being 2Q FY19. Crash Survivable Recorder RDT&E efforts are planned to being 1Q FY19.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Avionics System Flight Test	MIPR	VX-20: NAS Patuxent River : MD	-	-		0.340	Jan 2018	-		-		-	Continuing	Continuing	-
Spectrum Management Support	Various	Not specified. : OH	-	-		0.022	Mar 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	-		0.362		-		-		-	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA Contract Support	C/FFP	Not specified. : TBD	-	-		0.100	Sep 2018	0.064	Sep 2019	-		0.064	Continuing	Continuing	-
Government Travel	Various	Not specified. : TBD	-	-		0.200	Sep 2018	0.100	Sep 2019	-		0.100	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force											Date: February 2018				
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0604233F / Specialized Undergraduate Flight Training				Project (Number/Name) 676035 / T-6 Operational System Development							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		0.300		0.164		-		0.164	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	1.745		3.008		1.776		-		1.776	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676035 / <i>T-6 Operational System Development</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

Joint Primary Aircraft Training System	
T-6 (JPATS) Studies	
Avionics Systems Development	
T-6 Avionics Upgrades for FAA Compliance	
T-6 Crash Survivable Recorder	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676035 / <i>T-6 Operational System Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Joint Primary Aircraft Training System</i>				
T-6 (JPATS) Studies	2	2017	4	2023
<i>Avionics Systems Development</i>				
T-6 Avionics Upgrades for FAA Compliance	4	2017	4	2018
T-6 Crash Survivable Recorder	4	2019	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>				Project (Number/Name) 676037 / <i>T-38 Operational System Development</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676037: <i>T-38 Operational System Development</i>	-	12.411	2.010	8.797	0.000	8.797	1.167	1.188	1.210	1.232	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The T-38 is a twin engine, two seat (tandem), supersonic jet trainer used by Air Education and Training Command as an advanced trainer in Specialized Undergraduate Pilot Training. Modifications are budgeted to enhance operational capability while improving flight safety, reliability and maintainability. There are currently 505 T-38's in the Air Force inventory (53 T-38A, 6 AT-38B and 446 T-38C) with 3 T-38Cs pending removal. T-38s first entered service in 1960 and average over 50 years old.

T-38C Avionics system obsolescence remediation efforts to qualify updated systems will continue through the 2nd quarter of FY2019 with development of a replacement Mission Display Processor, refurbishment of the existing Heads-Up Display, development and integration of an Automatic Dependent Surveillance - Broadcast solution, as well as replacement of the Very High Frequency Communication radio system and the Very High Frequency Navigation radio system. The development and integration of an Automatic Dependent Surveillance-Broadcast solution will also include the T-38A/B aircraft.

Additionally, studies & development efforts to support future ACAT III Engineering Change Proposals to address obsolescence issues and the regular block upgrades are required to keep the system current. These will be accomplished with O&M unless block upgrade provides additional capabilities. Block upgrades incorporate software and/or hardware improvements to comply with new capabilities mandated by Department of Defense, Federal Aviation Administration, or National Airspace System and to address flight safety issues. The block upgrades support the T-38C aircraft and Aircrew Training Devices.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: T-38 Avionics Component Integration (AvCI)	10.138	0.010	8.740	0.000	8.740
Description: T-38C Avionics System obsolescence remediation effort is developing and qualifying replacement components/Line Replaceable Units (LRU) that are becoming non-supportable. Systems include the Mission Display Processor, Heads-Up Display and Very High Frequency Communication and Navigation radios. Additionally, the T-38C program is developing a solution for the Federal Aviation Administration Automated Dependent Surveillance-Broadcast (Out) mandate.					
FY 2018 Plans: The T-38C program will continue development in FY18 of a replacement Mission Display Processor, refurbishment of the existing Heads-Up Display, development and integration of an Automatic Dependent					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676037 / <i>T-38 Operational System Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Surveillance Broadcast (ADS-B) solution as well as replacement of the Very High Frequency Communication and Navigation Radios. Developmental Testing is projected to begin in the 2nd quarter of FY18.</p> <p>FY 2019 Base Plans: All T-38C programs will complete developmental testing and move in to the production and deployment phase by 2nd quarter of FY19. This is the final funding requirements for development and testing.</p> <p>FY 2019 OCO Plans: None</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased to match requirements and complete the program development and testing.</p>					
<p>Title: T-38 Studies and Development Efforts</p> <p>Description: Studies and efforts to support future ACAT III Engineering Change Proposals to address obsolescence issues and the regular block upgrades are required to keep the system current.</p> <p>FY 2018 Plans: Obsolescence study planned for T-38C Video Data Transfer Unit Compact Flash Cards (CFC). The current CFC is no longer in production.</p> <p>FY 2019 Base Plans: Funding is for future requirements to address obsolescence issues and the regular block upgrades required to keep the system current.</p> <p>FY 2019 OCO Plans: None</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Slight funding increase in FY 2019</p>	0.100	0.010	0.042	0.000	0.042
<p>Title: T-38A/B ADS-B</p> <p>Description: Develop and integrate an Automatic Dependent Surveillance Broadcast (Out) solution the T-38A/B model fleet. The solution must maintain the military transponder modes.</p> <p>FY 2018 Plans:</p>	2.173	1.990	0.015	0.000	0.015

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676037 / <i>T-38 Operational System Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete system development and integration. Accomplish ground and flight testing. Finalize TCTO development. FY 2019 Base Plans: Development and testing will be completed by the 2nd quarter of FY19. The program will move to the production and deployment phase. FY 2019 OCO Plans: None FY 2018 to FY 2019 Increase/Decrease Statement: This is the final funding required for development and testing. Program development and testing will be completed by 2nd quarter FY19.					
Accomplishments/Planned Programs Subtotals	12.411	2.010	8.797	0.000	8.797

C. Other Program Funding Summary (\$ in Millions)										
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete
• APAF 05 Line Item T03800: T-38	33.590	51.641	70.623	-	70.623	35.076	38.026	39.624	38.489	Continuing

Remarks

D. Acquisition Strategy
The T-38 Operations System Development acquisition strategy for satisfying emerging software and hardware requirements is designed to enable competition and cost control. Developmental requirements resulting from Diminishing Manufacturing Sources and Material Shortages research and reporting will be evaluated and implemented incrementally to efficiently deliver required capabilities to Air Education & Training Command in support of the pilot training program. System block upgrades will be required to maintain aircraft airworthiness and will be implemented based on Air Education & Training Command requirements. An appropriate level of technical data rights is required by all current support contracts.

Contract FA8211-16-D-0001 is a Type D Indefinite Delivery, Indefinite Quantity contract competitively awarded to address T-38C avionics system obsolescence issues and provide Contractor Logistics Support follow-on support. The Avionics Component Integration contract was awarded 8 January 2016. Obsolescence remediation efforts began immediately and the follow-on Contractor Logistics Support effort began 1 April 2017.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force Date: February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
3600 / 7	PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	676037 / <i>T-38 Operational System Development</i>

The T-38A/B Automatic Dependent Surveillance-Broadcast program awarded a contract to develop and integrate and ADS-B solution in May 2017. The current contract is a Type D Indefinite Delivery, Indefinite Quantity contract sole source awarded to modify APX-119 transponders declared excess by the Item Manager and "free issued" to the T-38 Program Office. System development and aircraft integration work has started.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676037 / <i>T-38 Operational System Development</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
T-38 Avionics System DMSMS mitigation efforts	C/FFP	The Boeing Company : St. Louis, MO	-	9.244	Oct 2016	0.010	Oct 2017	8.648	Oct 2018	-		8.648	Continuing	Continuing	-
T-38 A/B Automatic Dependent Surveillance-Broadcast	SS/FFP	The Raytheon Company : Aberdeen, MD	-	2.173	Apr 2017	1.704	Oct 2017	0.015	Oct 2018	-		0.015	Continuing	Continuing	-
T-38 Studies and Development Efforts	Various	TBD : NV	-	0.100		0.010	Oct 2017	0.042	Oct 2018	-		0.042	Continuing	Continuing	-
Subtotal			-	11.517		1.724		8.705		-		8.705	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Avionics system Flight Test	PO	412th FTS : Edwards AFB, CA	-	0.809	Jun 2017	0.194	Oct 2017	0.000		-		0.000	Continuing	Continuing	-
Not specified.	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.809		0.194		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Funding for flight test is estimated to cover T-38A/B/C requirements.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA Contract support	C/FFP	Not specified. : NV	-	0.030	Dec 2016	0.033	Dec 2017	0.033	Dec 2018	-		0.033	Continuing	Continuing	-
Government Travel	Various	Not specified. : NV	-	0.055	Oct 2016	0.059	Oct 2017	0.059	Oct 2017	-		0.059	Continuing	Continuing	-
Subtotal			-	0.085		0.092		0.092		-		0.092	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force							Date: February 2018						
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>			Project (Number/Name) 676037 / <i>T-38 Operational System Development</i>						
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.411		2.010		8.797		-		8.797	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676037 / <i>T-38 Operational System Development</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Avionics Systems Development																												
Heads-Up Display Integration																												
Heads-Up Display Qualification Testing																												
Mission Display Processor Integration																												
Mission Display Processor Qualification Testing																												
Automatic Dependent Surveillance Broadcast Integration (T38-C)																												
Automatic Dependent Surveillance Broadcast Qualification Testing (T38-C)																												
Very High Frequency Radio Integration																												
Very High Frequency Radio Qualification Testing																												
Very High Frequency Navigation Unit Integration																												
Very High Frequency Navigation Unit Qualification Testing																												
T-38A/B ADS-B Development																												
T-38A/B ADS-B Integration																												
T-38A/B Qualification Testing																												
T-38 Block Software Upgrades																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676037 / <i>T-38 Operational System Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Avionics Systems Development</i>				
Heads-Up Display Integration	1	2017	4	2017
Heads-Up Display Qualification Testing	1	2018	1	2019
Mission Display Processor Integration	1	2017	4	2017
Mission Display Processor Qualification Testing	1	2018	1	2019
Automatic Dependent Surveillance Broadcast Integration (T38-C)	1	2017	1	2018
Automatic Dependent Surveillance Broadcast Qualification Testing (T38-C)	2	2018	2	2019
Very High Frequency Radio Integration	1	2017	4	2017
Very High Frequency Radio Qualification Testing	1	2018	1	2019
Very High Frequency Navigation Unit Integration	1	2017	4	2017
Very High Frequency Navigation Unit Qualification Testing	1	2018	1	2019
T-38A/B ADS-B Development	3	2017	1	2018
T-38A/B ADS-B Integration	3	2017	1	2018
T-38A/B Qualification Testing	1	2018	2	2020
T-38 Block Software Upgrades	1	2021	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	24.475	50.486	16.247	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000	91.212
675895: <i>Wide Area Surveillance*</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.004
675899: <i>Wide Area Surveillance</i>	24.475	50.486	16.247	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	91.208

Program MDAP/MAIS Code: 519

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019

Note

In FY2017, Project 675895, Wide Area Surveillance was terminated.

A. Mission Description and Budget Item Justification

Wide Area Surveillance (WAS) consists of two advanced sensor systems, the Stateside Affordable Radar System (STARS) and Scorpion, incorporated into a single WAS System. Based on existing technological capabilities, WAS will detect/track low, slow and other asymmetrical threats in the airspace and meet the user needs of sensing stressing airborne targets in complex environments with affordable sensors. The sensor outputs will be incorporated into the Battle Control Systems-Fixed (BCS-F) air picture and utilized as the North American Aerospace Defense Command/ Northern Command (NORAD/NORTHCOM) Command and Control (C2) air surveillance system of record.

Some aspects of the WAS program are classified and will be provided on a need-to-know basis.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver WAS 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	46.695	16.247	0.000	0.000	0.000
Current President's Budget	50.486	16.247	0.000	0.000	0.000
Total Adjustments	3.791	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	5.500	0.000			
• SBIR/STTR Transfer	-1.709	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

- FY17 \$5.5M RDT&E increase for pre-operational support, development and integration

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>				Project (Number/Name) 675899 / <i>Wide Area Surveillance</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675899: <i>Wide Area Surveillance</i>	24.475	50.486	16.247	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	91.208
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Wide Area Surveillance (WAS) consists of two advanced sensor systems, the Stateside Affordable Radar System (STARS) and Scorpion, incorporated into a single WAS System. Based on existing technological capabilities, WAS will detect/track low, slow and other asymmetrical threats in the airspace and meet the user needs of sensing stressing airborne targets in complex environments with affordable sensors. The sensor outputs will be incorporated into the Battle Control Systems-Fixed (BCS-F) air picture and utilized as the North American Aerospace Defense Command/ Northern Command (NORAD/NORTHCOM) Command and Control (C2) air surveillance system of record.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver WAS 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 2017	FY 2018	FY 2019
Title: Development, Test & Fielding	50.486	16.247	0.000
Description: Development, Test & Fielding			
FY 2018 Plans: Include but are not limited to: - Continue development, integration and testing of the Stateside Affordable Radar System (STARS) in preparation for Milestone C approval. - Continue development, integration and testing of a Regional Support Facility supporting both STARS and Scorpion systems. - Provide pre-operational support to STARS and Scorpion systems. - Continue to integrate and test track feeds into system of record, Battle Control System-Fixed. - Continue to establish site specific requirements to include but not limited to security, maintenance, material shipping and site/ environmental analysis for both STARS and Scorpion. - Develop technical data and maintenance manuals, continue to study, analyze, and mitigate risk activities to support Full Operational Capability (FOC) objectives, execute Test and Evaluation (T&E) and continue Reliability, Availability, and Maintainability (RAM) data collection. - Develop/test software and integrate builds to feed into the system of record, Battle Control Systems-Fixed.			
FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>	Project (Number/Name) 675899 / <i>Wide Area Surveillance</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Complete development, integration and testing of the Stateside Affordable Radar System (STARS) and Scorpion.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Program transitioned to production in FY18 and FY19.			
Accomplishments/Planned Programs Subtotals	50.486	16.247	0.000

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 834240: <i>Wide Area Surveillance</i>	6.943	62.087	92.104	-	92.104	109.597	27.715	28.205	28.708	818.915	1,174.274

Remarks

D. Acquisition Strategy

The Wide Area Surveillance (WAS) strategy is a single step acquisition approach for full capability to develop, produce, and field highly capable and sustainable advanced sensors in the National Capital Region. Science & technology contracts were led prior to the Engineering and Manufacturing Development phase for both sub-systems. The ongoing Cost Plus Fixed-Fee (CPFF) contract for Stateside Affordable Radar System (STARS) was awarded to a single developer to design, build, integrate, and test the STARS system. A subsequent task order was awarded (Jul 17) to include pre-operational site support. The ongoing CPFF contract for Scorpion was awarded (Aug 17) to a single developer to complete the design, build, integration, and testing of the Scorpion system, and conduct pre-operational site support. This strategy includes a single delivery approach with 11 STARS and 18 Scorpion systems for a total of 29 sub-systems delivered to achieve FOC. The pre-operational contract for the Scorpion system will transition to Interim Contract Support (ICS) in FY2018, STARS system will award ICS in FY19.

Air Force Program Executive Officer (PEO) for Battle Management (AFPEO BM) is the PEO for WAS. Air Force Life Cycle Management Center (AFLCMC) is the Contracting Authority for the WAS program and provides contracts, legal, and comptroller support. The Secretary of the Air Force for Acquisition (SAF/AQ) is the program's Milestone Decision Authority (MDA).

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 7				PE 0604445F / Wide Area Surveillance				675899 / Wide Area Surveillance							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Wide Area Surveillance (WAS)	Various	Various : Various	12.296	39.451	Sep 2017	9.930	May 2018	-		-		-	0.000	61.677	46.000
Subtotal			12.296	39.451		9.930		-		-		-	0.000	61.677	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Mission	Various	Various : Various	3.159	1.080	Aug 2017	0.000		-		-		-	0.000	4.239	-
Subtotal			3.159	1.080		0.000		-		-		-	0.000	4.239	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	Various	46 Test Squadron : Eglin AFB, FL	0.500	1.825	Aug 2017	1.890	Mar 2018	-		-		-	0.000	4.215	-
Subtotal			0.500	1.825		1.890		-		-		-	0.000	4.215	N/A
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	AFLCMC/HBDB : Hanscom AFB, MA	8.520	8.130	Aug 2017	4.427	Oct 2017	-		-		-	0.000	21.077	-
Subtotal			8.520	8.130		4.427		-		-		-	0.000	21.077	N/A
Project Cost Totals			24.475	50.486		16.247		-		-		-	0.000	91.208	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>	Project (Number/Name) 675899 / <i>Wide Area Surveillance</i>
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	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks	
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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>	Project (Number/Name) 675899 / <i>Wide Area Surveillance</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Wide Area Surveillance																												
Scorpion Pre-operational Support																												
STARS Pre-operational Support																												
Initial Operational Test and Evaluation (IOT&E)																												
Milestone C (July 2018)																												
Initial Operation Capability (IOC)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>	Project (Number/Name) 675899 / <i>Wide Area Surveillance</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Wide Area Surveillance</i>				
Scorpion Pre-operational Support	4	2017	4	2018
STARS Pre-operational Support	4	2017	4	2018
Initial Operational Test and Evaluation (IOT&E)	3	2018	4	2018
Milestone C (July 2018)	4	2018	4	2018
Initial Operation Capability (IOC)	4	2018	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605018F / <i>AF Integrated Personnel and Pay System (AF-IPPS)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	204.161	9.956	21.915	47.287	0.000	47.287	54.938	32.337	31.458	32.033	0.000	434.085
676003: <i>HRM Structural Development</i>	204.161	9.956	21.915	47.287	0.000	47.287	54.938	32.337	31.458	32.033	0.000	434.085
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: N86

A. Mission Description and Budget Item Justification

Air Force Integrated Personnel and Pay System (AFIPPS) will be a web-enabled, Enterprise Resource Planning (ERP) solution that will integrate existing personnel and pay processes into one self-service system. The Department of the Air Force (DAF) plans to accomplish this goal by modernizing existing technology, resulting in a secure and authoritative data environment that improves accuracy, strengthens decision making and reduces processing time and costs. AFIPPS supports effective military personnel management and development throughout the lifecycle of all military members, by providing an accurate and single authoritative source of personnel data. Active (RegAF), National Guard (ANG), and Reserve (AFRes) components will integrate personnel and pay functionality; streamline and improve automated support to the mobilization and deployment processes; and implement standard data that reflects the core requirements of the Combatant Commands, the Department of the Air Force, the Office of the Secretary of Defense and other federal agencies.

Congress, the Department of Defense (DoD), and other federal agencies rely on accurate AF Human Resources (HR) data to make key decisions on how the US military is organized, operated, maintained, and funded. The AFIPPS program will ensure accurate and timely delivery of pay, entitlements, allowances, and benefits information is provided for the Total Force (Active Duty, Guard, and Reserve). AFIPPS represents the AF commitment to modernize business practices and provide enhanced support to service members and their families by integrating personnel and pay systems. AFIPPS will eliminate AF reliance on the end-of-life/unsustainable Defense Finance and Accounting (DFAS) Defense Joint Military Pay System (DJMS) for payroll processing and will ensure continued/improved auditability of service member pay. The AFIPPS approach follows the DoD principle of pursuing enterprise solutions, not enterprise systems. Efforts are underway to establish DoD-level enterprise governance, ensure common standards, and create shared services while pursuing a distinctive approach appropriate for the AF.

AFIPPS's customers include approximately 510,000 AF service members across all components (RegAF, ANG, and AFRes) including thousands of military leaders of different ranks, specialties, and career fields who are responsible for the conduct of AF operations that rely on these services to ensure service members with the appropriate skill sets are deployed where needed at home and on the battlefield. Congress, the rest of the Department of Defense (DoD), and other federal agencies all rely on accurate AF Human Resources (HR) data to make key decisions that affect how the US military is organized, funded, deployed, and maintained.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver integrated personnel and pay 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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605018F / <i>AF Integrated Personnel and Pay System (AF-IPPS)</i>
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This program is in Budget Activity 7, Operational System Development, because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	10.368	21.915	52.428	0.000	52.428
Current President's Budget	9.956	21.915	47.287	0.000	47.287
Total Adjustments	-0.412	0.000	-5.141	0.000	-5.141
• Congressional General Reductions	-0.073	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	-0.339	0.000			
• Other Adjustments	0.000	0.000	-5.141	0.000	-5.141

Change Summary Explanation

The FY 2019 funding request was reduced by \$5.141 million to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Air Force Integrated Personnel and Pay System (AFIPPS) - Product Development	9.914	21.573	46.935	0.000	46.935
Description: Acquire and develop the activities that support the acquisition of a personnel/pay capability for USAF personnel across all components (i.e., RegAF, ANG, and AFRes).					
FY 2018 Plans:					
- Award contract to develop pay capabilities and integrate into existing USAF personnel system					
- Prepare contract documentation to support AFIPPS strategy and Acquisition ATP approval					
- Continue acquisition planning, reporting, and the execution of AFIPPS activities and follow-on activities					
- Continue AF information technology efforts (e.g., Common Computing Environment, FIAR/FISCAM audit support, etc.) to ensure AFIPPS is fully integrated into the AF & DoD enterprise networks, databases, and information systems					
- Build and maintain the required AFIPPS computing environments, e.g. development, test environment					
- Purchase initial increment of COTS S/W licenses to support development activities					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0605018F / <i>AF Integrated Personnel and Pay System (AF-IPPS)</i>			
C. Accomplishments/Planned Programs (\$ in Millions)					
<ul style="list-style-type: none"> - Continue risk reduction activities to support decision-making - Continue to design and implement enterprise architecture for pay - Continue EBS training contract - Perform change management and other integration activities - Continue to use PASS/ETASS contracted personnel and FFRDC resources to support implementation of the program <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Will determine and initiate system interface modifications required to integrate pay capability into AFIPPS - Will acquire Oracle Subject Matter Expertise to advise programs office on COTS product implementation - Will continue contract to develop pay capabilities and integrate into existing USAF personnel system (first full year) - Will purchase COTS S/W licenses to support development activities - Will maintain contract documentation to support AFIPPS strategy and Full Deployment ATP approval - Will continue acquisition planning, reporting, and the execution of AFIPPS and follow-on activities - Will continue AF information technology efforts (e.g., Common Computing Environment, FIAR/FISCAM audit support, etc.) to ensure AFIPPS is fully integrated into the AF & DoD enterprise networks, databases, and information systems - Will maintain the required AFIPPS computing environments, e.g. development, test environment - Will continue risk reduction activities to support decision-making - Will continue to design and implement enterprise architecture for pay - Will continue to perform change management and other integration activities - Will complete EBS training contract - Will continue to use PASS/ETASS contracted personnel and FFRDC resources to support implementation of the program <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase is due to the prime development contract, system interface, integration, and modification efforts, and Oracle Subject Matter Expert Support cost requirement.</p>					
Title: AFIPPS - Test and Evaluation					
0.042		0.342	0.352	0.000	0.352

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605018F / <i>AF Integrated Personnel and Pay System (AF-IPPS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Government integrated test and evaluation activities.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Refine Test and Evaluation Master Plan (TEMP) and prepare test plans - Begin Cyber Vulnerability Assessments to evaluate current/future AFIPPS system environments <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Will continue refining Test and Evaluation Master Plan (TEMP) and preparing test plans - Will begin AFIPPS Integrated Contractor and Development Test activities - Will continue Cyber Vulnerability Assessments to evaluate current/future AFIPPS system environments <p>FY 2019 OCO Plans:</p> <p>None</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <p>Funding increase is due to Inflation adjustment</p>					
Accomplishments/Planned Programs Subtotals	9.956	21.915	47.287	0.000	47.287

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

Remarks

E. Acquisition Strategy

AFIPPS acquisition strategy focuses on expanding the fielded AF personnel system (MilPDS) by integrating a pay capability. MilPDS is implemented using the commercial Oracle ERP E-Business Suite (EBS). The AFIPPS strategy will be to configure/develop the pay portion of EBS, ensure the system is fully integrated, and deployed. The Government will award a contract for the pay system development, test, and deployment. The development activities will be fully coordinated and integrated with the on-going operation and sustainment of MilPDS.

Air Force Program Executive Officer (PEO) for Business and Enterprise Systems (AFPEO BES) is the PEO for AFIPPS. Air Force Life Cycle Management Center (AFLCMC) is the Contracting Authority for the AFIPPS Program and provides Contracts, Legal, and Comptroller support. The Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics [OUSD(AT&L)] has delegated the program's Milestone Decision Authority (MDA) to the Service Acquisition Executive (SAE) for the Air Force.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity
3600: *Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 0605018F / *AF Integrated Personnel and Pay System (AF-IPPS)*

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605018F / AF Integrated Personnel and Pay System (AF-IPPS)	Project (Number/Name) 676003 / HRM Structural Development
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Application Hosting Environment	MIPR	DISA EIS : Pensacola, FL	55.745	0.334	Jul 2017	1.234	Mar 2018	1.631	Mar 2019	-		1.631	4.293	63.237	63.237
Common Computing Environment (CCE)	Various	Various : Various	0.701	0.162	Nov 2017	1.140	Mar 2018	1.235	Mar 2019	-		1.235	7.406	10.644	10.644
Prime Development & Integration Contract	C/TBD	TBD : TBD	16.391	0.000		7.119	Apr 2018	15.323	Jan 2019	-		15.323	59.171	98.004	98.004
COTs Licenses	Various	Various : Various	11.573	2.386	May 2017	3.547	Mar 2018	4.082	Mar 2019	-		4.082	12.455	34.043	34.043
System Interface Integration & Modification	TBD	TBD : TBD	0.000	-		0.231	Jun 2018	7.753	Nov 2018	-		7.753	7.245	15.229	15.229
Engineering Support (FFRDC)	SS/CPAF	CMU-SEI : Pittsburgh, PA	8.910	1.897	Aug 2017	1.943	Aug 2018	1.995	Aug 2019	-		1.995	4.703	19.448	19.448
Oracle EBS Subject Matter Experts	TBD	TBD : TBD	0.000	-		0.891	May 2018	2.127	Dec 2018	-		2.127	2.755	5.773	5.773
Direct Mission Support (Other)	Various	Various : Various	53.862	-		-		-		-		-	0.000	53.862	53.862
Subtotal			147.182	4.779		16.105		34.146		-		34.146	98.028	300.240	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Independent Verification & Validation (IV&V)	Various	Various : Various	2.354	-		-		-		-		-	0.000	2.354	2.354
Gov't Integrated Test & Evaluation Activities	MIPR	Various : Various	1.589	0.042	Jan 2018	0.342	Mar 2018	0.352	Mar 2019	-		0.352	16.541	18.866	18.866
Subtotal			3.943	0.042		0.342		0.352		-		0.352	16.541	21.220	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force Date: February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605018F / AF Integrated Personnel and Pay System (AF-IPPS)	Project (Number/Name) 676003 / HRM Structural Development
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technology Acquisition Support Services (ETASS)	C/CPFF	Oasis Systems, Inc : Lexington, MA	10.290	0.300	Nov 2017	1.378	Mar 2018	1.415	Mar 2019	-		1.415	1.833	15.216	15.216
Other Program Support Cost	Various	Various : Various	25.605	3.645	Jun 2017	2.638	Mar 2018	8.884	Mar 2019	-		8.884	29.372	70.144	70.144
Professional Acquisition Support Services II (PASS II)	C/CPAF	Quantech Services, Inc. : Lexington, MA	14.040	0.890	Oct 2017	0.900	Feb 2018	1.923	Nov 2018	-		1.923	4.258	22.011	22.011
Specialized Cost Services (SCS): EPASS	C/CPAF	BusinessTechnologies & Solutions : Beavercreek, OH	3.101	0.300	Apr 2017	0.552	Apr 2018	0.567	Apr 2019	-		0.567	0.734	5.254	5.254
Subtotal			53.036	5.135		5.468		12.789		-		12.789	36.197	112.625	N/A
Project Cost Totals			204.161	9.956		21.915		47.287		-		47.287	150.766	434.085	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605018F / AF Integrated Personnel and Pay System (AF-IPPS)	Project (Number/Name) 676003 / HRM Structural Development

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Integrated Personnel and Pay System	
AFIPPS Development, Test, and Production Environments	[Redacted]
Enterprise Architecture Design/Implement	[Redacted]
Acquisition planning, RFP, Contract Award	[Redacted]
Prime Development, Integration, and Deployment	[Redacted]
AF Information Technology Efforts	[Redacted]
Government Integrated Test and Evaluation Activities	[Redacted]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605018F / <i>AF Integrated Personnel and Pay System (AF-IPPS)</i>	Project (Number/Name) 676003 / <i>HRM Structural Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Integrated Personnel and Pay System</i>				
AFIPPS Development, Test, and Production Environments	1	2017	1	2021
Enterprise Architecture Design/Implement	1	2017	4	2020
Acquisition planning, RFP, Contract Award	1	2017	3	2018
Prime Development, Integration, and Deployment	3	2018	2	2021
AF Information Technology Efforts	1	2017	4	2023
Government Integrated Test and Evaluation Activities	1	2017	1	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	32.646	33.150	32.770	0.000	32.770	34.193	35.583	36.321	36.983	Continuing	Continuing
675066: <i>Anti-Tamper Technology Executive Agent</i>	-	32.646	33.150	32.770	0.000	32.770	34.193	35.583	36.321	36.983	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): N42

A. Mission Description and Budget Item Justification

The Anti-Tamper (AT) Technology Executive Agency budget funds activities related to two AT responsibilities required by DoDD 5200.47E Anti-Tamper. These responsibilities include areas unique to the DoD Executive Agent for Anti-Tamper (ATEA) and Air Force Component AT Office of Primary Responsibility (OPR). The ATEA is responsible for developing and implementing AT policy, coordinating and providing financial support for AT technology development and evaluations, hardware/software vulnerability assessments, laboratory infrastructure, establishing and maintaining a data bank/library of AT technologies, providing security mechanisms, providing outreach and education to the DoD AT community, and funding validation and evaluations of AT implementations across all DoD acquisition programs. This program element may include necessary civilian pay expenses required to manage, execute, and deliver AT 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. The AF AT OPR, that is also funded by this PE and is responsible for the oversight and security of AT on all AF acquisition programs under the Program Protection Planning process and manages AF AT technology development.

The DoD ATEA coordinates technology development among the DoD Services/Agencies, National Laboratories, and Industry.

AT protects critical program information (CPI) in U.S. weapon systems that may be sold to foreign governments or that could possibly fall into enemy hands on the battlefield. AT protections permit the U.S. to preserve its technological advantage and the combat capabilities of critical weapons systems while supporting the warfighters' mission requirements. Furthermore, AT adds longevity to DoD weapon systems and critical technologies by deterring efforts to reverse engineer or develop weapon countermeasures against the system or system component.

All DoD acquisition programs, Foreign Military Sales, and Direct Commercial Sales with resident critical program information (RCPI) require a validated AT Plan. The AT program includes resources required for subject matter experts (SMEs) to review AT Plans and conduct AT validation on all DoD Weapon Systems, and perform AT assessments of both commercial off the shelf and government off the shelf products. As technology advances, AT continues to perform AT hardware/software assessment capabilities. These capabilities include the acquisition of specialized equipment, maintenance and/or renovations to support the integration of this equipment, and modifications to new and/or existing laboratory facilities to meet equipment and security requirements.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>
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The DoD ATEA technology development strategy is to coordinate DoD AT technology development across the Services which fund development of new AT technology, as well as enhance existing AT technology efforts to increase the technology readiness level (TRL) and facilitate transition for programs to implement. The AT technology development and enhancement efforts include: advanced AT sensor hardware, secure processing, crypto-analysis, tamper penalties, and other AT enablers.

The Air Force AT OPR conducts Anti-Tamper technology development to meet Air Force service needs to mature promising AT technologies to transition to Air Force weapons systems. Technology development priorities are given to those technologies that most benefit AF acquisition programs. These activities are coordinated through the ATEA as a part of the ATEA technology development roadmap and to coordinate with Navy and Army AT technology development efforts. This program is in Budget Activity 07, Operational System Development, because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding.

This program is in Budget Activity 07, Operational System Development, because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	31.952	33.150	33.017	0.000	33.017
Current President's Budget	32.646	33.150	32.770	0.000	32.770
Total Adjustments	0.694	0.000	-0.247	0.000	-0.247
• 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	1.697	0.000			
• SBIR/STTR Transfer	-1.003	0.000			
• Other Adjustments	0.000	0.000	-0.247	0.000	-0.247

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: DoD Anti-Tamper Technology Executive Agent (DoDATEA)	24.724	23.828	22.870
Description: AT technology coordination and evaluations, hardware/software vulnerability assessments, laboratory infrastructure; provide outreach and education to the AT Community, conduct effective validation and evaluation of AT implementation as well as implementation of AT policy.			
FY 2018 Plans: - Conduct effective validation and evaluation of AT implementation on all DoD Acquisition programs; continue AT hardware/software technical development, vulnerability assessments, and maintenance of AT laboratory infrastructure.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>- Continue to train acquisition workforce on AT policy and technology, and implement AT policy within the AT Community.</p> <p>FY 2019 Plans:</p> <p>- Conduct effective validation and evaluation of AT implementation on all DoD Acquisition programs; continue AT hardware/software technical development, vulnerability assessments, and maintenance of AT laboratory infrastructure.</p> <p>- Continue to train acquisition workforce on AT policy and technology, and implement AT policy within the AT Community.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decreased \$0.711 million. Decrease driven by increase in Technology Development.</p>				
<p>Title: DoDATEA Program Management Support</p> <p>Description: Includes civilian pay, A&AS, outreach and education, travel, supplies, and AFLCMC/WWG support.</p> <p>FY 2018 Plans: Support program office efforts, including civilian pay, A&AS, outreach and education, travel, and supplies.</p> <p>FY 2019 Plans: Support program office efforts, including civilian pay, A&AS, outreach and education, travel, and supplies.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decreased \$0.022 million. No material change to program.</p>		5.522	5.722	5.700
<p>Title: Air Force Anti-Tamper Office Technology Development</p> <p>Description: The Air Force AT office conducts Anti-Tamper technology development to meet Air Force service needs to mature promising AT technologies to transition to Air Force weapon systems.</p> <p>The AT technology development and enhancement efforts include: advanced AT sensor hardware, secure processing, crypto-analysis, tamper penalties, and other AT enablers.</p> <p>The AF AT office will fund and manage new technology efforts to protect AF CPI. These new AT technology requirements will be obtained from AF programs and these new AT technologies will then transition to Air Force and DoD programs.</p> <p>FY 2018 Plans: The Air Force AT office conducts Anti-Tamper technology development to meet Air Force service needs to mature promising AT technologies to transition to Air Force weapons systems.</p>		2.400	3.600	4.200

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>The AT technology development and enhancement efforts include: advanced AT sensor hardware, secure processing, crypto-analysis, tamper penalties, and other AT enablers. Technology development priorities will be given to those technologies that most benefit AF acquisition programs.</p> <p>FY 2019 Plans: The Air Force AT office conducts Anti-Tamper technology development to meet Air Force service needs to mature promising AT technologies to transition to Air Force weapons systems.</p> <p>The AT technology development and enhancement efforts include: advanced AT sensor hardware, secure processing, crypto-analysis, tamper penalties, and other AT enablers. Technology development priorities will be given to those technologies that most benefit AF acquisition programs.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increased \$0.600 million. Increase driven by additional requirements in FY17 and program ramp up.</p>			
Accomplishments/Planned Programs Subtotals	32.646	33.150	32.770

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

N/A

Remarks

E. Acquisition Strategy

The DoD ATEA acquisition strategy is to coordinate DoD AT technology developments across the Services which fund coordination and assessments of new AT technology, as well as enhance existing AT technology efforts by increasing TRL. The ATEA will coordinate the Technology Roadmap with major Prime vendors. Evaluating their AT CRADA projects is of major importance. The ATEA will also coordinate with the Service AT personnel to foster communication and understand what programs, Services are developing for their AT implementation. Emerging research areas such as materials, cryptography and electronic circuits have the potential to bring new AT capabilities with reduced power needs and smaller form factor. The goal of the research is to mature promising technologies to the point they can be transitioned to a program office or industry for implementation in our weapon systems. Priorities will be given to those technologies that most benefit the DoD AT community.

The Air Force AT Office in 2017, will fund and manage new technology efforts to protect Air Force critical program information. These new AT technology requirements will be obtained from AF programs and these new AT technologies will then transition to Air Force programs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>
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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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>	Project (Number/Name) 675066 / <i>Anti-Tamper Technology Executive Agent</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Air Force Anti-Tamper Office Technology Development	Various	Not specified. : NV	-	2.400		3.600		4.200		-		4.200	Continuing	Continuing	-
Subtotal			-	2.400		3.600		4.200		-		4.200	Continuing	Continuing	N/A

Remarks
In the FY17 PB, the Air Force received funding specifically for Technology Development.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DoD Anti-Tamper Technology Executive Agent (DoDATEA)	Various	Not specified. : NV	-	24.724		23.828		22.870		-		22.870	Continuing	Continuing	-
Subtotal			-	24.724		23.828		22.870		-		22.870	Continuing	Continuing	N/A

Remarks
This funding is to support DoD ATEA requirements. Funding was broken out starting in FY15 between DoD ATEA and Air Force requirements.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DoDATEA Program Management Support	Various	Not specified. : NV	-	5.522		5.722		5.700		-		5.700	Continuing	Continuing	-
Subtotal			-	5.522		5.722		5.700		-		5.700	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	32.646	33.150	32.770	-	32.770	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force							Date: February 2018			
Appropriation/Budget Activity 3600 / 7			R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>			Project (Number/Name) 675066 / <i>Anti-Tamper Technology Executive Agent</i>				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 Additional funding breakout and award dates are classified per the Anti-Tamper Security Classification Guide. Please contact the ATEA if additional information is required.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>	Project (Number/Name) 675066 / <i>Anti-Tamper Technology Executive Agent</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
ATEA																												
ATEA Program Office																												
AT RDT&E																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605024F / <i>Anti-Tamper Technology Executive Agency</i>	Project (Number/Name) 675066 / <i>Anti-Tamper Technology Executive Agent</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
ATEA				
ATEA Program Office	1	2017	4	2023
AT RDT&E	1	2017	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605117F / <i>Foreign Materiel Acquisition and Exploitation</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	58.360	66.653	68.368	0.000	68.368	70.083	71.360	72.573	73.895	Continuing	Continuing
675897: <i>Foreign Materiel Aquisition and Exploitation</i>	-	58.360	66.653	68.368	0.000	68.368	70.083	71.360	72.573	73.895	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Foreign Materiel Acquisition and Exploitation (FMA&E) program element supports the military services and defense agencies Foreign Material Program 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)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	42.960	66.653	68.882	0.000	68.882
Current President's Budget	58.360	66.653	68.368	0.000	68.368
Total Adjustments	15.400	0.000	-0.514	0.000	-0.514
• 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	15.400	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-0.514	0.000	-0.514

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605117F / Foreign Materiel Acquisition and Exploitation	Project (Number/Name) 675897 / Foreign Materiel Aquisition and Exploitation
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675897: Foreign Materiel Aquisition and Exploitation	-	58.360	66.653	68.368	0.000	68.368	70.083	71.360	72.573	73.895	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Foreign Materiel Acquisition and Exploitation (FMA&E) program element supports the military services and defense agencies Foreign Material Program activities.

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

	FY 2017	FY 2018	FY 2019
Title: Foreign Materiel Aquisition and Exploitation	58.360	66.653	68.368
Description: Classified details can be found in OSD Comptroller's classified Defense Wide Justification Book Volume 6.			
FY 2018 Plans: Classified			
FY 2019 Plans: Classified			
FY 2018 to FY 2019 Increase/Decrease Statement: The increase from FY2018 to FY2019 is due to inflation.			
Accomplishments/Planned Programs Subtotals	58.360	66.653	68.368

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

N/A

Remarks

D. Acquisition Strategy

Classified details can be found in OSD Comptroller's classified Defense-Wide Justification Book Volume 6

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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605117F / <i>Foreign Materiel Acquisition and Exploitation</i>	Project (Number/Name) 675897 / <i>Foreign Materiel Aquisition and Exploitation</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
<i>Foreign Materiel Acquisition & Exploitation</i>																																
FY18 requirements and funding requests submitted by Services/Agencies																																
Requirements and funding requests validated and prioritized																																
FY18 FMP Plan approved and published																																
FY18 Plan executed and updated as required																																
Additional acquisition opportunities reviewed quarterly; FY18 execution reprioritized																																
Additional exploitation opportunities reviewed quarterly; FY18 execution reprioritized																																
FY19 requirements and funding requests submitted by Services/Agencies																																
FY19 requirements and funding requests validated and prioritized																																
FY19 FMP Plan approved and published																																
FY19 Plan executed and updated as required																																
Additional acquisition opportunities reviewed quarterly; FY19 execution reprioritized																																
Additional exploitation opportunities reviewed quarterly; FY19 execution reprioritized																																
FY20 requirements and funding requests submitted by Services/Agencies																																
FY20 requirements and funding requests validated and prioritized																																
FY20 FMP Plan approved and published																																

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force																										Date: February 2018			
Appropriation/Budget Activity 3600 / 7													R-1 Program Element (Number/Name) PE 0605117F / Foreign Materiel Acquisition and Exploitation								Project (Number/Name) 675897 / Foreign Materiel Aquisition and Exploitation								
	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				
	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	
Additional acquisition opportunities reviewed quarterly; FY20 execution reprioritized																													
Additional exploitation opportunities reviewed quarterly; FY20 execution reprioritized																													
FY21 FMP process continues																													
FY22 FMP process continues																													
FY23 FMP process continues																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605117F / <i>Foreign Materiel Acquisition and Exploitation</i>	Project (Number/Name) 675897 / <i>Foreign Materiel Acquisition and Exploitation</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Foreign Materiel Acquisition & Exploitation</i>				
FY18 requirements and funding requests submitted by Services/Agencies	3	2017	4	2017
Requirements and funding requests validated and prioritized	4	2017	4	2017
FY18 FMP Plan approved and published	4	2017	4	2017
FY18 Plan executed and updated as required	1	2018	1	2019
Additional acquisition opportunities reviewed quarterly; FY18 execution reprioritized	1	2018	1	2019
Additional exploitation opportunities reviewed quarterly; FY18 execution reprioritized	1	2018	1	2019
FY19 requirements and funding requests submitted by Services/Agencies	3	2018	4	2018
FY19 requirements and funding requests validated and prioritized	4	2018	4	2018
FY19 FMP Plan approved and published	4	2018	4	2018
FY19 Plan executed and updated as required	1	2019	1	2020
Additional acquisition opportunities reviewed quarterly; FY19 execution reprioritized	1	2019	1	2020
Additional exploitation opportunities reviewed quarterly; FY19 execution reprioritized	1	2019	1	2020
FY20 requirements and funding requests submitted by Services/Agencies	3	2019	4	2019
FY20 requirements and funding requests validated and prioritized	4	2019	4	2019
FY20 FMP Plan approved and published	4	2019	4	2019
Additional acquisition opportunities reviewed quarterly; FY20 execution reprioritized	1	2020	1	2021
Additional exploitation opportunities reviewed quarterly; FY20 execution reprioritized	1	2020	1	2021
FY21 FMP process continues	3	2020	1	2022
FY22 FMP process continues	3	2021	1	2023
FY23 FMP process continues	3	2022	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605117F / <i>Foreign Materiel Acquisition and Exploitation</i>	Project (Number/Name) 675897 / <i>Foreign Material Aquisition and Exploitation</i>

Note
The schedule on the previous page, representing the Foreign Material Program acquisition and exploitation processes, repeats for each fiscal year. Out of cycle Ad-Hoc foreign material acquisition and exploitation reviews are held when required throughout each fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605278F / <i>HC/MC-130 Recap RDT&E</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	10.543	0.000	38.579	32.574	0.000	32.574	4.817	24.750	24.860	5.095	0.000	141.218
675006: <i>HC/MC-130 Recap</i>	10.543	0.000	38.579	32.574	0.000	32.574	4.817	24.750	24.860	5.095	0.000	141.218
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 257

A. Mission Description and Budget Item Justification

HC/MC-130 Recapitalization will replace and augment the aging USAF fleets of combat rescue HC-130P/N and special operations MC-130E/P/H aircraft which are experiencing airworthiness, maintainability and operational limitations.

The HC/MC RDT&E effort integrates Block 8.1 into a HC-130J, MC-130J and AC-130J, provides program capability updates, and integration with other HC, MC and AC unique modifications. The HC/MC Block 8.1 program follows the same "Block Upgrade" strategy being used in the C-130J program (PE 0401132F). A Block 8.X is planned to integrate future SOCOM-funded AC-130J/MC-130J capabilities with Block 8.1.

The USAF will be fielding the IFF Mode 5 and ADS-B Out portions of Block 8.1 ahead of the remaining 36 capabilities in order to comply with the 2020 mandates.

The Block 8.1 fleet modification program begins in FY 2019.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	13.987	38.579	13.632	0.000	13.632
Current President's Budget	0.000	38.579	32.574	0.000	32.574
Total Adjustments	-13.987	0.000	18.942	0.000	18.942
• 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	-13.987	0.000	18.942	0.000	18.942

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605278F / HC/MC-130 Recap RDT&E
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Change Summary Explanation

For PB19, FY17 funds were mistakenly put under BA05 rather than BA07.

FY19 increase attributed to rephrasing of Block 7.0/8.1 development program.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: HC/MC-130 Recap Test and Evaluation</p> <p>Description: Test and evaluation planning, conduct, and support for developmental and operational testing.</p> <p>FY 2018 Plans: Funding will support developmental and operational testing including Block 8.1 DT&E.</p> <p>FY 2019 Base Plans: Funding will support developmental and operational testing including Block 8.1 DT&E.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Block 8.1 test efforts expected to increase.</p>	0.000	0.266	0.330	-	0.330
<p>Title: HC/MC-130 Recap Continuous Improvement Program (CIP)</p> <p>Description: Recurring Software and hardware enhancements to address evolving requirements for Special Operations Forces and Personnel Recovery missions. These enhancements will be incorporated in both production and fielded aircraft. These enhancements will include, but are not limited to, parallel operational flight program (OFP) updates.</p> <p>FY 2018 Plans: Lay in funding through the FYDP to allow for a continuous improvement cycle of both hardware and software of multiple onboard systems, some of which may impact the aircraft OFP with programs already in work.</p> <p>FY 2019 Base Plans: Lay in funding through the FYDP to allow for a continuous improvement cycle of both hardware and software of multiple onboard systems, some of which may impact the aircraft OFP with programs already in work.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Incorporating requirements that were not captured in the previous CIP upgrade.</p>	0.000	0.100	0.158	-	0.158
<p>Title: HC/MC-130 Block 8.1</p>	0.000	30.213	24.086	-	24.086

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605278F / HC/MC-130 Recap RDT&E
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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<p>Description: Combined software/hardware upgrade for Block 8.1. Block 8.1 includes, but is not limited to: Link 16, a new Flight Management System (FMS), Civil Global Positioning System (GPS) Navigation, a Special Mission Processor Interface (SMP-I), Identification Friend or Foe (IFF) Mode 5, Civil Data Link, and Automatic Dependent Surveillance-Broadcast Out (ADS-B-Out).</p> <p>FY 2018 Plans: The HC-130J and MC-130J Block 8.1 trial kit installation (TKI) fabrication and engineering development and integration effort begins on both the HC-130J Increment 2 and the MC-130J Increment 3 aircraft.</p> <p>FY 2019 Base Plans: The HC-130J and MC-130J Block 8.1 TKI kitting and installation efforts occur and testing will begin.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Contractor activity expected to level off after initial program kick off.</p>					
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<p>Title: HC/MC-130 Block 8.1 Baseline engineering change proposal</p> <p>Description: Re-define the baseline configuration of GFE aircraft to align with expected configuration at time of TKI to include, but not limited to, removal of Link-16 function. This will allow the contractor to design and integrate several HC, MC and AC unique hardware and software changes being brought to the aircraft via other programs.</p> <p>FY 2018 Plans: Contract to remove Link-16 Function from MC-130J Block 7.0/8.1. Release the RFP to change the aircraft baseline configuration to align with expected configuration at time of TKI.</p> <p>FY 2019 Base Plans: Begin work to remove Link-16 Function from MC-130J Block 7.0/8.1. Award contract to change the aircraft baseline configuration to align with expected configuration at time of TKI.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No change.</p>	-	8.000	8.000	-	8.000
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Accomplishments/Planned Programs Subtotals	0.000	38.579	32.574	-	32.574
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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0605278F / <i>HC/MC-130 Recap RDT&E</i>
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D. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item HCMC00: <i>HC/MC-130 Modifications</i>	51.317	220.754	37.754	87.900	125.654	5.882	4.015	4.099	4.375	385.000	801.096
• APAF 02 Line Item C130JH: <i>HC-130J</i>	337.576	198.502	129.437	100.000	229.437	0.000	0.000	0.000	0.000	0.000	765.515
• APAF 02 Line Item C-130JM: <i>MC-130J</i>	549.358	409.373	988.201	-	988.201	1,433.807	445.075	266.684	194.106	50.000	4,336.604

Remarks

E. Acquisition Strategy

Lockheed Martin is the primary contractor for Research and Development work in support of the HC/MC-130J Recap program. Block 8.1 strategy takes the common core Block 8.1 developed in the C-130J program and integrates it into the MC-130J Increment 3 and HC-130J Increment 2 configurations. Block 8.1 will also integrate with MC- and HC- unique mods. The C-130J ADS-B Out program includes all C-130J variants. The MC-130J ADS-B Mod funds the Group A kits and the installation for AC/MC-130Js.

Development work done to date on the HC/MC-130J Recap program has been on Cost Plus Award Fee (CPAF) and Cost Plus Incentive Fee (CPIF) type 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605278F / HC/MC-130 Recap RDT&E	Project (Number/Name) 675006 / HC/MC-130 Recap
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
HC/MC-130 Recap Continuous Improvement Program (CIP)	SS/CPIF	Lockheed Martin : Marietta, GA	0.998	0.000	Mar 2018	0.100	Jul 2018	0.158	Mar 2019	-		0.158	0.000	1.256	1.198
HC/MC-130 Recap Block 8.1	SS/CPIF	Lockheed Martin : Marietta, GA	8.751	0.000	Dec 2016	30.213	Mar 2018	24.086	Oct 2018	-		24.086	18.391	81.441	81.441
HC/ MC-130 Recap Block 8.1 Baseline ECP	SS/CPIF	Lockheed Martin : Marietta, GA	-	-		8.000	Apr 2018	8.000	Apr 2019	-		8.000	0.000	16.000	-
Subtotal			9.749	0.000		38.313		32.244		-		32.244	18.391	98.697	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
HC/MC-130 Recap Test and Evaluation Support	RO	46th Test Wing : EAFB, FL	0.794	0.000	May 2017	0.266	May 2018	0.330	May 2019	-		0.330	8.075	9.465	7.756
Subtotal			0.794	0.000		0.266		0.330		-		0.330	8.075	9.465	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			10.543	0.000	38.579	32.574	-	32.574	26.466	108.162	N/A

Remarks
 HC/MC-130 Recap RDT&E switched from BA05 to BA07 in FY16. The FY15 and prior RDT&E total was \$91.885M.

 For PB19, FY17 funds were mistakenly put under BA05 rather than BA07 (PE: 65278F project: 675006).

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605278F / HC/MC-130 Recap RDT&E	Project (Number/Name) 675006 / HC/MC-130 Recap
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

HC/MC-130 Recap Development	
Development Test and Evaluation	
HC/MC-130 RECAP Block 8.1 Development	
HC/MC-130 RECAP Block 8.1 Baseline ECP	
Continuous Improvement Program (CIP)	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605278F / HC/MC-130 Recap RDT&E	Project (Number/Name) 675006 / HC/MC-130 Recap

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>HC/MC-130 Recap Development</i>				
Development Test and Evaluation	1	2017	4	2023
HC/MC-130 RECAP Block 8.1 Development	1	2017	3	2021
HC/MC-130 RECAP Block 8.1 Baseline ECP	3	2018	4	2020
Continuous Improvement Program (CIP)	1	2017	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606018F / <i>NC3 Integration</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	12.636	26.112	0.000	26.112	25.917	26.404	26.973	27.464	Continuing	Continuing
674877: <i>NC3 Integration, Assessment, and Improvement</i>	-	0.000	12.636	26.112	0.000	26.112	25.917	26.404	26.973	27.464	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018, Program 0303131F, Minimum Essential Emergency Communications Network (MEECN), Project 672832 MEECN System Improvements (MSI) efforts were transferred to Program 0606018F, Nuclear Command, Control, and Communications (NC3) Integration, Project 674877, NC3 Integration, Assessment, and Improvement in order to provide greater transparency.

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. These functions are accomplished through the NC3 system of systems.

The NC3 system of systems provides connectivity from the President or Secretary of Defense through the National Military Command System (NMCS) to nuclear execution forces worldwide. To enhance NC3 mission success, the AF formalized AF NC3 elements as a specified AF Weapon System (WS), AN/USQ-225. Activities funded in this Program integrate legacy systems, ongoing NC3 programs, and future capabilities for the overall AF NC3 WS.

The AF Nuclear Weapon Center NC3 Integration Directorate (AFNWC/NC) will ensure current, new, and future NC3 capabilities are fully integrated as part of the Air Force's overall effort to sustain, modernize, and recapitalize the nuclear enterprise. AFNWC/NC will be responsible for integrating NC3 materiel management across Air Force Materiel Command (AFMC) to include authority and responsibility for weapon system architecture, weapon system configuration management, weapon system state-of-health reporting, risk management, supply chain management, overall integration, system test, verification, and certification. AFNWC/NC is responsible for defining, building, and sustaining current and future NC3 WS system of systems configuration baselines, and marshaling necessary Supporting Centers in AFMC and other units/agencies in the Air Force and the Department of Defense (DoD) to support and/or accomplish these tasks. AFNWC/NC will collaborate with AFMC Supporting Centers to champion the full spectrum of doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) efforts, in support of Air Force Global Strike Command as the Lead Command championing NDO requirements for all Combatant Commands.

This program funds activities for integrating AF NC3 WS materiel, authority, and responsibility for the AF NC3 WS architecture, configuration management, weapon system state-of-health reporting, supply chain management, and overall AF NC3 WS integration, system test, verification, and certification.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606018F / <i>NC3 Integration</i>
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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.

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 years.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	12.636	19.308	0.000	19.308
Current President's Budget	0.000	12.636	26.112	0.000	26.112
Total Adjustments	0.000	0.000	6.804	0.000	6.804
• 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	6.804	0.000	6.804

Change Summary Explanation

FY19 PB Funding increase to meet NC3 Integration requirements (+\$6.804M)

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: NC3 Integration, Assessment, and Improvement	0.000	12.636	26.112
Description: To include but not limited to: Modeling and simulation of the NC3 WS current and future capabilities, conducting capability gap analysis, and establishing NC3 capability recapitalization and modernization plans. Developing and conducting the NC3 WS test and certification program as well as expanding existing High Frequency (HF) testbed utilizing a phased approach. Conducting NC3 system component verification. Implementing and employing program and material management controls for the NC3 WS including configuration management, risk management, supply chain management, maintenance data reporting capabilities and NC3 WS health monitoring solutions, issue tracking and resolution, assessments and analysis, and governance. Providing data-driven system of system solutions, and shaping NC3 component program acquisition strategies for AF NC3 sustainment and performance capability improvements. Initiating and implementing new capability programs/systems and changes to existing programs to align with NC3 WS requirements, test and certification, and future capabilities.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606018F / <i>NC3 Integration</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p><i>FY 2018 Plans:</i> NC3 weapon system integration efforts including, but not limited to:</p> <ul style="list-style-type: none"> - Continue to implement test and evaluation certification program for NC3 WS and expand existing HF testbed utilizing a phased approach - Continue to perform NC3 physics, communication and networking analysis - Continue to develop and evolve technical framework of the NC3 WS to meet mission threats of 2030 and beyond - Continue to conduct WS analysis, develop WS capability model, plan WS updates, and implement WS updates - Continue to evaluate options for pacing system-of-system performance improvements within constraints of WS - Continue to analyze, model, and prototype emerging NC3 technologies - Continue to develop and implement NC3 WS program and materiel management control processes including risk management, configuration control, integrated scheduling, budgeting and cost controls, etc. - Continue to conduct NC3 WS health assessments, reporting, and issue resolution - Continue to map out the NC3 WS supply chain and develop supply chain monitoring capability, supply chain supportability and supply chain risk management - Continue to develop layered architecture to measure and report capability impacts - Continue to develop and coordinate Operational Performance Capability Document (OPCD) to support weapon system configuration element specs, test and evaluation, and assessment of weapon capabilities and limitations <p><i>FY 2019 Plans:</i> NC3 weapon system integration efforts including, but not limited to:</p> <ul style="list-style-type: none"> - Continue to implement test and evaluation certification program for NC3 WS - Expand existing communication spectrum and cyber assessment test bed utilizing a phased approach - Continue to perform NC3 physics, communication and networking analysis - Continue to develop and evolve technical framework of the NC3 WS to meet mission threats of 2030 and beyond - Continue to conduct WS analysis, develop WS capability model, plan WS updates, and implement WS updates - Continue to evaluate options for system-of-system performance improvements within constraints of NC3 WS strategic vision and roadmap - Continue to analyze, model, and prototype emerging NC3 technologies - Continue to develop and implement NC3 WS program and materiel management control processes including risk management, configuration management, supply chain management, maintenance data reporting and NC3 WS health assessment application, integrated scheduling, budgeting and cost controls, etc. - Continue to conduct NC3 WS health assessments, reporting, and issue resolution - Continue to map out the NC3 WS supply chain and develop supply chain monitoring capability, supply chain supportability and supply chain risk management 			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606018F / <i>NC3 Integration</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Continue to develop layered architecture to measure and report capability impacts - Continue to develop and coordinate OPCD to support weapon system configuration element specs, test and evaluation, and assessment of weapon capabilities and limitations - Establish authoritative intelligence community analysis for high-altitude electromagnetic pulse (HEMP) - Improve integration and interoperability of the NC3 WS <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Increase to ramp up activities after stand up of Directorate.</p>			
Accomplishments/Planned Programs Subtotals	0.000	12.636	26.112

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

N/A

Remarks

E. Acquisition Strategy

The NC3 Integration acquisition strategy applies WS acquisition lifecycle principles across the system of systems AF NC3 WS. Key elements include configuration management, supply chain management, maintenance data risk management, integration, test, verification, and certification, as well as modeling, simulation, gap analysis, and architecture development for capabilities in sustainment, development, and for future capabilities. To conduct these essential activities a combination of competitively awarded contracts, as well as sole source contracts, will be used to augment AF organic capabilities with technical skill sets from Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry Advisory and Assistance Services (A&AS) providers.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0606018F / NC3 Integration	Project (Number/Name) 674877 / NC3 Integration, Assessment, and Improvement
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DMS FFRDC/UARC/A&AS	TBD	TBD : TBD	-	-		10.000	Oct 2017	23.500	Oct 2018	-		23.500	Continuing	Continuing	-
Subtotal			-	-		10.000		23.500		-		23.500	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integration Studies /Test Support	TBD	TBD : TBD	-	-		1.036	Oct 2017	1.000	Oct 2018	-		1.000	Continuing	Continuing	-
Subtotal			-	-		1.036		1.000		-		1.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA (Eng/Acq Spt/Travel/Supplies)	TBD	TBD : TBD	-	-		1.600	Oct 2017	1.612	Oct 2018	-		1.612	Continuing	Continuing	-
Subtotal			-	-		1.600		1.612		-		1.612	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-	12.636	26.112	-	26.112	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0606018F / <i>NC3 Integration</i>	Project (Number/Name) 674877 / <i>NC3 Integration, Assessment, and Improvement</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>NC3 WS Integration</i>																												
NC3 WS Test and Certification Program																												
NC3 Health Assessment and Analysis																												
Enhance Target Architecture through Development of NC3 Technologies																												
Implement NC3 WS Program and Materiel Management Control Process																												
Generate NC3 Mission - Space Resiliency																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0606018F / <i>NC3 Integration</i>	Project (Number/Name) 674877 / <i>NC3 Integration, Assessment, and Improvement</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>NC3 WS Integration</i>				
NC3 WS Test and Certification Program	1	2018	4	2023
NC3 Health Assessment and Analysis	1	2018	4	2023
Enhance Target Architecture through Development of NC3 Technologies	1	2018	4	2023
Implement NC3 WS Program and Materiel Management Control Process	1	2018	4	2023
Generate NC3 Mission - Space Resiliency	1	2018	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606942F / <i>Assessments and Evaluations Cyber Vulnerabilities</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	99.100	0.000	99.100	0.000	0.000	0.000	0.000	Continuing	Continuing
677821: <i>Cyberspace Vulnerability Assessment</i>	-	0.000	0.000	99.100	0.000	99.100	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0606942F, project 677821, Address Weapon System Cyber Vulnerabilities, is a new start.
 This program, BA 7, PE 0606942F, project 677821, Address Infrastructure Cyber Vulnerabilities, is a new start.
 This program, BA 7, PE 0606942F, project 677821, Exercise Participation, is a new start.

A. Mission Description and Budget Item Justification

This program funds cyber vulnerability assessments of Air Force weapons systems and critical infrastructure as well as non-recurring engineering for mitigations. The effort leverages the methodology described in the Air Force Cyber Campaign Plan (CCP) to provide Air Force mission assurance in a cyber-contested environment. Under the Air Force CCP, the Air Force is accomplishing work mandated by Section 1647 of the Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA) and Section 1650 of the FY 2017 NDAA. Section 1647 of the FY 2016 NDAA directs the Secretary of Defense to complete an evaluation of the cyber vulnerabilities of each major weapon system of the Department of Defense. Section 1650 of the FY 2017 NDAA mandates the Secretary of Defense submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations. This funding focuses on aspects of the AF CCP that develop processes, products, and people to perform the short term goals of conducting system cyber vulnerability assessments, cyber mitigations, and pilot programs and work toward the long term goal of achieving an enduring cyber resilient Air Force. The program builds upon existing efforts regarding the identification and mitigation of cyber vulnerabilities, and does not duplicate similar ongoing efforts or conduct redundant assessments on systems that have already been evaluated.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606942F / <i>Assessments and Evaluations Cyber Vulnerabilities</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	99.100	0.000	99.100
Total Adjustments	0.000	0.000	99.100	0.000	99.100
• 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	0.000	0.000	99.100	0.000	99.100

Change Summary Explanation

Increase in FY 2019 due to the Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics transitioning the responsibility of funding NDAA 1647 and 1650 activities directly to the Services.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: Address Weapon System Cyber Vulnerabilities	-	0.000	46.300
Description: Develop processes, products, and people to conduct weapon system cyber vulnerability assessments, cyber mitigations, demonstrations, and pilot programs toward the long term goal of achieving an enduring cyber resilient Air Force.			
FY 2018 Plans: Not applicable - program is a new start in FY 2019.			
FY 2019 Plans: Conduct weapon systems cyber vulnerability assessments and prototype mitigations.			
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 increased by \$46.3 million compared to FY 2018 due to this program being a new start.			
Title: Address Infrastructure Cyber Vulnerabilities	-	0.000	46.300
Description: Develop processes, products, and people to conduct infrastructure/control systems/Operational Technology cyber vulnerability assessments, cyber mitigations, demonstrations, and pilot programs toward the long term goal of achieving an enduring cyber resilient Air Force.			
FY 2018 Plans:			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606942F / <i>Assessments and Evaluations Cyber Vulnerabilities</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Not applicable - program is a new start in FY 2019.			
FY 2019 Plans: Conduct infrastructure cyber vulnerability assessments. Develop prototype mitigations. Initiate the infrastructure cyber pilot program.			
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 increased by \$46.3 million compared to FY 2018 due to this program being a new start.			
Title: Exercise Participation	-	0.000	6.500
Description: This effort supports exercise participation, Combatant Command support, and assessment team activities to validate candidate weapon system and infrastructure cyber vulnerabilities.			
FY 2018 Plans: Not applicable - program is a new start in FY 2019.			
FY 2019 Plans: Participate in USSTRATCOM and other Combatant Command exercises. Validate Air Force weapon system and infrastructure cyber vulnerabilities.			
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 increased by \$6.5 million compared to FY 2018 due to the program being a new start.			
Accomplishments/Planned Programs Subtotals	-	0.000	99.100

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

Remarks

E. Acquisition Strategy
When possible, activities in this effort will leverage current competitively-awarded contracts. Additional necessary contracts funded in this program element will be awarded using either competitive or sole source procedures, whichever is most appropriate.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0606942F / Assessments and Evaluations Cyber Vulnerabilities	Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Weapon Systems Cyber Vulnerability Studies and Reports	TBD	AFMC: TBD : TBD	-	0.000		0.000		27.000	Jan 2019	-		27.000	Continuing	Continuing	-
Weapon Systems Prototype Mitigations	TBD	AFMC: TBD : TBD	-	0.000		0.000		19.300	Jan 2019	-		19.300	Continuing	Continuing	-
Infrastructure Cyber Vulnerability Studies and Reports	TBD	AFCEC: TBD : TBD	-	0.000		0.000		26.400	Jan 2019	-		26.400	Continuing	Continuing	-
Infrastructure Cyber Vulnerability Prototype Mitigations and Pilot Activities	TBD	AFCEC: TBD : TBD	-	0.000		0.000		19.900	Jan 2019	-		19.900	Continuing	Continuing	-
Subtotal			-	0.000		0.000		92.600		-		92.600	Continuing	Continuing	N/A

Remarks
In FY 2019, the Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics transitioning the responsibility of funding NDAA 1647 and 1650 activities directly to the Services.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Exercise and Assessment Team Participation	TBD	AFMC: TBD : TBD	-	0.000		0.000		6.500	Jan 2019	-		6.500	Continuing	Continuing	-
Subtotal			-	0.000		0.000		6.500		-		6.500	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	0.000	0.000	99.100	-		99.100	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force			Date: February 2018				
Appropriation/Budget Activity 3600 / 7		R-1 Program Element (Number/Name) PE 0606942F / <i>Assessments and Evaluations Cyber Vulnerabilities</i>			Project (Number/Name) 677821 / <i>Cyberspace Vulnerability Assessment</i>		

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Cyberspace Vulnerability Assessment																											
Conduct cyber vulnerability assessments for weapon systems																											
Develop and assess weapon system cyber mitigations																											
Conduct cyber vulnerability assessments for infrastructure																											
Develop and assess infrastructure cyber mitigations																											
Conduct infrastructure pilot program																											
Participate in exercises and red team activities																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0606942F / <i>Assessments and Evaluations Cyber Vulnerabilities</i>	Project (Number/Name) 677821 / <i>Cyberspace Vulnerability Assessment</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Cyberspace Vulnerability Assessment</i>				
Conduct cyber vulnerability assessments for weapon systems	1	2019	4	2020
Develop and assess weapon system cyber mitigations	1	2019	4	2020
Conduct cyber vulnerability assessments for infrastructure	1	2019	4	2020
Develop and assess infrastructure cyber mitigations	1	2019	4	2020
Conduct infrastructure pilot program	1	2019	1	2020
Participate in exercises and red team activities	1	2019	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	74.550	111.910	280.414	0.000	280.414	529.772	560.381	408.331	319.518	Continuing	Continuing
675039: B-52 System Improvements	-	0.000	10.050	41.230	0.000	41.230	49.597	44.892	4.319	4.320	Continuing	Continuing
675041: Bomber Tactical Data Link	-	10.397	8.167	30.977	0.000	30.977	36.069	44.376	26.617	13.982	Continuing	Continuing
675048: 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)	-	28.870	15.164	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675050: CONECT	-	13.189	7.043	11.138	0.000	11.138	0.001	0.000	0.003	0.002	Continuing	Continuing
675055: GPS-IU	-	9.525	18.767	37.030	0.000	37.030	1.985	0.000	0.000	0.000	Continuing	Continuing
675056: B-52 Radar Modernization Program (RMP)	-	4.637	15.226	56.864	0.000	56.864	119.005	154.870	179.148	177.356	Continuing	Continuing
675057: B-52 Low Cost Improvement (LCI)	-	0.000	2.682	2.605	0.000	2.605	2.607	2.605	2.660	2.710	Continuing	Continuing
675058: B-52 Weapon Sys Trainer Air Ref Training Upgrade	-	4.702	13.240	0.000	0.000	0.000	7.858	0.000	0.000	0.000	Continuing	Continuing
675129: B-52 Re-Engining	-	0.000	0.000	64.515	0.000	64.515	312.650	313.638	195.584	121.148	Continuing	Continuing
675160: B-52 Crypto Modernization	-	3.230	11.919	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
676039: B-52 Airspace Compliance	-	0.000	9.652	36.055	0.000	36.055	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

This program, BA 7, PE 0101113F, project 671803, B-52 AFMC Test Aircraft Asset Support, is a new start.
 This program, BA 7, PE 0101113F, project 671805, B-52 VLF/LF, is a new start.
 This program, BA 7, PE 0101113F, project 671807, B-52 Advanced Target Pod Multi-Functional Color Display, is a new start.
 This program, BA 7, PE 0101113F, project 671810, B-52 AEHF Integration, is a new start.
 This program, BA 7, PE 0101113F, project 675039, AFMC Test Assets, is a new start.
 This program, BA 7, PE 0101113F, project 675039, B-52 VLF/LF Modernization, is a new start.
 This program, BA 7, PE 0101113F, project 675039, Advanced Target POD MFCD, is a new start.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	
<p>This program, BA 7, PE 0101113F, project 675041, B-52 Advanced Extremely High Frequency (AEHF) Integration, is a new start. This program, BA 7, PE 0101113F, project 675129, B-52 Re-Engining, is a new start.</p> <p>A. Mission Description and Budget Item Justification</p> <p>B-52 SYSTEM IMPROVEMENTS (BPAC 675039) The B-52 System Improvements is a comprehensive project to facilitate future capabilities and ensure the B-52's viability in performing current and future wartime missions. The scope of work may include studies and analyses to include development Analyses of Alternatives (AoA), Capability Development Documents (CDD), and/or any other analysis or documentation necessary to establish a Program of Record (POR). Additionally, this project may include airborne integration experiments or demonstrations of emerging technologies.</p> <p>Trainers and Upgrades for B-52 Systems Improvements In order to maintain currency with the latest aircraft configuration, the B-52 Systems Improvements projects will update existing trainers or use Computer-Based Training (CBT) to add any new systems improvement functionality to meet user training requirements and update/maintain the Systems Integration Lab (SIL) for the Weapon System Trainers (WSTs).</p> <p>MAJOR THRUSTS</p> <p>B-52 AFMC TEST ASSETS (future BPAC 671803) The B-52 Test Support project will provide funding for the test aircraft, manpower, and facilities at the Air Force Test Center located at Edwards AFB, California. This project will support the developmental testing and sustainment needs of the B-52 weapon system.</p> <p>B-52 VLF/LF Modernization (future BPAC 671805) The B-52 VLF/LF Modernization integrates a receive-only, low frequency receiver and antenna subsystem to provide secure, survivable strategic nuclear communication capability for the B-52. This project will consist of integrating an existing VLF/LF Modernization terminal into the B-52. Integration includes Group A wiring, rack and antenna, and the Group B terminal Line Replaceable Unit (LRU). Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. As the VLF/LF Modernization provides future communication growth to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.) as well as other aircraft upgrades (Link 16, EHF, 1760 IWBU, Mode S/Mode 5, IFF, BSB, Re-Engine, etc.) may require studies and/or support for potential impact to VLF/LF Modernization. Funds may be used to procure, test, and field terminals. 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. Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.</p> <p>Trainers and Upgrades for B-52 VLF/LF Modernization</p>		

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<p>In order to maintain currency with the latest aircraft configuration, the B-52 Systems Improvements projects will update existing trainers or use Computer-Based Training (CBT) to add any new systems improvement functionality to meet user training requirements and update/maintain the Systems Integration Lab (SIL) for the Weapon System Trainers (WSTs).</p> <p>B-52 ADVANCED TARGET POD-MULTI FUNCTION COLOR DISPLAY (future BPAC 671807) The B-52 Advanced Targeting Pod Multi-Function Color Display (ATP-MFCD) project consists of a monitor upgrade with a 10 gigabyte Ethernet connection. The current targeting pod is outdated and experiencing a historic break rate. Additionally, the current monitor does not support current and emerging video resolution improvements of the fielded Sniper and LITENING ATPs. The B-52's ATP is now capable of transmitting HD color and video at a much higher resolution than the current monochrome monitor; this upgrade will improve combat lethality and situational awareness.</p> <p>Trainers and Upgrades for B-52 Advanced Target Pod Multi Function Color Display In order to maintain currency with the latest aircraft configuration, the B-52 Systems Improvements projects will update existing trainers or use Computer-Based Training (CBT) to add any new systems improvement functionality to meet user training requirements and update/maintain the Systems Integration Lab (SIL) for the Weapon System Trainers (WSTs).</p> <p>BOMBER TACTICAL DATA LINK (TDL) (BPAC 675041) The Bomber Tactical Data Link (TDL), also known as B-52 Link 16, provides low latency, jam-resistant situation awareness and the Command and Control (C2) communications needed to support in-theater operations and missions. This project will consist of integrating an existing Commercial Off-the-Shelf (COTS) Link 16 terminal into the B-52. Integration includes Group A wiring, rack and antenna modification, and the incorporation of the Group B terminal Line Replaceable Unit (LRU). The TDL terminal will be fully integrated with Combat Network Communications Technology (CONNECT). This Line-Of-Sight (LOS) Link 16 capability allows the warfighter to maintain situational awareness, avoid threats, and most efficiently employ an array of weapons.</p> <p>Trainers and Upgrades for Bomber TDL In order to maintain currency with the latest aircraft configuration, the Bomber TDL project will update existing trainers or use CBT to add TDL functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>B-52 ADVANCED EXTREMELY HIGH FREQUENCY (AEHF) INTEGRATION The B-52 Advance Extremely High Frequency (AEHF) Integration SATCOM system provides a survivable, low probability of intercept/detection, high bandwidth system that ensures secure intra/inter-flight and two-way command and control communications in the modern anti-access/aerial denial battlespace. This communications upgrade replaces the non-survivable Military Strategic and Tactical Relay (MILSTAR) Ultra High Frequency (UHF) SATCOM capability (MILSTAR is nearing system end of life) on the B-52. The AEHF Integration effort will integrate the terminal, antenna and system components required to provide two-way EHF communication for the B-52.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
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<p>Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. As AEHF Integration provides future communication growth to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.) as well as other aircraft upgrades (Link 16, CVR, 1760 IWBU, Mode S/Mode 5, IFF, BSB, Re-Engine, etc.) may require studies and/or support for potential impact to AEHF. Funds may be used to procure, test, and field terminals and other system components.</p> <p>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. Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.</p> <p>Trainers and Upgrades for B-52 ADVANCED EXTREMELY HIGH FREQUENCY In order to maintain currency with the latest aircraft configuration, the B-52 Systems Improvements projects will update existing trainers or use Computer-Based Training (CBT) to add any new systems improvement functionality to meet user training requirements and update/maintain the Systems Integration Lab (SIL) for the Weapon System Trainers (WSTs).</p> <p>B-52 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU) The B-52 1760 Internal Weapons Bay Upgrade (IWBU) integrates MIL-STD 1760 weapons capability onto the B-52. This project utilizes 44 Common Strategic Rotary Launchers (CSRLs) converted into Conventional Rotary Launchers (CRLs), where three of the CRLs will be modified under Engineering and Manufacturing Development (EMD) for test purposes thus resulting in a production quantity of 41 CRLs. Increment 1.1 develops capability for internal carriage of eight Joint Direct Attack Munitions (JDAM) and variants, to include Laser JDAM (LJDAM), on a rotary launcher. Additionally, this increment develops the capability for external carriage for 16 LJDAM. Increment 1.2 develops the capability for internal carriage of eight Joint Air-to-Surface Standoff Missiles (JASSM) and its variants, to include JASSM-Extended Range (JASSM-ER), or eight Miniature Air Launched Decoys (MALD) and its variants, to include MALD Jammer (MALD-J). This increment also develops the capability for external carriage for 12 JASSM-ER. This requirement's CDD was validated by the Air Force Requirements Oversight Council (AFROC) in June 2013.</p> <p>Trainers and Upgrades for B-52 1760 IWBU In order to maintain currency with the latest aircraft configuration, the B-52 1760 IWBU project will update existing trainers or use CBT to add MIL-STD 1760 IWBU functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>B-52 COMBAT NETWORK COMMUNICATIONS TECHNOLOGY (CONECT) The B-52 CONECT project supports nuclear and conventional operations by upgrading the B-52 fleet with data and voice communications capabilities along with improved threat awareness and situational awareness to support participation in net-centric operations. The CONECT upgrade includes new Multi-Functional Color Displays (MFCDs) and a digital interphone system; both of which will survive and function through the nuclear environment to enhance crew interaction and situational awareness. In order to enable net-centric operations, the CONECT upgrade integrates the following systems: on-board client/server architecture supporting distributed processing with independent control functions; UHF Beyond Line-Of-Sight (BLOS) Joint Range Extension (JRE) capability via ARC-210 Warrior radio (for exchanging J-Series messaging within theater); Intelligence Broadcast Receiver (IBR); limited Internet Protocol (IP)-based UHF BLOS link (to support voice, e-mail, and file transfers); and an Improved Data Modem (IDM)-based digital Variable Message Format (VMF) datalink to significantly enhance Close Air Support (CAS) missions. This integrated</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
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<p>suite will provide the B-52 fleet with a machine-to-machine data transfer capability supporting aircraft re-tasking and retargeting of Conventional Air-Launched Cruise Missile (CALCM) and J-series weapons across the range of B-52 military operations and missions. This requirement's Capability Production Document (CPD) was validated by the Air Force Requirements Oversight Council (AFROC) on 16 September 2008.</p> <p>Trainers and Upgrades for B-52 CONECT In order to maintain currency with the latest aircraft configuration, the B-52 CONECT project will update existing trainers or use CBT to add CONECT functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>GLOBAL POSITIONING SYSTEM (GPS) INTERFACE UNIT (IU) (GPS-IU) REPLACEMENT The Global Positioning System (GPS) Interface Unit (IU) Replacement project will replace three Circuit Card Assemblies (CCAs) in the GPS-IU as well as the backplane (to integrate the new and old CCAs); the Central Processing Unit (CPU)/1553, the power supply CCA, and the video graphics card.</p> <p>Trainers and Upgrades for GPS-IU Replacement In order to maintain currency with the latest aircraft configuration, the GPS-IU Replacement project will update existing trainers or use CBT to add GPS-IU functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>RADAR MODERNIZATION PROGRAM (RMP) The RMP will support nuclear and conventional operations by replacing the current APQ-166 radar on the B-52H aircraft. The APQ-166 is increasingly difficult to support due to Diminished Manufacturing Sources (DMS) and obsolescent technologies; the average reliability rate places long-duration missions at risk. This modernization program will encompass the radar antenna array and up to 14 individual LRUs that comprise the entire B-52 radar system. Development and production of new systems to replace the legacy equipment will be installed on all 76 B-52H aircraft. The RMP will take advantage of advances in technology and on-going development efforts to acquire, to the maximum extent possible, COTS components and integrate them into the B-52. The use of new technology will increase reliability of the radar system while also allowing the operational command to fully utilize the capabilities of the B-52H aircraft to employ an array of weapons, perform mission-essential navigation, and conduct weather avoidance functions.</p> <p>Trainers and Upgrades for RMP In order to maintain currency with the latest aircraft configuration, the RMP will update existing trainers or use CBT to add modernized radar functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>LOW COST IMPROVEMENTS The Low Cost Improvements BPAC will facilitate future B-52 capabilities. The scope of work may involve, but is not limited to the following systems/functions: avionics, navigation, Situational Awareness (SA), weapons/targeting pod integration, communications, flight systems, nuclear systems, and electronic flight bags. Additionally, this project will develop and integrate emerging technologies for specialized B-52 missions to include Intelligence, Surveillance, and Reconnaissance (ISR), targeting, and weapons employment. Continuing work related to the Mission Data Recorder will make the T-1 modification a permanent modification to the platform.</p>		

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<p>Trainers and Upgrades for Low Cost Improvements In order to maintain currency with the latest aircraft configuration, this project will update existing trainers or use CBT to add low cost, improved functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>B-52 WEAPON SYSTEMS TRAINER (WST) AIR REFUELING TRAINER UPGRADE The Weapon Systems Trainer (WST) Air Refueling Trainer upgrade enhances the principal mission of the B-52 Training Systems program by ensuring high-fidelity simulators and training systems are available for aircrew members to support credible training, maintain proficiencies, and increase skill levels. B-52 Aircrew Training Devices simulate the necessary visual, motion, and audible cues to provide effective ground training for aircrew members. The B-52 WST Air Refueling Upgrade is a comprehensive project that will aid B-52 aircrew in accomplishing credible air refueling training in the simulator, which in turn will minimize the requirement for on-aircraft air refueling training. To facilitate this capability, the scope of work will involve development of an AoA, studies and analysis, a CDD, or any other analysis or documentation necessary to support the POR. This upgrade will also implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.</p> <p>B-52 RE-ENGINEING The B-52 Re-Engine Program (REP) supports nuclear and conventional operations by replacing the current TF33-PW-103 engine on the B-52H aircraft. The TF33-PW-103 engine is increasingly difficult to sustain due to diminished manufacturing sources and obsolescent technologies; the AF Propulsion Directorate projects the engine will become unsustainable by 2030. This sustainment program will replace the current TF33-PW-103 engine with jet engines of similar size, weight, and thrust characteristics. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. As the REP brings additional capability to the B-52, emerging security/certification requirements (nuclear hardening, cyber security, program protection, etc.) will also need to be addressed. Several concurrent aircraft upgrades during the REP may necessitate studies be performed during the program to determine optimal engine installation and deployment options.</p> <p>Trainers and Upgrades for B-52 Re-Engining In order to maintain currency with the latest aircraft configuration, the B-52 Re-Engining project will update existing trainers or use CBT to add modernized re-engining capabilities/functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>B-52 CRYPTO MODERNIZATION The B-52 Crypto Modernization project will upgrade the B-52 with Mobile User Objective System (MUOS)-capable ARC-210 radio systems to prevent loss of BLOS voice and data communications capability.</p> <p>Trainers and Upgrades for Crypto Modernization In order to maintain currency with the latest aircraft configuration, the B-52 Cryto Modernization project will update existing trainers or use CBT to add Cryto Modernization functionality to meet user training requirements and update/maintain the SIL for the WSTs.</p> <p>B-52 AIRSPACE COMPLIANCE</p>		

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The B-52 Airspace Compliance project will upgrade the Communication, Navigation and Surveillance and Air Traffic Management (CNS/ATM) systems to meet FAA mandates. Additionally, the Automatic Dependent Surveillance-Broadcast (ADS-B) upgrade will be accomplished to meet FAA requirements for FY20.

Trainers and Upgrades for B-52 Airspace Compliance

In order to maintain currency with the latest aircraft configuration, the B-52 Airspace Compliance project will update existing trainers or use CBT to add increased functionality to meet user training requirements and update/maintain the SIL for the WSTs. Funds may be used to resolve emerging safety of flight and DMS issues, accommodate technology insertion, and fulfill FAA (or other) mandates necessary to ensure continued aircrew safety and mission effectiveness and to accommodate the FAA mandate for ADS-B as outlined throughout previous AF and DoD budget exhibits.

This Program Element (PE) may include any necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

BA 7- This project 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.

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

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	88.267	111.910	130.323	0.000	130.323
Current President's Budget	74.550	111.910	280.414	0.000	280.414
Total Adjustments	-13.717	0.000	150.091	0.000	150.091
• 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	-0.760	0.000			
• SBIR/STTR Transfer	-2.957	0.000			
• Other Adjustments	-10.000	0.000	150.091	0.000	150.091

Change Summary Explanation

FY17: Decrease of \$13.717M consists of: -\$10M reduction for re-engine (Request of Additional Appropriations not fulfilled), -\$2.96M for SBIR, and -0.76M for BTR to B-1.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force Date: February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	PE 0101113F / <i>B-52 Squadrons</i>

FY19: Increase of \$150.1M consists of four new start programs: AFMC Test Assets \$17.9M, Advanced Targeting POD Multi-Function Color Display \$1.59M, VLF/LF Modernization \$22.00M, and AEHF Integration \$13.55M; funding additions to: Re-Engine \$65M, GPS-IU \$28M, Tactical Data Link \$12.078M; funding decreases to WST AR Trainer upgrade \$7.917M (moved to FY20) and overall inflation adjustment \$2.11M.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>				Project (Number/Name) 675039 / <i>B-52 System Improvements</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675039: <i>B-52 System Improvements</i>	-	0.000	10.050	41.230	0.000	41.230	49.597	44.892	4.319	4.320	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0101113F, project 675039, AFMC Test Assets, is a new start.
 This program, BA 7, PE 0101113F, project 675039, B-52 VLF/LF Modernization, is a new start.
 This program, BA 7, PE 0101113F, project 675039, Advanced Target POD MFCD, is a new start.

A. Mission Description and Budget Item Justification

B-52 System Improvements

B-52 System Improvements is a comprehensive project to facilitate future capabilities and ensure the B-52's viability in performing current and future wartime missions. The scope of work may include development of an AoA, studies and analysis, a CDD, and/or any other analysis or documentation necessary to establish a POR. Additionally, this project may include airborne integration experiments or demonstrations of emerging technologies.

Costs include any analysis, documentation, and related expenses necessary to establish a program of record and support the B-52 weapon system. Additionally, other costs include PMA and centralized support and initiatives for anticipated weapon system enhancements (to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership).

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continue aircrew safety and mission effectiveness.

B-52 AMFC Test Support

"The B-52 Test Support project will provide funding for the test aircraft, manpower, and facilities at the Air Force Test Center located at Edwards AFB, California. This project will support the developmental testing and sustainment needs of the B-52 weapon system.

Costs include any analysis, documentation, and related expenses necessary to establish a program of record and support the B-52 weapon system. Additionally, other costs include PMA and centralized support and initiatives for anticipated weapon system enhancements (to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership).

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continue aircrew safety and mission effectiveness.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
<p>"The B-52 VLF/LF Modernization integrates a receive-only, low frequency receiver and antenna subsystem to provide a secure, survivable strategic nuclear communication capability for the B-52. This project will consist of integrating an existing VLF/LF terminal into the B-52. Integration includes Group A wiring, rack and antenna, and the Group B terminal Line Replaceable Unit (LRU).</p> <p>Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. As the VLF/LF provides future communication growth to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.) as well as other aircraft upgrades (Link 16, EHF, 1760 IWBU, Mode S/Mode 5, IFF, BSB, Re-Engine, etc.) may require studies and/or support for potential impact to VLF/LF. Funds may be used to procure, test, and field terminals.</p> <p>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.</p> <p>Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness."</p> <p>B-52 Reengining The B-52 Re-Engine Program (REP) supports nuclear and conventional operations by replacing the current TF33-PW-103 engine on the B-52H aircraft. The TF33-PW-103 engine is increasingly difficult to sustain due to diminished manufacturing sources and obsolescent technologies; the AF Propulsion Directorate projects the engine will become unsustainable by 2030. This sustainment program will replace the current TF33-PW-103 engine with jet engines of similar size, weight, and thrust characteristics. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. B-52 REP will take advantage of advances in technology and on-going development efforts to acquire engines and integrate them into the B-52. The use of new technology will increase both the overall reliability/maintainability of the propulsion system and produce additional electrical power generation capabilities for emerging requirements. This Re-Engine Program will allow the operational command (AF Global Strike Command) to fully utilize the capabilities of the B-52H aircraft to employ an array of nuclear and conventional weapons while saving fuel and extending the range/loiter capabilities of the aircraft. In addition, applicable training devices for the engine throttles and engine health monitoring subsystem must also be developed, modified and/or upgraded in conjunction with the aircraft modifications. This upgrade will also require corresponding modification of the Weapon System Trainers (WST). As the REP brings additional capability to the B-52, emerging security/certification requirements (nuclear hardening, cyber security, program protection, etc.) will also need to be addressed. Several concurrent aircraft upgrades during the REP may necessitate studies be performed during the program to determine optimal engine installation and deployment options.</p> <p>B-52 Advanced Targeting Pod (ATP) Multi-Functional Color Display (MFCD) "The B-52 Advanced Targeting Pod (ATP) Multi-Functional Color Display (MFCD) project consists of a monitor upgrade with a 10 gigabyte Ethernet connection. The current targeting pod display is outdated and experiencing a historic break rate. Additionally, the current monitor does not support current and emerging video resolution improvements of the fielded Sniper and LITENING ATPs. The B-52's ATP is now capable of transmitting HD color and video at a much higher resolution than the current monochrome monitor; this upgrade will improve SA and combat lethality.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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Costs include any analysis, documentation, and related expenses necessary to establish a POR and support the B-52 weapon system. Additionally, other costs include PMA and centralized support and initiatives for anticipated weapon system enhancements (to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership).

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continue aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: B-52 Systems Improvements</p> <p>Description: Initiate Analysis of Alternatives, modeling, simulation, testing, and demonstration, including but not limited to: Studies of existing and planned avionics, communications/navigation, electrical, weapons, flight, and nuclear-related aircraft systems and subsystems to support the future viability of the B-52 fleet.</p> <p>FY 2018 Plans: Continue Analysis of Alternatives, modeling, simulation, testing, and demonstration, including but not limited to: Studies of existing and planned avionics, communications/navigation, electrical, weapons, flight, and nuclear-related aircraft systems and subsystems to support the future viability of the B-52 fleet.</p> <p>FY 2019 Base Plans: Continue Analysis of Alternatives, modeling, simulation, testing, and demonstration, including but not limited to: Studies of existing and planned avionics, communications/navigation, electrical, weapons, flight, and nuclear-related aircraft systems and subsystems to support the future viability of the B-52 fleet.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>	0.000	0.050	0.050	0.000	0.050
<p>Title: B-52 Re-Engining</p> <p>Description: Initial evaluation effort to study replacement of the current TF33-PW-103 engine with jet engines of similar size, weight, and thrust characteristics. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. B-52 Re-Engine Program will take advantage of advances in technology and on-going development efforts to acquire engines and integrate them into the B-52.</p> <p>FY 2018 Plans:</p>	0.000	10.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Begin TMRR phase in support of Milestone B decision. Complete Materiel Development Decision and Acquisition Strategy Panel.</p> <p>FY 2019 Base Plans: N/A - transfer to BPAC 675129 in FY19</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A - Future efforts moved to BPAC 675129</p>					
<p>Title: AFMC Test Assets</p> <p>Description: B-52 Test Support provides funding for the test aircraft, manpower and facilities at the Air Force Test Center, Edwards AFB. This will support the developmental testing and sustainment needs of the B-52 from FY19-23</p> <p>FY 2018 Plans: N/A</p> <p>FY 2019 Base Plans: Provide funding for the test aircraft, manpower and facilities at the Air Force Test Center, Edwards AFB. This will support the developmental testing and sustainment needs of the B-52 from FY19-23</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: This program is an FY19 New Start with no funding in FY18</p>	0.000	0.000	17.766	0.000	17.766
<p>Title: B-52 VLF/LF Modernization</p> <p>Description: The B-52 Very Low Frequency (VLF)/Low Frequency (LF) effort integrates a receive-only, VLF/LF receiver and antenna subsystem to provide a secure, survivable strategic nuclear communication capability for the B-52. This project will consist of integrating an existing VLF/LF terminal into the B-52. Integration includes Group A wiring, rack and antenna, and the Group B terminal Line Replaceable Unit (LRU).</p> <p>FY 2018 Plans:</p>	0.000	0.000	21.835	0.000	21.835

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675039 / B-52 System Improvements
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
FY 2019 Base Plans: Approve Acquisition and Contracting Strategy for the B-52 VLF/LF and accomplish MS B. Submit RFP for Engineering and Manufacturing Development (EMD) effort. Negotiate and award EMD proposal.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: This program is an FY19 New Start					
Title: Advanced Target POD MFCD	0.000	0.000	1.579	0.000	1.579
Description: B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection. ATPs are capable of transmitting high definition color, picture in picture video at a much higher resolution than the current monochrome ATP monitor can display. Capability increase will improve combat lethality and situational awareness.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: Initiate development activities for the B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection. Begin TMRR efforts.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: This program is an FY19 New Start					
Accomplishments/Planned Programs Subtotals	0.000	10.050	41.230	0.000	41.230

C. Other Program Funding Summary (\$ in Millions)			FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Line Item	FY 2017	FY 2018									
• APAF 05 B052000: BP11 Aircraft Procurement ATP MFCD	-	-	-	-	-	-	-	22.907	16.216	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 06 B052000: <i>BP16 Initial Spares - ATP MFCD</i>	-	-	-	-	-	-	-	-	2.232	Continuing	Continuing
• APAF 05 B052000 (2)...: <i>BP11 Aircraft Procurement VLF/LF Modernization</i>	-	-	-	-	-	-	8.410	33.557	57.852	Continuing	Continuing

Remarks

D. Acquisition Strategy

Analyses of Alternatives will be conducted by various AFLCMC organizations and AFGSC.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675039 / B-52 System Improvements
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Improvements Studies and Analysis - Re-Engining	SS/ Various	The Boeing Company, 559 SMXS/MXDPBA : Oklahoma City, OK	-	-		10.000	Jun 2017	-		-		-	Continuing	Continuing	-
VLF/LF EMD - BPAC 675805	SS/ Various	Various : Oklahoma City, OK	-	-		-		19.835	Jul 2019	-		19.835	Continuing	Continuing	-
Advanced Target POD MFCD - BPAC 675807	TBD	TBD : TBD	-	-		-		1.579	Jun 2019	-		1.579	Continuing	Continuing	-
Subtotal			-	-		10.000		21.414		-		21.414	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
VLF/LF - BPAC 675805	Various	Various : NV	-	-		-		1.000	Dec 2018	-		1.000	Continuing	Continuing	-
Subtotal			-	-		-		1.000		-		1.000	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AFMC Test Aircraft support - BPAC 675803	PO	AFTC : Edwards AFB, CA	-	-		-		17.766	Oct 2018	-		17.766	Continuing	Continuing	-
Subtotal			-	-		-		17.766		-		17.766	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
B-52 Centralized Support, Program Management Administration, TDY,	Various	TBD : NV	-	-		0.050	Jan 2018	0.050	Jan 2019	-		0.050	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force											Date: February 2018					
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
3600 / 7				PE 0101113F / B-52 Squadrons					675039 / B-52 System Improvements							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total		Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete			
A&AS Contractor Support - 675039																
B-52 Centralized Support, Program Management Administration, TDY, A&AS Contractor Support - 675039VLF/LF - BPAC 675805	Various	Various : TBD	-	-		-		1.000	Dec 2018	-		1.000	Continuing	Continuing	-	
Subtotal			-	-		0.050		1.050		-		1.050	Continuing	Continuing	N/A	
Project Cost Totals			-	-		10.050		41.230		-		41.230	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Systems Improvements	
System Improvements Studies and Analysis, etc. (Began 2Q16)	
AFMC Test Aircraft support - BPAC 675803	
Test Support	
B-52 VLF/LF Modernization - BPAC 675805	
MS B	
EMD	
MS C	
Production	
ATP - MFCD BPAC 675807	
TMRR Milestone BEMD Milestone C Production Required Assets Available	
MS B	
EMD	
MS C	
Production	
Required Assets Available	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Systems Improvements</i>				
System Improvements Studies and Analysis, etc. (Began 2Q16)	1	2017	4	2023
<i>AFMC Test Aircraft support - BPAC 675803</i>				
Test Support	1	2019	4	2023
<i>B-52 VLF/LF Modernization - BPAC 675805</i>				
MS B	3	2019	3	2019
EMD	4	2019	3	2021
MS C	3	2021	3	2021
Production	4	2021	4	2023
<i>ATP - MFCD BPAC 675807</i>				
TMRRMilestone BEMDMilestone CProductionRequired Assets Available	4	2019	1	2020
MS B	1	2020	1	2020
EMD	1	2020	4	2021
MS C	4	2021	4	2021
Production	1	2022	4	2023
Required Assets Available	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675041 / Bomber Tactical Data Link			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675041: <i>Bomber Tactical Data Link</i>	-	10.397	8.167	30.977	0.000	30.977	36.069	44.376	26.617	13.982	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0101113F, project 675041, B-52 Advanced Extremely High Frequency (AEHF) Integration, is a new start.

A. Mission Description and Budget Item Justification

B-52 Bomber Tactical Datalink - Link 16

The B-52 Combat Network Communications Technology (CONNECT) Capability Development Document (CDD), dated 18 March 2004, captures the requirements for a Tactical Data Link (TDL) capability on the B-52. The B-52 TDL provides low latency, jam-resistant situational awareness and C2 communications needed to support in-theater operations and missions. This project will consist of integrating an existing off-the-shelf Link 16 terminal into the B-52. Integration includes Group A wiring, rack and antennae, and the Group B terminal LRU. The TDL terminal will be fully integrated with CONNECT. This Line-of-Sight (LOS) Link 16 capability allows the warfighter to utilize this capability by maintaining situational awareness, avoiding threats, and employing an array of weapons.

Funds may be used to address emerging and short-notice DMSMS issues. As the Link-16 upgrade brings additional capability to the B-52, emerging security requirements (JRE messaging, crypto modernization, etc.) as well as other aircraft upgrades (1760 IWBU, Mode S/Mode 5, IFF, BSB updates, RMP, Re-Engining, etc.) may require study/support for potential impact to the CONNECT and Link-16 system. Funds may also be used for Engineering Development Models (EDMs) as well as testing and fielding terminals.

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. Additionally, implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

B-52 Advanced Extremely High Frequency (AEHF) Integration

The B-52 Advance Extremely High Frequency (AEHF) Integration SATCOM system provides a survivable, low probability of intercept/detection, high bandwidth system that ensures secure intra/inter-flight and two-way command and control communications in the modern anti-access/aerial denial battle space. This communications upgrade replaces the Military Strategic and Tactical Relay (MILSTAR) Ultra High Frequency (UHF) SATCOM capability (MILSTAR is nearing system end of life) on the B-52. The AEHF Integration effort will integrate the radio, antenna and system components required to provide two-way EHF communication for the B-52. Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. As AEHF Integration provides future communication growth to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.) as well as other aircraft upgrades (Link 16, VLF/LF, 1760 IWBU, Mode S/Mode 5, IFF, BSB, Re-Engine, etc.) may require studies and/or support for potential impact to AEHF. Funds

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675041 / <i>Bomber Tactical Data Link</i>
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may be used to procure, test, and field terminals. 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. Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness. Trainers and Upgrades for B-52 AEHF. In order to maintain currency with the latest aircraft configuration, the B-52 Systems Improvements projects will update existing trainers or use Computer-Based Training (CBT) to add any new systems improvement functionality to meet user training requirements and update/maintain the Systems Integration Lab (SIL) for the Weapon System Trainers (WSTs).

Funds may be used to resolve emerging safety of flight and DMS issues, accommodate technology insertion, and fulfill FAA (or other) mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Bomber Tactical Data Link</p> <p>Description: The TDL will provide low latency, jam-resistant situation awareness and command/control needed to support in-theater operations/missions via a line-of-sight (LOS) Link 16 capability. The program will consist of integrating an existing off-the-shelf Link 16 terminal into the B-52. This will include Group A wiring, rack and antennae and the Group B terminal LRU. The terminals will be installed inside the fuselage of the aircraft and external antennas will be mounted on the fuselage. The TDL terminal and LOS capability will be integrated with the rest of the CONECT subsystem.</p> <p>FY 2018 Plans: Continue EMD phase, with subsequent Developmental and Operational testing.</p> <p>FY 2019 Base Plans: Continue EMD phase to include unique software programming, and continued developmental and operational testing.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increased requirement to accommodate increased cost of EMD phase and to include unique software programming, and continued developmental and operational testing</p>	10.397	8.167	17.528	0.000	17.528
<p>Title: B-52 Advanced Extremely High Frequency (AEHF) Integration</p> <p>Description: The B-52 Advance Extremely High Frequency (AEHF) Integration SATCOM system provides a survivable, low probability of intercept/detection, high bandwidth system that ensures secure intra/inter-flight</p>	0.000	0.000	13.449	0.000	13.449

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675041 / Bomber Tactical Data Link

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
and two-way command and control communications in the modern anti-access/aerial denial battle space. This communications upgrade replaces the Military Strategic and Tactical Relay (MILSTAR) and its Ultra High Frequency (UHF) SATCOM capability (MILSTAR is nearing system end of life) on the B-52. The AEHF Integration effort will integrate the radio, antenna and system components required to provide two-way EHF communication for the B-52.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: Approve Acquisition and Contracting Strategy for B-52 AEHF Integration and accomplish MS B. Submit RFP for Engineering and Manufacturing Development (EMD) effort. Negotiate and award EMD proposal.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: This program is an FY19 New Start					
Accomplishments/Planned Programs Subtotals	10.397	8.167	30.977	0.000	30.977

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item B05200: BP11 Production	-	-	2.976	-	2.976	15.925	30.214	24.917	25.372	0.000	99.404
• APAF 06 Line Item B05200: Initial Spares/Repair Parts	-	-	-	-	-	2.381	2.499	-	-	0.000	4.880

Remarks

D. Acquisition Strategy

The Milestone Decision Authority (MDA) approved the 28 October 2016 decision of the B-52 Link-16 Acquisition Strategy Panel (ASP), which authorized the program to enter into the EMD phase with the Original Equipment Manufacturer (OEM). The program is required to return to the MDA for the production/deployment ASP following a successful Preliminary Design Review (PDR).

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675041 / <i>Bomber Tactical Data Link</i>

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675041 / Bomber Tactical Data Link
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Link 16 EMD - Wright Patt - BPAC 675041	SS/ Various	Boeing : Oklahoma City, OK	-	8.897	Jul 2017	6.667	Feb 2018	16.000	Feb 2019	-		16.000	Continuing	Continuing	-
AEHF Development - BPAC 671810	SS/CPAF	Various : Various	-	-		-		11.449	Jul 2019	-		11.449	Continuing	Continuing	-
Subtotal			-	8.897		6.667		27.449		-		27.449	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Other Government Cost (OGC) - Link 16 BPAC 675041	Various	Various : NV	-	1.000	May 2017	1.000	Mar 2018	1.000	Mar 2019	-		1.000	Continuing	Continuing	-
Other Government Cost (OGC) - AEHF BPAC 671810	C/CPAF	Not specified. : TBD	-	-		-		1.000	Dec 2018	-		1.000	Continuing	Continuing	-
Subtotal			-	1.000		1.000		2.000		-		2.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS, Travel, Centralized Support - Link 16 BPAC 675041	Various	Various : NV	-	0.500	Jun 2017	0.500	Mar 2018	0.528	Mar 2019	-		0.528	Continuing	Continuing	-
A&AS, Travel, Centralized Support - AEHF BPAC 671810	Various	Various : TBD	-	-		-		1.000	Dec 2018	-		1.000	Continuing	Continuing	-
Subtotal			-	0.500		0.500		1.528		-		1.528	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force							Date: February 2018				
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons			Project (Number/Name) 675041 / Bomber Tactical Data Link				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	10.397	8.167	30.977	-	30.977	Continuing	Continuing	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675041 / <i>Bomber Tactical Data Link</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Bomber Tactical Data Link</i>																												
EMD																												
Milestone C																												
Production and Install																												
Required Assets Available																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675041 / <i>Bomber Tactical Data Link</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Bomber Tactical Data Link</i>				
EMD	4	2017	3	2020
Milestone C	4	2020	4	2020
Production and Install	4	2020	4	2023
Required Assets Available	4	2021	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675048 / 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675048: 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)	-	28.870	15.164	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 MIL-STD-1760 Internal Weapons Bay Upgrade (IWBU) enables the integration of the 1760 weapons capability into the bomb bay on 78 B-52H aircraft. It includes two Ground Instructional Training Aircraft (GITA), utilizing 44 Common Strategic Rotary Launchers (CSRLs) converted into Conventional Rotary Launchers (CRLs). Three of the CRLs will be modified under EMD for test purposes.

The 1760 IWBU project is segmented into increments. Increment 1.0 provides internal and external carriage of JDAM, Laser-JDAM, JASSM, JASSM/ER, MALD, and MALD/J. It consists of two sub-increments 1.1 and 1.2. This requirement's CDD was validated by the Air Force Requirements Oversight Council (AFROC) in June 2013.

The 1760 CDD was revalidated as a Capability Production Document (CPD) by the AFROC in February 2015. Development efforts for Increment 1.1 were completed in November 2015 and Air Force Global Strike Command (AFGSC) declared Initial Operational Capability (IOC) in May 2016.

Increment 1.1 utilizes 44 CSRLs converted into CRLs, where three of the CRLs will be modified under EMD for test purposes.

Increment 1.2 converts 44 CRLs three of which will be modified under EMD and 78 B-52H aircraft. This includes two GITA.

Increment 1.2 develops the capability for internal carriage of eight Joint Air-to-Surface Standoff Missiles (JASSM) and its variants, to include JASSM Extended Range (JASSM-ER), and eight Miniature Air Launched Decoys (MALD) and its variants, to include MALD Jammer (MALD-J). This increment also develops the capability for external carriage for 12 JASSM-ER.

Increment 1.2 completed Preliminary Design Review (PDR) in October 2015. Critical Design Review (CDR) was conducted in March 2016. Milestone B approval was granted in April 2016. An Integrated Baseline Review (IBR) was conducted in May 2016, validating cost and schedule baselines. Long Lead parts approval was granted in October 2016. In addition, a change from Low Rate Initial Production (LRIP)/Full Rate Production (FRP) to an FRP-only strategy with 2 lot buys; 1 in FY18 and 1 in FY19, was approved in October 2016.

Upon completion of JASSM/ER software development, an interim capability providing for carriage and deployment of no less than 20 JASSM/ER [8 bay (power 4), 12 external] is planned. A combined DT/OT validated this capability in advance of 1.2 Full System validation, and Required Assets Available (RAA) was declared September 2017. AFGSC declared 1.2 Interim Fielding Authorization October 2017.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675048 / 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)
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Aircraft Hardware Development: Development of Group A wiring and circuit breakers to supply additional power to the CRL per JASSM-ER requirements (for all 76 operational B-52H aircraft) and two GITA.

Software Development consists of a modification to existing aircraft SMO and weapon (JASSM and MALD) OFP software to allow for internal and external carriage and modification to ground-based Joint Mission Planning System (JMPS).

CRL Hardware Development consists of developing Group A-associated interface hardware and two Group B LRUs (power supply and power distribution box). Two CRLs will be modified for Interim and three CRLs will be modified for 1.2 Full system using RDT&E funds.

Support Equipment consists of developing software updates to the existing MUSTANG to interface with the CRL and the development of additional ground handling support equipment, maintenance stands.

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. Additionally, implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

Funds may be used to resolve emerging safety of flight and DMS issues, accommodate technology insertion, and fulfill FAA (or other) mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: 1760 IWBU Inc 1.2</p> <p>Description: Provides internal J-series weapons capability through modification of CRLs with aircraft hardware modifications and upgraded weapon management software. Upon completion of JASSM software coding, but prior to full 1760 hardware design completion, an interim JASSM/ER capability will be validated thru DT/OT in FY17.</p> <p>FY 2018 Plans: Completed Increment 1.2 development: Continues Engineering and Manufacturing Development phase in support of Milestone C decision. Continue weapon software modification and Developmental/Operational Test efforts. Continue SEEK EAGLE safe separation analysis. Initiate and conclude modification of two prototype aircraft and two prototype CRLs. Finalize test planning and technical orders in preparation for full 1.2 Capability validation.</p> <p>FY 2019 Base Plans:</p>	28.870	15.164	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675048 / 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: EMD complete					
Accomplishments/Planned Programs Subtotals	28.870	15.164	0.000	-	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item B05200: BP11 Production	3.691	26.934	24.176	-	24.176	-	-	-	-	0.000	54.801
• APAF 06 Line Item B05200: Initial Spares/Repair Parts	0.944	0.814	0.174	-	0.174	-	-	-	-	0.000	1.932
• APAF 07 Line Item B05200: Depot Activation	-	-	0.981	-	0.981	-	-	-	-	0.000	0.981

Remarks

D. Acquisition Strategy

The 1760 IWBU Increment 1.1 project will acquire software development and hardware design via a sole source contract to Boeing Defense, Space & Security (DSS) in Oklahoma City, OK. Deliverables include updated J-series weapon SMOs (software), three prototype modified CSRLs, six LRIP assets, logistics support, ground and flight test support, and engineering drawings. The Increment 1.1 program procured the CRL modification kits via sole source to Boeing DSS, OKC for LRIP and Full Rate Production (FRP), LRIP Installations, and FRP. Installs of the kits will be completed via Contract Field Teams (CFTs).

Increment 1.2 Program has a sole source EMD contract to Boeing Defense, Space & Security (DSS) in Oklahoma City, OK. Deliverables include updated JASSM and MALD weapon SMOs (software), three prototype modified CRLs, logistics support, ground and flight test support, and engineering drawings. Upon completion of JASSM/ER OFP and SMO software coding, an interim capability of no less than 20 JASSM/ER [8 bay (power 4), 12 external] was validated thru DT/OT in FY17. The Increment 1.2 program will procure the CRL modification and aircraft kits for full rate production via sole source. The installs of the kits are planned to be completed via CFTs and PDM.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675048 / 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
1.2 1760 IWBU Production Development	Various	Boeing : OKC, OK	-	8.445	Jul 2017	3.000	May 2018	-		-		-	Continuing	Continuing	-
1.2 1760 IWBU MALD OFP	SS/FFP	Raytheon : Tuson, AZ	-	3.071	Mar 2017	1.500	Mar 2018	-		-		-	Continuing	Continuing	-
1.2 1760 IWBU JASSM OFP	SS/FFP	Lockheed : Orlando, FL	-	2.961	Dec 2017	1.500	Feb 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	14.477		6.000		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
1.2 1760 559th SMXG	C/FFP	559 SMXG : Tinker AFB, OK	-	-		-		-		-		-	Continuing	Continuing	-
Subtotal			-	-		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
1.2 1760 IWBU Government Test	PO	419 FLTS : Edwards AFB, CA	-	6.444	May 2017	4.843	Mar 2018	-		-		-	Continuing	Continuing	-
1.2 1760 IWBU Trainer Software	Allot	AFLCMC : Wright Patterson AFB, OH	-	2.093	Jan 2018	-		-		-		-	Continuing	Continuing	-
1.2 1760 IWBU JASSM Test Assets	SS/FFP	Lockheed : Orlando, FL	-	5.856	Sep 2017	3.265	Apr 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	14.393		8.108		-		-		-	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675048 / 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

1760 Internal Weapons Bay Upgrade																												
1760 IWBU Inc. 1.2 EMD (Began 2Q16)	████████████████																											
1760 IWBU Inc. 1.2 Milestone C (Jul 18)							██																					
1760 IWBU Inc. 1.2 Production and Installations																												
1760 IWBU Inc. 1.2 RAA (Jul 19)																												
1760 IWBU Inc. 1.2 FOC (Jul 20)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675048 / 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
1760 Internal Weapons Bay Upgrade				
1760 IWBU Inc. 1.2 EMD (Began 2Q16)	1	2017	3	2018
1760 IWBU Inc. 1.2 Milestone C (Jul 18)	4	2018	4	2018
1760 IWBU Inc. 1.2 Production and Installations	4	2018	4	2020
1760 IWBU Inc. 1.2 RAA (Jul 19)	4	2019	4	2019
1760 IWBU Inc. 1.2 FOC (Jul 20)	4	2020	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675050 / CONECT			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675050: CONECT	-	13.189	7.043	11.138	0.000	11.138	0.001	0.000	0.003	0.002	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The B-52 Combat Network Communications Technology (CONECT) acquisition project supports nuclear and conventional operations by upgrading the B-52 fleet with data and voice communications capabilities, along with improved threat and situational awareness to support participation in net-centric operations. The CONECT upgrade includes the following: new MFCDs, a digital interphone system, on-board client/server architecture supporting distributed processing with independent control functions, an Ultra High Frequency (UHF) Beyond Line-Of-Sight (BLOS) Joint Range Extension (JRE) capability Intelligence Broadcast Receiver (IBR), limited Internet Protocol (IP)-based UHF BLOS link supporting voice, e-mail and file transfers, and an Improved Data Modem (IDM)-based digital Variable Message Format (VMF) datalink.

As the CONECT upgrade brings additional capability to the B-52, emerging communication and security requirements (upgrades to IBR, JRE messages, crypto modernization, etc.) and aircraft upgrades (1760 IWBU, Mode S/Mode 5 Identification, IFF, etc.) may require study for potential impacts to CONECT. In order to maintain currency with the latest aircraft configuration, the CONECT project will update existing trainers (using stimulate/simulate/computer-based training or a mix) to add CONECT functionality to meet user-training requirements, and update/maintain the SIL for the WSTs. In order to assist PDM during after-install checkout and Barksdale AFB and Minot AFB units with maintenance checkout and operational training, a CONECT ground station is being developed.

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. Additionally, implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

Funds may be used to address emerging and short-notice DMSMS issues. Funds may also be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: B-52 CONECT	13.189	7.043	11.138	-	11.138
Description: Diminishing Manufacturing Source (DMS) redesign development and test effort. Continued engineering design of CONECT capability into the B-52 training systems. Began incorporating changes required due to updates in Government Furnished Equipment (GFE) and crypto modernization requirements. Incorporated/integrated CONECT with recurring updates of the B-52 software baseline. As the CONECT upgrade brings additional capability to the B-52, emerging communication and security requirements (upgrades to the IBR, JRE messages, crypto modernization, etc.) and aircraft upgrades (1760 Internal Weapons Bay					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675050 / <i>CONNECT</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Upgrade, Mode S/Mode 5 IFF, etc.) may require study for potential impacts to CONNECT. CONNECT will update the existing trainers and/or use computer-based training to add CONNECT functionality to meet user-training requirements, and update/maintain the System Integration Lab (SIL) and for the WST. A CONNECT ground station, is required in order to assist PDM during after-install checkout, and provide Barksdale/Minot units with maintenance checkout and operational training capability.					
<i>FY 2018 Plans:</i> Continue Diminishing Manufacturing Source (DMS) redesign development and test effort. Continue the engineering design of the CONNECT ground station, required in order to assist PDM during after-install checkout, and provide Barksdale/Minot units with maintenance checkout and operational training capability. CONNECT will continue the development/update of the existing trainers, by simulation/computer-based training or a mix, to add CONNECT functionality to meet user-training requirements, and update/maintain the SIL for the Weapon System Trainer (WST). Continue development of offensive station mission trainer.					
<i>FY 2019 Base Plans:</i> Continue Diminishing Manufacturing Source (DMS) redesign development and test effort. Continue the engineering to assist PDM during after-install checkout, and provide Barksdale/Minot units with maintenance checkout and operational training capability. CONNECT will continue the development/update of the existing trainers, by simulation/computer-based training or a mix, to add CONNECT functionality to meet user-training requirements, and update/maintain the SIL for the Weapon System Trainer (WST). Continue development of offensive station mission trainer.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Increase due to WST upgrade to BSB07 to support CONNECT new moving map. Update AFTRS R3 to AFTRS R4 integration. Upgrade EMD test jet to CONNECT FRP configuration.					
Accomplishments/Planned Programs Subtotals	13.189	7.043	11.138	-	11.138

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item B05200: <i>BP11 Production</i>	99.068	74.355	55.444	-	55.444	22.067	22.261	14.569	13.796	Continuing	Continuing
• APAF 06 Line Item B05200: <i>Initial SparesRepair Parts</i>	4.561	4.609	-	-	-	-	-	-	-	0.000	9.170

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675050 / CONECT
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 07 Line Item B05200: <i>Post Production Support</i>	28.125	0.199	12.819	-	12.819	4.641	5.550	5.662	5.765	Continuing	Continuing

Remarks

D. Acquisition Strategy

The B-52 CONECT EMD prime contract is a sole source to Boeing Defense, Space & Security (DSS) in Oklahoma City, OK. Boeing DSS designs, develops, tests and procures necessary equipment from their subcontractors; developed engineering drawings, logistic and technical data. The Government is developing the Time Compliance Technical Order (TCTO) for installation on the B-52. Pro-Active Systems is the current contractor for the trainer update to integrate CONECT into the existing trainers (currently in source selection).

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675050 / CONECT
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AFTRS R3 Integration	SS/CPAF	The Boeing Company : Oklahoma City, OK	-	2.118	Oct 2016	1.979	Oct 2017	3.000	Dec 2018	-		3.000	Continuing	Continuing	-
CONECT Weapon Sys Trainer Update	C/Various	Aviation Training Consultants LLC : Edmond, OK	-	10.040	May 2017	5.064	May 2018	3.500	Nov 2018	-		3.500	Continuing	Continuing	-
Subtotal			-	12.158		7.043		6.500		-		6.500	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Support	Various	Not specified. : NV	-	0.922	Feb 2017	-		2.138	Apr 2019	-		2.138	Continuing	Continuing	-
Subtotal			-	0.922		-		2.138		-		2.138	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ground Station Testing	RO	Not specified. : NV	-	0.109	Mar 2017	-		-		-		-	Continuing	Continuing	-
EMD Test Jet to FRP Configuration	C/CPAF	Not specified. : TBD	-	-		-		2.500	Oct 2018	-		2.500	Continuing	Continuing	-
Subtotal			-	0.109		-		2.500		-		2.500	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	13.189	7.043	11.138	-	11.138	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675050 / <i>CONNECT</i>
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

CONNECT	
Weapon System Trainer (WST) Upgrade	[REDACTED]
WST System Integration Lab (SIL) Development	[REDACTED]
System Integration Lab Relocation	[REDACTED]
Offensive Station Mission Trainer (OSMT) Development	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675050 / <i>CONNECT</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CONNECT				
Weapon System Trainer (WST) Upgrade	1	2017	2	2019
WST System Integration Lab (SIL) Development	1	2017	1	2019
System Integration Lab Relocation	1	2018	4	2019
Offensive Station Mission Trainer (OSMT) Development	2	2018	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675055 / GPS-IU			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675055: GPS-IU	-	9.525	18.767	37.030	0.000	37.030	1.985	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The GPS IU Upgrade program will provide increased throughput and memory capacity by replacing the current processor, static memory, and necessary associated electronics with a newer processor, more memory, and sustainable electronic packages. This program will replace six Circuit Card Assemblies (CCA) which include combining three Circuit Cards into one Input/Output (I/O) CCA. The Backplane and Motherboard will require an upgrade to integrate the new CCAs: the Central Processing Unit / 1553, the power supply CCA, and the video graphics cards. The Input/Output CCA will combine the Discrete Inputs Analog, Audio Video (DAAV), Discrete Outputs (DOA) and Serial Busses functionality. This upgrade will improve system reliability and address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues on subcomponents of the IU.

In addition the new GPS IU will retain the existing functions and interfaces of the legacy GPS IU, and provide additional interfaces to allow for future growth requirements: Which include two Ethernet Ports and two connectors on face-plate for future growth.

The GPS IU integrates GPS Position, Navigation and Timing (PNT) data into navigation, communications, and weapons systems on board the B-52. The GPS IU acts as a controller for a MIL-STD-1553 data bus communications path. The major areas of support include GPS interface control and monitoring, targeting pod functions, navigation displays for the Pilot and Copilot stations, and Identification Friend or Foe (IFF) control functions.

Originally developed with a 33MHz processor with 4MB of Static Random Access Memory (SRAM), the GPS IU has become overloaded as more software has been added to the B-52. Currently operating at 86% throughput capacity and at 90% memory capacity, it is projected to exceed the designated safety threshold of 95% memory load by 2018. The GPS IU is also facing parts obsolescence issues. Studies show that the current spares will be exhausted by 2018. The upgrade will improve system reliability and address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues on subcomponents of the IU. The modified GPS IU will retain the existing functions and interfaces of the legacy GPS IU, and provide additional interfaces to allow for future growth requirements.

GPS IU requires upgrading to incorporate any other GPS dependent capabilities on the B-52 platform. B-52 fleet will have the capability to carry additional GPS dependent weapons and targeting pods, and the increased capacity to incorporate future GPS-dependent capabilities beyond 2018.

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675055 / GPS-IU

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Global Positioning System (GPS) Interface Unit (IU)</p> <p>Description: Global Positioning System (GPS) Interface Unit (IU) Upgrade will replace three circuit card assemblies in the GPS IU, as well as the backplane (to integrate the new and old CCAs): the Central Processing Unit/1553, the power supply CCA, and the video graphics card.</p> <p>FY 2018 Plans: Continue GPS IU Upgrade development. Complete TMRR phase in support of Milestone B decision. Award EMD sole source contract to Boeing, OKC</p> <p>FY 2019 Base Plans: Continue EMD and begin development phase and DT/OT.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to additional DMS issues identified and the current design will not support new components. As a result additional hardware/software is required to include; combining 3 circuit card assemblies into one input/output card, adding an Ethernet port/connectors, and increasing test assets required from four to eight.</p>	9.525	18.767	37.030	-	37.030
Accomplishments/Planned Programs Subtotals	9.525	18.767	37.030	-	37.030

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item B05200: BP11 Production	-	-	-	-	-	25.440	23.904	11.079	11.280	Continuing	Continuing
• APAF 06 Line Item B05200: Initial Spares	-	-	-	-	-	-	-	4.760	4.846	Continuing	Continuing

Remarks

D. Acquisition Strategy

The GPS IU Modernization program will begin development in the Technology Maturation and Risk Reduction (TMRR) phase via a sole source contract to Boeing Defense, Space & Security (DSS) in Oklahoma City, OK. Development will continue in the EMD phase via a sole source contract to Boeing DSS, OKC. Deliverables include software, eight modernized prototypes, logistics support, ground and flight test support, and engineering drawings.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675055 / <i>GPS-IU</i>

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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force Date: February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675055 / GPS-IU
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GPS-IU																												
MS A (Mar 17)		■																										
TMRR Phase I		■	■																									
TMRR Phase II				■	■	■	■																					
MS B (Apr 18)							■																					
EMD						■	■	■	■	■	■	■	■	■	■													
DT/OT									■	■	■	■	■	■	■													
MS C																		■										
Production & Installs																		■	■	■	■	■	■	■	■	■	■	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675055 / <i>GPS-IU</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>GPS-IU</i>				
MS A (Mar 17)	2	2017	2	2017
TMRR Phase I	2	2017	3	2017
TMRR Phase II	4	2017	4	2018
MS B (Apr 18)	3	2018	3	2018
EMD	3	2018	1	2021
DT/OT	3	2019	2	2020
MS C	1	2021	1	2021
Production & Installs	2	2021	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons					Project (Number/Name) 675056 / B-52 Radar Modernization Program (RMP)		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675056: B-52 Radar Modernization Program (RMP)	-	4.637	15.226	56.864	0.000	56.864	119.005	154.870	179.148	177.356	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The B-52 Radar Modernization Program (RMP) supports nuclear and conventional operations by replacing the current APQ-166 radar on the B-52H aircraft. The APQ-166 system will be increasingly difficult to sustain due to diminished manufacturing sources and obsolescent technologies; the current failure rate of the APQ-166 places long-duration missions at risk. This modernization program will encompass the radar antenna array and up to 14 individual LRUs that comprise the entire radar system. Development, production and installation of new components and systems to replace the legacy equipment; to be installed on all 76 B-52H aircraft. RMP will take advantage of advances in technology and on-going development efforts to acquire, to the maximum extent possible, previously developed Radar systems and integrate them into the B-52. The use of new technology will increase both the overall reliability of the radar system and the capabilities for new missions. This Radar Modernization Program will allow the operational command (AF Global Strike Command) to fully utilize the capabilities of the B-52H aircraft to employ an array of nuclear and conventional weapons and to perform mission-essential navigation and weather avoidance functions. In addition, applicable training devices for the new radar subsystem must also be developed, modified and/or upgraded in conjunction with the aircraft modifications. This upgrade will affect all three Weapon System Trainers (WST), the WST Training Systems Integration Laboratory (SIL), and both B-52 Offensive Station Maintenance Trainers (OSMT).

As the RMP upgrade brings additional capability to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.), increased radar integration (advanced targeting pod, mission planning, crew vehicle interfaces), as well as other aircraft upgrades (Link 16, EHF, 1760 IWBU, Mode S/Mode 5, IFF, BSB, Re-Engine, etc.) may require studies and/or support for potential impact to RMP.

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. 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.

Funds may be used to resolve emerging safety of flight, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Radar Modernization Program	4.637	15.226	56.864	-	56.864

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675056 / B-52 Radar Modernization Program (RMP)

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Support nuclear and conventional operations by replacing the current APQ-166 radar on the B-52H aircraft. Development and production of new systems to replace the legacy equipment and to be installed on all 76 B-52H aircraft.					
FY 2018 Plans: Continue requirements development/refinement, acquisition planning, and preparations for radar vendor competition/award and Developmental Request for Proposal Release Date (DRFPRD).					
FY 2019 Base Plans: Continue requirements development/refinement, acquisition planning, and preparations for radar vendor competition/award. Also begin OEM integration efforts and complete system Preliminary Design Review.					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to ramp up of risk reduction activities					
Accomplishments/Planned Programs Subtotals	4.637	15.226	56.864	-	56.864

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item B05200: BP11 Production	-	-	-	-	-	5.809	12.995	13.256	13.497	Continuing	Continuing
• APAF 07 Line Item B05200: Post Production Support	-	-	-	-	-	-	0.098	0.100	0.102	Continuing	Continuing
• APAF 06 Line Item B05200: Initial Spares/Repair Parts	-	-	-	-	-	0.118	0.197	0.200	0.204	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Milestone Decision Authority approved the B-52 RMP Materiel Development Decision (MDD) and signed the Acquisition Decision Memorandum on 11 March 2017. This program has been designated as an ACAT I Pre-Major Defense Acquisition Program (MDAP) with authorization to enter into the Pre-Milestone B phase with the DRFPRD as the next decision point.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675056 / <i>B-52 Radar Modernization Program (RMP)</i>

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force											Date: February 2018		
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675056 / B-52 Radar Modernization Program (RMP)					

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Gov (OGC)	TBD	Not specified. : TBD	-	-		-		3.754	Jan 2019	-		3.754	Continuing	Continuing	-
Risk Reduction	TBD	Not specified. : NV	-	3.484	Jul 2017	12.226	Dec 2017	50.910	Jul 2019	-		50.910	Continuing	Continuing	-
Subtotal			-	3.484		12.226		54.664		-		54.664	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support, A&AS, PMA	Various	Not specified. : NV	-	1.153	Aug 2017	3.000	Jan 2018	2.200	Aug 2019	-		2.200	Continuing	Continuing	-
Subtotal			-	1.153		3.000		2.200		-		2.200	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	4.637	15.226	56.864	-		56.864	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675056 / B-52 Radar Modernization Program (RMP)

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

Radar Modernization Program																												
Acquisition Planning					██████████																							
Risk Reduction					██																							
Development Request for Proposal Release									████																			
MS B																	████											
EMD																					██							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675056 / <i>B-52 Radar Modernization Program (RMP)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Radar Modernization Program</i>				
Acquisition Planning	3	2017	1	2018
Risk Reduction	1	2018	4	2020
Development Request for Proposal Release	1	2019	1	2019
MS B	4	2020	4	2020
EMD	4	2020	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675057 / B-52 Low Cost Improvement (LCI)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675057: B-52 Low Cost Improvement (LCI)	-	0.000	2.682	2.605	0.000	2.605	2.607	2.605	2.660	2.710	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program will include projects to facilitate future B-52 capabilities. Scope of work may involve, but is not limited to, Avionics, Navigation, Situational Awareness (SA) and Defensive Systems. Additionally, develop and integrate emerging technologies for specialized B-52 missions to include Intelligence Surveillance and Reconnaissance (ISR), Targeting and Weapons. Continuing work related to the Mission Data Recorder to make the T-1 modification a Permanent Modification to the platform.

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. Additionally, implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

Funds may be used to address emerging and short-notice DMSMS issues. Funds may be used to resolve emerging safety of flight and DMS issues, accommodate technology insertion, and fulfill FAA (or other) mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: B-52 Low Cost Improvements	0.000	2.682	2.605	-	2.605
Description: Develop and integrate emerging technologies for specialized B-52 missions to include ISR, targeting, and weapons. This includes performing demonstrations and experimentation of emerging and advanced technologies, as well as supporting external agency projects of the technology in a relevant environment.					
FY 2018 Plans: Develop and integrate emerging technologies for specialized B-52 missions to include ISR, targeting, and weapons. This includes performing demonstrations and experimentation of emerging and advanced technologies, as well as supporting external agency projects of the technology in a relevant environment. Perform work necessary to make the Mission Data Recorder a permanent modification on the platform.					
FY 2019 Base Plans: Develop and integrate emerging technologies for specialized B-52 missions to include ISR, targeting, and weapons. This includes performing demonstrations and experimentation of emerging and advanced					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675057 / B-52 Low Cost Improvement (LCI)
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
technologies, as well as supporting external agency projects of the technology in a relevant environment. Perform work necessary to make the Mission Data Recorder a permanent modification on the platform. FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	0.000	2.682	2.605	-	2.605

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 05 Line item B05200: BP11 Production	2.331	2.378	2.362	-	2.362	2.412	2.461	2.511	2.557	Continuing	Continuing

Remarks

D. Acquisition Strategy
Studies and Analyses will be conducted by various AFLCMC organizations and AFGSC. Additionally, the OEM will perform work necessary to make the Mission Data Recorder a permanent modification.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675057 / B-52 Low Cost Improvement (LCI)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Studies and analyses to develop and integrate emerging technologies for the B-52	C/Various	TBD : NV	-	-		2.682	Feb 2018	2.605	Jan 2019	-		2.605	Continuing	Continuing	-
Subtotal			-	-		2.682		2.605		-		2.605	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Not specified.	TBD	Not specified. : NV	-	-		-		-		-		-	Continuing	Continuing	-
Subtotal			-	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	-	2.682		2.605	-	2.605	Continuing	Continuing	N/A

Remarks
This program is a FY18 3600 New Start

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675057 / B-52 Low Cost Improvement (LCI)
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Low Cost Improvements	
Low Cost Improvements Studies and Analyses	
Contract with Boeing Permanent Modification of Mission Data Recorder	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675057 / <i>B-52 Low Cost Improvement (LCI)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Low Cost Improvements				
Low Cost Improvements Studies and Analyses	2	2018	4	2023
Contract with Boeing Permanent Modification of Mission Data Recorder	2	2018	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675058 / B-52 Weapon Sys Trainer Air Ref Training Upgrade			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675058: B-52 Weapon Sys Trainer Air Ref Training Upgrade	-	4.702	13.240	0.000	0.000	0.000	7.858	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The principal mission of the B-52 Training Systems program is to ensure high fidelity simulators and training systems are available for aircrew members to support credible training, maintain proficiencies, and increase skill levels. B-52 Aircrew Training Devices simulates the necessary visual, motion, and audible cues to provide ground training of Air Force Global Strike Command aircrew members. The B-52 Weapon System Trainer (WST) Air Refueling Upgrade is a comprehensive project that will allow B-52 Aircrew to accomplish credible air refueling training in the simulator, which minimizes the requirement for on-aircraft air refueling training. To facilitate this capability, scope of work may involve development of Analysis of Alternatives (AoA), Studies and Analysis, Capability Development Documents (CDD) or any other Analysis or paperwork necessary to establish a program of record. Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. DMSMS 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.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: B-52 Weapons Systems Trainer Air Refueling Training Upgrade	4.702	13.240	0.000	-	0.000
Description: Upgrade allows pilots to conduct effective air refueling training in a simulator; mitigates tanker availability shortfalls for training.					
FY 2018 Plans: Continuing engineering studies, flight test planning, data collection, data analysis, and software development required to support B-52 Weapon System Trainer Air Refueling Training Upgrade.					
FY 2019 Base Plans: Continuing engineering studies, flight test planning, data collection, data analysis, and software development required to support B-52 Weapon System Trainer Air Refueling Training Upgrade.					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease in requirement program ramp down					
Accomplishments/Planned Programs Subtotals	4.702	13.240	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675058 / <i>B-52 Weapon Sys Trainer Air Ref Training Upgrade</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line item B05200: <i>BP11 Production</i>	-	1.809	-	-	-	10.998	-	-	-	0.000	12.807

Remarks

D. Acquisition Strategy

The B-52 Training Systems Contract will be utilized for Weapon System Trainer Air Refueling contracting actions.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018				
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons					Project (Number/Name) 675058 / B-52 Weapon Sys Trainer Air Ref Training Upgrade						
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Weapon System Trainer Air Refueling Training Upgrade	TBD	TBD : NV	-	4.702	Feb 2017	13.240	Feb 2018	-		-		-	Continuing	Continuing	-	
Subtotal			-	4.702		13.240		-		-		-	Continuing	Continuing	N/A	
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total		Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	4.702		13.240		-		-		-	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675058 / B-52 Weapon Sys Trainer Air Ref Training Upgrade

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Weapon System Trainer																												
Master Flight Test Plan																												
Data Collection/Compilation																												
Software/Hardware Development/Integration/ Test																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675058 / <i>B-52 Weapon Sys Trainer Air Ref Training Upgrade</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Weapon System Trainer</i>				
Master Flight Test Plan	3	2018	2	2019
Data Collection/Compilation	3	2019	2	2020
Software/Hardware Development/Integration/Test	3	2020	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675129 / B-52 Re-Engining			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675129: B-52 Re-Engining	-	0.000	0.000	64.515	0.000	64.515	312.650	313.638	195.584	121.148	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0101113F, project 675129, B-52 Re-Engining, is a new start.

B-52 Re-Engining is not an FY19 New start. Initial \$10.0M in BPAC 675039 in FY18

A. Mission Description and Budget Item Justification

The B-52 Re-Engine Program (REP) supports nuclear and conventional operations by replacing the current TF33-PW-103 engine on the B-52H aircraft. The TF33-PW-103 engine is increasingly difficult to sustain due to diminished manufacturing sources and obsolescent technologies; the AF Propulsion Directorate projects the engine will become unsustainable by 2030. This sustainment program will replace the current TF33-PW-103 engine with jet engines of similar size, weight, and thrust characteristics. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. B-52 REP will take advantage of advances in technology and on-going development efforts to acquire engines and integrate them into the B-52. The use of new technology will increase both the overall reliability/maintainability of the propulsion system and produce additional electrical power generation capabilities for emerging requirements. This Re-Engine Program will allow the operational command (AF Global Strike Command) to fully utilize the capabilities of the B-52H aircraft to employ an array of nuclear and conventional weapons while saving fuel and extending the range/loiter capabilities of the aircraft. In addition, applicable training devices for the engine throttles and engine health monitoring subsystem must also be developed, modified and/or upgraded in conjunction with the aircraft modifications. This upgrade will also require corresponding modification of the Weapon System Trainers (WST). As the REP brings additional capability to the B-52, emerging security/certification requirements (nuclear hardening, cyber security, program protection, etc.) will also need to be addressed. Several concurrent aircraft upgrades during the REP may necessitate studies be performed during the program to determine optimal engine installation and deployment options.

Cost includes any other analysis or documentation and related expenses necessary to establish a program of record and support the B-52 Weapon System. Cost includes Program Management Administration (PMA) costs, centralized support and initiatives for anticipated weapon system enhancements, to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675129 / B-52 Re-Engining

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: B-52 Re-Engining</p> <p>Description: This sustainment program will replace the current TF33-PW-103 engine with jet engines of similar size, weight, and thrust characteristics. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. B-52 Re-Engine Program will take advantage of advances in technology and on-going development efforts to acquire engines and integrate them into the B-52.</p> <p>FY 2018 Plans: Begin TMRR phase in support of Milestone B decision. Complete Materiel Development Decision and Acquisition Strategy Panel.</p> <p>FY 2019 Base Plans: Complete TMRR phase, Engine down selection, preliminary design with the integrator, and accomplish Milestone B. Begin EMD.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Program moved from Risk Reduction and Acquisition planning phase into EMD phase.</p>	0.000	0.000	64.515	-	64.515
Accomplishments/Planned Programs Subtotals	0.000	0.000	64.515	-	64.515

C. Other Program Funding Summary (\$ in Millions)										
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete Total Cost
• APAF 05 B05200: BP11 Production	-	-	-	-	-	-	-	43.632	505.821	Continuing Continuing

Remarks

D. Acquisition Strategy
Ongoing risk reduction activities with Original Equipment Manufacturer. Acquisition Strategy Panel scheduled for 4QFY19.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675129 / B-52 Re-Engining
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Pre-EMD Risk Reduction, Acquisition Planning, preliminary integration design and Engine Source Selection System Performance Requirements decomposition	SS/CPFF	The Boeing Co : Oklahoma City, OK	-	-		-		59.515	Apr 2019	-		59.515	Continuing	Continuing	-
Subtotal			-	-		-		59.515		-		59.515	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration, Centralized Support, A&AS support, TDY	Various	EPASS Contract for A&AS : WPAFB, OH	-	-		-		5.000	Nov 2018	-		5.000	Continuing	Continuing	-
Subtotal			-	-		-		5.000		-		5.000	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	0.000	64.515	-	64.515	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675129 / <i>B-52 Re-Engining</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Re-Engining</i>				
Pre-EMD Acquisition Planning/Risk Reduction and early Engine Source Selection Planning	3	2018	3	2019
Milestone B	3	2019	3	2019
EMD	3	2019	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons			Project (Number/Name) 675160 / B-52 Crypto Modernization				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675160: B-52 Crypto Modernization	-	3.230	11.919	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

Upgrades aircraft with Mobile User Objective System (MUOS) capable ARC-210 radio systems to prevent loss of BLOS voice and data communications capability.

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: B-52 Crypto Modernization	3.230	11.919	0.000	-	0.000
Description: Upgrades aircraft with MUOS capable ARC-210 radio systems to prevent loss of BLOS voice and data communications capability.					
FY 2018 Plans: Continue market research and develop and refine requirements. Release of request for proposal, contract award activities, and systems requirement review in FY2018. Initiate development activities supporting integration of MUOS radio, and planning in the out years for preliminary/critical design reviews, software lab tests/flight tests, combined DT/OT, depot source or repair assignment, and government furnished equipment deliveries and installs. Award EMD contract.					
FY 2019 Base Plans: Continue EMD efforts. Complete preliminary design reviews, s/w lab test, and prepare for FY20 flight testing.					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase needed for Preliminary Design Review and flight test planning.					
Accomplishments/Planned Programs Subtotals	3.230	11.919	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675160 / <i>B-52 Crypto Modernization</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line item B05200: <i>BP11 Production</i>	-	-	14.759	-	14.759	17.722	21.659	22.093	22.495	Continuing	Continuing

Remarks

Combined Acquisition Strategy (AS) and AS Panel conducted in Dec 2017 and initial POE submitted for coordination/approval.

D. Acquisition Strategy

EMD - Expected to execute via a contract with the OEM (Boeing, Oklahoma City).
 Group A Kit (wiring / kitting / receiver) - Execute using Small Business non-competitive 8a
 Group B Kit (APX-119 transponder) - MIPR through iGATM catalog
 Installation - Executed via Contract Field Team (CFT) competitive contract

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675160 / B-52 Crypto Modernization
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Crypto Modernization development and integration activities	TBD	Not specified. : NV	-	2.830	Jan 2017	11.885	Jan 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	2.830		11.885		-		-		-	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Initiate test requirements and DTE planning	TBD	TBD : NV	-	0.300	Jan 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.300		-		-		-		-	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Costs for Program Management Administration and Travel	Various	TBD : NV	-	0.100	Jan 2017	0.034	Jan 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	0.100		0.034		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
	Project Cost Totals			-	3.230	11.919	-	-	-	Continuing	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675160 / <i>B-52 Crypto Modernization</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Crypto Modernization</i>																												
MDD		■																										
Milestone B			■																									
EMD contract award			■																									
EMD																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675160 / <i>B-52 Crypto Modernization</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Crypto Modernization</i>				
MDD	1	2017	1	2017
Milestone B	2	2017	2	2017
EMD contract award	2	2017	2	2017
EMD	2	2017	1	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 676039 / B-52 Airspace Compliance
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676039: B-52 Airspace Compliance	-	0.000	9.652	36.055	0.000	36.055	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

B-52 Airspace Compliance - Communication, Navigation and Surveillance and Air Traffic Management (CNS/ATM) upgrades are required to comply with increasing FAA requirements. Automatic Dependent Surveillance-Broadcast (ADS-B) upgrades to meet FAA mandate for FY20.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: B-52 Airspace Compliance	0.000	9.652	36.055	-	36.055
Description: Communication, Navigation and Surveillance and Air Traffic Management (CNS/ATM) upgrades are required to comply with increasing FAA requirements. Automatic Dependent Surveillance-Broadcast (ADS-B) upgrade to meet FAA mandate for FY20.					
FY 2018 Plans: Establish/stand-up program office, develop and refine requirements, initiate development activities supporting integration of Communication, Navigation and Surveillance and Air Traffic Management (CNS/ATM) upgrades and Automatic Dependent Surveillance-Broadcast (ADS-B) upgrades					
FY 2019 Base Plans: Continue develop and refine requirements, initiate development activities supporting integration of Communication, Navigation and Surveillance and Air Traffic Management (CNS/ATM) upgrades and Automatic Dependent Surveillance-Broadcast (ADS-B) upgrades					
FY 2018 to FY 2019 Increase/Decrease Statement: Funds were rephrased to shorten EMD phase in support of FAA mandate.					
Accomplishments/Planned Programs Subtotals	0.000	9.652	36.055	-	36.055

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 676039 / <i>B-52 Airspace Compliance</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line item B05200: <i>BP11 Production</i>	-	-	1.954	-	1.954	19.694	16.374	3.570	3.635	Continuing	Continuing

Remarks

Combined Acquisition Strategy (AS) and AS Panel conducted in Dec 2017 and initial POE submitted for coordination/approval.

D. Acquisition Strategy

EMD - Expected to execute via a contract with the OEM (Boeing, Oklahoma City).
 Group A Kit (wiring / kitting / receiver) - Execute using Small Business non-competitive 8a
 Group B Kit (APX-119 transponder) - MIPR through iGATM catalog
 Installation - Executed via Contract Field Team (CFT) competitive contract

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0101113F / B-52 Squadrons				676039 / B-52 Airspace Compliance								
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
B-52 Airspace Compliance	SS/ Various	TBD : NV	-	-		3.731	Jul 2018	30.977	Jul 2019	-		30.977	Continuing	Continuing	-	
Subtotal			-	-		3.731		30.977		-		30.977	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Other Government Costs	TBD	TBD : NV	-	-		0.500	Mar 2018	-		-		-	Continuing	Continuing	-	
Subtotal			-	-		0.500		-		-		-	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Test Support	TBD	Not specified. : NV	-	-		4.900	Apr 2018	4.900	Apr 2019	-		4.900	Continuing	Continuing	-	
Subtotal			-	-		4.900		4.900		-		4.900	Continuing	Continuing	N/A	
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Administration, TDY, Centralized Support	TBD	Not specified. : NV	-	-		0.521	Jan 2018	0.178	Jan 2019	-		0.178	Continuing	Continuing	-	
Subtotal			-	-		0.521		0.178		-		0.178	Continuing	Continuing	N/A	
Project Cost Totals			-	-		9.652		36.055		-		36.055	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 676039 / <i>B-52 Airspace Compliance</i>
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	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 676039 / B-52 Airspace Compliance
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Airspace compliance</i>	
EMD/RFP Release	██████████
EMD	██
MS C	██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 676039 / <i>B-52 Airspace Compliance</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Airspace compliance</i>				
EMD/RFP Release	2	2018	3	2018
EMD	4	2018	4	2020
MS C	4	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101122F / <i>Air-Launched Cruise Missile (ALCM)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.437	0.463	5.955	0.000	5.955	10.421	8.436	5.460	1.002	Continuing	Continuing
674797: <i>ALCM Upgrades</i>	-	0.437	0.463	5.955	0.000	5.955	10.421	8.436	5.460	1.002	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 This program, BA 7, PE 0101122F, project 674797, Inertial Navigation Element (INE), is a new start.

A. Mission Description and Budget Item Justification

The AGM-86B, Air Launched Cruise Missile (ALCM), is a subsonic, air-to-surface strategic nuclear missile, operational since 1982. Armed with a W-80 warhead, it is designed to evade air and ground-based defenses in order to strike targets at any location within any enemy's territory. The ALCM is designed for B-52H internal and external carriage.

RDT&E funds support development of new tests and evaluation procedures, software, and equipment. RDT&E funds also provide sustainment solutions for Line Replaceable Units (LRU) and technology insertion to ensure ALCM sustainability supports Air Force strategic nuclear deterrence and Global Strike mission requirements through 2030.

The ALCM Test Plan Development and Evaluation program develops plans and procedures for testing nuclear systems, and implements those procedures as directed by the Chairman, Joint Chiefs of Staff (CJCS) and to satisfy the recurring requirements to test Chemical, Biological, Radiological, and Nuclear (CBRN) susceptibility.

An extensive Service Life Extension Program (SLEP) is in place to address age related issues and to ensure reliability and sustainability through 2030. Technology insertion is anticipated to address serviceability of components at or near end of life.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ALCM 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.

BA7- This program is in Budget Activity 7, Operational System Development, because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101122F / <i>Air-Launched Cruise Missile (ALCM)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.453	0.463	0.472	0.000	0.472
Current President's Budget	0.437	0.463	5.955	0.000	5.955
Total Adjustments	-0.016	0.000	5.483	0.000	5.483
• 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	-0.016	0.000			
• Other Adjustments	0.000	0.000	5.483	0.000	5.483

Change Summary Explanation

FY19: \$5.483M increase for start of Inertial Navigation Element (INE) Service Life Extension Program (SLEP) and additional CBRN test planning.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Title: Inertial Navigation Element (INE)</p> <p>Description: This is a three phase approach to ensure short and long term supportability of the ALCM Inertial Navigation Element (INE).</p> <p>FY 2018 Plans: N/A</p> <p>FY 2019 Plans: The program plans to assess the engineering feasibility of recreating the INE memory modules technology of the circuit cards for technology insertion into the ALCM to offset memory module serviceability end of life.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase due to FY19 new start.</p>	-	0.000	4.955
<p>Title: ALCM Test Plan Development and Evaluation</p> <p>Description: Develop test procedures to implement CJCS-directed requirement for Electromagnetic (EM) testing for nuclear systems.</p> <p>FY 2018 Plans:</p>	0.437	0.463	1.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101122F / <i>Air-Launched Cruise Missile (ALCM)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Continue development of test plans and procedures for implementation of Chemical Biological Radiological Neutron (CBRN) testing requirements and Line Replaceable Units (LRU) test plan development and execution. FY 2019 Plans: Develop a test plan for an active system test of the ALCM to be exposed to a neutron/gamma environment. Intent of the test is to assess survivability of a legacy mission critical system in a CBRN environment per DoDI 3150.09 and AFI 10-2607. FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase due to increase in effort/scope.			
Accomplishments/Planned Programs Subtotals	0.437	0.463	5.955

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• MPAF 03 Line Item MALCBG: <i>ALCM, Missile Modifications</i>	21.762	36.425	47.632	-	47.632	63.958	74.957	75.279	74.323	Continuing	Continuing
• MPAF 04 Line Item MALCBG: <i>ALCM, Replenishment Spares</i>	2.796	2.942	2.280	-	2.280	2.321	2.359	2.407	2.451	Continuing	Continuing
• OPAF 03 Line Item MALCBG: <i>ALCM, Electronics & Telecommunications Equipment (BP83)</i>	1.710	1.757	1.775	-	1.775	1.806	1.840	1.873	1.906	Continuing	Continuing
• MPAF 04 Line Item 999/Replen: <i>Spa...: ALCM, Initial Spares</i>	0.254	0.304	0.308	-	0.308	0.319	0.328	0.335	0.341	Continuing	Continuing

Remarks

E. Acquisition Strategy
 Previously, the Air Launched Cruise Missile (ALCM) was assessed in the nuclear environment for Chemical, Biological, Radiological and Nuclear (CBRN) Survivability for High Altitude Electromagnetic Pulse (HEMP) and Total Ionizing Dose at White Sands Missile Range (WSMR).

 Follow-on test development will assess the neutron and gamma component in the nuclear environment for CBRN survivability. Test development and execution will utilize organic and contractor agencies.

 INE SLEP plans for a three phase reliability assessment with comprehensive plan to address short and long term supportability.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101122F / <i>Air-Launched Cruise Missile (ALCM)</i>	
Phase 1 - Short-term parts shortage mitigation analyses with Tomahawk Reference Measuring Unit and Computer Phase 2 - Definition of scope of efforts and establishing the manufacturing methodology Phase 3 - Delivery of working engineering samples, certification of production, and production of INE's equal to the function and reliability of 'like new' devices		
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.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101122F / Air-Launched Cruise Missile (ALCM)	Project (Number/Name) 674797 / ALCM Upgrades
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
INE LRU Sustainment Assessment	TBD	NG : UT	-	-		0.000		4.955	Oct 2018	-		4.955	Continuing	Continuing	-
CBRN Test Plan Development & Evaluation	Various	WSMR, Boeing : NV	-	0.417	Jul 2017	0.443	May 2018	1.000		-		1.000	Continuing	Continuing	-
Subtotal			-	0.417		0.443		5.955		-		5.955	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA - Government Costs	Various	Various : Various	-	0.020	Aug 2017	0.020	Aug 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	0.020		0.020		-		-		-	Continuing	Continuing	N/A

Remarks
Test Development and Evaluation PMA is for Supplies and Travel in support of project number 674797

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.437	0.463	5.955	-	5.955	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101122F / <i>Air-Launched Cruise Missile (ALCM)</i>	Project (Number/Name) 674797 / <i>ALCM Upgrades</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

INE Sustainment																												
INE Line Replaceable Unit Assessment																												
CBRN Test																												
CBRN Test Plan Development																												
CBRN Test Execution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101122F / <i>Air-Launched Cruise Missile (ALCM)</i>	Project (Number/Name) 674797 / <i>ALCM Upgrades</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>INE Sustainment</i>				
INE Line Replaceable Unit Assessment	2	2019	4	2022
<i>CBRN Test</i>				
CBRN Test Plan Development	1	2017	4	2019
CBRN Test Execution	1	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101126F / <i>B-1B Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.562	62.471	76.030	0.000	76.030	6.586	18.276	7.962	8.107	Continuing	Continuing
675344: <i>B-1B Modernization</i>	-	4.562	62.471	76.030	0.000	76.030	6.586	18.276	7.962	8.107	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The B-1B Lancer is a swing-wing, supersonic, long-range conventional bomber. It carries the largest payload of both guided and unguided weapons in the AF inventory. The multi-mission B-1B is the backbone of America's long-range conventional bomber force and can rapidly deliver massive quantities of precision (and non-precision) weapons against any adversary, anywhere in the world, at any time. The current structural service life extends beyond 2040.

The B-1B modernization projects alleviate aircraft obsolescence issues due to Diminishing Manufacturing Sources (DMS) while at the same time providing improved capabilities to the B-1B weapon system that require significant hardware and software development and testing.

FULLY INTEGRATED TARGETING POD (FITP)

The Fully Integrated Targeting Pod (FITP) modification permanently integrates the Advanced Targeting Pod (ATP) capability into the B-1B's avionics flight software architecture and replaces the B-1B's Temporary T-1 Beyond Line of Sight (BLOS) / Laptop Controlled Targeting Pod (LCTP) system with a digital, high-definition video-streaming targeting pod. This will provide increased B-1B aircrew situational awareness, weapons de-confliction, and Intelligence, Surveillance and Reconnaissance (ISR) within the Combat Air Forces (CAF). FITP will provide robust combat targeting processing power, computing speed and throughput for aircrew mission planning, and a permanent sustainment support structure. It will provide all four crew members access to targeting pod information displayed on digital-quality video using the Integrated Battle Station (IBS), Multi-Function Displays (MFDs), and the cursor controller. FITP will address the aircrew ergonomic issues caused by the current system configuration, allowing more rapid prosecution of targets through improved integration with Avionics Flight Software (AFS) capabilities. In addition, FITP will provide growth capability for implementation and interaction with follow-on systems to augment targeting pod use. Furthermore, the FITP removes the need for an Interim Contractor Support (ICS) sustainment support structure, which will resolve DMS issues.

MODE 5/S AUTOMATIC SURVEILLANCE BROADCAST (ADS-B) OUT

B-1B Identification Friend or Foe (IFF) Mode 5/S is the replacement for the B-1B Mark XII IFF Mode 4. Mode 5 will provide secure target identification and will be a response system for combat identification. Mode Select (Mode S) and ADS-B Out provides timely aircraft position and flight path prediction to receiver units for aircraft, Air Traffic Control, and the Air Defense System. The IFF Mode 5 upgrade uses an automated system that responds to interrogations to avoid the loss of B-1B aircraft through fratricide. Upgrades to ADS-B Out and Mode S are Federal Aviation Administration (FAA) mandates to field by January 2020 and the upgrade to Mode 5 is a Joint Requirements Oversight Council (JROC) mandate to field by September 2020. Failure to meet these mandates will require FAA and ICAO waivers or will result in delayed/denied service of controlled airspace within the US and Europe. The Air Force is currently seeking waiver with FAA. Funds are included to accommodate the FAA mandate for ADS-B and Mode S and the JROC mandate for Mode 5 as outlined in previous AF and DoD budget exhibits.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101126F / <i>B-1B Squadrons</i>	
RADIO CRYPTO COMPLIANCE The B-1B Radio Crypto Compliance requirements originated to meet DoD mandates by 1 January 2020. If the requirements are not met, the B-1B is at risk of losing secure Line of Sight (LOS) and BLOS communication with ground and air forces. The Air Force is in the process of negotiating a waiver to the mandate. Without the radio crypto compliance the B-1B will not be able to participate in CONUS/OCONUS military operations. The program replaces the existing radios with crypto-compliant radios providing BLOS communications. Funds are included to accommodate the DoD mandate as outlined in previous AF and DoD budget exhibits.		
Multifunctional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) The B-1B Multifunctional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) replaces the existing MIDS Low Volume Terminal (LVT) 1 Link 16 terminal to meet National Security Agency (NSA) Crypto Modernization (CM) Device Cease Key and FAA Frequency Remap mandates: Current systems become non-compliant in 2025. MIDS-JTRS resolves all LVT 1 deficiencies and adds substantial combat capability enhancements to Link 16 Enhanced Throughput (LET) and Concurrent Multi-Netting (CMN-4) with Concurrent Retention Receive (CRR). MIDS-JTRS also provides multi-datalink capability, improving situational awareness and allowing rapid in-flight retargeting in a cooperative combat environment. Funds are included to accommodate DoT/DoD-approved Frequency Remap and Crypto Modernization Device Cease mandates as outlined in previous AF and DoD budget exhibits.		
Bomb Rack Unit 56 (BRU-56) The Bomb Rack Unit 56 (BRU-56) upgrade will solve a safety risk present within the legacy BRU-56 ejector rack. The upgrade will alleviate the deficiency within the current ejector rack as well as add increased carriage capability. Prolonged use has resulted in a deficiency of the rivets within the linkage of the rack. This deficiency led to multiple failures, to include one Class A mishap in 2003, one Class C mishap in 2010, and multiple ground mishaps. The BRU-56 modification guards against future bomb rack mishaps and the possibility of a catastrophic aircraft loss as well as the loss of life.		
GAP AND INTEGRATION ANALYSIS Program funds cover engineering/planning studies, related engineering efforts, and the auxiliary equipment needed for development projects that have not yet been fielded. Funds may be used to resolve emerging safety of flight and DMS issues, accommodate technology insertion, and fulfill FAA (or other) mandates necessary to ensure continued aircrew safety and mission effectiveness. Costs includes Program Management Administrative (PMA) costs, total ownership cost, as well as initiatives for anticipated weapon system enhancements, to include efforts for improving weapon system operational capabilities, safety, supportability, maintainability, and reliability. All B-1B development projects support planned requirements for unique identification in their production phases. Funding is also required to ensure test asset availability for testing of aircraft RDT&E efforts.		
This PE may include necessary civilian pay expenses required to manage, execute, and deliver B-1B weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.		
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 current or subsequent fiscal year.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	5.830	62.471	67.101	0.000	67.101
Current President's Budget	4.562	62.471	76.030	0.000	76.030
Total Adjustments	-1.268	0.000	8.929	0.000	8.929
• Congressional General Reductions	-1.900	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	-0.128	0.000			
• Other Adjustments	0.760	0.000	8.929	0.000	8.929

Change Summary Explanation

FY17: Decrease of \$1.268 was due to \$1.9M due to Congressional General Reductions, \$0.128M reduction for SBIR, and \$0.760 BTR for B-1 Tech insertion.

FY19: Increase of \$8.929M includes \$4.0M BRU-56 EMD efforts, \$5.5M Fully Integrated Targeting Pod (FITP) and decrease of \$0.571M for Inflation Adjustment

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
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Title: Fully Integrated Targeting Pod	-	23.283	20.388
Description: The Fully Integrated Targeting Pod (FITP) Modification permanently integrates the Advanced Targeting Pod (ATP) capability into the B-1B's avionics flight software architecture and replaces the B-1B's Temporary T-1 Beyond Line of Sight (BLOS) / Laptop Controlled Targeting Pod (LCTP) system with a digital, high-definition video-streaming targeting pod. This will provide increased B-1B aircrew situational awareness, weapons de-confliction, and Intelligence, Surveillance and Reconnaissance (ISR) within the Combat Air Forces (CAF). FITP will provide robust combat targeting processing power, computing speed and throughput for aircrew mission planning, and a permanent sustainment support structure. It will provide all four crew members access to targeting pod information displayed on digital-quality video using the Integrated Battle Station (IBS), Multi-Function Displays (MFDs), and the cursor controller. FITP will address the aircrew ergonomic issues caused by the current system configuration, allowing more rapid prosecution of targets through improved integration with Avionics Flight Software (AFS) capabilities. In addition, FITP will provide growth capability for implementation and interaction with follow-on systems to augment targeting pod use. Furthermore, the FITP removes the need for an ICS sustainment support structure, which will resolve the DMS issue.			
FY 2018 Plans:			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development (EMD) Phase I efforts thru Preliminary Design Review (PDR) completion.</p> <p>FY 2019 Plans: Continue EMD Phase 2 efforts. Conduct software development and software integration and developmental/operational testing efforts for qualification onto the aircraft via Configuration Control Board approval.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease in funding due to ramp down in FY2019 as EMD activities conclude.</p>				
<p>Title: Mode 5/S Automatic Dependent Surveillance Broadcast (ADS-B) Out</p> <p>Description: B-1B Identification Friend or Foe (IFF) Mode 5/S is the replacement for the B-1B Mark XII IFF Mode 4. Mode 5 will provide secure target identification and will be a response system for combat identification. Mode Select (Mode S) and ADS-B Out provides timely aircraft position and flight path prediction to receiver units for aircraft, Air Traffic Control, and the Air Defense System. The IFF Mode 5 upgrade uses an automated system that responds to interrogations to avoid the loss of B-1B aircraft through fratricide. Upgrades to ADS-B Out and Mode S are required FAA mandates to field by January 2020 and the upgrade to Mode 5 is a JROC mandate to field by September 2020. Failure to meet these mandates will result in delayed/denied service of controlled airspace within the US and Europe.</p> <p>FY 2018 Plans: Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts.</p> <p>FY 2019 Plans: Continue Engineering and Manufacturing efforts. Perform Preliminary and Critical design reviews, Frequency and First Article testing, and Developmental testing.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase in funding is due to major EMD activities being performed in the 2nd year of EMD.</p>		0.000	13.546	17.065
<p>Title: Radio Crypto Compliance</p> <p>Description: The B-1B Radio Crypto Compliance requirements originated to meet DoD mandates by 1 January 2020. If the requirements are not met, the B-1B is at risk of losing secure LOS and BLOS communication with ground and air forces. Without the radio crypto compliance the B-1B will not be able to participate in CONUS/OCONUS military operations. The program replaces the existing radios with crypto-compliant radios providing BLOS communications.</p> <p>FY 2018 Plans:</p>		0.000	5.117	8.491

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0101126F / <i>B-1B Squadrons</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts.</p> <p>FY 2019 Plans: Continue Engineering and Manufacturing Development (EMD) efforts. Perform Preliminary and Critical design reviews, Frequency and First Article testing, and Developmental testing.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase in funding is due to a ramp up of EMD activities in FY19.</p>				
<p>Title: Multifunctional Information Distribution System-Joint Tactical Radio System</p> <p>Description: The B-1B Multifunctional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) replaces the existing MIDS Low Volume Terminal (LVT) 1 Link 16 terminal to meet National Security Agency (NSA) Crypto Modernization (CM) Device Cease Key and FAA Frequency Remap mandates; systems become non-compliant in 2025. MIDS-JTRS resolves all LVT 1 deficiencies and adds substantial combat capability enhancements to Link 16 Enhanced Throughput (LET) and Concurrent Multi-Netting (CMN-4) with Concurrent Retention Receive (CRR). MIDS-JTRS also provides multi-datalink capability, improving situational awareness and allowing rapid in-flight retargeting in a cooperative combat environment.</p> <p>FY 2018 Plans: Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts.</p> <p>FY 2019 Plans: Continue Engineering and Manufacturing Development efforts. Perform Preliminary and Critical design reviews, Frequency and First Article testing, and Developmental testing.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase in FY2019 funding from FY2018 is due to a increase in contract cost and flight test.</p>		0.000	8.241	9.715
<p>Title: Bomb Rack Unit - 56</p> <p>Description: The Bomb Rack Unit 56 (BRU-56) upgrade will solve a safety risk present within the legacy BRU-56 ejector rack. The upgrade will alleviate the deficiency within the current ejector rack as well as add increased carriage capability. Prolonged use has resulted in a deficiency of the rivets within the linkage of the rack. This deficiency led to multiple failures, to include one Class A mishap in 2003, one Class C mishap in 2010, and multiple ground mishaps. The BRU-56 modification avoids future bomb rack mishaps and the possibility of a catastrophic aircraft loss as well as the loss of life.</p> <p>FY 2018 Plans:</p>		0.000	5.898	20.114

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Conduct acquisition planning, risk assessments, and other pre-Engineering and Manufacturing Development (EMD) activities. Begin software development.</p> <p>FY 2019 Plans: Award EMD contract and continue software development. Begin Preliminary Design Review activities.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase in funds due to beginning of EMD efforts.</p>				
<p>Title: Gap and Integration Analysis</p> <p>Description: Funds will be used for studies to facilitate new capabilities and enhancements to improve operational aircraft safety, supportability, maintainability, reliability and total ownership cost. Conduct engineering studies that will involve a gap and integration analysis to include but not limited for Small Diameter Bomb (SDB) II Integration with Universal Armament Interface (UAI), Guided Bomb Unit (GBU)-56 Integration, Miniature Air Launch Decoy (MALD) Integration (All variants) and Helmet Mounted Cueing System.</p> <p>FY 2018 Plans: Engineering studies will be conducted to include a gap and integration analysis to include but not limited to Small Diameter Bomb (SDB) II Integration with Universal Armament Interface (UAI), Guided Bomb Unit (GBU)-56 Integration, Miniature Air Launch Decoy (MALD) Integration (all variants) and Helmut Mounted Cueing System.</p> <p>FY 2019 Plans: Engineering studies will be conducted to include a gap and integration analysis to include but not limited to Small Diameter Bomb (SDB) II Integration with Universal Armament Interface (UAI), Guided Bomb Unit (GBU)-56 Integration, Miniature Air Launch Decoy (MALD) Integration (all variants) and Helmut Mounted Cueing System.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: GPS-M-Code was a New Start in FY17. Funding was not used due to a two year delay in the development of the Military GPS User Equipment (MGUE) box to FY19. As a result of the delay in development FY2018 and FY2019 funds were removed. FY17 funds were realigned to Gap and Integration Analysis.</p>		4.562	6.386	0.257
Accomplishments/Planned Programs Subtotals		4.562	62.471	76.030

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons
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D. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item B01B00: <i>Training Support to Units, Mods PE 0809731F</i>	0.438	0.448	0.450	-	0.450	0.458	0.467	0.476	0.485	Continuing	Continuing
• APAF 05 Line Item B01B00 (1)...: <i>Bomber Tactical Data Link Mods PE 0207446F</i>	1.380	0.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.480
• APAF 05 Line Item B01B00 (2)...: <i>B-1B Squadrons, Mods</i>	148.501	155.086	50.840	-	50.840	85.885	121.815	85.172	73.594	Continuing	Continuing
• APAF 05 Line Item B01B00 <i>Spares: B-1B Squadrons, Spares</i>	7.429	7.806	0.000	-	0.000	2.513	0.718	0.856	0.872	Continuing	Continuing

Remarks

- (U) Program Element 0809731F, Training Support to Units, Mods
- (U) Program Element 0207446F, Bomber Tactical Data Link, Mods

E. Acquisition Strategy

FITP acquisition strategy will be a Cost Plus Fixed Fee (CPFF) Sole Source contract with a three-year EMD effort and a Firm Fixed Fee (FFP)sole source contract with a three-year Production and Installation effort.

Mode 5/S ADS-B Out, Radio Crypto Compliance, and MIDS-JTRS acquisition strategies will be a CPFF sole source contract with a two-year EMD effort and a Firm Fixed Price (FFP)competitively-selected contract with a three-year Production and Installation effort.

The acquisition strategy for the Bomb Rack Unit 56 (BRU-56) will be competitively-selected contract for hardware development and a sole source to Boeing (OEM) for software development. EMD will be a four year effort and a three-year Production and Installation effort. Contract type is TBD.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons	Project (Number/Name) 675344 / B-1B Modernization
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Fully Integrated Targeting Pod (FITP)	SS/CPFF	Boeing : OKC, OK	-	-		22.786	Jun 2018	19.922	Jun 2019	-		19.922	Continuing	Continuing	-
Mode 5/S Automatic Dependent Surveillance Broadcast (ADS-B) Out	SS/CPFF	Boeing : OKC, OK	-	-		11.937	Jun 2018	10.112	Jun 2019	-		10.112	Continuing	Continuing	-
Radio Crypto Compliance	SS/CPFF	Boeing : OKC, OK	-	-		5.092	Jun 2018	7.534	Jun 2019	-		7.534	Continuing	Continuing	-
Multifunction Information Distribution System (MIDS) Joint Tactical Radio System (JTRS)	SS/CPFF	Boeing : OKC, OK	-	-		5.743	Jun 2018	6.075	Jun 2019	-		6.075	Continuing	Continuing	-
Bomb Rack Unit - (BRU) 56	C/TBD	TBD : NV	-	-		5.898	Mar 2018	19.054	Mar 2019	-		19.054	Continuing	Continuing	-
Subtotal			-	-		51.456		62.697		-		62.697	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Gap And Integration Analysis	Various	Various : TBD, OK	-	2.569	Sep 2017	6.361	Apr 2018	0.257	Apr 2019	-		0.257	Continuing	Continuing	-
A&AS	C/TBD	TBD : TBD, VA	-	-		0.939	Mar 2018	1.073	Mar 2019	-		1.073	Continuing	Continuing	-
Trainers	TBD	Various : TBD, OH	-	-		1.889	Jun 2018	1.722	Jun 2019	-		1.722	Continuing	Continuing	-
Subtotal			-	2.569		9.189		3.052		-		3.052	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AFFTC	PO	Edward AFB : CA	-	1.968	Dec 2017	0.363	Dec 2018	8.524	Jun 2019	-		8.524	Continuing	Continuing	-
Subtotal			-	1.968		0.363		8.524		-		8.524	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons	Project (Number/Name) 675344 / B-1B Modernization
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
B-1B Modernization																												
Gap and Integration Analysis Contract Award (Sep 17)				■																								
Gap & Integration Analysis Contract Award (Apr 18)							■																					
Gap & Integration Analysis Contract Award (Apr 19)																												
Fully Integrated Targeting Pod - EMD Activities							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Fully Integrated Targeting Pod - Contract Award (Jun 18)							■																					
Fully Integrated Targeting Pod - MS C																												
Fully Integrated Targeting Pod - Production																												
Mode 5/S ADS-B Out - EMD Activities							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Mode 5/S ADS-B Out - Contract Award (Jun 18)							■																					
Mode 5/S ADSB Out - PDR																												
Mode 5/S ADSB Out - CDR																												
Mode 5/S ADSB Out - MS C																												
Mode 5/S ADSB Out - Production																												
Radio Crypto Compliance - EMD Activities							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Radio Crypto Compliance - Contract Award (Jun 18)							■																					
Radio Crypto Compliance - PDR																												
Radio Crypto Compliance - CDR																												
Radio Crypto Compliance - MS C																												
Radio Crypto Compliance - Production																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons	Project (Number/Name) 675344 / B-1B Modernization
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
MIDS JTRS - EMD Activities																												
MIDS JTRS - Milestone B Decision and Contract Award (Jun 18)																												
MIDS JTRS - PDR																												
MIDS JTRS - CDR																												
MIDS JTRS - MS C																												
MIDS JTRS - Production																												
BRU-56 EMD Activities																												
BRU-56 - Contract Award for Software Development (Mar 18)																												
BRU-56 - Contract Award for Hardware Development (Mar 19)																												
BRU-56 - MS C																												
BRU-56 - Production																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons	Project (Number/Name) 675344 / B-1B Modernization

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
B-1B Modernization				
Gap and Integration Analysis Contract Award (Sep 17)	4	2017	4	2017
Gap & Integration Analysis Contract Award (Apr 18)	3	2018	3	2018
Gap & Integration Analysis Contract Award (Apr 19)	3	2019	3	2019
Fully Integrated Targeting Pod - EMD Activities	3	2018	2	2020
Fully Integrated Targeting Pod - Contract Award (Jun 18)	3	2018	3	2018
Fully Integrated Targeting Pod - MS C	2	2020	2	2020
Fully Integrated Targeting Pod - Production	2	2020	4	2023
Mode 5/S ADS-B Out - EMD Activities	3	2018	4	2019
Mode 5/S ADS-B Out - Contract Award (Jun 18)	3	2018	3	2018
Mode 5/S ADSB Out - PDR	2	2019	2	2019
Mode 5/S ADSB Out - CDR	3	2019	3	2019
Mode 5/S ADSB Out - MS C	1	2020	1	2020
Mode 5/S ADSB Out - Production	1	2020	4	2023
Radio Crypto Compliance - EMD Activities	3	2018	4	2019
Radio Crypto Compliance - Contract Award (Jun 18)	3	2018	3	2018
Radio Crypto Compliance - PDR	2	2019	2	2019
Radio Crypto Compliance - CDR	3	2019	3	2019
Radio Crypto Compliance - MS C	1	2020	1	2020
Radio Crypto Compliance - Production	1	2020	4	2023
MIDS JTRS - EMD Activities	3	2018	3	2019
MIDS JTRS - Milestone B Decision and Contract Award (Jun 18)	3	2018	3	2018
MIDS JTRS - PDR	2	2019	2	2019

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101126F / B-1B Squadrons	Project (Number/Name) 675344 / B-1B Modernization
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MIDS JTRS - CDR	3	2019	3	2019
MIDS JTRS - MS C	4	2019	4	2019
MIDS JTRS - Production	4	2019	4	2022
BRU-56 EMD Activities	3	2018	3	2021
BRU-56 - Contract Award for Software Development (Mar 18)	3	2018	3	2018
BRU-56 - Contract Award for Hardware Development (Mar 19)	3	2019	3	2019
BRU-56 - MS C	4	2021	4	2021
BRU-56 - Production	4	2021	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101127F / <i>B-2 Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	122.973	193.108	105.561	0.000	105.561	106.376	43.727	41.534	42.293	Continuing	Continuing
675345: <i>B-2 Modernization</i>	0.000	73.768	54.523	91.472	0.000	91.472	92.025	29.128	26.631	27.118	Continuing	Continuing
676021: <i>BASELINE SUPPORT</i>	0.000	13.181	13.967	14.089	0.000	14.089	14.351	14.599	14.903	15.175	Continuing	Continuing
676022: <i>AEHF Strategic Comm</i>	0.000	36.024	124.618	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	160.642

Note

This program, BA 7, PE 0101127F, project 675345, B-2 Radar Aided Targeting System (RATS), is a new start.

A. Mission Description and Budget Item Justification

The B-2 is currently undergoing modernization of avionics/communications systems, engines, armament systems, low observable components, core training system components, aircraft supportability improvements, and support equipment development.

The Air Force will also study multiple structural, avionics, and engine modifications that could improve the performance of the aircraft and engines and reduce maintenance man-hours and the logistics footprint of the fleet. Focus of the studies will be on non-mission capable (maintenance) drivers, safety issues, and obsolescence issues through modernization of key components in the airframe, avionics, and engines resulting in improved aircraft availability of a high demand/low density fleet.

Modern communications are key enablers for the B-2 in the anti-access/area denial battlespace, and directly enhance lethality and force multiplication. The Common Very Low Frequency (VLF) Receiver effort (CVR) develops and integrates a receive-only, low bandwidth receiver and antenna subsystem to provide a secure, survivable strategic nuclear communication capability for the B-2.

The B-2 Advanced Extremely High Frequency (AEHF) Satellite Communications (SATCOM) system provides secure, strategic, two-way, survivable Anti-Access/Area Denial communications capability for conventional and nuclear missions. The B-2 AEHF SATCOM program is terminated in the FY 2019 Budget.

B-2 Armament upgrades integrate new and/or advanced weapons on the B-2 to attack a wider array of target sets, to include hardened, deeply buried targets, as well as destroy more targets per sortie. Upgrades includes Flex Strike and JASSM-ER integration.

The Low Observable Signature and Supportability Modifications (LOSSM) program supports the B-2 ability to penetrate anti-access combat environments, performing missions directed by the National Command Authority while ensuring aircrew survivability. The LOSSM program reduces low observable (LO) maintenance, and stabilizes and improves the combat-ready LO signature for the B-2 fleet.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons
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The B-2 Crash Survivable Memory Unit (CSMU) provides a more capable Flight Data Recorder (FDR) with increased capacity for storing Flight Information Data (FID) for recovery and use in the event of a mishap.

The Radar Aided Targeting System (RATS) is planned to be a software only solution implemented in several B-2 system level Operational Flight Programs (OFPs) to provide radar-aided enhanced targeting capability through weapon hand-off navigational updates for guided nuclear weapons in a non-GPS environment.

The B-2 Identification, Friend or Foe (IFF) Mode 5/S and Automatic Dependent Surveillance Broadcast (ADS-B) modification will fulfill the requirements of the FAA's Next Generation Air Transportation System (NextGen) air traffic modernization mandate and the DoD mandate for secure combat identification.

The B-2 Training System upgrades include updates to training device hardware and components, simulation software, courseware and academic materials, instructional system design architectures, engineering drawings, and system documentation that is not driven by a funded aircraft modification.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-2 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.

This program is in Budget Activity 7, Operational System Development. This budget activity includes developmental 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	152.458	193.108	314.851	0.000	314.851
Current President's Budget	122.973	193.108	105.561	0.000	105.561
Total Adjustments	-29.485	0.000	-209.290	0.000	-209.290
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-25.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.006	0.000			
• SBIR/STTR Transfer	-4.479	0.000			
• Other Adjustments	0.000	0.000	-209.290	0.000	-209.290

Change Summary Explanation

FY2017: Congress reduced AEHF SATCOM by -\$25M, -\$4.479M for SBIR, and \$0.006M reprogrammed.

FY2019: AEHF SATCOM terminated in FY19 budget, reducing by -\$209.290M in FY 2019 budget.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons				Project (Number/Name) 675345 / B-2 Modernization			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675345: B-2 Modernization	0.000	73.768	54.523	91.472	0.000	91.472	92.025	29.128	26.631	27.118	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0101127F, project 675345, B-2 Radar Aided Targeting System (RATS), is a new start.

A. Mission Description and Budget Item Justification

The B-2 is currently undergoing modernization of avionics/communications systems, engines, armament systems, low observable components, core training system components, aircraft supportability improvements, and support equipment development.

The Air Force will also study multiple structural, avionics, and engine modifications that could improve the performance of the aircraft and engines and reduce maintenance man-hours and the logistics footprint of the fleet. Focus of the studies will be on non-mission capable (maintenance) drivers, safety issues, and obsolescence issues through modernization of key components in the airframe, avionics, and engines resulting in improved aircraft availability of a high demand/low density fleet.

Modern communications are key enablers for the B-2 in the anti-access/area denial battlespace, and directly enhance lethality and force multiplication. The Common Very Low Frequency (VLF) Receiver effort (CVR) develops and integrates a receive-only, low bandwidth receiver and antenna subsystem to provide a secure, survivable strategic nuclear communication capability for the B-2. B-2 cryptographic modernization updates cryptographic equipment for B-2 AIT/ARC-234, AN/ARC-211 and MIDS/LVT communication systems. The Adaptive Communication Suite (ACS) explores incremental improvements to the B-2 ACS UHF communication system.

B-2 Armament upgrades integrate new and/or advanced weapons on the B-2 to attack a wider array of target sets, to include hardened, deeply buried targets, as well as destroy more targets per sortie. The Flexible Strike Phase 1 program will re-host the current B-2 stores management software onto a new integrated processor. Integration of the Joint Air-to-Surface Standoff Missile Extended Range (JASSM-ER) weapon will further enhance the B-2's ability to attack and destroy high value target sets.

The Low Observable Signature and Supportability Modifications (LOSSM) program supports the B-2 ability to penetrate anti-access combat environments, performing missions directed by the National Command Authority while ensuring aircrew survivability. The LOSSM program reduces low observable (LO) maintenance, and stabilizes and improves the combat-ready LO signature for the B-2 fleet. This program encompasses multiple improvement projects including, but not limited to, improved LO materials (electrically conductive materials, adhesives, electrically resistive materials, radar absorbing material, fastener fills, coatings, welds, material removal tools, and improved processes), LO structures (radar radomes, antennas, hot trailing edges and tiles, intermediate section doors, tailpipes, windows, lib bay panels, leading edge, permanent fasteners, exhaust pockets, gust load alleviation system, inlets, radar absorbing structures, overall signature stability, and Alternate High Frequency Material expansion), and radio frequency (RF) diagnostic tools, evaluation systems, and other tools (Tier One Material Inspection System, Signature Diagnostic System, next generation Tier II and Tier III systems, Test Article 0998 optimization, conductivity probes, tailpipe inspection tools, LO-related special test equipment, data archival, and communications tools).

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization

The B-2 Crash Survivable Memory Unit (CSMU) provides a more capable Flight Data Recorder (FDR) with increased capacity for storing Flight Information Data (FID) for recovery and use in the event of a mishap. The initiative includes replacement of the current CSMU with an adapted Commercial Off the Shelf (COTS) replacement, modification of the Flight Data Recorder Processor (FDRP) to provide 28 vdc power to the new CSMU, modification of the FDRP Operational Flight Program (OFP), and addition of a Underwater Locator Beacon (ULB). The current CSMU/FDRP does not meet the minimum requirements specified in the Aircraft Information Program (AIP) reference documents (AFI 63-133 and AFH 63-1402).

The B-2 Identification, Friend or Foe (IFF) Mode 5/S and Automatic Dependent Surveillance Broadcast (ADS-B) modification will fulfill the requirements of the FAA's Next Generation Air Transportation System (NextGen) air traffic modernization mandate and the DoD mandate for secure combat identification. ADS-B is a foundational technology that will modernize the national airspace by replacing ground-based radar technology with satellite-based GPS technology that will enable more efficient tracking and management of aircraft and will provide coverage where radar doesn't exist. Only ADS-B Out capability is mandated. Mode S enhances ADS-B by providing improved accuracy and altitude resolution and reduced interference from closely spaced aircraft through selective interrogation of assigned transponder addresses. Mode 5 provides improved combat identification security, with better discrimination between closely spaced platforms, while reducing interference with civil Air Traffic Control transponders enabling the B-2 fleet to accomplish its anti-access and global strike mission. Mode 5 is the DoD standard for secure combat ID.

The B-2 Training System upgrades include updates to training device hardware and components, simulation software, courseware and academic materials, instructional system design architectures, engineering drawings, and system documentation that is not driven by a funded aircraft modification. Upgrades may include Diminishing Manufacturing Sources 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. Additional Training System Upgrades may also include efforts to implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

The Radar Aided Targeting System (RATS) is planned to be a software only solution implemented in several B-2 system level Operational Flight Programs (OFPs) to provide radar-aided enhanced targeting capability through weapon hand-off navigational updates for guided nuclear weapons in a non-GPS environment. Funding supports timely software development, test and roll-out of software into a future B-2 OFP, specifically the B61-12 integration.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019
Title: B-2 Common Very Low Frequency Receiver (CVR)	11.469	0.000	0.000
Description: Provides secure, survivable, receive-only strategic nuclear communication for the B-2.			
FY 2018 Plans: N/A			
FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
N/A				
FY 2018 to FY 2019 Increase/Decrease Statement: There are no changes from FY 2018 to FY 2019 RDT&E funding ended in FY 2017 for CVR Inc 1.				
Title: B-2 Flexible Strike Phase 1		42.816	2.006	0.000
Description: Rehost the currently separate Stores Management Operational Flight Programs onto the new integrated processor unit made available by the B-2 EHF Increment 1 program.				
FY 2018 Plans: Complete Engineering and Manufacturing Development efforts. Complete software/hardware integration and flight test.				
FY 2019 Plans: N/A				
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2018 was the last year of RDT&E funding for Flexible Strike Phase 1.				
Title: Low Observable Signature and Supportability Mods and Trainers		11.701	24.841	32.477
Description: B-2 Low Observable Signature and Supportability Modifications (LOSSM) pursues multiple low-cost development efforts for Low Observable (LO) materials, diagnostics and procedures to enhance LO signature and/or improve aircraft supportability, as well as other development or study efforts for training system improvements.				
FY 2018 Plans: Continue development of on-going Low Observable Signature and Supportability Modifications and Training System core upgrades. Expand development efforts for advanced LO materials, structures, and procedures including the Advanced Signature Reduction efforts; increase efforts for enhanced diagnostics and measurement systems such as the follow-on to the SCI-2k system as well as requirements analysis for Next Generation Tier III system.				
FY 2019 Plans: Continue development of on-going Low Observable Signature and Supportability Modifications and Training System core upgrades. Accelerate development efforts for three Advanced Signature Reduction efforts, the Next Generation Zonal Radar, an upgrade to the Tier One Material Inspection System (TOMIS), and Tape Improvement. Continues development efforts for advanced LO materials, structures, procedures, other Advanced Signature Reduction efforts, and enhanced diagnostics and measurement systems.				
FY 2018 to FY 2019 Increase/Decrease Statement:				

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Funding levels increased from FY 2018 to FY 2019 due to improved materials qualification, diagnostic tool development, and technology maturation.				
<p>Title: B-2 Joint Air-to-Surface Standoff Missile - Extended Range (JASSM-ER) Integration</p> <p>Description: Integrates the Joint Air to Surface Standoff Missile, Extended Range weapon (JASSM-ER) onto the B-2.</p> <p>FY 2018 Plans: Continue acquisition planning and other pre-EMD activities in preparation for EMD contract award.</p> <p>FY 2019 Plans: Begin EMD efforts to include design finalization for Critical Design Review, Tech Order generation, and pre-production planning.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: JASSM-ER integration funding decreases between FY 2018 and FY 2019 as the integration completes.</p>		5.697	15.431	12.120
<p>Title: B-2 Cryptographic Modernization</p> <p>Description: Provides NSA-mandated cryptographic modifications to three communication system components on the aircraft: Advanced Integrated Terminal (AIT) also known as AN/ARC-234 (UHF/VHF Radio), AN/ARC-211 (HF Radio), and the Multifunction Information Distribution System (MIDS) Low Volume Terminal (Link-16 Terminal).</p> <p>FY 2018 Plans: Complete Multifunction Information Distribution System (MIDS) Low Volume Terminal (LVT) Risk Reduction Terminal (RRT) Regression Testing.</p> <p>FY 2019 Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Crypto modification funding decreases from FY 2018 to FY 2019 as program completes in order to meet NSA mandate.</p>		2.085	1.987	0.000
<p>Title: B-2 Adaptable Communications Suite (ACS)</p> <p>Description: The Adaptable Communications Suite provides a non-integrated avionics and communications system that allows the B-2 fleet to receive complete integrated mission data, time sensitive targeting information, intelligence updates, and positive command and control procedures.</p> <p>FY 2018 Plans:</p>		0.000	0.199	0.197

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Conduct acquisition planning, affordability assessments, and requirements maturation associated with future ACS requirements. Future ACS requirements include providing for a permanent BLOS communications system for integrated mission data, time sensitive targeting, intelligence updates, positive command and control capability, and address ACS obsolescence issues.</p> <p>FY 2019 Plans: Continue requirements definition and maturation as new communications and mission planning systems come online. Continue to address ACS obsolescence issues.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No changes to ACS funding from FY 2018 to FY 2019.</p>				
<p>Title: B-2 IFF Mode 5/S/ADS-B out</p> <p>Description: B-2 IFF Mode 5/S/ADS-B Out provides improved combat identification security with better discrimination between closely spaced platforms, while reducing interference with civil air traffic control transponders enabling the B-2 fleet to accomplish its anti-access and global strike mission, in compliance with the FAA mandate. Mode S provides improved accuracy, altitude resolution, and reduced interference from closely spaced aircraft through interrogation of assigned transponder addresses.</p> <p>FY 2018 Plans: Conduct acquisition planning and other pre-EMD activities in preparation for contract award.</p> <p>FY 2019 Plans: Execute EMD activities to include Preliminary Design Review (PDR), Milestone B, developmental testing, and planning for IOT&E.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increases from FY 2018 to FY 2019 due to increase in development activities, integration, and engineering work.</p>		0.000	7.687	18.139
<p>Title: B-2 Crash Survivable Memory Unit (CSMU)</p> <p>Description: The B-2 Crash Survivable Memory Unit (CSMU) provides a more capable Flight Data Recorder (FDR) with increased capacity for storing Flight Information Data (FID) for recovery and use in the event of a mishap. The initiative includes replacement of the current CSMU with an adapted Commercial Off the Shelf (COTS) replacement, modification of the Flight Data Recorder Processor (FDRP) to provide 28 vdc power to the new CSMU, modification of the FDRP Operational Flight Program (OFFP), and addition of a Underwater Locator Beacon (ULB).</p> <p>FY 2018 Plans: Conduct acquisition planning and other pre-EMD activities in preparation for 4Q FY 2018 EMD contract award. CSMU is an FY 2018 new start.</p> <p>FY 2019 Plans:</p>		0.000	2.372	4.818

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Perform Non-recurring Engineering (NRE) to adapt Commercial Off the Shelf (COTS) CSMU to the B-2 Flight Data Recorder (FDR) system; modify the FDRP; and update the FDRP OFP. Two prototype CSMUs will be assembled for integration and flight test, and two FDRPs will be modified to operate with the COTS CSMU design.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase from FY 2018 to FY 2019 funding due to the development of two prototype assets and modification of two Flight Data Recorders.</p>			
<p>Title: B-2 Radar Aided Targeting System (RATS)</p> <p>Description: The Radar Aided Targeting System (RATS) is planned to be a software only solution implemented in several B-2 system level Operational Flight Programs (OFPs) to provide radar-aided enhanced targeting capability through weapon hand-off navigational updates for Type 2 nuclear weapons in a non-GPS environment.</p> <p>FY 2018 Plans: N/A</p> <p>FY 2019 Plans: Award Requirements Maturation (RM) effort, affordability assessments, and other pre-EMD activities. Radar Aided Targeting System (RATS) is a new start.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Program is a New Start in FY 2019.</p>	0.000	0.000	23.721
Accomplishments/Planned Programs Subtotals	73.768	54.523	91.472

C. Other Program Funding Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item B00200: B-2 CVR Inc 1 Mod Funding, PE 0101127F	18.592	10.610	7.051	-	7.051	2.376	-	-	-	0.000	38.629
• APAF 05 Line Item B00200 (1)...: B-2 Training Support Modification, PE 0809731F	0.428	9.082	7.800	-	7.800	7.938	8.080	8.242	8.392	Continuing	Continuing
• APAF 05 Line Item B00200 (2)...: B-2 Flexible Strike Mod Funding, PE 0101127F	4.214	6.658	7.662	-	7.662	4.894	-	-	-	0.000	23.428

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 07 Line Item B00200: B-2 Post Production Support, B-2A ICS for CVR Inc 1: PE 0101127F	0.010	0.131	1.442	-	1.442	1.403	1.686	1.686	1.785	Continuing	Continuing
• APAF 06 Line Item B00200: B-2 Squadrons, A/C Initial Spares for CVR Inc 1	2.036	2.578	-	-	-	-	-	-	-	0.000	4.614
• APAF 07 Line Item B00200 (5)...: B-2 Depot Activation for CVR Inc 1, PE 0101127F	-	2.025	-	-	-	-	-	-	-	0.000	2.025
• APAF 05 Line Item B00200 (6)...: B-2 LOSSM Mod Funding, PE 0101127F	8.263	8.454	13.489	-	13.489	9.607	19.878	20.276	20.645	Continuing	Continuing
• APAF 05 Line Item B00200 (7)...: B-2 CSMU Mod Funding, PE 0101127F	-	-	-	-	-	2.480	0.793	1.601	1.631	Continuing	Continuing
• APAF 05 Line Item B00200 (8)...: B-2 IFF Mode 5/S Mod Funding, PE 0101127F	-	-	-	-	-	1.984	7.239	15.020	15.294	Continuing	Continuing
• APAF 05 Line Item B00200 (9)...: B-2 B61-12 Integration Mod	-	27.514	-	-	-	-	-	-	-	0.000	27.514
• APAF 05 Line Item B00200 (10)...: B-2 MGUE Mod	4.066	10.704	0.578	-	0.578	0.990	-	-	-	0.000	16.338

Remarks

D. Acquisition Strategy

Key elements of the overall acquisition strategy include: use of sole source contract with a prime/integrating contractor (Northrop Grumman), employ the program office as the system integrator when practical, leverage mature technology and systems development investments by other Department of Defense organizations, encourage prime contractor competition of subsystems and key components to reduce risk and cost, use of cost plus incentive fee (CPIF) development contracts, and combine developmental upgrades with software sustainment blocks to minimize the number of software releases, aircraft downtime, and differences in fielded configurations.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
B-2 Flex Strike Phase 1	Various	Various : Various	-	35.289	Oct 2016	1.893	Dec 2017	-		-		-	0.000	37.182	-
B-2 Common Very Low Frequency Receiver (CVR)	Various	Various : Various	-	10.709	Oct 2016	-		-		-		-	0.000	10.709	-
Low Observable Signature and Supportability Mods	Various	Various : Various	-	11.418	Feb 2017	23.141	Dec 2017	29.943	Nov 2018	-		29.943	Continuing	Continuing	-
B-2 Joint Air-to-Surface Standoff Missile - Extended Range (JASSM-ER) Integration	Various	Various : Various	-	5.315	Sep 2017	12.672	Jan 2018	8.727	Jan 2019	-		8.727	0.000	26.714	-
B-2 Cryptographic Modernization	Various	Various : Various	-	0.963	Jul 2017	1.719	Dec 2017	-		-		-	0.000	2.682	-
B-2 Adaptable Communications Suite (ACS)	Various	Various : Various	-	0.000	Jul 2017	0.188	Dec 2017	0.184	Dec 2018	-		0.184	Continuing	Continuing	-
B-2 IFF Mode 5/S/ADS-B Out	Various	Various : Various	-	-		7.247	Jan 2018	16.343	Jan 2019	-		16.343	Continuing	Continuing	-
B-2 Crash Survivable Memory Unit (CSMU)	Various	Various : Various	-	-		2.218	Aug 2018	4.166	Jan 2019	-		4.166	2.992	9.376	-
B-2 RATS	Various	Various : Various	-	-		-		19.599	Jan 2019	-		19.599	0.000	19.599	-
Aircrew Training	Various	Various : Various	-	1.100	Dec 2016	0.086	Dec 2017	1.091	Dec 2018	-		1.091	Continuing	Continuing	-
Mission Planning	Various	Various : Various	-	0.014	Jan 2017	0.430	Jan 2018	1.100	Jan 2019	-		1.100	Continuing	Continuing	-
Subtotal			-	64.808		49.594		81.153		-		81.153	Continuing	Continuing	N/A

Remarks
Northrop-Grumman is the prime contractor and serves as integrator and hence main contractor for many (ie "Various"), but not all, B-2 modernization efforts.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Test	MIPR	Various : CA	-	5.336	Nov 2016	1.555	Nov 2017	3.525	Nov 2018	-		3.525	Continuing	Continuing	-
Subtotal			-	5.336		1.555		3.525		-		3.525	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA	Various	Various : TBD	-	3.624	Oct 2016	3.374	Oct 2017	6.794	Oct 2018	-		6.794	Continuing	Continuing	-
Subtotal			-	3.624		3.374		6.794		-		6.794	Continuing	Continuing	N/A
Project Cost Totals			-	73.768		54.523		91.472		-		91.472	Continuing	Continuing	N/A

Remarks
Award dates listed are the first incremental funding opportunity associated with each cost category.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force	Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons
	Project (Number/Name) 675345 / B-2 Modernization

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
B-2 Modifications Schedule																												
Flexible Strike EMD																												
Flexible Strike Ph 1 Milestone C																												
Flexible Strike Ph 1 Production Contract Award																												
Flexible Strike Production																												
Flexible Strike Ph 1 Required Assets Available																												
Common Very Low Frequency Receiver EMD																												
Common Very Low Frequency Receiver Milestone C																												
Common Very Low Frequency Receiver Production Contract Award																												
Common Very Low Frequency Production																												
Common Very Low Frequency Receiver Required Assets Available																												
Low Observable Signature and Supportability Mods and Trainers																												
JASSM-ER Integration Preliminary Design																												
JASSM-ER Integration Milestone B																												
Crypto Modification Regression Testing																												
IFF Mode 5/S ADS-B Out TMRR Phase																												
IFF Mode 5/S ADS-B Out Milestone B																												
IFF Mode 5/S ADS-B Out EMD Phase																												
Crash Survivable Memory Unit Milestone B																												
Crash Survivable Memory Unit EMD Contract																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Crash Survivable Memory Unit Milestone C / Production and Deployment	[REDACTED]																											
Radar Aided Targeting System (RATS) Software Development and Fielding	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 675345 / B-2 Modernization
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
B-2 Modifications Schedule				
Flexible Strike EMD	1	2017	2	2019
Flexible Strike Ph 1 Milestone C	2	2018	2	2018
Flexible Strike Ph 1 Production Contract Award	2	2018	2	2018
Flexible Strike Production	2	2018	4	2021
Flexible Strike Ph 1 Required Assets Available	4	2020	4	2020
Common Very Low Frequency Receiver EMD	1	2017	4	2017
Common Very Low Frequency Receiver Milestone C	1	2017	1	2017
Common Very Low Frequency Receiver Production Contract Award	1	2017	1	2017
Common Very Low Frequency Production	2	2017	2	2020
Common Very Low Frequency Receiver Required Assets Available	2	2019	2	2019
Low Observable Signature and Supportability Mods and Trainers	1	2017	4	2023
JASSM-ER Integration Preliminary Design	3	2018	1	2019
JASSM-ER Integration Milestone B	1	2019	2	2019
Crypto Modification Regression Testing	3	2018	1	2019
IFF Mode 5/S ADS-B Out TMRR Phase	2	2018	4	2019
IFF Mode 5/S ADS-B Out Milestone B	3	2019	3	2019
IFF Mode 5/S ADS-B Out EMD Phase	3	2019	2	2020
Crash Survivable Memory Unit Milestone B	2	2018	2	2018
Crash Survivable Memory Unit EMD Contract	4	2018	2	2020
Crash Survivable Memory Unit Milestone C / Production and Deployment	2	2020	2	2023
Radar Aided Targeting System (RATS) Software Development and Fielding	2	2019	1	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons				Project (Number/Name) 676021 / BASELINE SUPPORT			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676021: <i>BASELINE SUPPORT</i>	0.000	13.181	13.967	14.089	0.000	14.089	14.351	14.599	14.903	15.175	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Baseline Support maintains and upgrades the B-2 unique flight test aircraft as well as hardware/software and test equipment to support developmental systems integration, and flight test, reducing the need for additional operational aircraft and accelerating deployment of advanced operational capabilities to the warfighter. Baseline Support also ensures the Mission Planning System keeps pace with aircraft modifications and improves the mission planning core system. Baseline Support provides for other B-2 unique government costs and includes assorted studies of aircraft performance and cost trades as well as acquisition planning activities, up to and including proposal preparation, for future aircraft, engine, weapon, communication, navigation or other capabilities.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2017	FY 2018	FY 2019
<p>Title: Baseline Support Acq Plan/Studies/Integr Test Support</p> <p>Description: Baseline Support provides for other B-2 unique government costs, including acquisition planning activities for future capabilities, long range planning, studies, and program integration activities, as well as integration and test support of upgraded crypto components as needed.</p> <p>FY 2018 Plans: Continue Baseline Support activities including acquisition planning for future capabilities, long range planning, studies, program integration activities, integration and test support of upgraded crypto components.</p> <p>FY 2019 Plans: Continue Baseline Support activities including acquisition planning for future capabilities, long range planning, studies, program integration activities, integration and test support of upgraded crypto components.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No change to Baseline Support Acq Plan/Studies/Integr Test Support funding from FY 2018 to FY 2019.</p>	0.297	0.297	0.297
<p>Title: Baseline Support Flight Test</p> <p>Description: Description: Baseline Support Flight Test maintains and upgrades the B-2 unique flight test aircraft as well as hardware/software and test equipment to support developmental systems integration and flight test, reducing the need for additional operational aircraft and accelerating deployment of advanced operational capabilities to the warfighter.</p>	10.161	13.670	13.792

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 676021 / BASELINE SUPPORT
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>FY 2018 Plans: Continue B-2 Flight Test activities, maintaining and upgrading the B-2 unique flight test aircraft as well as hardware/software and test equipment, to support developmental systems integration and flight test, and test aircraft de-mod efforts.</p> <p>FY 2019 Plans: Continue B-2 Flight Test activities, maintaining and upgrading the B-2 unique flight test aircraft as well as hardware/software and test equipment, to support developmental systems integration and flight test, and test aircraft de-mod efforts.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No significant change to Baseline Support Flight Test funding from FY 2018 to FY 2019.</p>			
<p>Title: Baseline Support Mission Planning</p> <p>Description: Description: Baseline Support Mission Planning System improvements ensure the mission planning system keeps pace with aircraft modifications and improves mission planning core systems.</p> <p>FY 2018 Plans: Effort completed in FY 2017.</p> <p>FY 2019 Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>	2.723	0.000	0.000
Accomplishments/Planned Programs Subtotals	13.181	13.967	14.089

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

Remarks

D. Acquisition Strategy
Key elements of the overall acquisition strategy include: use of a sole source contract with a prime/integrating contractor (Northrop Grumman) for most but not all B-2 programs; use of cost plus incentive fee (CPIF) development contracts; and the combination of developmental upgrades with software sustainment blocks to minimize the number of software releases, aircraft downtime, and differences in fielded configurations.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 676021 / BASELINE SUPPORT
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mission Planning	Various	Various : Various	-	2.248	Oct 2016	-		-		-		-	0.000	2.248	-
Subtotal			-	2.248		-		-		-		-	0.000	2.248	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Other Government Costs	Various	Various : Various	-	7.661	Oct 2016	9.919	Oct 2017	9.799	Oct 2018	-		9.799	Continuing	Continuing	-
Subtotal			-	7.661		9.919		9.799		-		9.799	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Test	MIPR	AFTC : CA	-	2.841	Oct 2016	3.200	Oct 2017	3.268	Oct 2018	-		3.268	Continuing	Continuing	-
Subtotal			-	2.841		3.200		3.268		-		3.268	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA	Various	Various : TBD	-	0.431	Oct 2016	0.848	Oct 2017	1.022	Oct 2018	-		1.022	Continuing	Continuing	-
Subtotal			-	0.431		0.848		1.022		-		1.022	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	13.181	13.967	14.089	-	14.089	Continuing	Continuing	N/A

Remarks
Award dates listed are the first incremental funding opportunity associated with each cost category.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 676021 / BASELINE SUPPORT
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
B-2 Baseline Support																												
FY17 Flight Test Core Support Contract Award	■																											
Mission Planning 4.4 Release			■																									
FY18 Flight Test Core Support Contract Award					■																							
FY19 Flight Test Core Support Contract Award								■																				
FY20 Flight Test Core Support Contract Award										■																		
FY21 Flight Test Core Support Contract Award													■															
FY22 Flight Test Core Support Contract Award																	■											
FY23 Flight Test Core Support Contract Award																									■			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / <i>B-2 Squadrons</i>	Project (Number/Name) 676021 / <i>BASELINE SUPPORT</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>B-2 Baseline Support</i>				
FY17 Flight Test Core Support Contract Award	1	2017	1	2017
Mission Planning 4.4 Release	3	2017	3	2017
FY18 Flight Test Core Support Contract Award	1	2018	1	2018
FY19 Flight Test Core Support Contract Award	1	2019	1	2019
FY20 Flight Test Core Support Contract Award	1	2020	1	2020
FY21 Flight Test Core Support Contract Award	1	2021	1	2021
FY22 Flight Test Core Support Contract Award	1	2022	1	2022
FY23 Flight Test Core Support Contract Award	1	2023	1	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons				Project (Number/Name) 676022 / AEHF Strategic Comm			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676022: AEHF Strategic Comm	0.000	36.024	124.618	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	160.642
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The initial FY 2016 efforts for B-2 AEHF (strategic communication) were documented in PE 0101127F BPAC 675345 B-2 Modernization.

A. Mission Description and Budget Item Justification

The B-2 Advanced Extremely High Frequency (AEHF) Satellite Communications (SATCOM) system provides secure, strategic, two-way, survivable Anti-Access/Area Denial communications capability for conventional and nuclear missions. The effort was established in Project 675345 B-2 Modernization; the B-2 AEHF effort continued in FY 2017 and subsequent years under Project 676022 AEHF Strategic Comm. The AEHF SATCOM program was terminated in the FY 2019 Budget.

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

	FY 2017	FY 2018	FY 2019
Title: B-2 AEHF (Strategic Communication)	36.024	124.618	0.000
Description: B-2 AEHF (Strategic Communication) provides secure, strategic, two-way, survivable Anti-Access/Area Denial communications capability for conventional and nuclear missions.			
FY 2018 Plans: Continue TMRR efforts to include conducting a System Functional Review (SFR) and Preliminary Design Review (PDR). Develop pre-EMD RFP and accomplish activities to support a future Milestone B decision.			
FY 2019 Plans: B-2 EHF SATCOM program is terminated in FY 2019 budget.			
FY 2018 to FY 2019 Increase/Decrease Statement: B-2 EHF SATCOM program is terminated in FY 2019 budget.			
Accomplishments/Planned Programs Subtotals	36.024	124.618	0.000

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

N/A

Remarks

D. Acquisition Strategy

Key elements of the overall acquisition strategy include: use of sole source contract with a prime/integrating contractor (Northrop Grumman), leverage mature technology and system development investments by other Department of Defense organizations, encourage prime contractor to conduct competitions at the subsystem/key

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
3600 / 7	PE 0101127F / <i>B-2 Squadrons</i>	676022 / <i>AEHF Strategic Comm</i>

component level to reduce risk and cost, use cost plus incentive fee (CPIF) development contracts, and combine developmental upgrades with software sustainment blocks to minimize the number of software releases, aircraft downtime, and differences in fielded configurations

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 676022 / AEHF Strategic Comm
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AEHF Strategic Comm	SS/CPPIF	Northrop Grumman : Palmdale, CA	-	34.511	Jul 2017	117.080	Dec 2017	-		-		-	Continuing	Continuing	-
Subtotal			-	34.511		117.080		-		-		-	Continuing	Continuing	N/A

Remarks
Northrop-Grumman is the prime contractor and lead integrator.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA	Various	Various : TBD	-	1.513	Oct 2016	7.538	Jan 2018	-		-		-	Continuing	Continuing	0.000
Subtotal			-	1.513		7.538		-		-		-	Continuing	Continuing	N/A

Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
-	36.024		124.618		-		-		-	Continuing	Continuing	N/A

Remarks
Award dates listed are the first incremental funding opportunity associated with each cost category.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 676022 / AEHF Strategic Comm
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Program Terminated</i>	
Termination	■

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 Squadrons	Project (Number/Name) 676022 / AEHF Strategic Comm
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Program Terminated</i>				
Termination	1	2019	1	2019

Note
Program is terminated in the FY19 budget. No events are planned.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	173.718	210.845	156.047	0.000	156.047	128.961	136.978	120.727	122.926	Continuing	Continuing
672983: <i>MM Ground and Comm Equipment</i>	0.000	53.716	119.384	91.273	0.000	91.273	100.066	121.442	101.576	103.425	Continuing	Continuing
672984: <i>MM III Baseline Support</i>	0.000	74.058	59.812	37.371	0.000	37.371	14.816	8.954	12.940	13.176	Continuing	Continuing
672985: <i>MM Support Equip</i>	0.000	18.658	31.649	12.863	0.000	12.863	11.995	6.086	6.211	6.325	Continuing	Continuing
672986: <i>MM Crypto Mods</i>	0.000	27.286	0.000	14.540	0.000	14.540	2.084	0.496	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The MM Ground and Comm Equipment program replaces obsolete/unsupportable ground-based weapon system equipment located at Launch Control Centers (LCCs) and Launch Facilities (LFs) necessary to continue Minuteman III (MM III) operations through 2030. Current efforts include development, qualification, integration, and testing of replacement equipment such as the LGM-30G Air Launch Control System Replacement (ALCS-R), LGM-30G Automatic Switching Unit (ASU), LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP), LGM-30G Launch Control Center Break-In-Kit (LCCB), LGM-30G Launch Control Center Block Upgrade (LCCBU), and LGM-30G Remote Visual Assessment Phase II (RVA II).

MM III Baseline Support program replaces or upgrades obsolete/unsupportable flight test unique equipment installed on the missile during flight test, used to test MM III systems on the ground, or located at test facilities to collect, process, and analyze test data. Flight test equipment supports test and evaluation of newly developed or modified MM III capabilities, and MM III Operational Test Launches (OTLs) to determine ICBM force readiness, reliability and capability shortfalls. Efforts include development, qualification, integration and testing of replacement equipment such as LGM-30G Arm Disarm Switch Replacement (ADSR), LGM-30G Flight Test Telemetry and Termination System (FT3), LGM-30G Ground Test Upgrade (GTU), and LGM-30G Squadron Data Simulator (SDS). These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to GBSD. As other similar equipment is identified for replacement, it will be added to this program. MM III Baseline Support also provides for other MM III unique government costs, studies of system performance, contract closeout costs, cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities.

MM Support Equipment program designs, develops, and tests replacement of obsolete/non-serviceable weapon system support equipment. These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to Ground Based Strategic Deterrent (GBSD). Current efforts include design, development, and testing of support equipment such as LGM-30G Alignment Set Test Set (ASTS), LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT), LGM-30G G6B4 Build Equipment Replacement (G6B4 BER), LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU), LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER), LGM-30G Payload Transporter Replacement (PTR), and LGM-30G Transporter Erector Replacement Program (TERP).

MM Crypto Mods executes USSTRATCOM, Air Force Global Strike Command, and Nuclear Weapon Safety Center requirements by implementing the KS-60 capabilities in LGM-30G ICBM Cryptography Upgrade II (ICU II) of remote key/code change and irreversible transformation as mandated in the approved Capabilities Development

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>
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Document (dated 4 Jan 05) and addresses Nuclear Weapon System Safety Group Operational Safety Review requirements 98-2, 00-1 and 02-2. It also incorporates continuous signal lockout capabilities to prevent the widespread loss of status monitoring. These features will greatly increase security during code changes by reducing the frequency of open sites 75 days annually and will reduce associated resource costs for 450 Launch Facilities (LFs) and 45 Launch Control Centers (LCCs).

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.

This program is in Budget Activity 07, 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	182.958	210.845	84.603	0.000	84.603
Current President's Budget	173.718	210.845	156.047	0.000	156.047
Total Adjustments	-9.240	0.000	71.444	0.000	71.444
• Congressional General Reductions	0.000	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	0.000	0.000			
• SBIR/STTR Transfer	-5.240	0.000			
• Other Adjustments	0.000	0.000	71.444	0.000	71.444

Change Summary Explanation

FY 2017 funding reflects a \$4.000M Congressional directed reduction for ASU excess along with \$5.240M for Small Business Innovative Research (SBIR).
 FY 2019 funding reflects a \$71.444M increase in order to fully fund ALCS-R, FT3, ICU-II, and TERP risk reduction and development activities.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
672983: <i>MM Ground and Comm Equipment</i>	0.000	53.716	119.384	91.273	0.000	91.273	100.066	121.442	101.576	103.425	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MM Ground and Comm Equipment program replaces obsolete/unsupportable ground-based weapon system equipment located at Launch Control Centers (LCCs) and Launch Facilities (LFs) necessary to continue MM III operations through 2030. Current efforts include development, qualification, integration, and testing of replacement equipment such as the LGM-30G Air Launch Control System Replacement (ALCS-R), LGM-30G Automatic Switching Unit (ASU), LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP), LGM-30G Launch Control Center Break-In-Kit (LCCB), LGM-30G Launch Control Center Block Upgrade (LCCBU), and LGM-30G Remote Visual Assessment Phase II (RVA II).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LGM-30G Air Launch Control System Replacement (ALCS-R)	26.747	78.492	82.974	0.000	82.974
Description: ALCS-R will replace the legacy nuclear command and control system that provides the capability to launch Intercontinental Ballistic Missiles (ICBMs) from an airborne platform, currently the Navy E-6B. The system consists of a nuclear hardened radio and MM III interface at each LF, and a suite of launch and cryptographic equipment that generates and transmits commands from the E-6B. ALCS-R is dependent on the Strategic Air Command Code Processing System for codes data supplied to airborne equipment, and the Navy E-6B radio Command, Control, and Communication data path to transmit signals to the LFs. The approved acquisition strategy will replace ALCS equipment by 2024 to resolve critical sustainment and cryptographic sunset issues and assure survivable, airborne launch capability for current and future ICBMs. ALCS-R will be designed for Ground Based Strategic Deterrent (GBSD) airborne survivable launch platform capability maximizing investment across both ICBM weapon systems.					
FY 2018 Plans:					
<ul style="list-style-type: none"> • Complete System Functional Review • Continue trusted anchor hardness testing • Complete hardened LF antenna analysis • Complete Phase I Cost Capability Analysis and support CDD finalization • Initiate Phase II Cost Capability Analysis • Complete Government facility modifications 					
FY 2019 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • Complete System Preliminary Design Review • Begin Prototype Evaluation • Complete Development Request for Proposal Decision Point • Complete System Requirements Document • Complete System Integration Lab Development • Complete EMD Acquisition Strategy • Complete Phase II Cost Capability Analysis and Support CDD Finalization <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased as risk reduction activities and prototyping ramps up.</p>					
<p>Title: LGM-30G Automatic Switching Unit (ASU)</p> <p>Description: The ASU program will replace the current Minuteman ASU, Diesel Electric Unit (DEU) and Minuteman Power Processor (MPP). The ASU is controlled by the MPP, which contains software and electronics to measure incoming and standby power characteristics. The DEU provides standby power in the event of a loss of the primary power source. Current equipment and lack of repair/reprogram capability causes inadvertent source transfers by the MPP. Technical data does not exist for repair or reprogramming of the MPP making it unsupported. The ASU contacts have exceeded their service life, and unnecessary source transfers stress mission critical components. The increased power transfers have increased the use and accelerated the wear on the DEU.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Complete integration testing, finalize design, and validate installation • Complete Critical Design Review • Validate, verify, and publish technical data and drawings • Prepare a technical data package for production <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> • Conduct Functional Configuration Audit and Physical Configuration Audit • Conduct Production Readiness Review • Complete Milestone C <p>FY 2019 OCO Plans:</p>	5.796	10.185	3.428	0.000	3.428

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
<p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding decreased due to ramping down EMD efforts in preparation for production.</p> <p><i>Title:</i> LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP)</p> <p><i>Description:</i> The Fast Rising B-Plug (FRBP) provides a secondary security element to the Personnel Access System (PAS) of the Launch Facilities (LFs). It is a 14,000 pound cylinder with 12 locking pins used to deny/delay access to intruders during LF maintenance activities.</p> <p>This effort will include hardware and software modification solutions to a variety of safety and maintenance issues affecting the operational wings.</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> • Program under revision/assessment due to cost/schedule growth <p><i>FY 2019 Base Plans:</i></p> <ul style="list-style-type: none"> • Perform market research • Prepare pre-acquisition documents to support acquisition strategy review • Prepare development contract documentation <p><i>FY 2019 OCO Plans:</i> N/A</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding increased due to preparation for EMD contract award</p>	0.863	0.400	0.814	0.000	0.814
<p><i>Title:</i> LGM-30G Launch Control Center Break-In-Kit (LCCB)</p> <p><i>Description:</i> The LCCB program will develop a kit that will enable personnel to extract incapacitated missile combat crew members in the event the LCC crew becomes unresponsive and cannot open the LCC Blast Door. The LCCB is a new capability and has not been previously fielded.</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> • Prepare and conduct Preliminary Design Review • Prepare and conduct Critical Design Review 	1.424	3.671	1.094	0.000	1.094

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>			
B. Accomplishments/Planned Programs (\$ in Millions)					
<ul style="list-style-type: none"> • Prepare and conduct Test Readiness Review <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> • Prepare and conduct Functional and Physical Configuration Audit • Prepare and conduct Production Readiness Review • Prepare and conduct Milestone C <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to ramp down of EMD in preparation of Milestone C.</p>					
Title: Launch Control Center (LCC) Block Upgrade (LCCBU)					
<p>Description: The LCCBU program will address several elements within the LCC that are experiencing supportability issues and negatively impacting voice communications in the MM missile fields. Components will be procured as a single modification kit and installed as a single kit at each LCC. It will consist of five primary replacement efforts:</p> <ol style="list-style-type: none"> 1) Journal Memory Loader (JML) - replaces the JML with a modern data storage solution which will increase the available memory required to support annual software changes and mitigate Floppy Disk obsolescence concerns. 2) Floppy Disk Drive (FDD) - replaces the legacy FDDs which are no longer manufactured with a modern, supportable hardware solution. 3) Voice Communications Control Panel (VCCP) - replaces the current deficient communication equipment to provide the voice communications quality required to perform the ICBM mission. 4) Weapon System Control Console (WSCC) Printer - replaces the current printer that is no longer produced and is unsupported due to aging hardware and a lack of qualified vendors for replacement/repair components. 5) Oxygen Regeneration Unit (ORU) - replaces the current unsupported system to provide the crew with breathable air during periods when the LCC is locked down. <p>All LCCBU efforts will support the 45 operational LCCs and additional support equipment/test/maintenance locations.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Complete Critical Design Review 					
	17.354	22.294	2.963	0.000	2.963

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • Complete testing <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> • Complete Milestone C • Begin production <p>FY 2019 OCO Plans: NA</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to concluding EMD activities in preparation for Production and Deployment Phase</p>					
<p>Title: LGM-30G Remote Visual Assessment Phase II (RVA II)</p> <p>Description: RVA II will provide enhanced situational awareness by providing the current remote camera feed to responding security vehicles and helicopters. RVA II will also provide backup power to current remote visual equipment, increase video archival storage, and implement auto-activation of outer and inner zone alarms. RVA II will also implement changes required to meet DoD CyberSecurity requirements.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Complete Critical Design Review • Complete development testing • Complete all required documentation • Complete EMD Phase II • Release Request For Proposal for Production Contract <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> • Complete functional configuration and physical configuration audits • Complete Milestone C • Development completed <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to the completion of EMD phase in FY2018</p>	1.532	4.342	0.000	-	0.000
Accomplishments/Planned Programs Subtotals	53.716	119.384	91.273	0.000	91.273

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF Line Item M30MLG: <i>Minuteman III Modifications BP21</i>	23.682	39.031	48.651	-	48.651	39.327	32.120	20.982	70.872	Continuing	Continuing
• MPAF Ballistic Missiles/ BSA 3, M...: <i>Minuteman III</i> <i>Replacement Eq-Ballistic BP22</i>	7.655	9.197	6.106	-	6.106	3.818	0.000	0.000	-	Continuing	Continuing
• MPAF Line Item 000999: <i>Replen</i> <i>Spares/Repair Parts BP25/26</i>	0.033	1.348	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Ground and Communication equipment replacement efforts are reviewed to determine the best method for execution, including vendor qualification and procurement with no development required, develop and/or modification with organic depot capabilities or development with industry. Industry development for Ground and Communication equipment efforts will be executed through contracts available under the Future ICBM Sustainment and Acquisition Construct (FISAC) or competitive source selections. Nuclear Surety Cross Check Analysis (NSCCA) and Independent Verification and Validation (IV&V) efforts are contracted separately. Nuclear Surety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672983 / MM Ground and Comm Equipment
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Airborne Launch Control System (ALCS) TMRR Contractor A	C/FPIF	Lockheed Martin : Littleton, CO	0.000	2.590	Oct 2017	29.176	Nov 2017	31.130	Oct 2018	-		31.130	Continuing	Continuing	-
LGM-30G Airborne Launch Control System (ALCS) TMRR Contractor B	C/FPIF	Rockwell Collins : Cedar Rapids, IA	0.000	2.900	Oct 2017	29.175	Nov 2017	29.342	Oct 2018	-		29.342	Continuing	Continuing	-
LGM-30G Airborne Launch Control System (ALCS) SIL	MIPR	Aerospace : El Segundo, CA	-	4.282	Mar 2017	-		-		-		-	Continuing	Continuing	-
LGM-30G Automatic Switching Unit (ASU) TMRR/EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	-	4.427	May 2017	8.976	Dec 2017	3.001	Dec 2018	-		3.001	Continuing	Continuing	-
LGM-30G Launch Control Center Break-In-Kit EMD	MIPR	Navy Crane : Crane, IN	-	0.757	Apr 2017	3.671	Apr 2018	0.769	Apr 2019	-		0.769	Continuing	Continuing	-
LGM-30G Launch Control Center Block Upgrade TMRR/EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	-	17.138	Jul 2017	21.744	Jul 2018	2.645	Oct 2018	-		2.645	Continuing	Continuing	-
LGM-30G Remote Visual Assessment Phase II (RVA II) EMD	C/CPFF	Sentry View Systems : Melbourne, FL	-	0.811	Mar 2017	2.939	Nov 2017	-		-		-	Continuing	Continuing	-
Subtotal			0.000	32.905		95.681		66.887		-		66.887	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Airborne Launch Control System (ALCS) ISC	SS/FP	BAE : Layton, UT	-	5.901	Nov 2016	3.314	May 2018	7.037	Oct 2018	-		7.037	Continuing	Continuing	-
LGM-30G Airborne Launch Control System (ALCS) MITRE	MIPR	MITRE : Bedford, MA	-	2.765	Dec 2016	3.113	Dec 2017	2.967	Oct 2018	-		2.967	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672983 / MM Ground and Comm Equipment
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Airborne Launch Control System (ALCS) Aerospace	MIPR	Aerospace : El Segundo, CA	-	2.176	Apr 2017	1.891	Jan 2018	1.931	Oct 2018	-		1.931	Continuing	Continuing	-
LGM-30G Airborne Launch Control System (ALCS) Design Support	Various	Various : Various	0.000	2.491	Mar 2017	4.184	Jan 2018	5.279	Oct 2018	-		5.279	Continuing	Continuing	-
LGM-30G Automatic Switching Unit A&AS Support	C/FP	BAE : Layton, UT	-	0.540	Oct 2016	0.689	Oct 2017	0.347	Oct 2018	-		0.347	Continuing	Continuing	-
LGM-30G Remote Visual Assessment II (RVA II) Engineering Support	Various	Various : Various	0.000	0.130	Dec 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			0.000	14.003		13.191		17.561		-		17.561	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Airborne Launch Control System (ALCS) Testing	Various	Various : Various	-	0.183	Feb 2017	1.349	Jan 2018	0.820	Oct 2018	-		0.820	Continuing	Continuing	-
LGM-30G Launch Control Center Block Upgrade TMR/EMD	Various	Various : Various	0.000	-		-		0.100	Oct 2018	-		0.100	Continuing	Continuing	-
Subtotal			0.000	0.183		1.349		0.920		-		0.920	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Air Launch Control System Replacement (ALCS) PMA	Various	Various : Various	-	3.459	Mar 2017	6.290	Jan 2018	4.468	Dec 2018	-		4.468	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672983 / MM Ground and Comm Equipment
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Automatic Switching Unit PMA	Various	Various : Various	-	0.829	Nov 2016	0.520	Oct 2017	0.080	Oct 2018	-		0.080	Continuing	Continuing	-
LGM-30G Launch Control Center Break-In-Kit PMA	Various	Various : Various	-	0.667	Feb 2017	-		0.325	Feb 2019	-		0.325	Continuing	Continuing	-
LGM-30G Launch Control Center Block Upgrade TMRR/EMD	Various	Various : Various	-	0.216	Jul 2017	0.550	Jul 2018	0.218	Jul 2019	-		0.218	Continuing	Continuing	-
LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP) A&AS Support	C/FP	BAE : Layton, UT	-	0.863	Dec 2016	0.400	Dec 2017	0.814	Dec 2018	-		0.814	Continuing	Continuing	-
LGM-30G Remote Visual Assessment Phase II (RVA II) PMA	Various	Various : Various	-	0.022	Mar 2017	0.753	Feb 2018	-		-		-	Continuing	Continuing	-
LGM-30G Remote Visual Assessment Phase II (RVA II) A&AS	C/FP	BAE : Layton, UT	-	0.569	Jan 2017	0.650	Jan 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	6.625		9.163		5.905		-		5.905	Continuing	Continuing	N/A
Project Cost Totals			0.000	53.716		119.384		91.273		-		91.273	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
MM Ground and Comm Equipment																												
ALCS Technology Maturation and Risk Reduction Phase																												
ALCS PDR (Apr 2019)																												
ALCS Development RFP Release Decision Point (Oct 2019)																												
ALCS Milestone B (Nov 2020)																												
ALCS Engineering and Manufacturing Development Phase																												
ALCS CDR (May 2021)																												
ALCS Milestone C (Nov 2022)																												
ASU Technology Maturation and Risk Reduction phase																												
ASU PDR (Mar 2017)																												
ASU Milestone B (May 2017)																												
ASU Engineering and Manufacturing Development Phase																												
ASU CDR (May 2018)																												
ASU Milestone C (Mar 2019)																												
ASU Production and Deployment Phase																												
FRBP SLEP Material Solution Analysis Phase																												
LCCB Milestone B (Mar 2017)																												
LCCB Engineering and Manufacturing Development Phase																												
LCCB CDR (Mar 2018)																												
LCCB Milestone C (Mar 2019)																												
LCCB Production and Deployment Phase																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
LCCB RAA (Jun 2019)																												
LCCBU Pre Milestone-B Phase	█	█	█	█																								
LCCBU PDR (Apr 2017)			█	█																								
LCCBU Milestone B (Jul 2017)				█	█																							
LCCBU Engineering and Manufacturing Development Phase																												
LCCBU CDR (Jan 2018)																												
LCCBU Milestone C (Dec 2018)																												
LCCBU Production and Deployment Phase																												
LCCBU RAA (Jul 2020)																												
RVA II Engineering and Manufacturing Development Phase I																												
RVA II PDR (Oct 2017)																												
RVA II Engineering and Manufacturing Development Phase II																												
RVA II CDR (Jun 2018)																												
RVA II Milestone C (Dec 2018)																												
RVA II Production and Deployment Phase																												
RVA II IOC (Jun 2020)																												
RVA II FOC (May 2022)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MM Ground and Comm Equipment</i>				
ALCS Technology Maturation and Risk Reduction Phase	1	2018	1	2021
ALCS PDR (Apr 2019)	3	2019	3	2019
ALCS Development RFP Release Decision Point (Oct 2019)	1	2020	1	2020
ALCS Milestone B (Nov 2020)	1	2021	1	2021
ALCS Engineering and Manufacturing Development Phase	1	2021	1	2023
ALCS CDR (May 2021)	3	2021	3	2021
ALCS Milestone C (Nov 2022)	1	2023	1	2023
ASU Technology Maturation and Risk Reduction phase	1	2017	3	2017
ASU PDR (Mar 2017)	2	2017	2	2017
ASU Milestone B (May 2017)	3	2017	3	2017
ASU Engineering and Manufacturing Development Phase	3	2017	2	2019
ASU CDR (May 2018)	3	2018	3	2018
ASU Milestone C (Mar 2019)	2	2019	2	2019
ASU Production and Deployment Phase	3	2019	4	2023
FRBP SLEP Material Solution Analysis Phase	1	2017	4	2019
LCCB Milestone B (Mar 2017)	2	2017	2	2017
LCCB Engineering and Manufacturing Development Phase	2	2017	2	2019
LCCB CDR (Mar 2018)	2	2018	2	2018
LCCB Milestone C (Mar 2019)	2	2019	2	2019
LCCB Production and Deployment Phase	2	2019	3	2019
LCCB RAA (Jun 2019)	3	2019	3	2019
LCCBU Pre Milestone-B Phase	1	2017	3	2017

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LCCBU PDR (Apr 2017)	3	2017	3	2017
LCCBU Milestone B (Jul 2017)	4	2017	4	2017
LCCBU Engineering and Manufacturing Development Phase	4	2017	2	2019
LCCBU CDR (Jan 2018)	2	2018	2	2018
LCCBU Milestone C (Dec 2018)	1	2019	1	2019
LCCBU Production and Deployment Phase	1	2019	4	2020
LCCBU RAA (Jul 2020)	4	2020	4	2020
RVA II Engineering and Manufacturing Development Phase I	2	2017	1	2018
RVA II PDR (Oct 2017)	1	2018	1	2018
RVA II Engineering and Manufacturing Development Phase II	2	2018	1	2019
RVA II CDR (Jun 2018)	3	2018	3	2018
RVA II Milestone C (Dec 2018)	1	2019	1	2019
RVA II Production and Deployment Phase	1	2019	3	2022
RVA II IOC (Jun 2020)	3	2020	3	2020
RVA II FOC (May 2022)	3	2022	3	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672984 / <i>MM III Baseline Support</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
672984: <i>MM III Baseline Support</i>	0.000	74.058	59.812	37.371	0.000	37.371	14.816	8.954	12.940	13.176	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MM III Baseline Support program replaces or upgrades obsolete/unsupportable flight test unique equipment installed on the missile during flight test, used to test MM III systems on the ground, or located at test facilities to collect, process, and analyze test data. Flight test equipment supports test and evaluation of newly developed or modified MM III capabilities, and MM III Operational Test Launches (OTLs) to determine ICBM force readiness, reliability and capability shortfalls. Efforts include development, qualification, integration and testing of replacement equipment such as LGM-30G Arm Disarm Switch Replacement (ADSR), LGM-30G Flight Test Telemetry and Termination System (FT3), LGM-30G Ground Test Upgrade (GTU), and LGM-30G Squadron Data Simulator (SDS). These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to GBSD. As other similar equipment is identified for replacement, it will be added to this program. MM III Baseline Support also provides for other MM III unique government costs, studies of system performance, contract closeout costs, cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LGM-30G Arm Disarm Switch Replacement (ADSR)	-	0.272	1.142	-	1.142
Description: The ADSR program designs, develops, fabricates and tests replacements for the aging Arm/Disarm (A/D) switches currently on the MM III Missile fleet. The A/D switch is responsible for completing or interrupting ordnance electrical circuits. A/D switches are placed at five key locations in the system: Interstage I-II, Stage II Liquid Injection Thrust Vector Control (LITVC) and Roll Control, Interstage II-III, PSRE Staging, and PSRE Isolation Valves. Aging and surveillance is an ongoing study to generate a tradeoff curve between reliability/availability and cost.					
Reliability/availability are monitored by periodic testing to discover unforeseen issues. Because all existing A/D switches cannot be repaired/refurbished, the number in inventory will eventually be inadequate to meet the need of the PDM cycle. Supply is estimated to deplete by approximately FY24 with repair/refurbish mitigation. Repair/refurbish is a reliable mitigation plan to meet the ongoing needs of the fleet while a manufacturer is selected and the manufacturing system is selected to develop a replacement A/D switch that meets requirements and production quantities through 2036.					
FY 2018 Plans:					
• Develop acquisition documentation					
FY 2019 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • Complete Milestone B • Award EMD contract • Initiate design development <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding increased due to EMD contract award</p>					
<p><i>Title:</i> LGM-30G Flight Test Telemetry and Termination System (FT3)</p> <p><i>Description:</i> The FT3 Program replaces the Mod 7 Instrumentation Wafer (Mod 7) and associated Signal Conditioner Monitor Group, and All Ordnance Destruct System (AODS) with a flight test kit. In addition, a replacement of the current Launch Support System (LSS) is required to deploy the flight test kit. The flight test kit which consists of the Flight Destruct System (FDS) and a wafer-less Integrated Instrumentation System (IIS), along with an upgraded LSS, will meet 30th Space Wing Range Safety and Air Force Global Strike Command requirements and resolve obsolescence concerns.</p> <p>The AODS, Mod 7 Instrumentation Wafer, and current LSS include many components that are not economically available, are no longer compliant with applicable Range Safety requirements, or are in need of technical modernization. Replacement of the Vandenberg Air Force Base flight test unique equipment is necessary to sustain future Operational Test Launches (OTL).</p> <p>The OTLs are critical to validating the continued accuracy and reliability of the MM III ICBM Weapon System and providing valuable data to ensure a safe, secure, and effective nuclear deterrent. The FT3 System of Systems (SoS) will perform the same function as the existing systems with upgraded design features in order to comply with Air Force Space Command Manual (AFSPCMAN) 91 710, Range Safety User Requirements, Range Commanders Council 319, Flight Termination Systems Commonality Standard, and RCC-324, Global Positioning and Inertial Measurements Range Safety Tracking Systems' Commonality Standard.</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> • Conduct SoS Critical Design Review • Build qualification hardware and conduct qualification testing • Conduct component level Test Readiness Reviews • Procure long lead items <p><i>FY 2019 Base Plans:</i></p> <ul style="list-style-type: none"> • Prepare for SoS Test Readiness Reviews 	60.958	39.868	33.229	-	33.229

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • Conduct SoS qualification testing • Prepare for SoS Production Readiness Review <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to EMD activities nearing completion</p>					
<p>Title: LGM-30G Baseline Support</p> <p>Description: This program provides for other MM III unique government costs, studies of system performance, contract closeout costs, cost trades, and acquisition planning activities, up to and including proposal preparation, for future capabilities.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Conduct studies of system performance. • Pay contract closeout costs. • Conduct cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities. <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> • Conduct studies of system performance. • Conduct cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities. <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to paying contract closeout costs in FY18</p>	0.100	5.000	2.000	-	2.000
<p>Title: LGM-30G Ground Test Upgrade (GTU)</p> <p>Description: GTU will address parts obsolescence and an A4 drawer interface change through a design that replaces the Guided Missile Launcher Electronic Circuit (GMLEC) test sets. GTU supports Operational Force Development Evaluation testing by enabling operational checkout and test of LFs up to the point of a launch.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Build requirement package for GMLEC • Conduct Cost analysis on GMLEC requirements <p>FY 2019 Base Plans:</p>	2.000	4.354	0.500	-	0.500

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • Prepare program documentation <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to de-scoping GTU program to just GMLEC.</p> <p>Title: LGM-30G Squadron Data Simulator (SDS)</p> <p>Description: Design and develop the SDS to replace the current test set. SDS will increase the Mean Time Between Failures (MTBF), improve user interface, and meet DoD Cyber Security requirements. Additionally, this modeling and simulation tool is used to replicate the message traffic for a selectable number of Launch Control Centers and Launch Facilities within an ICBM squadron.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Complete Critical Design Review • Program placed on strategic pause <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> • Conducting studies regarding program affordability and acquisition strategy <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <ul style="list-style-type: none"> • Funding decreased due to program pause post Critical Design Review 	11.000	10.318	0.500	-	0.500
Accomplishments/Planned Programs Subtotals	74.058	59.812	37.371	-	37.371

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• MPAF 03 M30MLG: <i>Minuteman III Modifications BP21</i>	0.000	0.000	0.000	0.000	0.000	0.000	6.190	8.361	10.460	Continuing	Continuing
• MPAF 01 00099L: <i>Missile Replacement Eq-Ballistic BP22</i>	0.000	5.205	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• MPAF 04 000999: <i>Replen Spares/Repair Parts BP25/26</i>	0.805	0.224	0.000	0.000	0.000	13.544	13.815	14.163	0.000	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force Date: February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>
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D. Acquisition Strategy

Baseline Support equipment replacement efforts are reviewed to determine the best method for execution, including vendor qualification and procurement with no development required, develop and/or modification with organic depot capabilities or development with industry. Industry development for Baseline Support equipment efforts will be executed through contracts available under the Future ICBM Sustainment and Acquisition Construct (FISAC) or competitive source selections. Nuclear Surety Cross Check Analysis (NSCCA) and Independent Verification and Validation (IV&V) efforts are contracted separately. Nuclear Surety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672984 / MM III Baseline Support
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Arm Disarm Switch Replacement (ADSR)	C/TBD	TBD : TBD	-	-		-		0.842	Jul 2019	-		0.842	Continuing	Continuing	-
LGM-30G Flight Test Telemetry and Termination System (FT3) TMRR/EMD	C/CPIF	Boeing : Clearfield, UT	-	53.981	Nov 2016	36.055	Sep 2018	26.639	Nov 2018	-		26.639	Continuing	Continuing	-
LGM-30G Flight Test Telemetry and Termination System (FT3) MOTP	C/CPIF	Northrop Grumman : Clearfield, UT	-	2.000	Aug 2017	-		3.319	Aug 2019	-		3.319	Continuing	Continuing	-
LGM-30G Ground Test Upgrade (GTU) TMRR/EMD	C/CPAF	Northrop Grumman : Clearfield, UT	-	1.000	Nov 2016	2.999	Dec 2017	-		-		-	Continuing	Continuing	-
LGM-30G Squadron Data Simulator (SDS) TMRR/EMD	C/CPFF	Lockheed Martin : Bethesda, MD	-	8.886	Feb 2017	7.214	Sep 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	65.867		46.268		30.800		-		30.800	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Flight Test Telemetry and Termination System (FT3)	C/Variou	BAE Systems : Clearfield, UT	-	1.444	Oct 2016	0.600	Oct 2017	1.021	Oct 2018	-		1.021	Continuing	Continuing	-
LGM-30G Baseline Support	C/Variou	BAE Systems : Clearfield, UT	-	0.100	Mar 2017	5.000	Mar 2018	2.000	Mar 2019	-		2.000	Continuing	Continuing	-
Subtotal			-	1.544		5.600		3.021		-		3.021	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672984 / MM III Baseline Support
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Flight Test Telemetry and Termination System (FT3) NSCCA-PATE	C/Various	Northrop Grumman : Clearfield, UT	-	0.500	Jul 2017	0.347	Sep 2018	0.410	Sep 2019	-		0.410	Continuing	Continuing	-
LGM-30G Ground Test Upgrade (GTU) NSCCA-PATE	C/CPIF	Northrop Grumman : Clearfield, UT	-	-		0.225	May 2018	-		-		-	Continuing	Continuing	-
Subtotal			-	0.500		0.572		0.410		-		0.410	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Arm Disarm Switch Replacement (ADSR)	C/FPIF	Various : Clearfield, UT	-	-		0.272	May 2018	0.300	May 2019	-		0.300	Continuing	Continuing	-
LGM-30G Flight Test Telemetry and Termination System (FT3) PMA	Various	Various : Various	-	2.002	Oct 2017	2.866	Oct 2018	1.840	Oct 2019	-		1.840	Continuing	Continuing	-
LGM-30G Flight Test Telemetry and Termination System (FT3) Cyber Security	C/FFP	BAE Systems : Clearfield, UT	0.000	1.031	Mar 2017	-		-		-		-	Continuing	Continuing	-
LGM-30G Ground Test Upgrade (GTU) PMA	Various	Various : Various	-	1.000	Jun 2017	1.130	Mar 2018	0.500	Mar 2019	-		0.500	Continuing	Continuing	-
LGM-30G Squadron Data Simulator (SDS) PMA	Various	Various : Various	-	2.114	Sep 2017	3.104	Mar 2018	0.500	Mar 2019	-		0.500	Continuing	Continuing	-
Subtotal			0.000	6.147		7.372		3.140		-		3.140	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	74.058	59.812	37.371	-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force							Date: February 2018			
Appropriation/Budget Activity 3600 / 7			R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>			Project (Number/Name) 672984 / <i>MM III Baseline Support</i>				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672984 / MM III Baseline Support
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
MM III Baseline Support																												
ADSR Milestone B (Oct 2018)									■																			
ADSR Engineering and Manufacturing Development Phase									■	■	■	■	■	■	■	■	■	■	■	■								
ADSR PDR (Jul 2020)															■													
ADSR CDR (Jan 2021)																■												
ADSR Milestone C (Jul 2022)																												■
ADSR Production and Deployment Phase																												■
GTU Program Rescope Activities	■	■	■	■					■	■	■	■	■	■	■	■												
FT3 Technology Maturation and RiskReduction Phase	■	■	■	■																								
FT3 Milestone B (Apr 2017)			■																									
FT3 Engineering and ManufacturingDevelopment Phase			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
FT3 CDR (May 2018)							■																					
FT3 Milestone C (Jan 2020)															■													
FT3 Production and Deployment Phase															■	■	■	■	■	■								
FT3 RAA (Apr 2020)																■												
SDS Technology Maturation and Risk Reduction Phase	■	■	■	■																								
SDS Preliminary Design Review (Oct 2016)	■																											
SDS Milestone B (Mar 2017)		■																										
SDS Engineering and Manufacturing Development Phase		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
SDS Critical Design Review (Dec 2017)							■																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MM III Baseline Support</i>				
ADSR Milestone B (Oct 2018)	1	2019	1	2019
ADSR Engineering and Manufacturing Development Phase	1	2019	3	2022
ADSR PDR (Jul 2020)	4	2020	4	2020
ADSR CDR (Jan 2021)	2	2021	2	2021
ADSR Milestone C (Jul 2022)	4	2022	4	2022
ADSR Production and Deployment Phase	4	2022	4	2023
GTU Program Rescope Activities	1	2017	4	2019
FT3 Technology Maturation and RiskReduction Phase	1	2017	3	2017
FT3 Milestone B (Apr 2017)	3	2017	3	2017
FT3 Engineering and ManufacturingDevelopment Phase	3	2017	3	2021
FT3 CDR (May 2018)	3	2018	3	2018
FT3 Milestone C (Jan 2020)	2	2020	2	2020
FT3 Production and Deployment Phase	2	2020	3	2022
FT3 RAA (Apr 2020)	3	2020	3	2020
SDS Technology Maturation and Risk Reduction Phase	1	2017	2	2017
SDS Preliminary Design Review (Oct 2016)	1	2017	1	2017
SDS Milestone B (Mar 2017)	2	2017	2	2017
SDS Engineering and Manufacturing Development Phase	2	2017	3	2021
SDS Critical Design Review (Dec 2017)	1	2018	1	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672985 / <i>MM Support Equip</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
672985: <i>MM Support Equip</i>	0.000	18.658	31.649	12.863	0.000	12.863	11.995	6.086	6.211	6.325	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MM Support Equipment program designs, develops, and tests replacement of obsolete/non-serviceable weapon system support equipment. These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to Ground Based Strategic Deterrent (GBSD). Current efforts include design, development, and testing of support equipment such as LGM-30G Alignment Set Test Set (ASTS), LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT), LGM-30G G6B4 Build Equipment Replacement (G6B4 BER), LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU), LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER), LGM-30G Payload Transporter Replacement (PTR), and LGM-30G Transporter Erector Replacement Program (TERP).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LGM-30G G6B4 Build Equipment Replacement (G6B4 BER)	0.404	6.353	2.530	0.000	2.530
<p>Description: The G6B4 BER program impacts three stations: the G6B4 Rotor Balance Test Station, the G6B4 Hydrogen Fill Station, and the Gyro F-coefficient Station (GFS). The G6B4 Rotor Balance Test Station (S-133-18024) is used to determine radial and dynamic balance of the G6B4 gyro rotor after repair, and it needs to have the obsolete Schenk balancer and console replaced. Two copies of the G6B4 Rotor Balance Test Station will be delivered. The G6B4 Hydrogen Fill Station (S-133-132-4-384) is used to fill the G6B4 with hydrogen gas following repairs, and it needs to have obsolete and failing gauges, plumbing and valves replaced. The Gyro F-coefficient Station (GFS) (S-133-18038) is used to calibrate the F-coefficient of the G6B4 gyro after repairs are complete; it needs its obsolete hydraulic and electrical power systems replaced.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Purchase commercial off-the-shelf items • Continue drawing updates for the integration of the commercial off-the-shelf items • Conduct Preliminary Design Review <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> • Complete Milestone B • Begin Engineering and Manufacturing Development (EMD) Phase • Prepare and conduct Critical Design Review • Prepare and conduct Test Readiness Review <p>FY 2019 OCO Plans:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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NA FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to development hardware purchases in FY18 not reoccurring in FY19.					
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Title: LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) Description: CMPT replaces the classroom trainer supporting start-up and shut-down of the MM III LF and missile, computer memory loading operations, and maintenance procedures. The program will update software, outdated operating systems, and obsolete/unsupportable hardware (desktop computers, motherboards, simulated programmer group, drivers, simulated cable sets, tape sets, and other miscellaneous parts) located at each Missile Wing and Vandenberg AFB necessary to continue the training capability of the CMPTs through 2030. FY 2018 Plans: <ul style="list-style-type: none"> • Initiate Engineering and Manufacturing Development contract award • Conduct Preliminary Design Review FY 2019 Base Plans: <ul style="list-style-type: none"> • Prepare for Test Readiness Review • Prepare and conduct Critical Design Review FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to ramp down of EMD working towards Milestone C.	0.556	5.974	2.800	-	2.800
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Title: LGM-30G Transporter Erector Replacement Program (TERP) Description: Design and develop the capabilities necessary to replace the current Transporter Erector (TE). The TE is used to emplace, extract and transport Minuteman III boosters to and from the launch facilities. TERP will update existing drawings, specifications and technical orders to eliminate parts obsolescence and address intended usage through 2030 and will qualify the new system prior to production. FY 2018 Plans: <ul style="list-style-type: none"> • Conduct developmental and qualification testing FY 2019 Base Plans: <ul style="list-style-type: none"> • Conduct root cause analysis 	4.942	0.000	1.503	-	1.503
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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • Conduct delta qualification testing <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding increased to support delta qualification testing.</p>					
<p><i>Title:</i> LGM-30G Payload Transporter Replacement (PTR)</p> <p><i>Description:</i> Designs and develops the capabilities necessary to replace the current Payload Transporter tractor and trailer, mitigating emerging threat technologies and methods. The PTR replaces, extracts, and transports the MM III reentry system, propulsion system rocket engine, and missile guidance set. The new PTR design increases safety and security during transport activities and improves maintenance operations.</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> • Conduct Milestone C • Initiate Production and Deployment Phase <p><i>FY 2019 Base Plans:</i> Conduct Delta Qualification testing on first article</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding decreased due ramp down of EMD and award of production contract.</p>	7.557	4.000	0.415	-	0.415
<p><i>Title:</i> LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU)</p> <p><i>Description:</i> The current Communications Equipment Interface Unit (CEIU) is used to transmit MM III Inertial Measurement Unit (IMU) Performance Data (IPD) from MM III LCC to the Performance Assessment Data System (PADS) at the support base via telephone lines. The CEIU is unclassified equipment but interfaces with both classified and non-classified systems. The update will utilize more secure and reliable internet protocol transmission methods. The update effort consists of rewriting the CEIU imbedded software language using secure coding practices and changes the CEIU design from telephony to internet protocol. In addition, the PADS interfacing system is to be updated to interface with the updated CEIU design.</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> • Conduct Critical Design Review • Complete Milestone C • Begin Production and Deployment Phase <p><i>FY 2019 Base Plans:</i></p>	2.186	7.704	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding decreased due to completion of EMD and award of production contract					
<i>Title:</i> LGM-30G Alignment Set Test Set (ASTS) <i>Description:</i> The ASTS is a one-of-a-kind station built for the repair and calibration of the Alignment Set on a MM III guidance platform. ASTS completes the design, development, fabrication and installation of two operational systems and support equipment along with a Level III data package and source data as required for Technical Order (TO) creation. <i>FY 2018 Plans:</i> • Development Completed <i>FY 2019 Base Plans:</i> N/A <i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> N/A	2.362	0.000	0.000	-	0.000
<i>Title:</i> LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) <i>Description:</i> The Missile Guidance Set (MGS) repair is dependent on the proper functioning of the PIGA build equipment. The PIGA build and test equipment used at the repair facility is well over twenty years old and is becoming unsustainable due to obsolescence issues. This program will modify or replace two Digital Pickoff Alignment stations, two Electrical Alignment stations, two Alignment Test stations, one Torque Test station, one Temperature Probe Calibration station, two Fluid Fill stations and one Slip Ring/Module Test station. <i>FY 2018 Plans:</i> • Purchase commercial off-the-shelf items • Continue drawing updates for the integration of the commercial off-the-shelf items • Conduct Preliminary Design Review • Prepare and Conduct System Requirement Review and System Functional Review <i>FY 2019 Base Plans:</i> • Complete Milestone B • Begin Engineering and Manufacturing Development (EMD) Phase • Prepare and conduct Critical Design Review	0.651	7.618	5.615	-	5.615

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
• Prepare and conduct Test Readiness Review					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding decreased due to development hardware purchases in FY18 not reoccurring in FY19.					
Accomplishments/Planned Programs Subtotals	18.658	31.649	12.863	0.000	12.863

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• MPAF 03 Line Item M30MLG: <i>MM III Modifications BP21</i>	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• MPAF 01 Line Item 00099L: <i>Missile Replacement Eq-Ballistic BP22</i>	40.484	76.011	27.680	-	27.680	67.770	9.645	1.700	1.785	Continuing	Continuing
• MPAF 04 Line Item 000999: <i>Replen Spares/ Repair Parts BP25/26</i>	3.413	0.326	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Support and test equipment replacement efforts are reviewed to determine the best method for execution including vendor qualification and procurement with no development required, develop and/or modification with organic depot capabilities or development with industry. Industry development efforts for support equipment will be executed through contracts available under the Future ICBM Sustainment and Acquisition Construct (FISAC) or competitive source selections. Nuclear Surety Cross Check Analysis (NSCCA) and Independent Verification and Validation (IV&V) efforts are contracted separately. Nuclear Surety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672985 / MM Support Equip
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G G6B4 Build Equipment Replacement (G6B4 BER)	SS/FPIF	Boeing : Layton, UT	-	0.404	Aug 2017	5.956	May 2018	2.000	May 2019	-		2.000	Continuing	Continuing	-
LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) EMD	PO	309th SMXG : Hill AFB, UT	-	-		4.948	Dec 2017	2.500	Dec 2018	-		2.500	Continuing	Continuing	-
LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) EMD	SS/FPIF	Boeing : Layton, UT	-	0.651	Aug 2017	7.283	May 2018	5.092	May 2019	-		5.092	Continuing	Continuing	-
LGM-30G Transporter Erector Replacement Program (TERP) EMD	C/FPIF	DRS Environmental Systems : Cincinnati, OH	-	3.981	May 2017	-		0.896	Dec 2018	-		0.896	Continuing	Continuing	-
LGM-30G Payload Transporter Replacement (PTR) EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	0.000	6.421	May 2017	4.000	Oct 2017	-		-		-	Continuing	Continuing	-
LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU) Software Development	SS/CPIF	Boeing : Layton, UT	-	1.879	Jul 2017	7.284	Apr 2018	-		-		-	Continuing	Continuing	-
LGM-30G Alignment Set Test Set (ASTS) Engineering Development	SS/CPAF	Boeing : Heath, OH	-	2.362	Jan 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			0.000	15.698		29.471		10.488		-		10.488	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G Payload Transporter Replacement	MIPR	586 FLTS : WSMR, NM	0.000	-		-		0.300	Oct 2018	-		0.300	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672985 / MM Support Equip
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
(PTR) Delta Qualification Testing															
LGM-30G Transporter Erector Replacement Program (TERP) Delta Qualification Testing	MIPR	586 FLTS : WSMR, NM	0.000	-		-		0.300	May 2019	-		0.300	Continuing	Continuing	-
Subtotal			0.000	-		-		0.600		-		0.600	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G G6B4 Build Equipment Replacement (G6B4 BER)	Various	Various : Various	-	-		0.397	May 2018	0.530	May 2019	-		0.530	Continuing	Continuing	-
LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) PMA	Various	Various : Various	0.000	0.556	Aug 2017	1.026	Jan 2018	0.300	Jan 2019	-		0.300	Continuing	Continuing	-
LGM-30G Transporter Erector Replacement Program (TERP) PMA	Various	Various : Various	-	0.961	Feb 2017	-		-		-		-	Continuing	Continuing	-
LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) PMA	Various	Various : Various	-	-		0.335	May 2018	0.523	May 2019	-		0.523	Continuing	Continuing	-
LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU) PMA	Various	Various : Various	-	0.307	Jul 2017	0.420	Apr 2018	-		-		-	Continuing	Continuing	-
LGM-30G Payload Transporter Replacement (PTR) PMA	Various	Various : Various	-	1.136	Jul 2017	-		0.115	Oct 2018	-		0.115	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672985 / MM Support Equip
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

MM Support Equipment																												
G6B4 BER TMRR Phase																												
G6B4 BER Milestone B (Nov 2018)																												
G6B4 BER Engineering and Manufacturing Development Phase																												
G6B4 BER PDR (Jul 2018)																												
G6B4 BER CDR (Mar 2019)																												
G6B4 BER Milestone C (Dec 2019)																												
G6B4 BER Production and DeploymentPhase																												
G6B4 BER RAA (Oct 2020)																												
CMPT Milestone B (Oct 2017)																												
CMPT Engineering and Manufacturing Development Phase																												
CMPT PDR (Mar 2018)																												
CMPT CDR (Dec 2018)																												
CMPT Milestone C (Mar 2020)																												
CMPT Production and Deployment Phase																												
CMPT RAA (Sep 2020)																												
PTR Engineering and Manufacturing Development Phase																												
PTR Milestone C (Jan 2018)																												
PTR Production and Deployment Phase																												
PTR RAA (Jan 2023)																												
TERP Engineering and Manufacturing Development Phase																												
TERP Milestone C (Apr 2018)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	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				
ASTS RAA (Sep 2017)				■																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MM Support Equipment				
G6B4 BER TMRR Phase	4	2017	1	2019
G6B4 BER Milestone B (Nov 2018)	1	2019	1	2019
G6B4 BER Engineering and Manufacturing Development Phase	1	2019	3	2020
G6B4 BER PDR (Jul 2018)	3	2018	3	2018
G6B4 BER CDR (Mar 2019)	2	2019	2	2019
G6B4 BER Milestone C (Dec 2019)	1	2020	1	2020
G6B4 BER Production and DeploymentPhase	1	2020	1	2021
G6B4 BER RAA (Oct 2020)	1	2021	1	2021
CMPT Milestone B (Oct 2017)	1	2018	1	2018
CMPT Engineering and Manufacturing Development Phase	1	2018	2	2020
CMPT PDR (Mar 2018)	2	2018	2	2018
CMPT CDR (Dec 2018)	1	2019	1	2019
CMPT Milestone C (Mar 2020)	2	2020	2	2020
CMPT Production and Deployment Phase	2	2020	4	2020
CMPT RAA (Sep 2020)	4	2020	4	2020
PTR Engineering and Manufacturing Development Phase	1	2017	1	2019
PTR Milestone C (Jan 2018)	2	2018	2	2018
PTR Production and Deployment Phase	2	2018	2	2023
PTR RAA (Jan 2023)	2	2023	2	2023
TERP Engineering and Manufacturing Development Phase	1	2017	3	2018
TERP Milestone C (Apr 2018)	3	2018	3	2018
TERP Production and Deployment Phase	3	2018	1	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
TERP RAA (Dec 2020)	1	2021	1	2021
PADS CEIU Technology Maturation and Risk Reduction (TMRR) Phase	1	2017	4	2017
PADS CEIU Milestone B (Aug 2017)	4	2017	4	2017
PADS CEIU Engineering and Manufacturing Development Phase	4	2017	4	2018
PADS CEIU PDR (Jan 2017)	2	2017	2	2017
PADS CEIU CDR (Nov 2017)	1	2018	1	2018
PADS CEIU Milestone C (Sep 2018)	4	2018	4	2018
PADS CEIU Production and Deployment Phase	4	2018	1	2020
PADS CEIU RAA (Oct 2019)	1	2020	1	2020
PIGA BER TMRR Phase	4	2017	1	2019
PIGA BER Milestone B (Nov 2018)	1	2019	1	2019
PIGA BER Engineering and Manufacturing Development Phase	1	2019	3	2020
PIGA BER PDR (Jul 2018)	4	2018	4	2018
PIGA BER CDR (Mar2019)	2	2019	2	2019
PIGA BER Milestone C (Dec 2019)	1	2020	1	2020
PIGA BER Production and Deployment Phase	1	2020	1	2021
PIGA BER RAA (Oct 2020)	1	2021	1	2021
ASTS Engineering and Manufacturing Development Phase	1	2017	4	2017
ASTS Production and Deployment Phase	3	2017	4	2017
ASTS FCA/PCA (Aug 2017)	4	2017	4	2017
ASTS TRR (Feb 2017)	2	2017	2	2017
ASTS RAA (Sep 2017)	4	2017	4	2017

Note

Due to IDECS software constraints, R-4 events can only span years 2017 - 2023. The following events have occurred:

PTR EMD Phase : 1QFY2016-3QFY2018

TERP EMD Phase : 1QFY2016-2QFY2018

PADS CEIU TMRR Phase : 4QFY2016-4QFY2017

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
3600 / 7	PE 0101213F / <i>Minuteman Squadrons</i>	672985 / <i>MM Support Equip</i>

ASTS EMD Phase : 4QFY2018-1QFY2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons				Project (Number/Name) 672986 / MM Crypto Mods			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
672986: MM Crypto Mods	0.000	27.286	0.000	14.540	0.000	14.540	2.084	0.496	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MM Crypto Mods executes USSTRATCOM, Air Force Global Strike Command, and Air Force Safety Center requirements by implementing the KS-60 capabilities in LGM-30G ICBM Cryptography Upgrade II (ICU II) of remote key/code change and irreversible transformation as mandated in the approved Capabilities Development Document (dated 4 Jan 05) and addresses Nuclear Weapon System Safety Group Operational Safety Review requirements 98-2, 00-1 and 02-2. It also incorporates continuous signal lockout capabilities to prevent the widespread loss of status monitoring. These features will greatly increase security during code changes by reducing the frequency of open sites 75 days annually and will reduce associated resource costs for 450 Launch Facilities (LFs) and 45 Launch Control Centers (LCCs).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LGM-30G ICBM Cryptography Upgrade II (ICU II)	27.286	0.000	14.540	-	14.540
Description: ICU II completes design and development, implements KS-60 remote key/code change, irreversible transformation capabilities, and prevents continuous signal lockout.					
FY 2018 Plans:					
• Conduct user training					
• Prepare and conduct successful Test Readiness Review					
• Complete Milestone C					
FY 2019 Base Plans:					
• Develop Support Equipment					
FY 2018 to FY 2019 Increase/Decrease Statement:					
• Funding increased to support continuing EMD activities.					
Accomplishments/Planned Programs Subtotals	27.286	0.000	14.540	-	14.540

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• MPAF 03 Line Item M30MLG: MM III Modifications BP21	31.639	29.559	63.880	-	63.880	29.280	14.304	50.494	0.000	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672986 / <i>MM Crypto Mods</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• MPAF 04 Line Item 000999: <i>Replen Spares/ Repair Parts BP25/26</i>	2.367	1.231	4.190	-	4.190	0.150	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

LGM-30G ICBM Cryptography Upgrade II (ICU II) Program utilizes the ICBM Prime Integration Contract (IPIC) services of Northrop Grumman (NG), which were competitively awarded for the design and development of the ICU II capability. The contract type of the ICU II Engineering and Manufacturing Development (EMD) Contract is Cost Plus Incentive Fee. Also, ICU II EMD uses a separate contract for Nuclear Safety Cross Check Analysis/Performance Analysis and Technical Evaluation (NSCCA/PATE) Independent Validation & Verification (IV&V). This contract is driven by critical nuclear safety requirements to perform an independent assessment of all modifications to nuclear-certified software. The FY16 Pre-Production contract will be awarded on the Ground Subsystems Support Contract (GSSC). Nuclear Safety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672986 / MM Crypto Mods
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G ICBM Cryptography Upgrade II EMD	C/CPIF	Northrop Grumman : Clearfield, UT	-	23.063	Mar 2017	-		6.801	Oct 2018	-		6.801	Continuing	Continuing	-
LGM-30G ICBM Cryptography Upgrade II EMD Extension	C/CPAF	Northrop Grumman : Clearfield, UT	-	0.103	Mar 2017	-		-		-		-	Continuing	Continuing	-
LGM-30G ICBM Cryptography Upgrade II Support Equipment	C/CPFF	Northrop Grumman : Clearfield, UT	-	0.021	Apr 2017	-		2.673	Oct 2018	-		2.673	Continuing	Continuing	-
Subtotal			-	23.187		-		9.474		-		9.474	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G ICBM Cryptography Upgrade II Nuclear Safety Support (NSSCA)	C/CPIF	Northrop Grumman : Clearfield, UT	-	0.986	Mar 2017	-		1.818	Oct 2018	-		1.818	Continuing	Continuing	-
Subtotal			-	0.986		-		1.818		-		1.818	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LGM-30G ICBM Cryptography Upgrade II PMA	Various	Various : Various	-	2.168	Mar 2017	-		3.248	Dec 2018	-		3.248	Continuing	Continuing	-
LGM-30G ICBM Cryptography Upgrade II A&AS	C/FFP	BAE Systems : Clearfield, UT	-	0.945	Mar 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	3.113		-		3.248		-		3.248	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672986 / <i>MM Crypto Mods</i>
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>MM Crypto Mods</i>	
ICU II Engineering and Manufacturing Development Phase	
ICU II Milestone C (Aug 2018)	
ICU II Production and Deployment Phase	
ICU II RAA (May 2023)	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672986 / <i>MM Crypto Mods</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MM Crypto Mods</i>				
ICU II Engineering and Manufacturing Development Phase	1	2017	3	2020
ICU II Milestone C (Aug 2018)	4	2018	4	2018
ICU II Production and Deployment Phase	4	2018	3	2023
ICU II RAA (May 2023)	3	2023	3	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	252.851	39.120	25.736	0.000	0.000	0.000	0.000	0.000	0.000	0.000	330.008	647.715
675029: <i>ISPAN Increment 5</i>	0.000	8.621	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.621
675059: <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>	252.851	30.499	25.736	0.000	0.000	0.000	0.000	0.000	0.000	0.000	330.008	639.094

Program MDAP/MAIS Code: 481

A. Mission Description and Budget Item Justification

In FY 2018, PE 0101313F, Strategic War Planning System - USSTRATCOM, Project 675059, will be completed.

The Integrated Strategic Planning and Analysis Network (ISPAN) (formerly known as SWPS) is a USSTRATCOM system that must be capable of both deliberate and adaptive planning employing the full spectrum of kinetic and non-kinetic weapons. The planning system will continue to evolve as weapon systems are matured, new systems are developed, and the threat changes, particularly in the area of worldwide proliferation of Weapons of Mass Destruction (WMD).

ISPAN Increment 4 will modernize the Mission Planning and Analysis System (MPAS), that develops Joint Staff Level I through Level IV nuclear and conventional attack options for national and theater requirements. Increment 4 will fulfill MPAS requirements by reducing Crisis Action Planning and Time Sensitive Planning timelines, integrating nuclear and conventional kinetic weapon capabilities with non-kinetic effects, providing the capability to integrate planning and analysis capabilities of future Global Strike weapons, updating the MPAS system to provide the ability to train users in significantly less time, and leveraging new technologies to lower sustainment costs. ISPAN Inc 4 is an evolution of the ISPAN Block 1 baseline system using proven technologies.

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.

No funding required in FY19

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	39.148	25.736	0.000	0.000	0.000
Current President's Budget	39.120	25.736	0.000	0.000	0.000
Total Adjustments	-0.028	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	-0.028	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675029: <i>ISPAN Increment 5</i>	0.000	8.621	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.621
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ISPAN Increment 5 will modernize the Mission Planning and Analysis System (MPAS) that develops Joint Staff Level I through Level IV nuclear and conventional attack options for national and theater requirements. Increment 5 will fulfill MPAS requirements of Resiliency and Consequences of Execution analysis. Increment 5 is an evolution of the ISPAN Increment 4 baseline system using proven technologies.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Increment 5	8.621	0.000	0.000	0.000	0.000
Description: ISPAN Increment 5 will modernize the Mission Planning and Analysis System (MPAS) that develops Joint Staff Level I through Level IV nuclear and conventional attack options for national and theater requirements.					
FY 2018 Plans: Program transferred to PE 0101324F					
FY 2019 Base Plans: N/A program transferred to PE 0101324F in FY18.					
FY 2019 OCO Plans: N/A program transferred to PE 0101324F in FY18.					
Accomplishments/Planned Programs Subtotals	8.621	0.000	0.000	0.000	0.000

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>

D. Acquisition Strategy

Increment 5 will develop and modernize software for the combatant commanders using an evolutionary acquisition strategy with development contracts that are negotiated and awarded in a competitive environment. Additionally, selected program management activities will be accomplished through the use of various contracting vehicles such as Military Interdepartmental Purchase Requests (MIPRs)

Air Force Life Cycle Management Center at Hanscom AFB, (AFLCMC/HB) and the 55 CONS at Offutt AFB are the contracting authorities for ISPAN and provide contracts, legal, and financial management support.

Air Force Program Executive Officer (PEO) for Battle Management (AFPEO/BM) is the PEO. The Secretary of the Air Force (SECAF) was delegated as the Milestone Decision Authority (MDA) 30 Nov 2017 (USA003782-17).

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Pre-Milestone B Risk Reduction	Various	Offutt AFB : Offutt AFB, NE	-	5.381	Jul 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	5.381		-		-		-		-	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Support	Various	Offutt AFB : Offutt AFB, NE	-	1.000	Jun 2017	-		-		-		-	Continuing	Continuing	-
Systems Engineering Operations	Various	Offutt AFB : Offutt AFB, NE	-	0.800	Jun 2017	-		-		-		-	Continuing	Continuing	-
Program Management Administration	Various	Offutt AFB : Offutt AFB, NE	-	1.440	Jun 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	3.240		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.621	0.000	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

ISPAN INC 5																												
ISPAN Inc 5 (MPAS) Pre-B Risk Reduction Activities	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
ISPAN INC 5				
ISPAN Inc 5 (MPAS) Pre-B Risk Reduction Activities	1	2017	4	2017

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>					Project (Number/Name) 675059 / <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675059: <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>	252.851	30.499	25.736	0.000	0.000	0.000	0.000	0.000	0.000	0.000	330.008	639.094
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Integrated Strategic Planning and Analysis Network (ISPAN) (formerly known as SWPS) is a USSTRATCOM system that must be capable of both deliberate and adaptive planning employing the full spectrum of kinetic and non-kinetic weapons. The planning system will continue to evolve as weapon systems are matured, new systems are developed, and the threat changes, particularly in the area of worldwide proliferation of Weapons of Mass Destruction (WMD).

ISPAN Increment 4 will modernize the Mission Planning and Analysis System (MPAS), that develops Joint Staff Level I through Level IV nuclear and conventional attack options for national and theater requirements. Increment 4 will fulfill MPAS requirements by reducing Crisis Action Planning and Time Sensitive Planning timelines, integrating nuclear and conventional kinetic weapon capabilities with non-kinetic effects, providing the capability to integrate planning and analysis capabilities of future Global Strike weapons, updating the MPAS system to provide the ability to train users in significantly less time, and leveraging new technologies to lower sustainment costs. ISPAN Inc 4 is an evolution of the ISPAN Block 1 baseline system using proven technologies.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ISPAN 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.

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: ISPAN Increment 4	30.499	25.736	0.000	0.000	0.000
Description: ISPAN Increment 4 (aka MPAS Modernization) will reduce Crisis Action Planning and Time Sensitive Planning timelines, integrates nuclear and conventional kinetic weapon capabilities with non-kinetic effects, and provides the capability to integrate planning and analysis capabilities of future Global Strike weapons. ISPAN Inc 4 is an evolution of the Block 1 baseline system using proven technologies.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675059 / <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<i>FY 2018 Plans:</i> - Initiate and complete the analysis, design, and coding of the Post Increment Enhancement (PIE) phase.					
<i>FY 2019 Base Plans:</i> N/A					
<i>FY 2019 OCO Plans:</i> N/A					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding decreased to zero for FY19 because it was transferred to PE0101324F -- Increment 5.					
Accomplishments/Planned Programs Subtotals	30.499	25.736	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 833560: <i>Integrated Strategic Planning and Analysis Network</i>	10.670	9.187	7.769	-	7.769	9.901	9.820	9.491	9.660	Continuing	Continuing

Remarks

D. Acquisition Strategy

ISPAN develops and modernizes strategic planning tools for the combatant commanders using an evolutionary acquisition strategy with development contracts that are negotiated and awarded in a competitive environment.

The program development is accomplished via Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts. Other efforts such as Program Management Administration are accomplished via Fixed Price (FP) contracts. Activities are also accomplished via Military Interdepartmental Purchase Requests (MIPR).

Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) and the 55 CONS office at Offutt AFB are contracting authorities for ISPAN and provide Contracts, Legal, and Comptroller Support.

Air Force Program Executive Officer (PEO) for Battle Management (AFPEO/BM) is the PEO. The Secretary of the Air Force (SECAF) was delegated as the Milestone Decision Authority (MDA) 30 Nov 2017 (USA003782-17).

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675059 / <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force											Date: February 2018				
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>					Project (Number/Name) 675059 / <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>						

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ISPAN Increment 2	C/CPIF	Various : Various, NV	114.006	-		-		-		-		-	0.000	114.006	114.006
ISPAN Inc 4 Pre-B Risk Reduction	C/CPIF	Various : Various, NV	12.548	-		-		-		-		-	0.000	12.548	12.548
ISPAN Inc 4 Spiral 1 Dev	C/CPIF	Various : Various, NV	26.363	-		-		-		-		-	0.000	26.363	26.363
ISPAN Inc 4 Spiral 2 Dev	C/CPIF	Various : Various, NV	25.240	-		-		-		-		-	0.000	25.240	26.642
ISPAN Inc 4 Spiral 3 Dev	C/CPIF	Various : Various, NV	31.515	24.832	Jul 2017	-		-		-		-	0.000	56.347	31.516
ISPAN Inc 4 Post IOC Enhancements	C/CPIF	Various : Various, NV	-	-		20.331	Jun 2018	-		-		-	0.000	20.331	20.257
Subtotal			209.672	24.832		20.331		-		-		-	0.000	254.835	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ISPAN Responsible Test Organization	C/CPIF	RTO : Bellevue, NE	1.902	0.210	Oct 2016	0.210	Oct 2017	-		-		-	0.000	2.322	2.322
ISPAN Certification and Accreditation	MIPR	JTIC : Ft Hichuaha, AZ	0.851	0.599	Oct 2016	0.075	Jan 2018	-		-		-	0.000	1.525	1.001
Subtotal			2.753	0.809		0.285		-		-		-	0.000	3.847	N/A

Remarks
 - Responsible Test Organization is funded at the beginning of the each FY for testing performed during the FY
 - Certification and accreditation is accomplished by Joint Test Interoperability Center (JTIC) and is funded at the beginning of each FY interoperability certification and accreditation performed during the FY

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force											Date: February 2018				
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>					Project (Number/Name) 675059 / <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>				

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost To Complete	Total Cost	Target Value of Contract
ISPAN Engineering and Technical Support	PO	Mitre Corp : Offutt AFB, NE	9.722	1.200	Oct 2016	1.200	Mar 2018	-		-		-		0.000	12.122	12.122
ISPAN Systems Engineering Operations	C/CPIF	Various : Bellevue, NE	2.240	1.190	Jan 2017	1.190	Mar 2018	-		-		-		0.000	4.620	4.620
Program Management Administration	C/CPIF	Various : Bellevue, NE	28.464	2.468	Jan 2017	2.730	Mar 2018	-		-		-		0.000	33.662	33.924
Subtotal			40.426	4.858		5.120		-		-		-		0.000	50.404	N/A
Project Cost Totals			252.851	30.499		25.736		-		-		-		0.000	309.086	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675059 / <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
ISPAN Inc 4																												
ISPAN Inc 4 (MPAS) Spiral 2 Development Testing																												
ISPAN Inc 4 (MPAS) Spiral 3 Development Testing																												
ISPAN Inc 4 (MPAS) Post IOC Enhancements																												
ISPAN Inc 4 (MPAS) FDD (Jun 2018)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101313F / <i>Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM</i>	Project (Number/Name) 675059 / <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>ISPAN Inc 4</i>				
ISPAN Inc 4 (MPAS) Spiral 2 Development Testing	1	2017	4	2017
ISPAN Inc 4 (MPAS) Spiral 3 Development Testing	1	2018	3	2018
ISPAN Inc 4 (MPAS) Post IOC Enhancements	1	2018	4	2018
ISPAN Inc 4 (MPAS) FDD (Jun 2018)	3	2018	3	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101316F / <i>Worldwide Joint Strategic Communications</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	5.876	6.272	10.442	0.000	10.442	18.177	27.284	15.453	2.502	Continuing	Continuing
671820: <i>Strategic Automated Command and Control System</i>	-	5.876	6.272	10.442	0.000	10.442	18.177	27.284	15.453	2.502	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Worldwide Joint Strategic Communication efforts include Nuclear Command, Control, and Communications (NC3) systems to include the Defense Injection Reception Emergency Action Message (EAM) C2 Terminals (DIRECT), Aircrew Alerting Communications Electromagnetic Pulse (AACE), the Strategic Emergency Action Transmission System (SEATS), the Defense Red Switch Network (DRSN), and the Strategic Automated Command and Control System (SACCS). Funding may be used to modernize these, and other, NC3 systems. Funding may also be used for research, testing, validation, certification, configuration management, and assessment of the Air Force NC3 Weapon System.

SACCS is a dedicated, high speed, multi-level secure, data transmission, processing, and display system. SACCS provides the primary non-survivable command and control capability for receiving and disseminating secure Emergency Action Messages (EAM), Force Direction Messages (FDM), Force Status Reporting (FSR), and exchanging information type messages from USSTRATCOM. SACCS provides messages for effective deployment of strategic bombers, reconnaissance aircraft, mobilization aircraft, tanker support aircraft, and the Intercontinental Ballistic Missile (ICBM) force.

SACCS has equipment that has reached its end of life and is no longer repairable due to diminished manufacturing sources and parts obsolescence. This jeopardizes Air Force Global Strike Command's (AFGSC) ability to meet mission requirements as required by Chairman Joint Chief of Staff Nuclear Technical Performance Criteria and Operational Standards (CJCSI 6811.01). In order to mitigate the risk of SACCS inability to operate once the current spares are completely diminished, and ensure the system remains secure against modern/future threats, the Air Force is developing a replacement system.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver NC3 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.

This program is in Budget Activity 07, 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 years.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0101316F I Worldwide Joint Strategic Communications
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B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	6.042	6.272	6.285	0.000	6.285
Current President's Budget	5.876	6.272	10.442	0.000	10.442
Total Adjustments	-0.166	0.000	4.157	0.000	4.157
• 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	0.205	0.000			
• SBIR/STTR Transfer	-0.371	0.000			
• Other Adjustments	0.000	0.000	4.157	0.000	4.157

Change Summary Explanation

FY 2019 Increase, updated Program Office Estimate for migration to the Navy Automated Message Store and Forward (NOVA) System (\$4.157M).

C. Accomplishments/Planned Programs (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>
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<p>Title: SACCS Replacement</p> <p>Description: Design and develop replacement Strategic Automated Command Control System (SACCS). Replaces all SACCS network components with the Navy Automated Message Store and Forward (NOVA) System. Removing the Message Processing Server at Offutt AFB, NE. New equipment mitigates cybersecurity issues, improves Mean Time Between Failure rates, reliability, availability, improves user interface, decreases annual sustainment costs, addresses Diminishing Manufacturing Sources and Material Shortages and obsolescence challenges, and meets Chairman Joint Chiefs of Staff Nuclear Technical Performance Criteria and Operational Standards (CJCSI 6811.01).</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Enter Milestone B - Procure EMD hardware and COTS software - Conduct preliminary testing on COTS hardware, ensure products meeting cybersecurity needs - Conduct logical analysis of developed system requirements to ensure proper relationship between all derived requirements - Begin EMD system design and software development for core message processor, the HAC/RMPE adapter, and end user terminals - Continue Phase II of the Depot Source Repair (DSOR) Process - Begin tailoring cybersecurity controls and overlays to ensure RMF controls are incorporated into system design 	5.876	6.272	10.442
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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101316F / <i>Worldwide Joint Strategic Communications</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
- Continue working towards completing Critical Design Review (CDR)			
<i>FY 2019 Plans:</i>			
- Continue software development of the core message processor, the HAC/RMPE adapter, and the end user terminal software			
- Continue EMD system design up to Critical Design Review (CDR) (ensure critical supportability aspects including materiel availability, reducing the logistics footprint, incorporating cybersecurity and program protection measures in the design)			
- Finalize system/subsystem specifications, interface control documents, software requirements specifications and drawing package			
- Complete CDR			
- Develop RFP for Missile Procedure Training contractors			
- Begin missile procedure trainer development			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i>			
Funds for continuing EMD effort.			
Accomplishments/Planned Programs Subtotals	5.876	6.272	10.442

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• OPAF 03 PE 0101316F: <i>Strategic Command and Control (833140)</i>	0.246	6.497	3.000	-	3.000	3.973	1.514	1.537	0.260	Continuing	Continuing

Remarks

E. Acquisition Strategy
Programmed funds continue to leverage technology development and architecture analysis conducted as part of MS B activities. Development activities transition to the 309 SMXG as the organic design agent.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101316F / <i>Worldwide Joint Strategic Communications</i>	Project (Number/Name) 671820 / <i>Strategic Automated Command and Control System</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SACCS-R TMRR	SS/CPFF	Northrop Grumman : Layton, UT	-	0.868	Sep 2017	0.200	Dec 2017	-		-		-	Continuing	Continuing	-
SACCS-R TMRR Organic	PO	OO-ALC : Hill AFB, UT	-	3.548	May 2017	3.783	Jan 2018	-		-		-	Continuing	Continuing	-
SACCS-R EMD Organic	PO	OO-ALC : Hill AFB, UT	-	-		-		6.200	Nov 2018	-		6.200	Continuing	Continuing	-
SACCS-R EMD	SS/TBD	Northrop Grumman : Layton, UT	-	-		-		1.043	Nov 2018	-		1.043	Continuing	Continuing	-
Subtotal			-	4.416		3.983		7.243		-		7.243	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SACCS-R Engineering Development	Various	Various : Various	-	0.326	Dec 2017	-		0.829	Nov 2018	-		0.829	Continuing	Continuing	-
Subtotal			-	0.326		-		0.829		-		0.829	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SACCS-R Development Test & Evaluation	Various	Various : Various	-	0.113	Dec 2017	-		0.627	Feb 2019	-		0.627	Continuing	Continuing	-
Subtotal			-	0.113		-		0.627		-		0.627	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101316F / <i>Worldwide Joint Strategic Communications</i>	Project (Number/Name) 671820 / <i>Strategic Automated Command and Control System</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SACCS-R Program Management Administration	Various	Various : Various, NV	-	0.037	Apr 2017	2.289	Jan 2018	0.820	Nov 2018	-		0.820	Continuing	Continuing	-
SACCS-R Integration Support	C/FFP	BAE Systems, Inc. : Hill AFB, UT	-	0.984	Feb 2017	-		0.923	Nov 2018	-		0.923	Continuing	Continuing	-
Subtotal			-	1.021		2.289		1.743		-		1.743	Continuing	Continuing	N/A

Remarks
Costs and services in support of program office management and administration processes such as: program oversight, resource justification, budget and programming, milestone and scheduling--PMA costs.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.876	6.272	10.442	-	10.442	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101316F / <i>Worldwide Joint Strategic Communications</i>	Project (Number/Name) 671820 / <i>Strategic Automated Command and Control System</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

Strategic Automated Command and Control System																												
SACCS-R Technology Maturation/Risk Reduction	██████████																											
SACCS-R PDR (Sep 2017)			██																									
SACCS-R Milestone B (Feb 2018)					██																							
SACCS-R Engineering and Manufacturing Development					████████████████████																							
SACCS-R CDR (Mar 2019)									██																			
SACCS-R Milestone C (Oct 2020)																██												
SACCS-R Production and Deployment																██████████████████												
SACCS-R Full Operational Capability (FOC)																						██						

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101316F / <i>Worldwide Joint Strategic Communications</i>	Project (Number/Name) 671820 / <i>Strategic Automated Command and Control System</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Strategic Automated Command and Control System</i>				
SACCS-R Technology Maturation/Risk Reduction	1	2017	1	2018
SACCS-R PDR (Sep 2017)	4	2017	4	2017
SACCS-R Milestone B (Feb 2018)	2	2018	2	2018
SACCS-R Engineering and Manufacturing Development	2	2018	4	2020
SACCS-R CDR (Mar 2019)	2	2019	2	2019
SACCS-R Milestone C (Oct 2020)	1	2021	1	2021
SACCS-R Production and Deployment	1	2021	3	2022
SACCS-R Full Operational Capability (FOC)	2	2022	2	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101324F / <i>Integrated Strategic Planning & Analysis Network</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	11.032	22.833	0.000	22.833	26.804	25.807	24.854	22.522	0.000	133.852
675029: <i>ISPAN Increment 5</i>	0.000	0.000	11.032	22.833	0.000	22.833	26.804	25.807	24.854	22.522	0.000	133.852
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 522

A. Mission Description and Budget Item Justification

ISPAN Increment 5 will modernize the Mission Planning and Analysis System (MPAS) that develops Joint Staff Level I through Level IV nuclear and conventional attack options for national and theater requirements. Increment 5 will fulfill MPAS requirements of Resiliency and Enhanced Consequences Analysis. Increment 5 is an evolution of the ISPAN Increment 4 baseline system using proven technologies.

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.

In FY18, PE 11313F (ISPAN Inc. 4) efforts were transferred to PE 11324F (ISPAN Inc. 5) as an evolution to ISPAN Inc. 4 baseline system.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	11.032	12.708	0.000	12.708
Current President's Budget	0.000	11.032	22.833	0.000	22.833
Total Adjustments	0.000	0.000	10.125	0.000	10.125
• 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	10.125	0.000	10.125

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101324F / <i>Integrated Strategic Planning & Analysis Network</i>
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Change Summary Explanation

Funding was increased to accelerate program per Program Office estimate.

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

	FY 2017	FY 2018	FY 2019
Title: ISPAN Increment 5	0.000	11.032	22.833
Description: ISPAN Increment 5 will modernize the Mission Planning and Analysis System (MPAS) that develops Joint Staff Level I through Level IV nuclear and conventional attack options for national and theater requirements.			
FY 2018 Plans: Funds will be used for acquisition program document development and pre-engineering and manufacturing development (EMD) activities to outline the hardware and software architecture approach and preliminary design activities for MPAS Increment 5 modernization. - Generate program milestone products and artifacts - Preliminary Design Review preparation - Conduct data architecture study - Update Nuclear Command and Control(NC2) planning enterprise architecture - Develop cyber-security architecture - Consequences of Execution analysis and visualization planning			
FY 2019 Plans: Funds will be used for EMD activities to develop the hardware and software architecture for MPAS Increment 5 modernization.			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding was increased to match program requirements.			
Accomplishments/Planned Programs Subtotals	0.000	11.032	22.833

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

N/A

Remarks

E. Acquisition Strategy

Increment 5 will develop and modernize software for the combatant commanders using an Agile DevOps Continuous Delivery / Continuous Integration (CD/CI) acquisition strategy with development contracts that are negotiated and awarded in a competitive environment. The program will consider the best contract options to implement the Agile DevOps CD/CI strategy. Other program management activities will be accomplished via Fixed Price (FP) contracts. Other activities are also accomplished through the use of various contracting vehicles such as Military Interdepartmental Purchase Requests (MIPRs).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101324F / <i>Integrated Strategic Planning & Analysis Network</i>
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The PEO is the Air Force Program Executive Officer (PEO) for Battle Management and Milestone Decision Authority (MDA) is the Secretary of the Air Force for Acquisition (SAF/AQ).

Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) and the 55 CONS at Offutt AFB are the contracting authorities for ISPAN and provide contracts, legal, and financial management support.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101324F / <i>Integrated Strategic Planning & Analysis Network</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Pre-Milestone B Risk Reduction	Various	Offutt AFB : Offutt AFB, NE	-	-		7.542	Jan 2018	-		-		-	0.000	7.542	-
ISPAN Inc 5 Spiral 1 Dev	Various	Offutt AFB : Offutt AFB, NE	-	-		-		17.083	Jan 2019	-		17.083	0.000	17.083	-
Subtotal			-	-		7.542		17.083		-		17.083	0.000	24.625	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Not specified.	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	0.000	0.000	-
Subtotal			-	-		-		-		-		-	0.000	0.000	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Support	Various	Offutt AFB : Offutt AFB, NE	-	-		1.150	Nov 2017	1.200	Nov 2018	-		1.200	0.000	2.350	-
Systems Engineering and Operations	Various	Offutt AFB : Offutt AFB, NE	-	-		0.900	Nov 2017	1.420	Nov 2018	-		1.420	0.000	2.320	-
Program Management Administration	Various	Offutt AFB : Offutt AFB, NE	-	-		1.440	Nov 2017	3.130	Nov 2018	-		3.130	0.000	4.570	-
Subtotal			-	-		3.490		5.750		-		5.750	0.000	9.240	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	-	11.032	-	22.833	-	22.833	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101324F / <i>Integrated Strategic Planning & Analysis Network</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

ISPAN Increment 5																												
ISPAN Inc 5 (MPAS) Pre-B Risk Reduction Activities																												
Milestone B (program entry) 1st Qtr FY19																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101324F / <i>Integrated Strategic Planning & Analysis Network</i>	Project (Number/Name) 675029 / <i>ISPAN Increment 5</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>ISPAN Increment 5</i>				
ISPAN Inc 5 (MPAS) Pre-B Risk Reduction Activities	1	2018	1	2019
Milestone B (program entry) 1st Qtr FY19	1	2019	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101328F / ICBM Reentry Vehicles
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	18.412	0.000	18.412	75.571	112.959	74.868	81.905	Continuing	Continuing
674920: <i>IW1/Mk21A</i>	-	0.000	0.000	18.412	0.000	18.412	75.571	112.959	74.868	81.905	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0101328F, project 674920, Mk21A Technology Maturation Risk Reduction, is a new start.

A. Mission Description and Budget Item Justification

The Mk21A Reentry Vehicle (RV) program will design, develop, produce and deploy an integrated RV capable of delivering the Interoperable Warhead 1 (IW-1) nuclear warhead when released from the Ground Based Strategic Deterrent (GBSD) Intercontinental Ballistic Missile (ICBM). The major activities in the Technology Maturation and Risk Reduction (TMRR) phase of the Mk21A RV program include 1) Government system engineering, analytics, and test capability development, 2) RV Risk Reduction, and 3) Weapon System Integration Risk Reduction. Reentry vehicle components include a high velocity nosetip, high impulse transducer, fuze, aeroshell forward section, body section and rear cover, radio frequency subsystem with antennas, RV spin-up system, inflight disconnect cable and other electrical cables. The MK21A program will include prime contractor development of applicable support equipment, data, flight test hardware, infrastructure, training materials while examining and mitigating weapon system integration risks, and any needed nuclear surety and certification and system vulnerability assessments.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Mk21A RV 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.

BA7 - 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 current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101328F / <i>ICBM Reentry Vehicles</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	18.412	0.000	18.412
Total Adjustments	0.000	0.000	18.412	0.000	18.412
• 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	18.412	0.000	18.412

Change Summary Explanation

FY 2019 funding increased to support Mk21A Reentry Vehicle risk reduction activities.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
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Title: Mk21A Technology Maturation Risk Reduction	-	0.000	18.412
Description: The objectives of TMRR for the Mk21A RV program are as follows: 1) to deliver preliminary designs to address evolving threats; 2) incorporate a modular open systems architecture; 3) perform cost capability analysis to aid with validation of user requirements; 4) demonstrate performance of weapon system capabilities through prototyping, modeling, simulation, and testing.			
FY 2018 Plans: None			
FY 2019 Plans: <ul style="list-style-type: none"> • Complete Milestone A • Award TMRR contract(s) • Mature reentry vehicle preliminary design • Develop ground and flight test plans for prototypes • Begin development of prototype test vehicles 			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101328F / ICBM Reentry Vehicles
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Mk21A RV is a new start in 2019.			
Accomplishments/Planned Programs Subtotals	-	0.000	18.412

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE 04 0605230F/641025: <i>Ground Based Strategic Deterrent</i>	109.260	215.721	345.041	-	345.041	570.373	1,527.545	2,539.060	3,018.653	Continuing	Continuing
• RDTE 05 0604933F/655082: <i>Fuze Modernization</i>	172.946	178.991	172.902	-	172.902	161.199	132.926	60.016	2.035	Continuing	Continuing
• RDTE 04 060351F/641022: <i>Dem/Val - RVAP</i>	64.740	7.085	17.920	-	17.920	19.439	19.776	20.186	20.554	Continuing	Continuing

Remarks

E. Acquisition Strategy
 The Mk21A RV program strategy is to deliver an integrated RV capable of delivering the IW1 to target beginning in FY30. For the Technology Maturation and Risk Reduction (TMRR) phase, the Program Office will competitively award two contracts in FY19. The objectives of TMRR for Mk21A are as follows: 1) to deliver preliminary designs to address evolving threats; 2) incorporate a modular open systems architecture; 3) perform cost capability analysis to aid with validation of user requirements; 4) demonstrate performance of weapon system capabilities through prototyping, modeling, simulation, and testing.

The TMRR phase will include a System Requirements Review, System Functional Review, Preliminary Design Review, and Prototype RV Demonstration. The contractors may elect to perform additional risk reduction testing on select components to further evolve the design during TMRR, in order to lower component integration risk during Engineering and Manufacturing Development (EMD). The anticipated period of performance for the TMRR contracts will be from 4QFY19 to 4QFY22. After MS B approval, EMD contract will be competitively awarded as early as FY22.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0101328F / ICBM Reentry Vehicles				674920 / IW1/Mk21A								
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Mk21A TMRR Contractor	TBD	TBD : TBD	-	-		-		13.596	Aug 2019	-		13.596	Continuing	Continuing	-	
Subtotal			-	-		-		13.596		-		13.596	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Mk21A/GBSD Integration Support	TBD	TBD : TBD	-	-		-		0.817	Oct 2018	-		0.817	Continuing	Continuing	-	
Mk21A/Fuze Integration Support	TBD	TBD : TBD	-	-		-		0.336	Oct 2018	-		0.336	Continuing	Continuing	-	
Subtotal			-	-		-		1.153		-		1.153	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
GBSD Guidance System T&E	C/CPAF	TBD : TBD	-	-		-		0.077	Oct 2018	-		0.077	Continuing	Continuing	-	
Subtotal			-	-		-		0.077		-		0.077	Continuing	Continuing	N/A	
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Mk21A PMA	TBD	TBD : TBD	-	-		-		3.586	Oct 2018	-		3.586	Continuing	Continuing	-	
Subtotal			-	-		-		3.586		-		3.586	Continuing	Continuing	N/A	
Project Cost Totals			-	-		0.000		18.412		-		18.412	Continuing	Continuing	N/A	

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101328F / <i>ICBM Reentry Vehicles</i>	Project (Number/Name) 674920 / <i>IW1/Mk21A</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Mk21A Reentry Vehicle (RV)</i>																												
Materiel Development Decision (Sep 2017)																												
Milestone A (Oct 2018)																												
TMRR Phase																												
PDR (Jan 2021)																												
Milestone B (Jul 2022)																												
EMD Phase																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101328F / ICBM Reentry Vehicles	Project (Number/Name) 674920 / IW1/Mk21A
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Mk21A Reentry Vehicle (RV)</i>				
Materiel Development Decision (Sep 2017)	4	2017	4	2017
Milestone A (Oct 2018)	1	2019	1	2019
TMRR Phase	1	2019	3	2022
PDR (Jan 2021)	2	2021	2	2021
Milestone B (Jul 2022)	4	2022	4	2022
EMD Phase	4	2022	3	2023

Note
EMD Phase continues beyond FY2023 to FY2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0102110F / <i>UH-1N Replacement Program</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	86.856	108.617	288.022	0.000	288.022	16.575	7.444	0.000	0.000	0.000	507.514
672021: <i>UH-1N Replacement Program</i>	0.000	86.856	108.617	288.022	0.000	288.022	16.575	7.444	0.000	0.000	0.000	507.514
Quantity of RDT&E Articles	-	-	4	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 562

A. Mission Description and Budget Item Justification

The UH-1N Replacement program will replace the Air Force fleet of UH-1N aircraft with modern helicopters that will close significant mission capability gaps associated with the current fleet of UH-1N aircraft. The replacement aircraft will provide vertical airlift and support the requirements of five Air Force major commands and operating agencies: Air Force Global Strike Command (AFGSC), Air Force District of Washington, Air Education and Training Command, Pacific Air Forces, and Air Force Materiel Command. AFGSC is the Air Force lead command and operational capability requirements sponsor. This program is an element of the Air Force's nuclear enterprise reform initiatives.

Program provides continued funding for four aircraft for test, support equipment, training devices, Type I training and courseware, non-developmental integration and associated government activities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver UH-1N Replacement Program 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.

FY19 RDT&E funding provides incremental funding for four aircraft for test, support equipment, training, along with NDI integration and associated government activities.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0102110F / <i>UH-1N Replacement Program</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	14.116	108.617	298.690	0.000	298.690
Current President's Budget	86.856	108.617	288.022	0.000	288.022
Total Adjustments	72.740	0.000	-10.668	0.000	-10.668
• 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	75.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-2.260	0.000	-10.668	0.000	-10.668

Change Summary Explanation

FY17 \$75M addition due to Procurement Congressional Add funding Reprogramming action. FY17 \$2.260M reduction due to various Below Threshold Reprogramming actions. FY19 \$10.668M reduction is a result of updated program office estimate due to revised acquisition strategy and inflation adjustments.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
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<p>Title: UH-1N Replacement Weapon System Integration</p> <p>Description: Integration of non-developmental item (NDI) hardware, software, training, and other capabilities into existing aircraft system and technical/manufacturing baselines to achieve UH-1N Replacement operational capability requirements.</p> <p>FY 2018 Plans: Initiate systems engineering efforts for NDI integration onto an airworthiness-certified aircraft to achieve operational capability requirements, including associated mission planning and aircrew training systems. Includes government oversight of contractor design reviews toward finalizing changes from the airworthiness-certified baseline aircraft specifications. Other contractor and government systems engineering tasks include associated testing and certifications. Management services include miscellaneous program office support, travel, office supplies, and service contracts. Includes incremental funding of four aircraft for test.</p> <p>FY 2019 Plans: Continue systems engineering efforts for NDI integration onto an airworthiness-certified aircraft to achieve operational capability requirements, including associated mission planning and aircrew training systems. Includes government oversight of contractor design reviews toward finalizing changes from the airworthiness-certified baseline aircraft specifications. Other contractor and</p>	86.656	106.882	280.313
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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0102110F / <i>UH-1N Replacement Program</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
government systems engineering tasks include associated testing and certifications. Management services include miscellaneous program office support, travel, office supplies, and service contracts. Includes incremental funding of four aircraft for test. FY 2018 to FY 2019 Increase/Decrease Statement: RDT&E funding increased due to increased integration activities for NDI aircraft and associated training equipment.			
Title: UH-1N Replacement Test and Evaluation Description: System and subsystem test and evaluation of the UH-1N Replacement solution. FY 2018 Plans: Continue test planning activities. Conduct technical reviews of the UH-1N Replacement contractor's NDI integration onto an airworthiness-certified baseline aircraft system; continue planning for government Developmental Test, Operational Test, and Live Fire Test and Evaluation; procure subsystem component test articles for LFT&E. FY 2019 Plans: Continue test planning activities. Conduct technical reviews of the UH-1N Replacement contractor's NDI integration onto an airworthiness-certified baseline aircraft system; continue planning for government Developmental Test, Operational Test, and Live Fire Test and Evaluation; procure subsystem component test articles for LFT&E. FY 2018 to FY 2019 Increase/Decrease Statement: RDT&E funding for government test increased due to contractor development testing, LFT&E execution, and Milestone C Test & Evaluation Master Plan.	0.200	1.735	7.709
Accomplishments/Planned Programs Subtotals	86.856	108.617	288.022

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 04 Line Item H0106O: <i>UH-1N Replacement</i>	18.337	-	0.000	-	0.000	380.181	379.700	467.760	476.259	2,369.611	4,091.848
• APAF 06 Line Item 000999: <i>Initial Spares/Repair Parts</i>	-	-	-	-	-	16.143	16.593	17.063	17.373	62.244	129.416
• MILCON PE 0207576F: <i>Consolidated Helicopter Operations, Tactical Response Force Alert, and Aircraft Maintenance Facilities</i>	-	62.000	66.000	-	66.000	-	-	-	-	0.000	128.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0102110F / <i>UH-1N Replacement Program</i>
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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

E. Acquisition Strategy

The Air Force intends to procure an airworthiness-certified baseline helicopter that requires NDI integration (e.g. Electro-Optical/Infrared Sensor, personnel recovery hoists, cockpit/cabin armor, etc.) to meet all operational capability requirements. Specific acquisition and contracting strategies for RDT&E funded integration tasks and the test and evaluation program will be determined as part of the overall program strategy. The Air Force intends to enter the acquisition process at pre-Milestone C and award a contract for this program no later than the end of 3Q/FY2018.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0102110F / UH-1N Replacement Program	Project (Number/Name) 672021 / UH-1N Replacement Program
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UH-1N Replacement weapon system integration and type/airworthiness certification	C/FFP	TBD : TBD	-	83.039	Jun 2018	101.882	Jun 2018	271.413	Dec 2018	-		271.413	14.625	470.959	0.000
Subtotal			-	83.039		101.882		271.413		-		271.413	14.625	470.959	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UH-1N Replacement live fire, qualification, and operational test and evaluation planning and technical support	Various	Various : TBD	-	0.200	Dec 2017	1.735	Dec 2018	7.709	Dec 2018	-		7.709	9.394	19.038	-
Subtotal			-	0.200		1.735		7.709		-		7.709	9.394	19.038	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UH-1N Replacement program management activity	Various	Various : TBD	-	3.617	Jan 2017	5.000	Jan 2018	8.900	Jan 2019	-		8.900	0.000	17.517	-
Subtotal			-	3.617		5.000		8.900		-		8.900	0.000	17.517	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	86.856	108.617	288.022	-	288.022	24.019	507.514	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0102110F / UH-1N Replacement Program	Project (Number/Name) 672021 / UH-1N Replacement Program

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
UH-1N Replacement Program																												
Acquisition Strategy Panel		■																										
Pre-Milestone C Review and Contract Award							■																					
Weapon System Integration							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
-- Purchase of 4 RDT&E Aircraft							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
-- AV CDR													■															
-- AV FCA/PCA															■	■	■	■	■	■	■	■	■	■	■	■	■	
-- TS CDR																												
-- TS FCA/PCA																												
-- AWP							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
-- Test MFR																												
-- OP MTC																												
System/Subsystem Test and Integration							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
-- LFTE Planning							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
-- LFTE Execution																												
-- DT Planning																												
-- DT Execution																												
-- OT Planning																												
-- OT Execution																												
-- OA Planning																												
-- OA Execution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0102110F / UH-1N Replacement Program	Project (Number/Name) 672021 / UH-1N Replacement Program

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
UH-1N Replacement Program				
Acquisition Strategy Panel	2	2017	2	2017
Pre-Milestone C Review and Contract Award	3	2018	3	2018
Weapon System Integration	3	2018	3	2022
-- Purchase of 4 RDT&E Aircraft	3	2018	1	2020
-- AV CDR	3	2019	3	2019
-- AV FCA/PCA	2	2020	4	2020
-- TS CDR	4	2020	4	2020
-- TS FCA/PCA	1	2022	3	2022
-- AWP	2	2018	4	2020
-- Test MFR	4	2019	4	2019
-- OP MTC	4	2020	4	2020
System/Subsystem Test and Integration	2	2018	4	2021
-- LFTE Planning	2	2018	3	2019
-- LFTE Execution	4	2018	3	2021
-- DT Planning	3	2018	4	2019
-- DT Execution	1	2020	4	2020
-- OT Planning	3	2018	4	2020
-- OT Execution	1	2021	3	2021
-- OA Planning	3	2018	2	2020
-- OA Execution	2	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0102326F / <i>Region/Sector Operation Control Center Modernization Program</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	10.868	3.347	9.252	0.000	9.252	0.000	6.427	0.783	0.797	Continuing	Continuing
674592: <i>R/SAOC MODERNIZATION</i>	-	10.868	3.347	9.252	0.000	9.252	0.000	6.427	0.783	0.797	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Regional/Sector Operation Center Modernization program supports the NORAD/NORTHCOM homeland defense and air sovereignty mission for fixed Air Defense Sectors.

BATTLE CONTROL SYSTEM-FIXED (BCS-F): BCS-F is the effort to implement the bi-national program with Canada. The BCS-F Program is an AF Homeland Defense battle management command and control system with the capability to integrate data from existing and future civil and military defense surveillance systems into a comprehensive air picture. BCS-F provides tactical communications and data link capabilities with other military and civil systems responsible for planning, directing, coordinating and controlling forces for air surveillance, air defense, and control of sovereign US air space. This integrated air picture enhances the capability to conduct peacetime air sovereignty operations and transition to active air defense operations in the event of aggression.

BATTLE CONTROL SYSTEM-FIXED MODIFICATION ONE (BCS-F Modification 1). BCS-F Modification 1 effort will implement Automatic Dependent Surveillance-Broadcast (ADS-B) and Earth Center Earth Fixed (ECEF) into the BCS-F system. ADS-B provides the BCS-F system the capability to ingest Global Position System (GPS) based location data, from ADS-B equipped aircraft, at the Air Defense Sectors. Implementation of ADS-B on aircraft flying in US airspace is mandated by the Federal Aviation Administration (FAA) by 2020. ECEF is a three-dimensional earth model that eliminates artificial boundaries in the two-dimensional BCS-F stereographic plane. ECEF also allows the ingestion and processing of sensor, target, track, and graphical data without compromising data accuracy due to translation errors. The BCS-F Modification 1 effort will be executed as a Cooperative Program between the US and Canada.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver BCS-F Modification 1 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0102326F / <i>Region/Sector Operation Control Center Modernization Program</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	10.868	3.347	9.322	0.000	9.322
Current President's Budget	10.868	3.347	9.252	0.000	9.252
Total Adjustments	0.000	0.000	-0.070	0.000	-0.070
• 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	-0.070	0.000	-0.070

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: BATTLE CONTROL SYSTEMS MODERNIZATION 1	10.868	3.347	9.252
Description: Begin systems engineering, development, risk reduction, integration, test & evaluation and fielding of the BCS-F Modification 1 effort. The BCS-F Modification 1 effort will be executed as a Cooperative Program between the US and Canada.			
FY 2018 Plans: Activities include, but are not limited to: <ul style="list-style-type: none"> - Continue developing test strategy and systems engineering related documentation - Begin the ADS-B and ECEF systems engineering development, integration, test and evaluation, risk reduction - Execute source selection activities and award a competitively selected contract - Continue to document changes to the program that could affect the system baseline - Continue test and cyber-security planning - Continue to identify, monitor and mitigate technical risks - Conduct the Post Award Conference, Program Management Reviews, Technical Interchange Meetings, Systems Readiness Review and Integrated Baseline Review 			
FY 2019 Plans: Activities include, but are not limited to: <ul style="list-style-type: none"> - Will continue developing test strategy and systems engineering related documentation - Will continue the ADS-B and ECEF systems engineering development, integration, test and evaluation, risk reduction - Will continue to document changes to the program that could affect the system baseline - Will continue test and cyber-security planning 			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0102326F / <i>Region/Sector Operation Control Center Modernization Program</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
- Will conduct Technical Interchange Meetings, Preliminary Design Review, Critical Design Review and draft final technical order development and required training materials to support fielding activities. <i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding was increased in FY19 due to RDT&E activity. FY18 funding was to cover pre-EMD efforts and preparation for contract award. FY19 funding onward will cover de facto development efforts.			
Accomplishments/Planned Programs Subtotals	10.868	3.347	9.252

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 080330: <i>Battle Control System - Fixed</i>	5.677	6.415	3.012	-	3.012	3.063	3.119	3.175	3.232	0.000	27.693

Remarks

E. Acquisition Strategy
 Acquisition Strategy: The Program Management Office (PMO) will pursue full and open competition for BCS-F Modification 1 efforts. The BCS-F PMO is finalizing a Project Arrangement (PA) to become a cooperative program with Canada for the ADS-B and ECEF efforts. These two efforts are anticipated to be awarded concurrently for development in a single release to the Air Defense Sectors.

Management Strategy: Efforts supporting ADS-B and ECEF will be managed by BCS-F PMO in conjunction with Canada PMO and are under the purview of the Air Force Program Executive Officer for Battle Management (AFPEO BM). Air Force Life Cycle Management Center (AFLCMC) is the Contracting Authority.

Contracting Strategy: The BCS-F PMO will utilize full and open competition with a small business set-aside where viable to complete the development and integration of ADS-B and ECEF capabilities. Cost Plus contract with some Fixed Price and Time & Material CLINs will be utilized where possible and appropriate.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0102326F / Region/Sector Operation Control Center Modernization Program	Project (Number/Name) 674592 / R/SAOC MODERNIZATION
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BCS MODIFICATION 1	Various	Various : Various	-	8.129	Jul 2018	3.287	Jul 2018	7.783	Oct 2018	-		7.783	Continuing	Continuing	0.000
Subtotal			-	8.129		3.287		7.783		-		7.783	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
46th Test Wing/Other Test Act	Various	Various : Various	-	-		-		0.107	Oct 2018	-		0.107	Continuing	Continuing	0.000
Subtotal			-	-		-		0.107		-		0.107	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management and Administration	Various	Various : Hanscom AFB	-	0.155	Feb 2017	0.060	Apr 2018	0.389	Oct 2018	-		0.389	Continuing	Continuing	0.000
A&AS	Various	Various : Hanscom AFB	-	2.584		-		0.973	Oct 2018	-		0.973	Continuing	Continuing	-
Subtotal			-	2.739		0.060		1.362		-		1.362	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	10.868	3.347	9.252	-	9.252	Continuing	Continuing	N/A

Remarks
FY19 Milestones: Critical Design Review, Test Readiness Review, Developmental Test and Operational Test.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0102326F / <i>Region/Sector Operation Control Center Modernization Program</i>	Project (Number/Name) 674592 / <i>R/SAOC MODERNIZATION</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Battle Control System Fixed Modification 1																												
BCS MODIFICATION 1																												
Milestone B (JAN)																												
Contract Award Date (JUL)																												
SRR/IBR (AUG)																												
Critical Design Review (OCT)																												
Developmental Testing (AUG)																												
Initial Operation Capability (JUL)																												
BCS MODIFICATION 2																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0102326F / <i>Region/Sector Operation Control Center Modernization Program</i>	Project (Number/Name) 674592 / <i>R/SAOC MODERNIZATION</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Battle Control System Fixed Modification 1</i>				
BCS MODIFICATION 1	3	2017	1	2021
Milestone B (JAN)	2	2018	2	2018
Contract Award Date (JUL)	4	2018	4	2018
SRR/IBR (AUG)	4	2018	4	2018
Critical Design Review (OCT)	1	2019	1	2019
Developmental Testing (AUG)	4	2019	4	2019
Initial Operation Capability (JUL)	4	2020	4	2020
BCS MODIFICATION 2	2	2021	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0105921F / <i>Service Support to STRATCOM - Space Activities</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	8.381	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
670373: <i>DCIP</i>	-	0.474	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
672486: <i>JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES</i>	-	2.602	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A011: <i>Space Analysis and Application Development</i>	-	5.305	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

No mission description provided.

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	8.674	0.000	0.000	0.000	0.000
Current President's Budget	8.381	0.000	0.000	0.000	0.000
Total Adjustments	-0.293	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	-0.293	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0105921F / <i>Service Support to STRATCOM - Space Activities</i>	Project (Number/Name) 670373 / DCIP
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
670373: DCIP	-	0.474	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission Description not provided.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0105921F / <i>Service Support to STRATCOM - Space Activities</i>				Project (Number/Name) 672486 / <i>JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
672486: <i>JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES</i>	-	2.602	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission Description not provided.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0105921F / <i>Service Support to STRATCOM - Space Activities</i>	Project (Number/Name) 67A011 / <i>Space Analysis and Application Development</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>67A011: Space Analysis and Application Development</i>	-	5.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission Description not provided.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	1,086.386	167.239	201.394	115.345	4.500	119.845	225.619	246.000	192.116	172.650	922.964	3,334.213
675246: <i>MQ-9 Development and Fielding</i>	1,086.386	117.275	119.783	22.844	0.000	22.844	45.723	61.003	33.006	33.607	0.000	1,519.627
675247: <i>Squadron Operations Centers (SOC)</i>	0.000	0.000	7.264	5.752	0.000	5.752	0.000	0.000	0.000	0.000	0.000	13.016
675249: <i>MQ-9 Upgrade</i>	0.000	49.964	74.347	86.749	4.500	91.249	179.896	184.997	159.110	139.043	922.964	1,801.570

Program MDAP/MAIS Code: 424

Note

This program, BA 7, PE 0205219F, project 675246, Communications, is a new start.

Received \$35M of FY17 MQ-9 3600 ACAT II OCO funding under the 675249: MQ-9 Upgrade program, ESP coded 7C. This funding is not correctly reflected in IDECS or the latest ABIDES run (11 Jan 2018, version 2).

A. Mission Description and Budget Item Justification

The basic MQ-9 Reaper system consists of the aircraft, sensors, ground control station (GCS), communications equipment, weapon kits, support equipment, simulator and training devices, Readiness Spares Packages (RSP), technical data/training, and personnel required to operate, maintain, and sustain the system. The system is designed to be modular and open-ended. Mission-specific equipment is employed on specific aircraft and control station configurations to be tailored to fit mission needs.

In FY19 the MQ-9 Reaper system has three separate development programs. This PE includes:

1. MQ-9 Development and Fielding. This effort is for development and fielding of the baseline MQ-9 aircraft and GCSs and associated communications systems, sensors, payloads, simulators and support equipment as well as resolving DMS issues.
2. Squadron Operations Centers (SOC). This effort is for development and fielding of standardized operations centers containing the equipment necessary for remote split operation, to provide mission data and tasking information to the aircrew and disseminate and/or exchange mission data with decision-makers and the intelligence community.
3. MQ-9 Upgrade. This effort is to develop improvements for existing systems and to field new capabilities for the baseline MQ-9 fleet using a Hybrid Acquisition Strategy.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 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.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	151.373	201.394	197.573	0.000	197.573
Current President's Budget	167.239	201.394	115.345	4.500	119.845
Total Adjustments	15.866	0.000	-82.228	4.500	-77.728
• Congressional General Reductions	-0.057	0.000			
• Congressional Directed Reductions	-13.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	35.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-6.077	0.000			
• Other Adjustments	0.000	0.000	-82.228	4.500	-77.728

Change Summary Explanation

FY17

- \$13M Congressional reduction for program growth
- \$6.077M in SBIRS reductions
- + \$35M Congressional add for Automatic Take-off Landing Control (ATLC)

FY19 Base

- The FY19 funding request was reduced by \$96.728 million to account for the availability of prior year execution balances.
- + \$10M added to address Dismount Radar development

FY19 OCO

- + \$4.5M added to address Link 16 development

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675246: MQ-9 Development and Fielding	1,086.386	117.275	119.783	22.844	0.000	22.844	45.723	61.003	33.006	33.607	0.000	1,519.627
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0205219F, project 675246, Communications, is a new start.

Quantity of RDT&E Articles refers only to test aircraft.

A. Mission Description and Budget Item Justification

The basic MQ-9 Reaper system consists of the aircraft, sensors, ground control station (GCS), communications equipment, weapon kits, support equipment, simulator and training devices, Readiness Spares Packages (RSP), technical data/training, and personnel required to operate, maintain, and sustain the system. The system is designed to be modular and open-ended. Mission-specific equipment is employed on specific aircraft and control station configurations to be tailored to fit mission needs.

The MQ-9 Reaper aircraft is a single-engine, turbo-prop Remotely Piloted Aircraft (RPA) designed to operate over-the-horizon at medium-to-high altitude for long endurance sorties. The aircraft is designed to primarily prosecute critical emerging Time-Sensitive-Targets (TSTs) using a Synthetic Aperture Radar (SAR), Electro-optical/Infrared (EO/IR), and laser designator-based attack asset with on-board hard-kill weapon capability (hunter-killer). It also performs Intelligence, Surveillance, Reconnaissance and Target Acquisition (ISR TA).

The MQ-9 system is continuing to develop and field capabilities to meet evolving mission needs through incremental upgrades, including but not limited to: increasing the maximum gross takeoff weight; increasing operational range and endurance; propulsion system improvements; integrated redundant avionics; incorporating provisions for a Foreign Military Sales(FMS) exportable version of the weapon system; communications upgrades to include but not limited to datalink encryption, Internet Protocol (IP) networking, secure voice and data communications; navigation system upgrades; electrical system upgrades; sensor/stores management computer improvement; MIL-STD-1760 advanced weapons data bus; advanced sensor and weapon payloads; improved human-machine interface (HMI); software updates needed to support new configurations and development; integrating additional precision weapons; hardware and software upgrades to the ground control station. The program will also complete airworthiness and weapon system certification and accreditation; produce applicable training for payloads funded in other program elements (e.g. SIGINT, communications, Wide Area Motion Imagery (WAMI), Near Vertical Direction Finding (NVDF), Gorgon Stare Quick Reaction Capability, advanced Counter-Improvised Explosive Device (C-IED), missile defense, hyperspectral, and other sensors and weapons). Development efforts will address reliability, maintainability, sustainability, (Diminishing Manufacturing Sources) DMS and safety issues. Activities also include, but not limited to, trade studies, analyses, preliminary systems engineering, system and subsystem level testing in accordance with DoD and military standards, and specification development in support of both current program planning and execution, and studies supporting analysis and investment in future MQ-9 program planning.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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The GCS functions as the aircraft cockpit and can control the aircraft either within Line-of-Sight (LOS) or Beyond Line-of-Sight (BLOS) via a combination of satellite relay and terrestrial communication architectures. The GCS is either mobile to support forward operating locations or fixed at a facility to support reach back Remote Split Operations (RSO). The GCS has the capability to: perform mission planning; provide a means for manual control; and enable personnel to launch, recover, and monitor aircraft, payloads, and system communications status. It incorporates secure data links to send aircraft and payload commands and receive system telemetry and payload data; monitors threats to the aircraft; displays the common operational picture; and provides support functions. Launch and Recovery GCS (LRGCS) is used for servicing, systems checks, maintenance, launch and recovery of aircraft under LOS control for hand-off to a mobile or fixed facility GCS, and conducting operations within LOS range of the LRGCS. GCS upgrades will be developed and fielded in coordination with improvements to other MQ-9 system capabilities and in response to evolving operational and information assurance/certification and accreditation requirements.

This project will also increase interoperability among developed systems by developing common standards and tools.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 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.

Funding may be used to address Diminishing Manufacturing Sources (DMS) and Non-Recurring Engineering (NRE) issues.

This program is 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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: MQ-9 System Development and Demonstration (SDD)</p> <p>Description: Complete development to meet MQ-9 Capabilities Production Document (CPD) requirements. Including but not limited to engineering change orders and associated studies and general research.</p> <p>FY 2018 Plans: Will continue general research, engineering change orders and associated studies, this may include, but not limited to KU-BAND PDDL Line Of Sight Modification Characterization Testing, SATCOM and Predator Primary Data Link (PDDL), both Line Of Sight (LOS) and Beyond Line of Sight (BLOS), and upgrade and/or improvements.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY 2018 to FY 2019: SDD funding ends in FY18.</p>	7.622	3.894	-	-	-
<p>Title: Ground Control Station (GCS) Development</p>	66.084	13.526	9.311	-	9.311

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Description: Develop GCS capabilities. Major capabilities include, but not limited to, payload separation, open system architecture, multi-level security, ergonomic cockpit design, single seat operations, and reducing or eliminating known deficiencies in legacy GCS.

- FY 2018 Plans:**
Will continue GCS design/development, manufacturing and test including, but not limited to:
- Hardware/Software Development
 - Integration and test
 - Procure additional Block 50 GCS Development Test assets (for a total of 7 development Test Assets)
 - Continue Contractor test build
 - Maintenance evaluation team event
 - Military Flight Release
 - Resolution of diminishing manufacturing sources (DMS) issues
 - Field Service Representative (FSR) support during IOT&E

- FY 2019 Base Plans:**
Will continue GCS design/development, manufacturing and test including, but not limited to:
- Hardware/Software Development
 - Integration and test
 - Procure additional Block 50 GCS Development Test assets (for a total of 7 development Test Assets)
 - Continue Contractor test build
 - Maintenance evaluation team event
 - Military Flight Release
 - Resolution of DMS issues
 - Field Service Representative (FSR) support during IOT&E

FY 2018 to FY 2019 Increase/Decrease Statement:
Funding reduced in FY19 due to higher USAF priorities.

Title: MQ-9 MTS-B Electro-Optic/Infrared (EO/IR) Sensor	0.277	3.365	-	-	-
Description: Develop improved Multi-Spectral Targeting System (MTS-B) modes of operation and upgrade full motion video capability to include, but not limited to, an all digital architecture employing High-Definition (HD) camera formats, imagery improvements across all multi-spectral bands (color and infrared) and Target Location					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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B. Accomplishments/Planned Programs (\$ in Millions)

Accuracy (TLA) enhancements to support use of coordinate seeking weapons, and integration of High Definition Electro-optical Infra-red sensor upgrades, and software updates.

FY 2018 Plans:

- Will Support MTS software development integration into the MQ-9 platforms
- Will continue to develop, integrate, improve EO/IR sensor capabilities
- Will continue to develop, integrate enhanced laser spot tracker capabilities
- Will continue to progress towards improved organic field & depot support & sustainment
- Resolution of DMS issues

FY 2018 to FY 2019 Increase/Decrease Statement:

MTS software development integration will continue under the MQ-9 upgrade program (project 675249).

Title: Operator Simulator

Description: Develop Operator Simulators for training and updates to keep Operator Simulators concurrent with the aircraft and Ground Control Station (GCS) to include Joint Urgent Operational Need (JUON) support emerging Air Force Special Operations Command (AFSOC) configurations.

FY 2018 Plans:

Will continue to implement updates which will keep the Operator Simulator current with the aircraft and GCS, including, but not limited to:

- Sensors
- Databases
- Weapons upgrades
- Resolution of DMS issues

FY 2019 Base Plans:

Will continue to implement updates which will keep the Operator Simulator current with the aircraft and GCS, including, but not limited to:

- Sensors
- Databases
- Weapons upgrades
- Resolution of DMS issues

FY 2018 to FY 2019 Increase/Decrease Statement:

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Accuracy (TLA) enhancements to support use of coordinate seeking weapons, and integration of High Definition Electro-optical Infra-red sensor upgrades, and software updates.</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> • Will Support MTS software development integration into the MQ-9 platforms • Will continue to develop, integrate, improve EO/IR sensor capabilities • Will continue to develop, integrate enhanced laser spot tracker capabilities • Will continue to progress towards improved organic field & depot support & sustainment • Resolution of DMS issues <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i></p> <p>MTS software development integration will continue under the MQ-9 upgrade program (project 675249).</p> <p><i>Title:</i> Operator Simulator</p> <p><i>Description:</i> Develop Operator Simulators for training and updates to keep Operator Simulators concurrent with the aircraft and Ground Control Station (GCS) to include Joint Urgent Operational Need (JUON) support emerging Air Force Special Operations Command (AFSOC) configurations.</p> <p><i>FY 2018 Plans:</i></p> <p>Will continue to implement updates which will keep the Operator Simulator current with the aircraft and GCS, including, but not limited to:</p> <ul style="list-style-type: none"> • Sensors • Databases • Weapons upgrades • Resolution of DMS issues <p><i>FY 2019 Base Plans:</i></p> <p>Will continue to implement updates which will keep the Operator Simulator current with the aircraft and GCS, including, but not limited to:</p> <ul style="list-style-type: none"> • Sensors • Databases • Weapons upgrades • Resolution of DMS issues <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i></p>	7.461	4.745	3.769	-	3.769

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Operator Simulator development efforts will continue at a reduced level as efforts under the MQ-9 upgrade program (project 675249) ramp up.					
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Title: Release 1 and Release 2	28.255	80.186	5.605	-	5.605
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Description: Release 1 and Release 2 continue execution of a subset of work previously performed under the System Development and Demonstration (SDD) effort, while rapidly integrating upgrades or improvements (including limited urgent needs) fleet-wide. Development will combine the rigor of an event driven development process (referred to as a Technology Maturation Effort (TME)) with the expeditious delivery of a schedule driven integration and fielding process (referred to as a Release).
 These efforts may include, but not limited to: Take off and landing Data (TOLD), MTS-B Integration, GCS Block 50, Counter IED, IP Migration, SAR Development, GCS Block 30, Extended Range, Enablers Development, Multi Transit Ops, weapons integration, OA MCM, and test on MQ-9 platform for capabilities such as rockets, missiles, bombs, guns and direct energy weapons, as well as software development required to support new capabilities.

- FY 2018 Plans:**
 Continue developing and integrating the software and data to update the MQ-9 Block 5 UAS capabilities to include but not limited to:
- Test and delivery of updated Operational Flight Program (OFP) releases of increased communications, sensors and weapons capabilities
 - Systems Integration Laboratory and Hardware In Loop Laboratory testing
 - Systems engineering data development
 - Technical orders (TOs) and training documentation development
 - Test planning
 - Integrated test execution (development test & operational test)
 - Initial training
 - Preparation for limited fielding of aircraft (logistics activities)
 - Software Development to support new capabilities
 - Take off and landing Data (TOLD)
 - Resolution of DMS issues

Complete Tech Maturation events for Stations 1&7 Wiring (BLOS), Extended Range for Block 5 aircraft and Payload Multi-Plexing. Activities to include but not limited to:

- Drawings

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • T-2 Mods/Technical Orders • Ground test • Safety and Airworthiness certifications • Specification work • Software Development to support new capabilities <p>FY 2019 Base Plans: Continue developing and integrating the software and data to update the MQ-9 Block 5 UAS capabilities that would include, but not limited to:</p> <ul style="list-style-type: none"> • Resolution of DMS issues <p>FY 2018 to FY 2019 Increase/Decrease Statement: Tech maturation efforts will continue at a reduced level as efforts under the MQ-9 Upgrade program (project 675249) ramp up.</p>					
<p>Title: Test Support</p> <p>Description: Provides Other Government Agency support for MQ-9 testing to include, but not limited to, continued acceptance testing of weapon system hardware and software IAW with contract standards, developmental testing of new capabilities, and Reliability and Maintainability (R&M) upgrades.</p> <p>FY 2018 Plans: Will continue test support</p> <p>FY 2019 Base Plans: Will continue test support</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Test Support efforts will continue at a reduced level as efforts under the MQ-9 Upgrade program (project 675249) ramp up.</p>	1.453	1.240	0.801	-	0.801
<p>Title: Communications</p> <p>Description: Develop MQ-9 communications capabilities including, but not limited to, encrypted and improved LoS data links to ROVER/Video Data Link terminals (VORTEX/Airborne Platform Video Data Link) and Bandwidth Efficient (BE) Common Data Link (CDL) for Command and Control (C2) and ISR transmission to GCS, as well as improved (including BE) Beyond LOS (BLOS) military Satellite Communications (SATCOM) usage. Development and integration of an IP-based RSO network/infrastructure to include: Improvements to Ground Data Terminals (GDT), Design, development, and test of IP-based network interfaces, Improved</p>	-	-	0.073	-	0.073

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Predator Primary Data Link (PPDL) capabilities, network systems managers, SATCOM and relay site capabilities upgrades, drafting Technical Orders (TOs) and support documentation, training materials, production drawings, and retrofit acceptance plans.</p> <p>FY 2019 Base Plans: Begin to develop and enhance MQ-9 communications capabilities, to include but not limited to, solutions of various DMS issues</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Primarily in order to mitigate the effects of diminishing manufacturing sources, the communication subsystems of the MQ-9 ACAT I program will begin development of suitable replacements in FY19.</p>					
<p>Title: MQ-9 Technology Insertion</p> <p>Description: Develop program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System.</p> <p>FY 2018 Plans: Will continue development of program protection Technology Insertion capabilities and functionality for the MQ-9 Weapon System including aircraft, sensors, and Ground Control Station (GCS) documentation and drawings</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Technology Insertion will continue under the MQ-9 Upgrade program (project 675249).</p>	6.023	9.633	-	-	-
<p>Title: Reliability and Maintainability</p> <p>Description: Develop MQ-9 modification improvements for aircraft, engines and ground base infrastructure. Includes, but not limited to engineering change orders, associated studies and general research.</p> <p>FY 2018 Plans: Develop MQ-9 modification improvements for aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability cost, as well as addressing and resolving diminishing manufacturing sources (DMS) issues.</p> <p>FY 2019 Base Plans:</p>	0.100	3.194	3.285	-	3.285

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue to develop MQ-9 modification improvements for aircraft and ground base infrastructure, to include, but not limited to engineering change orders, associated studies and general research as well as addressing and resolving diminishing manufacturing sources (DMS) issues. FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to estimated inflation.					
Accomplishments/Planned Programs Subtotals	117.275	119.783	22.844	-	22.844

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 04 Line Item PRDTB1: MQ-9	488.552	388.221	349.707	-	349.707	497.568	213.863	266.727	413.252	396.090	3,013.980
• APAF 06 Line Item PRDTB1: MQ-9 Spares	82.193	48.693	103.890	-	103.890	181.076	74.995	66.872	103.508	21.330	682.557
• APAF 05 Line Item PRDTB2: MQ-9 Mods	69.295	132.869	155.727	-	155.727	138.646	141.801	101.319	103.162	40.680	883.499
• APAF 07 Line Item PRDTB1: MQ-9	30.858	36.368	25.671	-	25.671	26.607	26.622	27.154	27.648	0.000	200.928

Remarks

D. Acquisition Strategy

The MQ-9 Reaper system will be acquired via sole-source contracts with General Atomics Aeronautical Systems Inc. (GA-ASI), L3Comm, and Raytheon as the prime contractors. GA-ASI is the prime contractor for aircraft and ground control stations. GA-Mission Systems (GA-MS) is the prime contractor for Lynx SAR. L3Comm is the prime contractor for the Predator Satellite Link. Raytheon is the prime contractor for the MTS-B EO/IR sensor system. Management of development and fielding of new capabilities will be through an acquisition strategy that combines the rigor of an event driven development process (referred to as a Technology Maturation Effort (TME)) with the expeditious delivery of a schedule driven integration and fielding process. This will allow continued baseline improvements while rapidly integrating limited urgent needs fleet-wide.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MQ-9 System Development and Demonstration (SDD)	SS/CPIF	GA-ASI : Poway, CA	346.359	6.960	May 2017	3.466	May 2018	-		-		-	0.000	356.785	362.453
Ground Control Station (GCS) Development	SS/CPFF	GA-ASI : Poway, CA	229.411	60.346	Oct 2016	12.037	Oct 2017	7.359	Oct 2018	-		7.359	146.969	456.122	349.818
Multi-Spectral Targeting System (MTS)-B EO/IR Sensor	SS/CPFF	Raytheon : McKinney, TX	112.754	0.253	Feb 2017	2.994	Mar 2018	-		-		-	0.000	116.001	112.944
Operator Simulator	SS/CPIF	L3 Comm : Salt Lake City, UT	34.871	7.461	Apr 2017	4.745	Mar 2018	3.769	Mar 2019	-		3.769	6.382	57.228	56.512
Release1 and Release 2	SS/CPFF	GA-ASI : Poway, CA	84.112	25.803	May 2017	71.360	Feb 2018	4.430	Feb 2019	-		4.430	0.000	185.705	161.096
Communication	SS/CPFF	GA-ASI : Poway, CA	16.120	-		-		0.073	Mar 2019	-		0.073	0.118	16.311	17.336
MQ-9 Program Protection Technology Insertion	SS/CPFF	GA-ASI : Poway, CA	39.431	5.500	Apr 2017	8.572	Apr 2018	-		-		-	0.000	53.503	58.239
Reliability and Maintainability	SS/CPFF	GA-ASI : Poway, CA	3.860	0.101	Aug 2017	3.194	Apr 2018	3.285	Apr 2019	-		3.285	6.852	17.292	8.023
Completed Efforts	SS/ Various	Various : Various	141.525	-		-		-		-		-	0.000	141.525	77.805
Miscellaneous Prior	Various	Various : Various	-	-		-		-		-		-	0.000	0.000	71.556
Subtotal			1,008.443	106.424		106.368		18.916		-		18.916	160.321	1,400.472	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Support	Various	Various : Various, CA	19.878	1.453	Aug 2017	1.240	May 2018	0.801	May 2019	-		0.801	1.306	24.678	22.665
Subtotal			19.878	1.453		1.240		0.801		-		0.801	1.306	24.678	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Other Government Costs	Various	Various : Various	58.065	9.398	May 2017	12.175	May 2018	3.127	May 2018	-		3.127	11.711	94.476	119.924
Subtotal			58.065	9.398		12.175		3.127		-		3.127	11.711	94.476	N/A
Project Cost Totals			1,086.386	117.275		119.783		22.844		-		22.844	173.338	1,519.626	N/A

Remarks
PMA costs are included in Other Government Costs.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

MQ-9 ACAT IC Development	
MQ-9 System Development and Demonstration (SDD) / Modernization FOT&E	
Ground Control Station (GCS) Development	
MTS-B Updates (Electro-Optical/Infrared (EO/IR) Sensor)	
Operator Simulator	
Release 1 & Release 2	
Test Support	
Communications	
MQ-9 Technology Insertion	
Reliability & Maintainability	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675246 / MQ-9 Development and Fielding

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MQ-9 ACAT IC Development</i>				
MQ-9 System Development and Demonstration (SDD) / Modernization FOT&E	1	2017	4	2018
Ground Control Station (GCS) Development	1	2017	4	2023
MTS-B Updates (Electro-Optical/Infrared (EO/IR) Sensor)	1	2017	4	2018
Operator Simulator	1	2017	4	2023
Release 1 & Release 2	1	2017	4	2019
Test Support	1	2017	4	2023
Communications	1	2017	4	2023
MQ-9 Technology Insertion	1	2017	4	2018
Reliability & Maintainability	1	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV				Project (Number/Name) 675247 / Squadron Operations Centers (SOC)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675247: Squadron Operations Centers (SOC)	0.000	0.000	7.264	5.752	0.000	5.752	0.000	0.000	0.000	0.000	0.000	13.016
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

In FY19, PE 0205219F, MQ-9, Project 675247, Squadron Operations Centers(SOC) RDT&E efforts are completed.

A. Mission Description and Budget Item Justification

The SOC is required to employ Remote Split Operations (RSO). It provides the communications, network, aircraft control and sensor distribution circuits to effectively execute RSO missions. The SOC provides CONUS-based aircrews mission data, tasking, and ability to disseminate and exchange mission data with decision-makers and intelligence entities. This effort will define component standards, develop and stand up a SOC Systems Integration Lab (SIL), and integrate new technologies to maintain currency with technological and platform advancements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Squadron Operations Center	0.000	7.264	5.752	-	5.752
Description: Development of a Squadron Operations Center (SOC) common to ACC, AFSOC, and ANG. Major capabilities include secure mission communications; data reception, recording, editing, analysis, dissemination, and exchange; mission planning, preparation, and support; mission execution (e.g., updates to threat tracking and targeting, weather tracking, mission status and capability; tactical situational awareness; etc.); and mission reconstruction and debriefing.					
FY 2018 Plans:					
- Design and develop Remotely Piloted Aircraft Squadron Operations Center (RPA SOC) capabilities					
- Preliminary Design Review					
- Initial hardware purchase for test asset					
- Hardware/Software Development					
FY 2019 Base Plans:					
-Complete design review, development, and delivery of SIL to integrate capabilities into RPA SOC					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675247 / Squadron Operations Centers (SOC)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Integration of emerging technologies into the SOC baseline.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding decreased due to procurement of SIL Hardware and Software being programmed in FY18.					
Accomplishments/Planned Programs Subtotals	0.000	7.264	5.752	-	5.752

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 837300: <i>Base Communications Infrastructure</i>	-	7.529	45.460	-	45.460	28.898	31.684	32.244	32.818	0.000	178.633

Remarks
 Since 2004, MQ-1/MQ-9 squadrons have acquired equipment, on an ad hoc basis, to provide the communications, network, aircraft control and sensor distribution circuits needed to execute Remote Split Operations (RSO) missions. OPAF funding will be used to standardize and modernize existing RPA SOC capability, which is required to reduce security vulnerabilities, as well as address end of life/end of support issues of existing RPA SOC equipment. The Systems Integration Lab will be used to further enhance the program's ability to update future RPA-SOC modernization efforts.

D. Acquisition Strategy
 AFLCMC/WII manages the SOC Program for ACC, AFSOC, and ANG through organic development at the 402 SMXG, and hardware/software procurement utilizing the Air Force NETCENTS contract vehicle, as well as other Air Force and GSA contracts.

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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675247 / Squadron Operations Centers (SOC)

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
RPA SOC SIL																												
Systems Integration Lab (SIL) Development																												
RPA SOC SIL Preliminary Design Review (PDR)																												
RPA SOC SIL Critical Design Review (CDR)																												
RPA SOC SIL Development Testing																												
RPA SOC SIL Delivery																												
RPA SOC Emerging Technology Integration																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675247 / Squadron Operations Centers (SOC)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>RPA SOC SIL</i>				
Systems Integration Lab (SIL) Development	2	2018	4	2019
RPA SOC SIL Preliminary Design Review (PDR)	4	2018	4	2018
RPA SOC SIL Critical Design Review (CDR)	2	2019	2	2019
RPA SOC SIL Development Testing	3	2019	3	2019
RPA SOC SIL Delivery	4	2019	4	2019
RPA SOC Emerging Technology Integration	3	2019	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV				Project (Number/Name) 675249 / MQ-9 Upgrade			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675249: MQ-9 Upgrade	0.000	49.964	74.347	86.749	4.500	91.249	179.896	184.997	159.110	139.043	922.964	1,801.570
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MQ-9 Upgrade Program will develop and integrate improvements for existing systems and field new capabilities for the MQ-9 fleet through an Agile Acquisition Strategy.

The objective is to enable rapid fielding of new software, hardware, and sustainability for integration into the MQ-9 fleet. Per the Combined Capability List (CCL) signed 20 June 2017, capabilities may include, but are not limited to, efforts to reduce system configurations; perform technology upgrades; increase pilot awareness and usability; improve reconnaissance targeting and exploitation; expand weapons system selection and lethality; enlarge suitability to varying operational theaters; Diminishing Manufacturing source (DMS); improve security and self protect; reduce logistics footprint; train the warfighter.

Activities also include studies, analysis, simulations, demonstrations, and testing and the use of "experts" and agencies in developing and testing MQ-9 system capabilities, to include SIL/HIL and DET improvements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MQ-9 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.

Funding may be used to address Diminishing Manufacturing Sources (DMS) and Non-Recurring Engineering (NRE) issues.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MQ-9 Upgrade	49.964	66.595	78.371	4.500	82.871
<p>Description: Develop and integrate upgrade capabilities to support of the MQ-9 Upgrade Strategy. Development will combine the rigor of an event driven development process (referred to as Technology Maturation Effort (TME)) with the expeditious delivery of a schedule driven integration and fielding process. New capabilities will include, but not limited to, upgrades of existing aircraft, GCS, communication, payload systems, and software updates needed to support new configurations and development, the addition of new capabilities and subsystems, as well as addressing and resolving diminishing manufacturing sources (DMS) issues. Final lists of upgrades included will be determined as part of future Combatant Command (ACC, AFSOC) direction and inputs from JUONs and UON requests. Formal approval of software/hardware content will be established in FY 2018 and is currently subject to fluctuation pending customer priorities. Some current candidates for integration into upcoming software releases include, but not limited to:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> • Auto Take-off and Landing Capability (ATLC) • Weapons, weapons capabilities, and weapons usability • Reconnaissance, targeting and technology improvements in MTS, SAR, sensors, and GPS • System corrections, improvements, technology upgrades within the GCS, UAV communications and ground support (i.e., but not limited to DMS, batteries, engine, Bandwidth Efficient (BE) Common Data Link (CDL), Beyond Line of Sight (BLoS)) • Expand theater capabilities such as Anti-ice/De-ice, MWAS, Link 16, MCode, Mode 5, ADS-B, and ABSAA • Improve system security and the ability to self protect through KU or GPS jamming; data encryption, IFF, electronic warfare, signature reduction • Battle Management Command and Control <p>FY 2018 Plans: Will continue Tech Maturation effort (TME) developing upgrade capabilities in conjunction with the CCL to include, but not limited to:</p> <ul style="list-style-type: none"> • Auto take off and landing (ATLC) capabilities with agile ground operations (i.e. XC2 and PDGT) • Technology/reliability upgrades such as AoA vane, radios, batteries and operating systems • Improvements to weapons capabilities (i.e. auto-lockout, JAGM, LSDB/UAI) • Updated GCS components for usability, security, and performance (i.e. monitors, controllers) • MTS and SAR improvements for targeting, exploitation, and supportability (i.e. video SAR, improved diagnostics) • Expand theater capabilities (i.e. anti-ice/de-ice) • Studies and analysis, simulations, demonstrations, system corrections, training, and testing • Open Architecture Mission Control Module (OA MCM) <p>FY 2019 Base Plans: Will continue Tech Maturation effort (TME) developing upgrade capabilities in conjunction with the CCL to include, but not limited to:</p> <ul style="list-style-type: none"> • Unified Tactical Situational Awareness • Automated Dependent Surveillance - Broadcast (ADS-B) <p>Dismount Radar (DR) to design, development, integration, and testing of Moving Target Indicator (MDI) capability on medium altitude air vehicles for improved dismount and moving target detection, identification, tracking, and classification.</p> <p>FY 2019 OCO Plans:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Develop MQ-9 Link-16 (Airborne Mission Networking) Capability. Effort include, but not limited to, developmental testing, software updates, documentation and training.

FY 2018 to FY 2019 Increase/Decrease Statement:

MQ-9 Upgrade will continue at an increased level as efforts under the MQ-9 Development program (project 675246) ramp down.

Title: MQ-9 Upgrade - Operator Simulator

Description: Develop Operator Simulators for training and updates to keep operator simulators concurrent with the aircraft and Ground Control Station (GCS) to include, but not limited to, Joint Urgent Operational Need (JUON) support emerging, Air Force Special Operations Command (AFSOC) configurations.

FY 2018 Plans:

Implementation of updates which will keep the operator simulator current with the aircraft and GCS, including, but not limited to:

- Sensors
- Databases
- Weapons upgrades
- software

FY 2019 Base Plans:

Continuing to implement updates which will keep the operator simulator current with the aircraft and GCS.

FY 2018 to FY 2019 Increase/Decrease Statement:

MQ-9 Upgrade will continue to increase training and updates to keep operator simulators concurrent with aircraft and GCS configurations.

Title: MQ-9 Upgrade - Reliability and Maintainability

Description: Develop MQ-9 modification improvements for aircraft and ground base infrastructure. Includes engineering change orders and associated studies, and general research.

Address and resolve diminishing manufacturing sources (DMS) issues.

- Continue providing Other Government Agency support for MQ-9 testing to include continued acceptance testing of weapon system hardware and software IAW with contract standards, developmental testing of new capabilities, and Reliability and Maintainability (R&M) upgrades.

FY 2018 Plans:

	-	2.500	6.928	-	6.928
	0.000	1.645	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Development of MQ-9 upgrades for aircraft and ground base infrastructure to improve mission capable rates and reduce reliability and maintainability costs. Including addressing and resolving diminishing manufacturing sources (DMS) issues. FY 2018 to FY 2019 Increase/Decrease Statement: MQ-9 Upgrade reliability and maintainability improvements will continue in FY20 & out.					
Title: MQ-9 Upgrade - Test Support Description: MQ-9 Upgrade testing will provide support, but not limited to, activities for MQ-9 testing of weapon system hardware and software IAW contract standards, developmental testing of new capabilities, and reliability and maintainability (R&M) upgrades. FY 2018 Plans: Start Test Support FY 2019 Base Plans: MQ-9 upgrade will continue test support FY 2018 to FY 2019 Increase/Decrease Statement: MQ-9 upgrade continues to ramp up testing of weapon system hardware and software.	0.000	0.220	1.274	-	1.274
Title: MQ-9 Upgrade - Communications Description: Develop MQ-9 communications capabilities such as, but not limited to: network systems managers, SATCOM and relay site capabilities upgrades, drafting technical orders (TOs) and support documentation, training materials, production drawings, and retrofit acceptance plans. Examples: Bandwidth Efficient (BE) Common Data Link (CDL) Secure Voice MLS ARC-210 Guard Squelch Vortex C-2 Line of Sight C-Band Replacement ARC-210 Secure Communications VORTEX Air-to-Air/VORTEX BE-CDL FY 2018 Plans:	0.000	2.318	0.176	-	0.176

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Development of communications capabilities such as encrypted and improved data links, terminals, command and control, ISR transmissions, GCS communications, SATCOM usage, developm and integrate IP-based network interfaces, improve primary data links and capabilities, network systems managers, drafting technical orders and support documentation, training materials production drawings and retrofit acceptance plans, test and monitor relay equipment, operational durability, enhance remote split operations and supporting communications equipment including associated tech orders, training and interface updates. FY 2019 Base Plans: MQ-9 Upgrade communications capabilities development will continue FY 2018 to FY 2019 Increase/Decrease Statement: Level of effort.					
Title: MQ-9 Upgrade - Urgent Services Description: Urgent Services, engineering change orders, program office support, studies and general research, and other high level initiatives directed by the Air Force. FY 2018 Plans: Urgent services, engineering change orders, studies and general research, and other higher level initiatives directed by the Air Force FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY 2018 to FY 2019: MQ-9 Upgrade urgent services will continue in FY20 & out	0.000	1.069	-	-	-
Accomplishments/Planned Programs Subtotals	49.964	74.347	86.749	4.500	91.249

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 06 PRDTB1: MQ-9 Spares	2.850	16.386	1.726	-	1.726	54.069	14.288	14.084	14.341	0.000	117.744
• APAF 05 PRDTB2: MQ-9 Mods	134.402	131.871	15.821	-	15.821	289.948	91.845	116.954	71.448	373.020	1,225.309

Remarks

D. Acquisition Strategy
Acquisition of MQ-9 upgrades will initially be accomplished via sole-source contracts with General Atomics-ASI and L-3 Communications, the prime contractors. Management of development and fielding of new capabilities will be through a Hybrid Acquisition Strategy that combines the rigor of an event driven development

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
3600 / 7	PE 0205219F / MQ-9 UAV	675249 / MQ-9 Upgrade

process (referred to as a Technology Maturation Effort (TME)) with the expeditious delivery of a schedule driven integration and fielding process (referred to as a Hybrid Release). This will allow continued baseline improvements while rapidly integrating limited urgent needs fleet-wide.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MQ-9 Upgrade	SS/CPFF	GA-ASI : Poway, CA	-	47.409	Aug 2017	61.299	Jun 2018	70.687	Jun 2019	4.500	Jun 2019	75.187	1,315.839	1,499.734	1,656.723
Operator Simulator	SS/CPFF	L3 Comm : Salt Lake City, UT	-	-		2.500	Feb 2018	6.928	Feb 2019	-		6.928	69.463	78.891	137.452
Reliability and Maintainability	SS/CPFF	GA-ASI : Poway, CA	-	-		1.645	Apr 2018	-		-		-	33.201	34.846	42.290
Communications	SS/CPFF	GA-ASI : Poway, CA	-	-		2.318	Mar 2018	0.176	Mar 2019	-		0.176	8.806	11.300	2.383
Urgent Services	SS/CPFF	GA-ASI : Poway, CA	-	-		1.069	Mar 2018	-		-		-	19.202	20.271	24.434
Subtotal			-	47.409		68.831		77.791		4.500		82.291	1,446.511	1,645.042	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Support	Various	Various : Various	-	-		0.220	May 2018	1.274	May 2019	-		1.274	22.125	23.619	24.807
Subtotal			-	-		0.220		1.274		-		1.274	22.125	23.619	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Other Government Costs	Various	Various : Various	-	2.555	May 2017	5.296	May 2018	7.684	May 2019	-		7.684	117.374	132.909	206.328
Subtotal			-	2.555		5.296		7.684		-		7.684	117.374	132.909	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	49.964	74.347	86.749	4.500	91.249	1,586.010	1,801.570	N/A

Remarks
PMA costs are included in Other Government Costs.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

MQ-9 ACAT II Development	
MQ-9 Upgrade	
Operator Simulator	
Reliability and Maintainability	
Test Support	
Communications	
Urgent Services	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MQ-9 ACAT II Development</i>				
MQ-9 Upgrade	4	2017	4	2023
Operator Simulator	2	2018	4	2023
Reliability and Maintainability	3	2018	3	2019
Test Support	3	2018	4	2023
Communications	2	2018	4	2023
Urgent Services	2	2018	2	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0205671F I Joint Counter RCIED Electronic Warfare
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.000	4.000	4.000	0.000	0.000	0.000	0.000	Continuing	Continuing
674518: JCREW VEHICLE INTEGRATION	-	0.000	0.000	0.000	4.000	4.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
This program, BA 7, PE 0205671F, project 674518, CREW device integration, is a new start.

A. Mission Description and Budget Item Justification

Program funds Counter Radio-Controlled Improvised Explosive Device Electronic Warfare (CREW) Mounted, Dismounted, and Fixed systems. CREW devices are self-protection systems critical to Mine Resistant, Ambush Protected (MRAP) vehicle mounted, Explosive Ordinance Disposal dismounted and Entry Control Point operations. Includes integration of the devices into currently fielded systems.

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

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	0.000	4.000	4.000
Total Adjustments	0.000	0.000	0.000	4.000	4.000
• 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	4.000	4.000

C. Accomplishments/Planned Programs (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Title: CREW device integration	-	0.000	0.000	4.000	4.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0205671F <i>I Joint Counter RCIED Electronic Warfare</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: CREW device integration is FY16 OCO funding only. FY 2018 Plans: N/A - No FY18 funding. FY 2019 Base Plans: CREW Device Integration FY 2019 OCO Plans: CREW Device Integration FY 2018 to FY 2019 Increase/Decrease Statement: New Start					
Accomplishments/Planned Programs Subtotals	-	0.000	0.000	4.000	4.000

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPAF 04 Line Item 845100: <i>Engineering and EOD Equipment</i>	0.000	0.000	0.000	0.000	0.000	-	-	-	-	0.000	0.000

Remarks
 Program funds Counter Radio-Controlled Improvised Explosive Device Electronic Warfare (CREW) Mounted, Dismounted, and Fixed systems. CREW devices are self-protection systems critical to Mine Resistant, Ambush Protected (MRAP) vehicle mounted, Explosive Ordinance Disposal dismounted and Entry Control Point operations. Includes integration of the devices into currently fielded systems.

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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205671F / <i>Joint Counter RCIED Electronic Warfare</i>	Project (Number/Name) 674518 / <i>JCREW VEHICLE INTEGRATION</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

No project title.	
JCREW Vehicle Integration	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205671F / <i>Joint Counter RCIED Electronic Warfare</i>	Project (Number/Name) 674518 / <i>JCREW VEHICLE INTEGRATION</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>No project title.</i>				
JCREW Vehicle Integration	2	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	11.353	17.459	26.738	1.000	27.738	39.171	24.581	22.835	23.251	Continuing	Continuing
674809: <i>A-10 Squadrons</i>	-	11.353	17.459	26.738	1.000	27.738	39.171	24.581	22.835	23.251	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207131F, project 674809, ARC-210 Gen 6, is a new start.
 This program, BA 7, PE 0207131F, project 674809, J-Hook, is a new start.

A. Mission Description and Budget Item Justification

A-10 concept of operations requires a flexible, adaptable and survivable weapon system to conduct close air support (CAS), combat search and rescue (CSAR) and special operations missions. The A-10 must conduct around-the-clock air operations under various weather conditions against numerous and varied enemy threats.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues (J-Hook), A-10 Thunderbolt Advanced-wing Continuation Kit (ATTACK), accommodate technology insertion (Additional Gigabit Ethernet capability, High Resolution Display System (HRDS), 3-D Audio, On-Board Oxygen Generation System (OBOGS), Parking Brake, and fulfill FAA and other mandates (IFF Mode-5, Automatic Dependent Surveillance Broadcast (ADS-B) Out, M-Code, NSA Crypto Modernization/ARC-210 radio/Mobile User Objective System (MUOS)) to ensure continued aircrew safety and mission effectiveness, Anti-Jam Embedded Global Positioning System within the provisions of 10 USC 2244A.

Operational Flight Program (OFP) development addresses evolving and continuing user requirements that must be incorporated in the aircraft software in order to employ advanced weapons (SMART Triple Ejector Rack (TER), Small Diameter Bomb (SDB)), increase situational awareness and enhance targeting capabilities as they become available. The funds budgeted continue regular OFP suite development efforts.

Additionally, these OFP/RDT&E funds provide for updates and incorporation of capabilities for weapons integration, targeting pod updates, and communication/navigation/data link improvements (e.g., M-Code, MUOS communication system, ADS-B, Embedded GPS/ INS, Gigabit Ethernet, HRDS, 3-D Audio, ARC-210 radio Crypto Mod, Smart (TER), Small Diameter Bomb (SDB) capability and cyber security upgrades). These funds will ensure concurrency with systems impacted by OFP development, including but not limited to the Full Mission Trainer (FMT), mission planning and support equipment, as well as required upgrades to the Software Integration Laboratory (SIL). The

RDT&E funds provide A-10 Developmental and Operational Testing ensuring all added capability meets safety and airworthiness criteria. FMT's 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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver A-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, and 0605898F.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	21.353	17.459	31.355	0.000	31.355
Current President's Budget	11.353	17.459	26.738	1.000	27.738
Total Adjustments	-10.000	0.000	-4.617	1.000	-3.617
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-10.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-4.617	1.000	-3.617

Change Summary Explanation

FY17 Congressional reduction of -\$10M for excess to need.
 FY19 reduction of \$4.416M due to under execution as well as inflation adjustments.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: OFP Development	11.353	13.459	13.700	-	13.700
Description: Updates to the A-10C OFP Suite software to permit timely integration of new precision weapons, updated targeting pods, improved avionics and enhanced electronic warfare capabilities. These upgraded capabilities are in response to evolving operational requirements, including Urgent Operational Needs, generated by the ever-changing operational environment of air combat.					
This OFP effort also contains Program Management Administration (PMA) support activities to include travel, office supplies, training courses, Video Teleconferencing (VTC) and support contractors.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2018 Plans:</i> Continues Suite 9 development and funds Suite 10 candidate development by completing the software design, development and integration.</p> <p><i>FY 2019 Base Plans:</i> N/A</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Finish Suite 9 continue developing Suite 10. Begin the start of Suite 11.</p>					
<p><i>Title:</i> ARC-210 Gen 6</p> <p><i>Description:</i> The ARC-210 Gen 6 will provide the A-10 with numerous needed capabilities. The first of which is NSA crypto mandate compliant secure communications. The second is the Air Force mandate of all aircraft having Mobile User Objective System (MUOS) capability. The SATURN algorithm is also required for continued A-10 Combat Search and Rescue (CSAR) as well as Close Air Support with theater forces. The older Generation 4 radio does not currently have any of these capabilities.</p> <p><i>FY 2018 Plans:</i> No funding</p> <p><i>FY 2019 Base Plans:</i> Funding will be used for Non-recurring engineering (NRE) for System Integration Laboratory (SIL) Integration and Testing. This will ensure all required equipment and optimal configurations will be tested for fit and function within the A-10 aircraft. In addition, configurations will be flight tested to ensure capabilities are airworthy as well as functional.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> NSA Crypto Mandate needs to be met. Since the A-10 Retirement has been rescinded, Air Force has approved funding in FY19 vs not funding in FY18.</p>	-	0.000	9.083	-	9.083
<p><i>Title:</i> ADS-B Out</p> <p><i>Description:</i> This effort initiates Operational and Developmental Testing for AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST (ADS-B) Out. ADS-B Out is an FAA mandate to meet future air traffic demands and improve air traffic safety. This requirement was identified and approval for the A-10 by means of an AF Form 1067 dated 15 September 2006.</p>	0.000	4.000	3.955	-	3.955

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2018 Plans:</i> This effort initiates Operational and Developmental Testing for AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST (ADS-B) Out.</p> <p><i>FY 2019 Base Plans:</i> This effort continues Operational and Developmental Testing for AUTOMATIC DEPENDENT SURVEILLANCE- BROADCAST (ADS-B) out.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> This effort continues Operational and Developmental Testing for AUTOMATIC DEPENDENT SURVEILLANCE- BROADCAST (ADS-B) out.</p>					
<p><i>Title:</i> J-Hook</p> <p><i>Description:</i> Deployed A-10 units are reporting increased breakage/failure on weapons pylon retention snap hooks (J-Hooks) resulting in damage to the 1760 wiring harness at a rate of 4 to 6 times per week.</p> <p>Breaking J-Hooks/damaged 1760 cables were initially identified in 2009 during the PE Program. A-10 SPO East contracted Lockheed Martin Owego to develop a solution. The design was successfully put through DT at Eglin AFB. OT was subsequently conducted for 30 days, dropping >100 munitions with no defects noted. A-10 SPO has no documentation from OT. J-Hook T-2 Modification was shut down and the design shelved. This J-Hook modification design is now government property.</p> <p><i>FY 2018 Plans:</i> N/A</p> <p><i>FY 2019 Base Plans:</i> N/A</p> <p><i>FY 2019 OCO Plans:</i> This effort will provide material solution (kits) based on current drawings/specs to improve the pylon retention snap hook system.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i></p>	-	0.000	0.000	1.000	1.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
New approved requirement to repair A-10 (J-Hooks) caused during deployment.					
Accomplishments/Planned Programs Subtotals	11.353	17.459	26.738	1.000	27.738

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 05 Line Item A01000: <i>A-10 Squadrons, PE 0207131F</i>	25.139	6.010	19.530	-	19.530	-	-	-	-	0.000	25.139

Remarks

E. Acquisition Strategy
 A-10 OFP development efforts will be conducted organically by the 309th Software Maintenance Group (309 SMXG) at Ogden Air Logistics Complex, Hill AFB UT. The ADS-B, ARC-210 radio Crypto Mandate, SMART Triple Ejector Rack (TER) development for the Small Diameter Bomb (SDB) missionization efforts will be conducted by contractor and organically by the 309 SMXG. The A-10 FMT simulator OFP is managed by the Simulator Division at Wright-Patterson Air Force Base and is currently contractor-developed and integrated.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons	Project (Number/Name) 674809 / A-10 Squadrons
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
OFP Development 2nd Qtr FY16 (309th SMXG)	PO	309th SMXG : Hill AFB, UT	-	-		-		-		-		-	Continuing	Continuing	-
OFP Development (309th SMXG)	PO	309th SMXG : Hill AFB, UT	-	-		-		-		-		-	Continuing	Continuing	-
OFP Development 3rd Qtr FY16 (309 SMXG)	PO	309th SMXG : Hill AFB, UT	-	-		-		-		-		-	Continuing	Continuing	-
OFP Development 4th Qtr (309 SMXG)	PO	309th SMXG : Hill AFB, UT	-	-		-		-		-		-	Continuing	Continuing	-
OFP Development (309 SMXG) FY16	PO	309th SMXG : Hill AFB, UT	-	-		-		-		-		-	Continuing	Continuing	-
OFP Development (309 SMXG) FY16 BTR	PO	309th SMXG : Hill AFB, UT	-	-		-		-		-		-	Continuing	Continuing	-
OFP Development (309 SMXG) FY17	PO	309th SMXG : Hill AFB, UT	-	10.679	May 2017	-		-		-		-	Continuing	Continuing	-
OFP Development 1st Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		1.180	Nov 2017	-		-		-	Continuing	Continuing	-
OFP Development 2nd Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		1.800	Jan 2018	-		-		-	Continuing	Continuing	-
OFP Development 3rd Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		4.800	Apr 2018	-		-		-	Continuing	Continuing	-
OFP Development 4th Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		2.870	Jun 2018	-		-		-	Continuing	Continuing	-
OFP Development 1st Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-				2.610	Nov 2018	-		2.610	Continuing	Continuing	-
OFP Development 2nd Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-				2.610	Jan 2019	-		2.610	Continuing	Continuing	-
OFP Development 3rd Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-				2.610	Apr 2019	-		2.610	Continuing	Continuing	-
OFP Development 4th Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-				2.616	Jun 2019	-		2.616	Continuing	Continuing	-
Subtotal			-	10.679		10.650		10.446		-		10.446	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons	Project (Number/Name) 674809 / A-10 Squadrons
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
USAF (Multiple)	Various	Various : Various	-	0.514	May 2017	4.799	Jan 2018	9.242	Jan 2019	-		9.242	Continuing	Continuing	-
Subtotal			-	0.514		4.799		9.242		-		9.242	Continuing	Continuing	N/A

Remarks
 FY16 \$0.125M - SIM SPO Full Mission Trainers (FMT)
 FY16 \$0.067M - SPO TDY
 FY17 \$0.351M - SIM SPO Full Mission Trainers (FMT)
 FY17 \$0.351M - PMA Tax
 FY17 \$0.020M - SPO TDY
 FY18 \$4.00M - ADS-B Out
 FY18 \$0.750M - SIM SPO Full Mission Trainers (FMT)
 FY18 \$0.049M - SPO TDY
 FY19 \$4.00M - ADS-B Out
 FY19 \$9.083M - ARC-210 Crypto Mandate
 FY19 \$0.750M - SIM SPO Full Mission Trainers (FMT)
 FY19 \$0.049M - SPO TDY

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
USAF (OFF)	Various	Various : Various	-	0.000		1.850	Sep 2018	2.250	Sep 2019	1.000	Sep 2019	3.250	Continuing	Continuing	-
Subtotal			-	0.000		1.850		2.250		1.000		3.250	Continuing	Continuing	N/A

Remarks
 RDT&E Test and Evaluation will not begin until 1st Quarter FY18 due to FY17 cut/mark of \$10M.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA	Various	Various : Various	-	0.160	Aug 2017	0.160	Aug 2018	4.800	Aug 2019	-		4.800	Continuing	Continuing	-
Subtotal			-	0.160		0.160		4.800		-		4.800	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force								Date: February 2018			
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons				Project (Number/Name) 674809 / A-10 Squadrons			
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	11.353	17.459	26.738	1.000	27.738	Continuing	Continuing	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons	Project (Number/Name) 674809 / A-10 Squadrons
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	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				
OFP																																
Suite 9 - OFP System Design, Development and Flight Test																																
Suite 9 - OFP Fields																																
Suite 10 - OFP System Design, Development and Flight Test																																
Suite 10 - OFP Fields																																
ADSB-out																																
ARC - 210 Crypto Mandate																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons	Project (Number/Name) 674809 / A-10 Squadrons
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>OFP</i>				
Suite 9 - OFP System Design, Development and Flight Test	2	2017	1	2019
Suite 9 - OFP Fields	1	2019	1	2019
Suite 10 - OFP System Design, Development and Flight Test	2	2018	4	2020
Suite 10 - OFP Fields	4	2020	4	2020
ADSB-out	2	2018	4	2020
ARC - 210 Crypto Mandate	2	2019	4	2020

Note

Suite 10 was subjected to a FY17 mark for \$10M. The program was reinstated upon receiving supplemental funding. As a result of the mark and late-to-need funding, 13 candidates were also lost from Suite 9.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	132.113	246.578	191.564	0.000	191.564	175.610	175.499	170.536	162.955	Continuing	Continuing
672671: <i>F-16 Squadrons</i>	-	132.113	246.578	191.564	0.000	191.564	175.610	175.499	170.536	162.955	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2019, PE 0207701F, F-16 Full Combat Mission Training project funds were transferred to PE 0207133F, F-16 Squadrons to align program responsibilities.

A. Mission Description and Budget Item Justification

The F-16 Fighting Falcon is the world's premier fixed-wing, high performance, single engine multi-mission fighter aircraft that comprises 50% of the AF fighter inventory. Operational since 1980, the F-16 has proven itself in combat in a variety of air-to-air and air-to-surface missions, such as, offensive and defensive counter-air, close air support, forward air control, air interdiction (day/night and all-weather) and Suppression of Enemy Air Defenses (SEAD)/destruction of enemy air defenses (DEAD). The F-16 remains the USAF's primary SEAD/DEAD platform. The aircraft has evolved its capabilities by capitalizing upon advancements made in computers, avionics systems, engines, and structures technologies to meet emerging warfighter requirements and combat current and evolving enemy threats.

Modification programs include: Operational Flight Program (OFP) development on OFPs required to integrate new precision weapons, advanced targeting pods, improved avionics, hardware (HW) and software (SW) mods to meet DoD mandates and keep the F-16, the respective training simulators, and other hardware subsystems current; Legacy Service Life Extension Program (SLEP), which is a two-phased RDT&E effort, includes a Full Scale Durability Test (FSDT) and Engineering, Manufacturing and Development (EMD) to support structural modifications to increase Certified Service Life (CSL) from 8,000 Equivalent Flight Hours (EFH) to 10,000 EFH (Threshold), or 12,000 EFH (Objective); EMD Hardware/Advanced capability improvements require funding to develop, test, and qualify, weapon systems, aircraft subsystems replaced or modified due to requirements changes, pre-planned product improvements (P3I), Diminishing Manufacturing Sources (DMS) and parts obsolescence; Modular Mission Computer (MMC) Upgrade/Display Generator Upgrade resolves shortfalls in mission computer memory and throughput brought on by the addition of incremental combat capability addresses cyber-security and includes Non-Recurring Engineering (NRE), design, development, integration, and ground/flight test for fielding; F-16 Training Simulator updates enable the USAF to exercise/train using the most current F-16 OFP available to all block configurations, to include both aircrew and maintenance trainers; Joint Air-to-Surface Standoff Missile-Extended Range (JASSM-ER) on F-16 aircraft, and includes NRE, test assets, SEEK EAGLE, integration, and flight test; Comm Suite Radio Upgrade (CSU) improved satellite communication (SATCOM) radio upgrade with Mobile User Objective System (MUOS) capability to meet next-gen tactical narrowband SATCOM with better crypto capabilities; an active electronically scanned array (AESA) radar capable on all blocks that offers advanced electronic protection capabilities as well as improved reliability and maintainability on F-16 aircraft that perform the aerospace control alert mission; MIDS JTRS provides a real-time, jam resistant and secure information system for the transfer of combat data, voice and navigation information between widely dispersed battle elements; Hybrid Flight Control Computer (HFLCC) Auto Ground Collision Avoidance System (AGCAS) development and integration prevents most controlled flight into terrain (CFIT) accidents using terrain database and prediction algorithms for aircraft trajectory recovery and executes an automated fly up maneuver to avoid collision; Automatic Dependent Surveillance - Broadcast (ADS-B) Out on F-16 aircraft provides improved altitude, airspeed and location info to ground stations and other equipped aircraft in vicinity; Digital Radar Warning Receiver improves on existing radar warning receiver performance and improves Electronic Warfare (EW) threat detection range, azimuth, detection time, and allows reduction of radio frequency compatibility issues with other on board transmitters.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-16 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.

This program is 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	147.795	246.578	213.296	0.000	213.296
Current President's Budget	132.113	246.578	191.564	0.000	191.564
Total Adjustments	-15.682	0.000	-21.732	0.000	-21.732
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-12.600	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.531	0.000			
• SBIR/STTR Transfer	-2.551	0.000			
• Other Adjustments	0.000	0.000	-21.732	0.000	-21.732

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

Project: 672671: *F-16 Squadrons*

Congressional Add: *AESA Radars*

Congressional Add Subtotals for Project: 672671

Congressional Add Totals for all Projects

	FY 2017	FY 2018
	15.000	0.000
	15.000	0.000
	15.000	0.000

Change Summary Explanation

FY17 reduction of \$12.6M for a Congressional mark due to Operational Flight Test Program funding as well as Small Business Innovative Research for -\$2.551M and a -.531M reprogramming action

FY19 consists of rephasing of AESA; accelerating MID-J and transfer of F-16 Mission Training Centers (MTC) into PE27133F

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: OFP Updates on all F-16 aircraft</p> <p>Description: OFP tapes are updated continually to integrate new weapons, targeting pods, and improved avionics. M7.1+ is the first OFP developed by the 309th SMG at Hill AFB includes AIM-9X Block II updates and fielded in Mar 2017. M7.2+ OFP is in SW development phase and will incorporate DoD mandates and is scheduled to field in 2019. M8 is in the early stages of planning and will incorporate the MMC upgrade architecture and Display Generator Upgrade and is scheduled to field in 2022. The OFP effort also contains Program Management Administration (PMA) support activities to include travel, office supplies, training courses, Video Teleconferencing (VTC) and support contractors. The Software Capability Upgrade (SCU) program enables the design and coding of software for integration efforts. SCU is required to integrate new precision weapons, advanced targeting pods, improved avionics, and hardware and software modifications to meet DoD mandates and keep the F-16 current. SCU is developed by the 309th SMXG at Hill AFB, Utah.</p> <p>FY 2018 Plans: Continue M7.2+ combined Developmental Flight and Operational Flight test and initiate dedicated Operational Test & Evaluation (OT&E). Conduct M8.1 System Functional Review (SFR) of baseline candidates, start software design and code for re-hosting MMC Upgrade architecture and Programmable Display Generator (PDG) Upgrade and High Speed Data Network (HSDN). SCU9.1 continues developmental and operational flight test. Finalize procurement of SCU9.1 test assets to meet OFP mandates. SCU10 will conduct an Avionics System Requirements Review Council (ASRRC) 4Q FY17 to baseline candidates and begin designing and coding of those candidates in FY18.</p> <p>FY 2019 Base Plans: Complete dedicated OT&E, Functional Configuration Audit (FCA), and field M7.2+ OFP. Begin M8.1 System Integration Lab (SIL) testing. Conduct M8.2 Requirements Working Group (RWG) meeting to baseline M8.2 candidates and start M8.2 SW design and code. Begin early assessment for M9 requirements. Continue SCU9.1 and SCU10 design and code of selected candidates. Finalize developmental and operational flight test for SCU9.1 and field late 1Q FY19. SCU10 will continue to design and code and will field in 2020.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$22.471M change from FY18 to FY19. See above for details.</p>	75.393	76.882	98.613	0.000	98.613
<p>Title: Flight Test</p>	7.774	16.692	17.404	-	17.404

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Description: Development Test and Evaluation (DTE) at Edwards AFB and Development Test/Operational Test (DT/OT) at Eglin AFB, Edwards AFB, Nellis AFB, and Air National Guard Air Force Reserve Test Center (AATC), including integration test of associated subsystems and weapons as well as maintain test schedule for F-16 MMC OFPs, weapons integration, Radio Frequency (RF) compatibility, and sub-systems to ensure capabilities meet CAF's fielding schedule.

FY 2018 Plans:
 Continue support of DTE infrastructure. Initiate M7.2+ test planning for AESA JEON, M7.2+ and AESA begin developmental flight test, support out-of-cycle regression testing.

FY 2019 Base Plans:
 Continue AESA development flight test with M7.2+ OFP, continue M7.2+ combined developmental flight and Operational flight test, initiate dedicated OTE, continue support of DTE infrastructure, support out-of-cycle regression testing.

FY 2018 to FY 2019 Increase/Decrease Statement:
 Increase due to inflation and current estimate.

Title: Legacy Service Life Extension Program (SLEP) Structures	4.783	0.000	0.000	-	0.000
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Description: F-16 Legacy Service Life Extension Program (SLEP): A two-phased RDT&E effort which includes Full Scale Durability Test (FSDT) and Engineering, Manufacturing and Development (EMD) to support structural modifications to F-16 aircraft to increase service life. FSDT is required to prove finite element models and to develop the airworthiness certification basis to extend the current Certified Service Life from 8,000 Equivalent Flight Hours (EFH) to 10,000 EFH (Threshold), or 12,000 EFH (Objective). SLEP EMD develops the engineering solutions necessary to resolve the life-limiting structural issues defined in FSDT and develop the airworthiness certification recommendation.

FY 2018 Plans:
 N/A

FY 2019 Base Plans:
 N/A

FY 2018 to FY 2019 Increase/Decrease Statement:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>			
C. Accomplishments/Planned Programs (\$ in Millions)					
N/A; no efforts planned for FY18					
Title: EMD HW/Advanced Capabilities Improvements					
Description: Advanced Capability Improvements includes, but not limited to sensor upgrades, Radar updates and other self-protection/electronic protection (EP) enhancements, 4th/5th gen fighter network communications, Radio Frequency (RF) compatibility, requirements analysis and studies analysis, lab and/or on-aircraft evaluation of potential subsystem changes/capability improvements.					
FY 2018 Plans: Continue support to develop, test, and qualify aircraft weapons systems including F-16 subsystems replaced or modified due to requirements changes, P3I, DMS and/or parts obsolescence.					
FY 2019 Base Plans: Continue support to develop, test, and qualify aircraft weapons systems including F-16 subsystems replaced or modified due to requirements changes, P3I, DMS and/or parts obsolescence.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Title: MMC Upgrade / Display Generator Upgrade on F-16 aircraft					
Description: The MMC upgrade on the F-16 post-block aircraft, Blk 40, 42, 50, 52 resolves shortfalls in mission computer memory and throughput. Funding includes NRE, design, development, integration, and ground/flight test for fielding with the M8.1 OFP. The addition of an Ethernet High Speed Data Network (HSDN) facilitates future increments of combat capability with the OFP and system compatibility/interoperability (e.g., digital targeting pod video). The Programmable Display Generator (PDG)upgrade allows a fully integrated Multifunction Display solution including Hands On Throttle and Stick (HOTAS) integration with Sensor of Interest (SOI), format swapping and high definition video on 4x4 displays; provides improved display formats during dynamic maneuvers; resolves symbol freezing issues due to throughput constraints; and provides a sustainable approach to address growing DMS concerns with the current Programmable Display Generator.					
FY 2018 Plans:					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	13.657	0.200	0.200	0.000	0.200
	8.921	20.942	11.858	0.000	11.858

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue NRE activities for HSDN, MMC Upgrade and PDG Upgrade for design, development, integration, and ground/flight test for fielding with the M8 OFP. FY 2019 Base Plans: Continue NRE activities for HSDN, MMC Upgrade and PDG Upgrade for design, development, integration, deliver test assets for SIL and flight test for fielding with the M8 OFP. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to current cost estimate and development schedule.					
Title: Simulator Trainers Description: F-16 Simulator Training Programs (Simulators) supports the development, acquisition, fielding and integration of F-16 Simulators. Enables the USAF to exercise and train using the latest F-16 capabilities available to multiple aircraft configurations, while reducing the overall cost of maintenance and aircrew training. In order to maintain concurrency with the aircraft OFP, this funding support development, test and integration of simulator upgrades. Funds may be used to address emerging and short notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. 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. This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-16 weapon system capability. FY 2018 Plans: Continue contract efforts for managing and maintaining F-16 simulator trainers, to include tech order development. This funding also supports development, test, and integration of simulator upgrades to include new aircraft OFPs. FY 2019 Base Plans: Continue contract efforts for managing and maintaining F-16 simulator trainers, to include tech order development. This funding also supports development, test, and integration of simulator upgrades to include new aircraft OFPs. Begin supporting development efforts for the F-16 MTC trainer. FY 2019 OCO Plans:	3.400	2.049	14.625	0.000	14.625

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>				
C. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$12.686M due to MTC program being added to F-16 BPAC 672671 in FY19.						
Title: AESA Radar		0.209	40.766	3.542	0.000	3.542
Description: This is a continuation of the Active Electronically Scanned Array(AESA) Radar congressional add funding line in FY16 and FY17. The AESA Program provides an upgrade from the current APG-68 system to an AESA radar that offers advanced electronic protection capabilities as well as improved reliability and maintainability to support the Aerospace Control Alert (ACA) mission for Homeland Defense (HLD)and includes the Phase III development for full capability development document (CDD) implementation, as well as Radio Frequency (RF) compatibility with other systems.						
FY 2018 Plans: Completes EMD development and initiates flight testing for JEON aircraft. Also begins Phase III Full CDD radar development for CAF aircraft.						
FY 2019 Base Plans: Continues Phase III development efforts for full CDD radar development including flight testing and TO development.						
FY 2019 OCO Plans: N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 decreased due to re-phase of funding to FY20/FY21 for radar software and radome development needed in FY20 for continuation of Phase III development efforts.						
Title: Comm Suite Radio Upgrade Aircraft		2.976	12.416	5.670	0.000	5.670
Description: Provides updates to the ARC-210 satellite communication (SATCOM) radios on F-16 aircraft including Second Generation Anti-Jam Tactical radio for NATO (SATURN) with Mobile User Objective System (MUOS) and improved crypto capability.						
FY 2018 Plans:						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>			
C. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue NRE efforts, procure Group B test assets FY 2019 Base Plans: Continue NRE efforts, procure Group B test assets FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to current estimate.					
Title: Hybrid Flight Control Computer (HFLCC) Auto Ground Collision Avoidance System (AGCAS) Description: Development for Hybrid Flight Control Computer (HFLCC) Auto Ground Collision Avoidance System (AGCAS). FY 2018 Plans: Initiate development on Hybrid Flight Control Computer (HFLCC) Auto Ground Collision Avoidance System (AGCAS), ensure associated OFP effort development and begin Algorithm design development for integration with Advanced Data Transfer Equipment (ADTE) for the AGCAS solution. FY 2019 Base Plans: N/A FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: N/A	0.000	18.962	0.000	0.000	0.000
Title: Digital Radar Warning Receiver Description: Digital Radar Warning Receiver improves on existing radar warning receiver performance and improves Electronic Warfare (EW) threat detection range. The DRWR program also facilitates Radio Frequency (RF) compatibility with associated systems. FY 2018 Plans:	0.000	54.587	36.067	0.000	36.067

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Initiate contract efforts for Digital Radar Warning Receiver, begin NRE efforts for Group A and Group B Hardware, begin Digital RWR Software and any associated OFP updates. FY 2019 Base Plans: Continue efforts for Digital Radar Warning Receiver, continue NRE efforts for Group A and Group B Hardware, continue Digital RWR Software and any associated OFP updates. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: FY19 decreased due to re-phase of funding to FY20/FY21 for continued developmental efforts needed in FY20/ FY21.					
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Title: Multifunctional Information Distribution System Joint Tactical Radio System (MIDS-JTRS) Description: Multifunctional Information Distribution System Joint Tactical Radio System (MIDS JTRS) provides real time, jam-resistant and secure information system for the transfer of combat data, voice and navigation information between widely dispersed battle elements. Enhances situational awareness by exchanging digital data over a common communication link that is continuously and automatically updated in real time. Additionally MIDS JTRS enhanced capabilities provide concurrent multinetting which enhances Link 16 by adding capability to receive four messages in a single time slot and allows for greater network design flexibility along with concurrent contention receive capabilities and J-voice. The F-16 MIDS JTRS effort is developing Ethernet connectivity within the terminal. FY 2018 Plans: N/A FY 2019 Base Plans: Provide funding to the USN MPO development of the F-16 firmware build along with Ethernet capabilities. Fund the creation of technical data/orders. Fund remaining trial vehicle installations (TVIs) for test as well as kit proofing efforts. Fund group A IDIQ contracts required for TVIs and Kit proofing. Fund studies to explore expansion of additional/future MIDS JTRS capabilities including ICAS. FY 2018 to FY 2019 Increase/Decrease Statement: N/A	-	0.000	3.585	-	3.585
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Title: Automatic Dependent Surveillance - Broadcast (ADS-B) Out	0.000	3.082	0.000	0.000	0.000
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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Automatic Dependent Surveillance - Broadcast (ADS-B) Out provides improved altitude, airspeed and location information to ground stations and other appropriate receiving equipped aircraft in vicinity. Funds are included to accommodate the FAA mandate for ADS-B as outlined throughout previous AF and DoD budget exhibits. FY 2018 Plans: Initiate development efforts and contract award for hardware and software updates to the Combined Interrogator Transponder (CIT) and GPS card on F-16 aircraft. Funds are included to accommodate the FAA mandate for ADS-B as outlined throughout previous AF and DoD budget exhibits. FY 2019 Base Plans: N/A FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	117.113	246.578	191.564	0.000	191.564

	FY 2017	FY 2018
Congressional Add: AESA Radars FY 2017 Accomplishments: N/A FY 2018 Plans: N/A	15.000	0.000
Congressional Adds Subtotals	15.000	0.000

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 05 Line Item F01600: <i>F-16 Aircraft Modifications</i>	274.331	203.864	326.975	-	326.975	315.723	773.461	612.781	621.682	Continuing	Continuing
• APAF 07 Line Item F0160P: <i>F-16 Post Production Support</i>	15.155	18.051	11.813	-	11.813	22.021	25.611	19.873	20.232	Continuing	Continuing

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>
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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 06 Line Item F01600: <i>F-16 Initial Spares</i>	2.059	14.417	11.327	-	11.327	30.705	25.609	15.980	16.157	Continuing	Continuing

Remarks

E. Acquisition Strategy

The F-16 Program acquisition strategy is to improve capability, maintenance and safety mods through OFP development/flight test, enhanced weapons integration, structural upgrades, and simulator concurrency.

F-16 OFP SW updates will continually bring new capabilities to the warfighter. OFP SW development effort is now completely developed at Hill AFB (309 SMXG). Numerous Integration contracts (CPFF, FFP) are required to allow for Improved Avionics, Weapon, ADS-B, MIDS JTRS integration to successfully field with each OFP.

The Legacy SLEP program uses various contracts supporting Full Scale Durability Test (FSDT) and feeds the EMD effort to develop mod test kits and airworthiness certification recommendation. The prime contractor providing the majority of EMD is Lockheed Martin.

MMC Upgrade awarded to Raytheon on 22 Nov 2016. PDG Upgrade awarded to General Dynamics Mission Systems on 17 Apr 2017.

The EMD HW/Advanced capability improvements will develop, test, and qualify aircraft weapons systems, including subsystems and uses various contract types (Cost Plus and Fixed Price)

The Active Electronically Scanned Array (AESA) Joint Emergent Operational Need (JEON) contract for development and production of the APG-83 radar was awarded to Northrop Grumman 31 May 2017. The US Government is the prime integrator and a separate contract is in work for Lockheed Martin to provide integration support.

The new start programs in FY18; Digital Radar Warning Receiver, ADS-B Out and Auto-GCAS are all in acquisition development prior to entering source selection.

Flight Test requires both organic test range support and various contract support for integration test of F-16 subsystems to ensure capabilities meet CAF fielding schedule, which includes Radio Frequency (RF) compatibility.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207133F / F-16 Squadrons	Project (Number/Name) 672671 / F-16 Squadrons
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
OFP Updates on F-16 aircraft	Various	309th SMG : Hill AFB, UT	-	66.397	Nov 2016	65.765	Nov 2017	90.413	Nov 2018	-		90.413	Continuing	Continuing	-
Legacy Service Life Extension Program (SLEP) Structures	Various	Various : Various	-	4.783	Nov 2017	-		-		-		-	Continuing	Continuing	-
MMC Upgrade / Display Generator Upgrade	Various	Various : Various	-	8.921	Jan 2017	20.942	Jan 2018	11.858	Jan 2018	-		11.858	Continuing	Continuing	-
EMD HW / Advanced Capabilities	Various	Various : Various	-	13.657	Aug 2017	0.200	Aug 2018	0.200	Aug 2019	-		0.200	Continuing	Continuing	-
Simulator Trainers	Various	Various : Various	-	3.400	Mar 2017	2.049	Mar 2018	14.625	Mar 2019	-		14.625	Continuing	Continuing	-
AESA Radars	Various	Various : Various	-	15.209	Mar 2018	40.766	Jun 2018	3.542	May 2019	-		3.542	Continuing	Continuing	-
Digital Radar Warning Receiver	Various	Various : Various	-	-		54.587	Apr 2018	36.067	Aug 2019	-		36.067	Continuing	Continuing	-
Comm Suite Radio Upgrade	Various	Various : Various	-	2.976	Aug 2017	12.416	Feb 2018	5.670	Feb 2019	-		5.670	Continuing	Continuing	-
Hybrid Flight Control Computer (HFLCC) AGCAS	Various	Various : Various, UT	-	-		18.962	Mar 2018	-		-		-	Continuing	Continuing	-
Automatic Dependent Surveillance - Broadcast (ADS-B) Out	Various	Various : Various	-	-		3.082	Mar 2018	-		-		-	Continuing	Continuing	-
MIDS JTRS	Various	Various : Various	-	-		-		3.585	Nov 2018	-		3.585	Continuing	Continuing	-
Subtotal			-	115.343		218.769		165.960		-		165.960	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Tests	Various	Various : Various	-	7.774	Nov 2016	16.692	Nov 2017	17.404	Nov 2018	-		17.404	Continuing	Continuing	-
Subtotal			-	7.774		16.692		17.404		-		17.404	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207133F / F-16 Squadrons	Project (Number/Name) 672671 / F-16 Squadrons
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
F-16 Development Efforts																												
M8 OFP Requirements Working Group					■																							
Comm Suite Radio Upgrade Contract Award					■																							
Hybrid Flight Control Computer (HFLCC) AGCAS ASP					■																							
Hybrid Flight Control (HFLCC) AGCAS CDR					■																							
ADS-B OUT Contract Award					■																							
Finalize developmental and operational flight test for SCU 9.1 and field									■																			
Legacy Service Life Extension Program (SLEP) Structures Complete SLEP Kit Proof													■															
MMC Upgrade / Display Generator Upgrade Flt Test Release													■															
M7.2+ OFP Field													■															
M9 OFP System Functional Review																									■			
AESA JEON Initial Fielding													■															
Hybrid Flight Control Computer (HFLCC) AGCAS Field																	■											
Digital Radar Warning Receiver Flt Test Complete													■															
Digital Radar Warning Receiver Fielding Recommendation																	■											
M8 OFP Fielding with MMC Upgrade, Display Generator Upgrade																					■							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207133F / <i>F-16 Squadrons</i>	Project (Number/Name) 672671 / <i>F-16 Squadrons</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>F-16 Development Efforts</i>				
M8 OFP Requirements Working Group	2	2018	2	2018
Comm Suite Radio Upgrade Contract Award	2	2018	3	2018
Hybrid Flight Control Computer (HFLCC) AGCAS ASP	1	2018	1	2018
Hybrid Flight Control (HFLCC) AGCAS CDR	3	2018	3	2018
ADS-B OUT Contract Award	3	2018	3	2018
Finalize developmental and operational flight test for SCU 9.1 and field	1	2019	1	2019
Legacy Service Life Extension Program (SLEP) Structures Complete SLEP Kit Proof	3	2019	3	2019
MMC Upgrade / Display Generator Upgrade Flt Test Release	2	2019	2	2019
M7.2+ OFP Field	4	2019	4	2019
M9 OFP System Functional Review	4	2023	4	2023
AESA JEON Initial Fielding	3	2019	1	2020
Hybrid Flight Control Computer (HFLCC) AGCAS Field	1	2021	1	2021
Digital Radar Warning Receiver Flt Test Complete	1	2020	3	2020
Digital Radar Warning Receiver Fielding Recommendation	2	2021	2	2021
M8 OFP Fielding with MMC Upgrade, Display Generator Upgrade	2	2021	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207134F / <i>F-15E Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	344.184	320.271	192.883	0.000	192.883	241.404	275.615	182.657	187.076	Continuing	Continuing
670131: <i>Initial Operational Test and Evaluation</i>	0.000	86.926	51.513	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	138.439
676020: <i>F-15</i>	0.000	257.258	268.758	192.883	0.000	192.883	241.404	275.615	182.657	187.076	Continuing	Continuing

Note

This program, BA 7, PE 0207134F, project 676020, Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UUF Radio for NATO(SATURN), is a new start.

This program, BA 7, PE 0207134F, project 676020, F-15 C/D/E ADS-B, is a new start.

A. Mission Description and Budget Item Justification

The F-15 is the most versatile fighter in the world today. The F-15C/D continues to provide air superiority with an undefeated and unmatched aerial combat record. The F-15E retains this air superiority capability and adds systems, such as advanced imaging and targeting systems, to meet the requirement for all-weather, deep penetration, and night/under-the-weather, air-to-surface attack. Configured with conformal fuel tanks (CFTs), the F-15E deploys worldwide with minimal tanker support and arrives combat-ready. A mainstay in operations both domestic and abroad, upgrades to the F-15 (avionics, armament, airframe, and engines) are critical to maintaining combat viability (lethality, survivability, and supportability). Projected to remain in service past 2040, avionics modernization is key to long-term weapon system viability. This modernization is built on a foundation of technical and acquisition support studies (both internal to the Air Force and through outside contractors), forestalling obsolescence, exploiting proven technological advances, and leveraging new technology. Major avionics upgrades center around radar modernization (both hardware and software upgrades) and the exploitation of enhanced capability via precision timing, data delivery and processing technology, precision registration systems, cockpit Heads Up Display (HUD) and Heads Down Display, instrumentation digitization and modernization, central computer processing power increases, digital mission event recording systems and an infrared (IR) based fire control system. The proliferation of fourth generation enemy aircraft and sophisticated "doubledigit" anti-aircraft missile systems pose a significant threat to F-15 survivability. A fully integrated electronic warfare suite holds the promise of providing survivability as well as expanded electronic attack capability. Nearly all improvements are linked to an aircraft operational flight program update schedule that works to integrate new capabilities with the airframe. These updates are a responsive way to increase the offensive and defensive capability and survivability of the F-15. Incorporation of corresponding spiral and/or phased technology/equipment improvements that include support equipment, mission planning systems, and training device upgrades will improve performance, supportability, and aircrew training. Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness. This includes technical and acquisition-related studies to ensure F-15 lethality and survivability beyond 2040.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-15 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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207134F / <i>F-15E Squadrons</i>
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This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	356.717	320.271	251.334	0.000	251.334
Current President's Budget	344.184	320.271	192.883	0.000	192.883
Total Adjustments	-12.533	0.000	-58.451	0.000	-58.451
• 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	-12.533	0.000			
• Other Adjustments	0.000	0.000	-58.451	0.000	-58.451

Change Summary Explanation

FY17 reduced \$12.533M for Small Business Innovative Research (SBIR)

FY19 change of \$58.451M consists of rephase of F-15 Radar Enhancement, -\$43.7M and rephase of F-15 OFP Suite 9, -\$13.3M and remainder for inflation adjustments.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons				Project (Number/Name) 670131 / Initial Operational Test and Evaluation			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
670131: <i>Initial Operational Test and Evaluation</i>	0.000	86.926	51.513	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	138.439
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This includes development of the F-15C and F-15E Advanced Display Core Processor (ADCP) II and Mode 5 encryption and anti-jam updates.

ADCP II will develop a common mission computer for the F-15C and F-15E. The current mission computers of both platforms have reached their limits of speed, memory and throughput. Additionally, digital systems have changed the security requirements of both platforms and the older mission computers cannot be upgraded to meet these new requirements. A common mission computer is expected to reduce future development and long term maintenance costs. The program will also develop a new F-15C cockpit display to replace an obsolete one. Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

Mode 5 enables the NSA-mandated Mode 5 encryption and anti-jam for Air-Air Interrogator (AAI) and Identification Friend or Foe (IFF) systems. The Mode 5 program will remove, upgrade, and then replace the existing APX-114 and APX-119 on all F-15 aircraft in order to add Mode 5 capability.

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Advanced Display Core Processor (ADCP) II	78.626	51.513	0.000	-	0.000
Description: Program provides a new central computer for the entire F-15E fleet, replacing the ADCP I. Program also provides a new central computer, Remote Interface Unit (RIU) and Vertical Situation Display Replacement (VSDR)for the AESA-radar F-15C fleet, replacing the VCC and the existing F-15C Vertical Situation Display. This includes technical and acquisition-related studies.					
FY 2018 Plans: Complete F-15C and F-15E Force Development Evaluation (FDE). Conduct and complete F-15C and F-15E System Verification Review #2. Complete Engineering and Manufacturing Development (EMD) contract. This includes technical and acquisition-related studies. Complete NRE efforts for F-15E and F-15C Re-Spin and NRE on Re-wire NRE on F-15C.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 670131 / Initial Operational Test and Evaluation

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
FY 2019 Base Plans: Program ends in FY18					
FY 2018 to FY 2019 Increase/Decrease Statement: See Above					
Title: Mode 5	8.300	0.000	0.000	0.000	0.000
Description: Mode 5 enables the NSA-mandated Mode 5 encryption and anti-jam for Air-Air Interrogator (AAI) and Identification Friend or Foe (IFF) systems. The Mode 5 program will remove, upgrade, and then replace the existing APX-114 and APX-119 on all F-15 aircraft in order to add Mode 5 capability.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	86.926	51.513	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APAF 05 Line Item F01500: F-15 Modification of in Service Aircraft (PEs 0207130F, 0207134F, 0207445F, 0809731F)	5.624	55.377	76.464	-	76.464	136.516	123.192	174.471	-	52.829	628.528
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 670131 / Initial Operational Test and Evaluation

D. Acquisition Strategy

Program is a continuation of effort which includes the development of all F-15 models. Funds are executed organically in support of equipment improvement, study, analysis, and test. Acquisition and management strategies for each program are independently developed and use a variety of contract methods and types to accomplish program objectives.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 670131 / Initial Operational Test and Evaluation
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
F-15 ADCP II Contract	SS/CPIF	Boeing : St Louis, MO	-	75.331	Nov 2016	49.013	Nov 2017	-		-		-	0.000	124.344	-
F-15 ADCP II	C/Various	Various : Various	-	2.076	Mar 2017	-		-		-		-	0.000	2.076	-
F-15 C/D/E ADS-B	TBD	TBD : TBD	-	8.300	Aug 2017	-		-		-		-	0.000	8.300	-
Subtotal			-	85.707		49.013		-		-		-	0.000	134.720	N/A

Remarks
The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support Costs	Various	Various : Various	-	1.219	Sep 2017	2.500	Sep 2018	-		-		-	0.000	3.719	-
Subtotal			-	1.219		2.500		-		-		-	0.000	3.719	N/A

Remarks
The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	86.926	51.513	-	-	-	0.000	138.439	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / <i>F-15E Squadrons</i>	Project (Number/Name) 670131 / <i>Initial Operational Test and Evaluation</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
F-15																												
ADCP II EMD																												
ADCP II F-15E DT																												
ADCP II F-15C DT																												
ADCP II FDE																												
ADCP II MS C																												
ADS-B DT																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / <i>F-15E Squadrons</i>	Project (Number/Name) 670131 / <i>Initial Operational Test and Evaluation</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>F-15</i>				
ADCP II EMD	1	2017	4	2018
ADCP II F-15E DT	4	2017	4	2017
ADCP II F-15C DT	2	2017	4	2017
ADCP II FDE	4	2017	2	2018
ADCP II MS C	4	2017	4	2017
ADS-B DT	3	2017	3	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons				Project (Number/Name) 676020 / F-15			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676020: F-15	0.000	257.258	268.758	192.883	0.000	192.883	241.404	275.615	182.657	187.076	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207134F, project 676020, Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UUF Radio for NATO(SATURN), is a new start.

This program, BA 7, PE 0207134F, project 676020, F-15 C/D/E ADS-B, is a new start.

A. Mission Description and Budget Item Justification

These development efforts include F-15 Radar Enhancements Electronic Protection (EP) capabilities, Operational Flight Program (OFP) upgrades, Flight Testing, Infrared Search and Track (IRST), Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) and Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UUF Radio for NATO(SATURN). Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

The Radar Enhancements (EP) will upgrade the digital Active Electronic Scanned Array (AESA) radar capabilities to counter sophisticated electronic threats. Suite 7C introduced EP into the C/D-model fleet. Initial EP capability for APG-82(V)1 equipped E model aircraft took place in Suite 8E. Suite 9 and beyond will add additional EP capability to both the F-15E and F-15C.

For the F-15 to maintain operational effectiveness, the program must continuously provide the platforms with improved capabilities. To accomplish this there is an on-going need to develop software and hardware upgrades and to flight test new capabilities and systems. The OFP funding line allows the Air Force to release software upgrades approximately every 2 to 3 years. At any one time, there will normally be three OFP upgrades in work: one in requirements definition/pricing, one in code writing and test, and one in flight test and release preparation. The Flight Test funding line allows the Air Force to fund the on-going test effort.

Infrared Search and Track (IRST) system will provide air to air detection, tracking and ranging capability for F-15C/D in a radar-contested environment.

Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UUF Radio for NATO(SATURN) will provide Satellite Communications (SATCOM) capable Air Force F-15C/D/E aircraft the ability to communicate on the Mobile User Objective System (MUOS) constellation in support of a NORTHCOM Airspace Control Alert (ACA) requirement. SATURN to replace the Have Quick II and comply with the NSA lease key mandated dates.

Automatic Dependent Surveillance-Broadcast (ADS-B) provides Air Traffic Control position and other secondary surveillance data and must be installed on all CONUS aircraft by 2020 IAW FAA mandate.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-15 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.

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Operational Flight Program (OFP) Development Efforts</p> <p>Description: Provides OFP program software and hardware updates to integrate new capabilities on all F-15 aircraft. This includes technical and acquisition related studies.</p> <p>FY 2018 Plans: Continued Suite 9 development and integration of major line items, such as Data Transfer Module (DTM) II, Passive Attack Display (PAD), Eagle Passive/Active Warning Survivability System (EPAWSS), Multi-functional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) MIDS-JTRS, and implementing B61-12LEP (Life Extension Program); all on the new Advanced Display Core Processor (ADCP) II mission computer. Additionally, radar updates continued to be delivered for the APG-63 and APG-82 radars, along with continuation of organic software support and Special Projects development efforts. Continued funding support for all F-15 trainers and ongoing Problem Report (PR) and Deficiency Report (DR) fixes. Perform technical and acquisition related studies to ensure F-15 lethality and survivability beyond 2040.</p> <p>N/A</p> <p>FY 2019 Base Plans: Continue Suite 9 development and integration of major line items, such as Data Transfer Module (DTM) II, Passive Attack Display (PAD), Eagle Passive/Active Warning Survivability System (EPAWSS), Multi-functional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) MIDS-JTRS, and implementing B61-12LEP (Life Extension Program); all on the new Advanced Display Core Processor (ADCP) II mission computer. Continuation of radar updates being delivered for the APG-63 and APG-82 radars, along with continuation of organic software support and Special Projects development efforts. Continuation of funding support for all F-15 trainers and ongoing Problem Report (PR) and Deficiency Report (DR) fixes. Begin work on Suite 10. Perform technical and acquisition related studies to ensure F-15 lethality and survivability beyond 2040.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	99.772	112.322	97.790	-	97.790

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
<p>Title: Flight Test</p> <p>Description: Flight tested improvements initiated in prior years. Baselined infrastructure and personnel support for F-15 Developmental Test (DT) and Operational Test (OT) operations. Purchased long-lead test support assets and unique aircraft test instrumentation. This included technical and acquisition related studies.</p> <p>FY 2018 Plans: F-15 Flight Test Support provides contractor support cadre at Eglin and Nellis for DT/OT support, avionics integration, lab O&M, CTF O&M, and long-lead test unique equipment; i.e., program specific aircraft instrumentation, weapons instrumentation kits, data reduction/handling equipment. Repair radar test aircraft instrumentation. Begin design of replacement radar test aircraft obsolete instrumentation. Support 896 TSS with additional manpower, to include prefabrication and surge capability, during increased F-15 modernization activity. Continue Richter Lab modernization and sustainment provisions. This includes technical and acquisition-related studies.</p> <p>FY 2019 Base Plans: F-15 Flight Test Support continues to provide contractor support cadre at Eglin and Nellis for DT/OT support, avionics integration, lab O&M, CTF O&M, and long-lead test unique equipment; i.e., program specific aircraft instrumentation, weapons instrumentation kits, data reduction/handling equipment. Repair radar test aircraft instrumentation. Continues design of replacement radar test aircraft obsolete instrumentation. Continue Richter Lab modernization and sustainment provisions. Continue support to 896 TSS with additional manpower, to include prefabrication and surge capability, during increased F-15 modernization activity. This includes technical and acquisition-related studies.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>	22.470	19.347	17.314	-	17.314
<p>Title: F-15 Radar Enhancements</p> <p>Description: Improvements to F-15 Radar Enhancements (EP). This includes technical and acquisition related studies.</p> <p>FY 2018 Plans: Continued implementation of EP into S9 and began implementation into S10. Continued Special Projects testing support. Continued EP and Combat ID candidate risk reduction for future OFP integration. Continued to study and analyze F-15 radar performance against future threat baselines. Continued to develop and test radar</p>	61.853	50.814	17.033	-	17.033

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>technology candidates for future integration in accordance with ACC's F-15 roadmap and threat analysis. This includes technical and acquisition-related studies.</p> <p>FY 2019 Base Plans: Continue implementation of EP into S9 and into S10. Continue Special Projects testing support. Continue EP and Combat ID candidate risk reduction for future OFP integration. Continue to study and analyze F-15 radar performance and utilization against current and future threat baselines. Continue to develop and test radar technology candidates for future integration in accordance with ACC's F-15 roadmap and threat analysis. This includes technical and acquisition-related studies.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>					
<p>Title: F-15 Infrared Search and Track (IRST)</p> <p>Description: The Infrared Search and Track (IRST) system will provide the F-15C/Ds with the capability to detect and track objects by infrared radiation. The IRST complements other onboard sensors by scanning a large volume of air space, fills gaps left by other sensors. This capability complements the radar to enhance survivability and lethality against air-to-air threats, provides a passive infrared sensor system that searches for and detects infrared energy, and provides the aircraft mission computer track file data on infrared targets.</p> <p>FY 2018 Plans: Continued technical and acquisitions studies, integration into OFP and EMD asset build. Began qualification, integration testing and flight test.</p> <p>FY 2019 Base Plans: Continue technical and acquisitions studies, integration into OFP, EMD asset build and qualification, integration testing and flight test. Begin integration of advanced sensors.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>	41.838	53.103	43.176	-	43.176
<p>Title: Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UUF Radio for NATO(SATURN)</p> <p>Description: Description: To enable F-15C/D/E's with a MUOS/SATURN capability to replace the current UHF Follow-On (UFP) satellite system, Have Quick II and comply with the NSA Lease Key mandate dates.</p> <p>FY 2018 Plans:</p>	0.000	0.000	4.000	-	4.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A FY 2019 Base Plans: FY 2019 Plan: Initiate study to identify gap and COAs; purchase preliminary test units and begin to integrate with GFP. FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Title: F-15 Multifunctional Information Distribution System - Joint Tactical Radio System (MIDS JTRS) Description: This upgrade integrates and installs a new Link 16 system on the F-15C & F-15E that complies with an NSA mandate on cryptographic modernization and an FAA mandate on frequency remapping. The FAA mandate requires all fielded Link-16 terminals incorporate the frequency re-mapping capability by 2025. FY 2018 Plans: Finalize ESIL and Boeing flight test program. This includes technical and acquisition-related studies, oversee ESIL & flight test program. Monitoring, testing and incorporation of OFP fixes. FY 2019 Base Plans: Continue ESIL and Boeing flight test program. This includes technical and acquisition-related studies, oversee ESIL & flight test program. Monitoring, testing and incorporation of OFP fixes. System Verification Reviews on C & E model aircraft FY 2018 to FY 2019 Increase/Decrease Statement: N/A	27.474	9.672	6.670	-	6.670
Title: Service Life Extension Program (SLEP) Wing Replacement Description: The F-15C full scale fatigue test indicated the aircraft wing will not reach the required service life of 2045. This service life extension effort provides improved wings and internal components that may reduce Program Depot Maintenance requirements and supports ongoing development efforts. FY 2018 Plans: Initiate developmental testing for the F-15C Wing variant and internal components. Conduct airworthiness assessment activities. This includes technical and acquisition-related studies. FY 2019 Base Plans:	-	23.500	5.700	-	5.700

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue with developmental testing for the F-15C Wing variant and internal components. Conduct airworthiness assessment activities. This includes technical and acquisition-related studies FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Title: Cabin Pressure Indicator Description: Cabin Pressure Indicator is an aircraft safety modification to help address situations in which aircrew incapacitation due to hypoxia may occur. The upgrade adds an improved cabin pressurization indication system to increase aircrew situational awareness when a gradual loss of cabin pressure occurs. Cabin Pressure Indicator was approved by Congress as a safety modification in FY16 FY 2018 Plans: N/A FY 2019 Base Plans: N/A	3.851	0.000	0.000	-	0.000
Title: F-15 C/D/E ADS-B Description: ADS-B provides Air Traffic Control position and other secondary surveillance data and must be installed on all CONUS aircraft by 2020 IAW FAA mandate. The ADS-B program will upgrade the APX-119 on all F-15 aircraft in order to meet the FAA mandate. FY 2018 Plans: N/A FY 2019 Base Plans: ADS-B program upgrades the APX-119 on all F-15 aircraft in order to meet the FAA mandate. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Initiate ADS-B program analysis and development	0.000	0.000	1.200	0.000	1.200
Accomplishments/Planned Programs Subtotals	257.258	268.758	192.883	0.000	192.883

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line Item F01500: <i>F-15 Modification of In-Service Aircraft, PEs 0207130, 0207134, 0207445, 0809731</i>	100.061	429.489	493.989	-	493.989	750.925	847.882	683.950	-	Continuing	Continuing
• APAF 06 Line Item 000999: <i>Initial Spares/Repair Parts (BP16)</i>	49.476	37.732	41.411	-	41.411	42.868	48.029	48.893	-	Continuing	Continuing
• APAF 07 Line Item F0150P: <i>F-15 Post Production Support</i>	2.980	2.520	2.566	-	2.566	2.610	2.658	2.706	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Program is a continuation of effort which includes the development of all F-15 models. Funds are executed organically in support of equipment improvement, study, analysis, and test. Acquisition and management strategies for each program are independently developed and use a variety of contract methods and types to accomplish program objectives.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
OFP Suite 8/9/10 Development and Test	SS/ Various	Boeing : St. Louis, MO	-	99.772	Aug 2017	109.822	Aug 2018	94.090	Aug 2019	-		94.090	Continuing	Continuing	-
ADS-B	C/Various	Various : Various	-	-		-		1.200	Jul 2019	-		1.200	Continuing	Continuing	-
F-15 Radar Enhancement	SS/ Various	Boeing : St Louis, MO	0.000	61.853	Aug 2017	50.814	Aug 2018	17.033	Aug 2019	-		17.033	Continuing	Continuing	-
F-15 Infrared Search and Track	SS/ Various	Boeing : St Louis, MO	-	41.838	May 2018	50.765	Aug 2018	42.976	Jul 2019	-		42.976	Continuing	Continuing	-
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS)	SS/ Various	Boeing : St. Louis, MO	-	27.474	Jun 2017	12.010	Jul 2018	6.670	Feb 2019	-		6.670	Continuing	Continuing	-
Service Life Extension Program (SLEP) Wing Replacement	TBD	Not specified. : NV	-	-		23.500	Aug 2018	5.700	Feb 2019	-		5.700	Continuing	Continuing	-
V3	SS/ Various	Boeing : St. Louis, MO	-	-		-		-		-		-	Continuing	Continuing	-
Cabin Pressure Indicator	TBD	TBD : Various	-	3.851	Sep 2017	-		-		-		-	Continuing	Continuing	-
Mobile User Objective System (MUOS) /Second Generation Anti-jam Tactical UUF Radio for NATO (SATURN)	C/CPAF	Boeing : St. Louis	-	-		-		4.000	Mar 2019	-		4.000	Continuing	Continuing	-
Subtotal			0.000	234.788		246.911		171.669		-		171.669	Continuing	Continuing	N/A

Remarks
The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Boeing (Contractor Test Support)	SS/CPFF	Boeing : St. Louis, MO	-	21.320	Aug 2017	19.347	Aug 2018	17.714	Aug 2019	-		17.714	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	21.320		19.347		17.714		-		17.714	Continuing	Continuing	N/A

Remarks
The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Mgt Support Costs	Various	Various : Various	-	1.150	Sep 2017	2.500	Sep 2018	3.500	Sep 2019	-		3.500	Continuing	Continuing	-
Subtotal			-	1.150		2.500		3.500		-		3.500	Continuing	Continuing	N/A

Remarks
The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	257.258	268.758	192.883	-	192.883	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
F-15																												
OFP Continuous Development																												
OFP Suite 7C Fielding																												
OFP Suite 8E Fielding																												
OFP Integration and Test																												
OFP Suite 9 MS B																												
OFP Suite 9 EMD Award																												
OFP Suite 9 Fielding																												
Radar Enhancements Suite 8E Fielding																												
Radar Enhancements Suite 9 Fielding																												
Infrared Search and Track Integration and Test																												
Infrared Search and Track Integration and Test MS B																												
Infrared Search and Track Integration and Test EMD Award																												
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) Development																												
SLEP Wing Replacement Contract Award																												
APG-63-V3 Radar NRE Contract Award																												
ADS-B Contract Award																												
Cabin Pressure Indicator Testing																												
Mobile User Objective System (MUOS) Second Generation Anti-jam Tactical UUF Radio for NATO (SATURN) Study																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / F-15E Squadrons	Project (Number/Name) 676020 / F-15
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
F-15				
OFP Continuous Development	1	2017	4	2022
OFP Suite 7C Fielding	1	2017	3	2017
OFP Suite 8E Fielding	1	2017	2	2018
OFP Integration and Test	1	2017	2	2019
OFP Suite 9 MS B	1	2017	1	2017
OFP Suite 9 EMD Award	1	2017	3	2017
OFP Suite 9 Fielding	1	2019	3	2021
Radar Enhancements Suite 8E Fielding	1	2017	2	2018
Radar Enhancements Suite 9 Fielding	1	2019	3	2021
Infrared Search and Track Integration and Test	1	2017	3	2022
Infrared Search and Track Integration and Test MS B	4	2018	4	2018
Infrared Search and Track Integration and Test EMD Award	4	2018	4	2018
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) Development	1	2017	2	2020
SLEP Wing Replacement Contract Award	3	2018	3	2018
APG-63-V3 Radar NRE Contract Award	1	2017	1	2017
ADS-B Contract Award	3	2019	3	2019
Cabin Pressure Indicator Testing	1	2017	4	2017
Mobile User Objective System (MUOS) Second Generation Anti-jam Tactical UUF Radio for NATO (SATURN) Study	2	2019	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207136F / <i>Manned Destructive Suppression</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	12.697	15.106	15.238	0.000	15.238	15.521	15.792	16.119	16.413	Continuing	Continuing
674595: <i>F-16 HARM Targeting Sys</i>	-	12.697	15.106	15.238	0.000	15.238	15.521	15.792	16.119	16.413	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Manned Destructive Suppression (MDS) program element funds the development, procurement, and sustainment of the Air Force's Suppression of Enemy Air Defenses (SEAD) and Destruction of Enemy Air Defenses (DEAD) capabilities. The F-16 HARM Targeting System (HTS) is currently the only programmed reactive SEAD capability and enables targeting the HARM missile in its most lethal 'range known' mode. The program provides F-16 Block 50/52 and Block 40/42 aircraft with the ability to employ the AN/ASQ-213 Pod. With the introduction of HTS Revision 7 (HTS R7) in 2007, the AN/ASQ-213 Pod now has a precision geo-location capability to target Precision Guided Munitions (PGMs) to destroy fixed and mobile enemy air defense elements. Additionally, by relocating the AN/ASQ-213 HTS R7 Pod to the aircraft's left inlet hard point, the F-16 can simultaneously carry the HTS R7 Pod and an Advanced Targeting Pod (ATP). HTS R7 fielding is complete and represents the Air Force's near-term solution for reactive time critical targeting for DEAD until this mission can be transferred to F-35 or a yet to be defined system. HTS R7 derived precision targeting data can be provided to all Joint Forces via Link-16. This effort continues preplanned product improvements (P3I) for the HTS and applies technologies similar to those demonstrated in the Advanced Tactical Targeting Technologies (AT3) program and HTS R7 development.

Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortage (DMSMS) issues.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MDS 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, 0604832F, 0605898F.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207136F / <i>Manned Destructive Suppression</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	14.773	15.106	15.353	0.000	15.353
Current President's Budget	12.697	15.106	15.238	0.000	15.238
Total Adjustments	-2.076	0.000	-0.115	0.000	-0.115
• 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	-1.649	0.000			
• SBIR/STTR Transfer	-0.427	0.000			
• Other Adjustments	0.000	0.000	-0.115	0.000	-0.115

Change Summary Explanation

No Significant Changes

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
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<p>Title: P3I R7 Software Upgrade (SWUP)</p> <p>Description: P3I R7 Software Upgrade (SWUP)</p> <p>FY 2018 Plans: HTS SWUP risk reduction efforts continue to include minor software updates (maintenance releases) in support of F-16 OFP M7.2+ and candidate definition for the next SWUP upgrade. Mission support (i.e., program management for administrative and technical support) will continue. Down-selection of warfighter candidates for the next SWUP effort will occur, and risk reduction activities for subsequent SWUP upgrades will continue.</p> <p>FY 2019 Plans: HTS SWUP 3 continues from risk reduction to software development and preparation for flight testing in support of F-16 OFP M8.2+. Mission support (i.e., program management for administrative and technical support) will continue. Risk reduction activities for subsequent SWUP upgrades will continue.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$197K (1.5%) to address inflation.</p>	10.747	12.756	12.838
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<p>Title: Flight Test</p> <p>Description: Flight Test</p>	1.050	1.500	1.500
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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207136F / <i>Manned Destructive Suppression</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>FY 2018 Plans: Government flight test operations continue in planning for the next SWUP. This funding also includes baselining requirements from actual test data during recent flight testing. Ground testing such as anechoic chamber testing will be conducted, as needed. The test organization will conduct each mission to include F-16 test aircraft operations, threat/test ranges and associated support, air refueling, and range control support. Post-mission support for each mission is planned.</p> <p>FY 2019 Plans: Government flight test operations continue in planning for SWUP 3. This funding also includes baselining requirements from actual test data during recent flight testing. Ground testing such as anechoic changer testing will be conducted, as needed. The test organization will conduct each mission to include F-16 test aircraft operations, threat/test ranges and associated support, air refueling, and range control support. Post-mission support for each mission is planned.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No change.</p>			
<p>Title: Mission Planning</p> <p>Description: Joint Mission Planning System (JMPS) (Formerly Air Force Mission Support System (AFMSS))</p> <p>FY 2018 Plans: Continue mission planning in support of HTS SWUP and future P3I upgrades. This effort includes continued development and testing of candidate upgrades and incremental engineering releases in support of fielding.</p> <p>FY 2019 Plans: Continue mission planning in support of HTS SWUP and future P3I upgrades. This effort includes continued development and testing of candidate upgrades and incremental engineering releases in support of fielding.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$50K to address labor rates and inflation.</p>	0.900	0.850	0.900
Accomplishments/Planned Programs Subtotals	12.697	15.106	15.238

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

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207136F / <i>Manned Destructive Suppression</i>
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E. Acquisition Strategy
The HTS R7 acquisition improvement strategy includes accomplishment of risk reduction studies and selection of appropriate contracting strategies for P3I and upgrade of HTS inventory.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207136F / <i>Manned Destructive Suppression</i>	Project (Number/Name) 674595 / <i>F-16 HARM Targeting Sys</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
HTS R7 SWUP/P3I	SS/CPIF	Raytheon Systems Co. : Tucson, AZ	-	9.988	Jul 2017	11.566	May 2018	11.638	May 2019	-		11.638	Continuing	Continuing	-
JMPS (Formerly AFMSS)	MIPR	Multiple : Multiple, NV	-	0.900	Jan 2017	0.850	Jan 2018	0.900	Mar 2019	-		0.900	Continuing	Continuing	-
Subtotal			-	10.888		12.416		12.538		-		12.538	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Test	PO	412 TW : Edwards AFB, CA	-	1.050	Jan 2017	1.500	Jan 2018	1.500	Jan 2019	-		1.500	Continuing	Continuing	-
Subtotal			-	1.050		1.500		1.500		-		1.500	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration	C/Various	Multiple : Eglin AFB, FL	-	0.759	May 2017	1.190	Oct 2017	1.200	Oct 2018	-		1.200	Continuing	Continuing	-
Subtotal			-	0.759		1.190		1.200		-		1.200	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	12.697	15.106	15.238	-	15.238	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207136F / <i>Manned Destructive Suppression</i>	Project (Number/Name) 674595 / <i>F-16 HARM Targeting Sys</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Manned Destructive Suppression</i>																												
R7.9 SWUP (R7.8X MNX Updates) Risk Reduction																												
R7.9 SWUP Contract																												
R7.9 SWUP (CT&E/DT&E)																												
R7.9 Software Release																												
R7.8X MNX2 Update Release																												
R7.A SWUP Risk Reduction																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207136F / <i>Manned Destructive Suppression</i>	Project (Number/Name) 674595 / <i>F-16 HARM Targeting Sys</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Manned Destructive Suppression</i>				
R7.9 SWUP (R7.8X MNX Updates) Risk Reduction	1	2017	4	2018
R7.9 SWUP Contract	1	2018	3	2021
R7.9 SWUP (CT&E/DT&E)	1	2019	1	2021
R7.9 Software Release	4	2021	2	2022
R7.8X MNX2 Update Release	4	2018	4	2018
R7.A SWUP Risk Reduction	4	2019	3	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207138F / <i>F-22A Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	364.691	610.942	603.553	0.000	603.553	496.298	659.563	473.243	481.862	Continuing	Continuing
674785: <i>F-22</i>	0.000	178.267	413.149	406.617	0.000	406.617	420.138	481.526	473.243	481.862	Continuing	Continuing
674788: <i>F-22 Tactical Mandates</i>	0.000	186.424	197.793	196.936	0.000	196.936	76.160	178.037	0.000	0.000	0.000	835.350

Note
 This program, BA 7, PE 0207138F, project 674785, Sensor Enhancements, is a new start.

A. Mission Description and Budget Item Justification

The F-22 Raptor provides air superiority to the Joint Force; access in the highly contested operational environment; as well as homeland and cruise missile defense for the next 40+ years. The F-22 is a multi-mission fighter aircraft that combines stealth, supercruise, maneuverability and integrated avionics to make it the world's most capable combat aircraft. The Engineering and Manufacturing Development (EMD) phase of F-22 acquisition is complete. The program is now continuing pre-planned, incremental modernization development that enhances both F-22 Air Superiority and Global Strike capabilities. The F-22 modernization program upgrades the air vehicle, engine, and training systems to improve F-22 weapons, communications, electronic warfare (EW), and Intelligence Surveillance Reconnaissance (ISR) capabilities.

The F-22 Raptor's Operational Flight Program (OFP) is conducted using AGILE system development environments. Program Office executing Agile environment to evolve modernization activities into a single development stream in order to prototype a new acquisition construct. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs (product lines) using a schedule cadence for capabilities as they mature.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill Federal Aviation Administration or other mandates necessary to ensure continued aircrew safety and mission effectiveness. This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207138F / <i>F-22A Squadrons</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	387.564	610.942	514.005	0.000	514.005
Current President's Budget	364.691	610.942	603.553	0.000	603.553
Total Adjustments	-22.873	0.000	89.548	0.000	89.548
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-11.100	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	-11.773	0.000			
• Other Adjustments	0.000	0.000	89.548	0.000	89.548

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

Project: 674785: *F-22*

Congressional Add: *F-22 Software*

	FY 2017	FY 2018
	12.000	0.000
Congressional Add Subtotals for Project: 674785	12.000	0.000
Congressional Add Totals for all Projects	12.000	0.000

Change Summary Explanation

FY17 Changes: $-\$11.1\text{M}$ total Congressional reduction ($-\$8.1\text{M}$ movement to M-code; $-\$15\text{M}$ for Small projects unjustified growth and $+\$12\text{M}$ for F-22 Software) and $-\$11.773\text{M}$ SBIR/STTR Transfer
 FY19 programmatic increase of $\$94\text{M}$ along with inflation adjustments.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons				Project (Number/Name) 674785 / F-22			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
674785: F-22	0.000	178.267	413.149	406.617	0.000	406.617	420.138	481.526	473.243	481.862	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207138F, project 674785, Sensor Enhancements, is a new start.

F-22 development and production are complete. The remaining program consists of F-22 Operational Flight Program (OFP) updates, capability enhancements, and mandates necessary to sustain F-22 weapon system survivability, lethality and availability. The "Continuing" Cost to Complete and Total Cost reflect these initiatives.

A. Mission Description and Budget Item Justification

The F-22 Raptor represents the USAF's priority placed on providing the Joint Force with air dominance, operational access, and homeland & cruise missile defense for the next 40+ years. The F-22 is a multi-mission fighter aircraft that combines stealth, supercruise, advanced maneuverability and integrated avionics to make it the world's most capable combat aircraft. While F-22 Engineering and Manufacturing Development (EMD) and aircraft production completed May 2012, funding for F-22 modernization is "continuing" beyond the FYDP.

The F-22 Raptor's Operational Flight Program (OFP) is conducted using AGILE system development environments. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs (product lines) using a schedule cadence for capabilities as they mature.

This program funds all non-MDAP development efforts for the F-22. The program is now continuing the pre-planned and evolutionary modernization effort through incremental development phases that enhance the F-22 anti-access/area denial, Air Superiority and Global Strike capabilities. The development program modernizes and upgrades the air vehicle, engine, avionics, and training systems to improve/enhance F-22 weapons, communications, EW, and ISR capabilities.

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

	FY 2017	FY 2018	FY 2019
Title: Increment 3.2A	0.104	0.000	0.000
Description: The F-22 Increment 3.2A Modernization Program is software development to improve Electronic Protection, Combat Identification and Link 16 interoperability.			
FY 2018 Plans: N/A			
FY 2019 Plans: N/A			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
N/A				
<p>Title: Update 6 Interoperability</p> <p>Description: Update 6 (U6) Interoperability, is an Operational Flight Program (OFP) update providing cryptographic updates required by the National Security Agency (NSA) to Intra-Flight Data Link (IFDL), Link-16, and Tactical Secure Voice (TSV) to maintain interoperability with Link-16 and secure voice networks. The U6 Interoperability program builds upon the development work already accomplished in the KOV-20 Cryptographic Modernization Program and integrates that development into a single OFP for fleet release. In addition, U6 Interoperability will correct other software deficiencies previously identified during operations. The F-22 Update 6 Program is conducted using AGILE system development environments. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence as they mature.</p> <p>FY 2018 Plans: U6 Interoperability will continue to code and system test iterative software drops as well as begin formal integrated flight testing for IFDL/Link 16 interoperability, TSV modernization and software enhancements.</p> <p>FY 2019 Plans: U6 Interoperability will complete system test and formal integrated flight test followed by completion of a Sufficiency of Test Review. U6 Interoperability will then complete a Fielding Decision Review and begin fleet release.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$40.42M decrease from FY18 to FY19. See above for details.</p>		24.920	48.530	8.110
<p>Title: Operational Software Development</p> <p>Description: Operational Software Development (OSD) major thrust was formally known as Software Support. OSD has been utilizing the AGILE systems development process to develop, test, and field new capabilities and capability enhancements. OSD includes Pilot Training Systems (PTS) and IMIS software development; Integrated Maintenance Data System (IMDS), Reliability and Maintainability Information System (REMIS) interface development, and Raptor AGILE Software Release (RASR). RASR product line includes the Operational Flight Program (OFP) build in which mature software capabilities from multiple product lines are compiled for integration; Certification Support, to include but not be limited to, airworthiness, JSIG compliance, TCTO validation and verification. This product line also allows for the fielding of the OFPs and the governance which determined capability prioritization. The AGILE process continues to allow for a more rapid delivery of capability to the war fighter</p> <p>FY 2018 Plans: F-22 will begin to develop a path to cloud-based computing to leverage commercially-based Agile software and hardware development practices. Also, the F-22 enterprise will partner with commercial Agile hardware and software companies to increase the speed and quality of product delivery to the</p>		0.000	3.400	7.717

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
warfighter. FY 2019 Plans: F-22 will continue to develop a path to cloud-based computing to leverage commercially-based Agile software and hardware development practices. Also, the F-22 enterprise will partner with commercial Agile hardware and software companies to increase the speed and quality of product delivery to the warfighter. FY 2018 to FY 2019 Increase/Decrease Statement: \$4.317M increase from FY18 to FY19. See above for details.				
Title: Advanced Technology Development (ATD) Description: Technology maturation, risk reduction, studies, and demonstrations of classified F-22 development efforts. The F-22 ATD Program is conducted using AGILE system development environments. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence as they mature. FY 2018 Plans: Continue technology maturation and risk reduction projects in support of various classified F-22 development efforts. Provide continued technology maturation and acquisition planning in support of the F-22 Sensor Enhancements Program. FY 2019 Plans: Continue technology maturation and risk reduction projects in support of various classified F-22 development efforts. Provide continued technology maturation and acquisition planning in support of the F-22 Sensor Enhancements Program. FY 2018 to FY 2019 Increase/Decrease Statement: \$20.38M decrease from FY18 to FY19. See above for details.		19.750	126.400	106.020
Title: Sensor Enhancements Description: Improved sensor capabilities to maintain air dominance and preserve first shot, first kill capability. FY 2019 Plans: Commence proposal preparation activities for EMD and start PDR preparation contract to support 2020 MS B. Initiate integration studies to utilize results from related ATD efforts as part of assessing overall program technological readiness. FY 2018 to FY 2019 Increase/Decrease Statement: \$91.05M increase from FY18 to FY19. See above for details.		-	-	91.050
Title: System Engineering/Program Management Support		4.080	9.470	6.830

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Description: Provides F-22 program-wide planning and execution including the following: Strategic Analysis and Support, Cost Estimating Data, and Systems Engineering Process Management.</p> <p>FY 2018 Plans: Provide F-22 program-wide planning and execution including the following: Strategic Analysis and Support, Cost Estimating Data, and Systems Engineering Process Management.</p> <p>FY 2019 Plans: Provide F-22 program-wide planning and execution including the following: Strategic Analysis and Support, Cost Estimating Data, and Systems Engineering Process Management.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$2.64M decrease from FY18 to FY19. See above for details.</p>				
<p>Title: Reliability and Maintainability Program (RAMP)</p> <p>Description: The RAMP Program provides for solution identification and integration of modifications to improve reliability, availability and maintainability (RAM) for the F-22 combined test fleet, located at Edwards AFB. The associated RAMP effort (O&M funded) develops candidate initiatives which are down-selected for implementation and integration based on their development maturity and impact on the F-22 life cycle costs. The RAMP program includes modifications to address corrosion, reduce maintenance hours, increase safety, and provide urgent response requirements to the F-22 fleet.</p> <p>FY 2018 Plans: Continue retrofit modifications on the combined test fleet aircraft in order to improve system/component reliability, and maintainability and reduce F-22 weapon system life cycle costs. In FY 2018, the F-22 program will add an additional operational test aircraft to the combined test fleet, by bringing an aircraft out of flyable storage.</p> <p>FY 2019 Plans: Continue retrofit modifications on the combined test fleet aircraft in order to improve system/component reliability, maintainability and reduce F-22 weapon system life cycle costs. Beginning in FY 2019, the retrofit modification program will support four (4) operational test aircraft, with the addition of previously stored aircraft being brought into the combined test fleet.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$1.5M decrease from FY18 to FY19. See above for details.</p>		0.430	2.500	1.000
<p>Title: F-22 Small Projects</p> <p>Description: Provides F-22 technology studies and demonstrations to include, but not be limited to, Low Observable (LO) Signature Management, Threat Modeling Support, Developmental Test (DT) Weapon Assets, Pilot Training (PT), Dynamic</p>		14.310	30.380	15.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Synthetic Aperture Radar (SAR), Flight Test Engine Refurbishment, Support Equipment Development, Government Furnished Equipment (GFE), and Electronic Warfare (EW) system enhancements to counter evolving threats. F-22 Small Projects are conducted using AGILE system development environments. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence as they mature.</p> <p>FY 2018 Plans: Continue F-22 technology studies and demonstrations for DT Weapon Assets, Threat Modeling Support, Test Support, Test Aircraft Modifications, CRIIS Network development, PT, Dynamic SAR, Flutter Excitation System (FES), GFE, and continue acquisition planning for EW enhancements.</p> <p>FY 2019 Plans: Continue F-22 technology studies and demonstrations for DT Weapon Assets, Threat Modeling Support, Test Support, Test Aircraft Modifications, CRIIS Network development, PT, Dynamic SAR, FES, GFE, and continue acquisition planning for EW enhancements.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$15.38M decrease from FY18 to FY19. See above for details.</p>				
<p>Title: Combined Test Force (CTF)</p> <p>Description: The F-22 CTF, located at Edwards Air Force Base, conducts full-up weapons system testing to assess the effect of the F-22 combined characteristics of stealth, speed, maneuverability, and integrated avionics upon mission accomplishment. The CTF uses operationally significant ground and flight test scenarios to identify system performance deficiencies early before they are more difficult and costly to resolve. F-22 flight testing is conducted using the AGILE system development environment. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence as they mature.</p> <p>FY 2018 Plans: Continue flight testing at AFTC, and required technology refresh. Significant programs scheduled for flight test at AFTC include: Update 6, refueling certifications, Seek Eagle and missile tests, ATD, 3.2B, and FES. Also will continue flight test planning using Agile methods for the following programs: F-22 Tactical Mandates, TACLink 16, Update 6, ATD, 3.2B, and CRIIS. In FY 2018, the F-22 program added a fourth aircraft to the developmental test fleet by bringing an aircraft out of flyable storage.</p> <p>FY 2019 Plans: Significant programs scheduled for flight test at AFTC include: F-22 Tactical Mandates, TACLink 16, Sensor Enhancements, refueling certifications, Special Projects, ATD, and CRIIS. Also will continue flight test planning using Agile methods for the</p>		49.870	54.600	57.930

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>following programs: F-22 Tactical Mandates, TACLink 16, Sensor Enhancements, Special Projects, Helmet Mounted Display, EGI-M, ATD, and CRIIS.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$3.33M increase from FY18 to FY19. See above for details.</p>				
<p>Title: Laboratory Test and Operations (LTO)</p> <p>Description: The LTO is a continuous activity that plans and conducts development, integration, test, and verification of F-22 OFPs with F-22 hardware. LTO provides maintenance, staffing, and operation of 18 development labs including five unique major System Integration Laboratories (SILs): the Agile Integration Lab (AIL); the Raptor Integration Lab (RAIL); the Air Combat Simulation (ACS) Lab; Vehicle Integration Facility (VIF); and the Vehicle System Simulator (VSS). Through the ACS, LTO provides the combat air forces with advanced mission-level test and training capability via a fully representative virtual simulation. F-22 LTO is conducted using the AGILE system development environment. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence as they mature.</p> <p>FY 2018 Plans: Maintaining lab availability in support of F-22 programs. Updating critical systems to include tech refresh, as required to support new aircraft configurations and capabilities. Adding a RADAR to the VSS. Accomplish OFP verification and risk reduction. Support pilot training for Air Combat Command exercises and war gaming; Air Force Operation Test & Evaluation Center test planning; and test event rehearsals. Support periodic AFWC operational mission data updates. The significant programs that execute in lab tests are Increment 3.2B, F-22 TACLink 16, F-22 Tactical Mandates, Update 6, ATD and AFWC mission data loads.</p> <p>FY 2019 Plans: Maintain lab availability in support of F-22 programs. Update critical systems to include technology refresh and laboratory improvements required to support new aircraft configurations and capabilities. Accomplish OFP verification and risk reduction. Support pilot training for Air Combat Command exercises and war gaming; Air Force Operation Test & Evaluation Center test planning; and test event rehearsals. Support periodic AFWC operational mission data updates. Will continue Lab test planning using Agile methods for the following programs: F-22 Tactical Mandates, TACLink 16, Update 6, Sensor Enhancements and ATD. The significant programs planned for lab test are F-22 TACLink 16, F-22 Tactical Mandates, Update 6, ATD and AFWC mission data loads.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$46.53M decrease from FY18 to FY19. See above for details.</p>		51.720	129.859	83.330
<p>Title: Pilot Systems</p> <p>Description: This major thrust was formally known as Helmet Mounted Display and Cueing System (HMDCS). The Pilot Systems product line will select, integrate, test, and field mature hardware to support the F-22 Raptor's pilot environment. In FY17, the</p>		0.700	4.810	1.820

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>program began efforts to develop the HMDCS to take full advantage of advanced weapons such as the AIM-9X and improved battlespace situational awareness during day/night within-visual-range engagements. The HMDCS will be integrated on all Block 30/35 Raptors. In FY19, the program will support studies and integration risk reduction activities for Talon SPITBALL</p> <p>FY 2018 Plans: Complete a study and analysis on canopy distortion to inform understanding of display solutions compatible with the F-22s unique canopy construction/coatings. Updating market research and releasing the Request for Proposal for Pre-EMD.</p> <p>FY 2019 Plans: Select F-22 helmet solution. Enter Pre-EMD contract for integration of helmet solution and achieving system-level PDR. Support studies and integration risk reduction activities for Talon SPITBALL</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$2.99M decrease from FY18 to FY19. See above for details.</p>				
<p>Title: Navigation Systems</p> <p>Description: This major thrust was formally known as F-22 Global Positioning System (GPS) Military Code (M-Code). The Navigation Systems product line consists of the software and hardware development, test, and fielding necessary to ensure the F-22's ability to maintain Precision, Navigation and Timing (PNT) capabilities in GPS degraded environments. This effort will include the integration of Embedded GPS/Inertial Navigation System (INS) Modernization (EGI-M) onto the F-22 for M-Code, replacement of the current GPS antenna with a Controlled Radiation Pattern Antenna (CRPA), as well as other capabilities, to prevent exploitation of the weapon system by adversaries and provide assured PNT.</p> <p>FY 2018 Plans: Continue studies, analysis, and risk reduction for development of CRPA antenna, to include tasks necessary to prepare engineering data, drawings, and other documentation.</p> <p>FY 2019 Plans: Complete Tech Maturation and Risk Reduction (TMRR) and Preliminary Design Review for CRPA antenna. Begin Engineering, Manufacturing, and Design (EMD) phase for antenna. Release RFP for TMRR effort of EGI-M integration onto F-22.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$24.61M increase from FY18 to FY19. See above for details.</p>		0.383	3.200	27.810
Accomplishments/Planned Programs Subtotals		166.267	413.149	406.617
		FY 2017	FY 2018	
Congressional Add: F-22 Software		12.000	0.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22
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	FY 2017	FY 2018
<p>FY 2017 Accomplishments: Update 6 (U6) Interoperability, is an Operational Flight Program (OFP) update providing cryptographic updates required by the National Security Agency (NSA) to Intra-Flight Data Link (IFDL), Link-16, and Tactical Secure Voice (TSV) to maintain interoperability with Link-16 and secure voice networks. The U6 Interoperability program builds upon the development work already accomplished in the KOV-20 Cryptographic Modernization Program and integrates that development into a single OFP for fleet release. In addition, U6 Interoperability will correct other software deficiencies previously identified during operations</p> <p>FY 2018 Plans: N/A</p>		
Congressional Adds Subtotals	12.000	0.000

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line Item F02200: <i>F-22A Squadrons, PE 0207138F*</i>	253.390	306.581	338.611	-	338.611	358.086	496.972	494.086	549.196	Continuing	Continuing
• RDTE 07 PE 0605213F: <i>Increment 3.2B, RDT&E**</i>	70.290	13.600	0.000	-	0.000	0.000	0.000	-	-	0.000	83.890
• APAF 05 Line Item F2232B: F-22 <i>Increment 3.2B, PE 0207138F***</i>	78.410	105.756	13.081	-	13.081	20.373	6.013	-	-	0.000	223.633
• MILCON PE 0207138F: MILCON	-	-	0.000	-	0.000	0.000	0.000	-	-	0.000	0.000
• RDTE 07 PE 0207163F: <i>AIM-120D, AMRAAM, RDT&E****</i>	-	-	0.000	-	0.000	0.000	0.000	-	-	0.000	0.000
• RDTE 07 PE 0207138F: <i>F-22 Tactical Mandates</i>	101.294	197.793	198.418	-	198.418	76.732	179.378	-	-	0.000	753.615

Remarks

NOTES:

*F-22A Squadrons, APAF/PE 0207138F, includes funding for F-22A Squadrons BPs 11 (Aircraft Modifications), 13 (Post-Production Support), 16 (Initial Spares), and 19 (Depot Activation) only.

**F-22 Increment 3.2B, RDT&E/PE 0605213F, includes funding for FY 2013 and beyond identified in the Increment 3.2B documentation. PEs 0605213F and 0207318F share lab and infrastructure support costs across the F-22 enterprise.

***F-22 Increment 3.2B, APAF/PE 0207138F includes funding for associated Increment 3.2B BPs 11 (Aircraft Modifications) and 16 (Initial Spares) only.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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****AIM-120D, AMRAAM RDT&E/PE 0207163F, funding provides for the AIM-120 development as a part of the F-22 Increment 3.2B effort.

D. Acquisition Strategy

The Raptor Enhancement Development & Integration II (REDI II) contract is an Indefinite Delivery/Indefinite Quantity (ID/IQ) Ordering contract that maximizes flexibility to start, stop, accelerate and decelerate projects as required. The (REDI) II contract is a follow-on to the initial REDI contract. REDI II provides maximum flexibility to manage various modernization projects. The REDI II contract allows for the issuance of orders for efforts associated with the planning, analysis, design, development, qualification, test and documentation of F-22 weapon system performance enhancements, life-cycle improvements, Operational Flight Program (OFP) upgrades, and associated efforts essential to accomplishing the F-22 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674785 / F-22
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Increment 3.2A	SS/CPIF	Lockheed Martin : Fort Worth, TX	-	0.104		-		-		-		-	0.000	0.104	-
Update 6 Interoperability	SS/Various	Lockheed Martin : Fort Worth, TX	-	36.920	Mar 2017	48.530	Mar 2018	8.110	Mar 2019	-		8.110	0.000	93.560	-
Operational Software Development	SS/Various	Lockheed Martin : Fort Worth, TX	-	-		3.400	Nov 2017	7.717	Nov 2018	-		7.717	0.000	11.117	-
Advanced Technology Development	Various	Various : Various	-	19.750	Dec 2016	126.400	Nov 2017	106.020	Nov 2018	-		106.020	Continuing	Continuing	-
Sensor Enhancements	SS/Various	Lockheed Martin : Fort Worth, TX	-	-		-		91.050	Nov 2018	-		91.050	779.230	870.280	-
System Engineering / Program Management	SS/CPFF	Lockheed Martin : Fort Worth, TX	-	4.080	Jan 2017	9.470	Jan 2018	6.830	Jan 2019	-		6.830	Continuing	Continuing	-
RAMP	SS/CPFF	Lockheed Martin : Fort Worth, TX	-	0.430	Dec 2016	2.500	Dec 2017	1.000	Dec 2018	-		1.000	Continuing	Continuing	-
F-22 Small Projects	Various	Various : Various	-	14.310	Nov 2016	30.380	Dec 2017	15.000	Dec 2018	-		15.000	Continuing	Continuing	-
Pilot Systems	SS/Various	Lockheed Martin : Fort Worth, TX	-	0.700	Jul 2017	4.810	Jul 2018	1.820	Jul 2019	-		1.820	96.830	104.160	-
Navigation Systems	SS/CPIF	Lockheed Martin : Fort Worth, TX	-	0.383	Sep 2017	3.200	Feb 2018	27.810	Dec 2018	-		27.810	101.243	132.636	-
Subtotal			-	76.677		228.690		265.357		-		265.357	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Combined Test Force	Various	Various : Various	-	49.870	Nov 2016	54.600	Nov 2017	57.930	Nov 2018	-		57.930	Continuing	Continuing	-
Laboratory Test & Operations (LTO)	SS/Various	Lockheed Martin : Ft Worth, TX	-	51.720	Nov 2016	129.859	Nov 2017	83.330	Nov 2018	-		83.330	Continuing	Continuing	-
Subtotal			-	101.590		184.459		141.260		-		141.260	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / <i>F-22A Squadrons</i>	Project (Number/Name) 674785 / <i>F-22</i>
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>F-22 Squadrons</i>	
Update 6 Interoperability Development, Integration, & Test	
Update 6 Interoperability Preliminary Design Review (PDR)	
Update 6 Interoperability Milestone B	
Update 6 Interoperability Critical Design Review (CDR)	
Update 6 Interoperability Flight Test	
Update 6 Interoperability Deployment Decision Review	
Update 6 Interoperability Full Deployment Decision(Fleet Release)	
Advanced Technology Development Demonstrations	
Advanced Technology Development Studies & Analysis	
Pilot Systems Development, Integration and Test	
Navigation Systems Development, Integration, and Test	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / <i>F-22A Squadrons</i>	Project (Number/Name) 674785 / <i>F-22</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>F-22 Squadrons</i>				
Update 6 Interoperability Development, Integration, & Test	2	2017	4	2018
Update 6 Interoperability Preliminary Design Review (PDR)	2	2017	2	2017
Update 6 Interoperability Milestone B	2	2017	2	2017
Update 6 Interoperability Critical Design Review (CDR)	2	2018	2	2018
Update 6 Interoperability Flight Test	1	2018	1	2019
Update 6 Interoperability Deployment Decision Review	3	2019	3	2019
Update 6 Interoperability Full Deployment Decision(Fleet Release)	3	2019	3	2019
Advanced Technology Development Demonstrations	1	2017	4	2023
Advanced Technology Development Studies & Analysis	1	2017	4	2023
Pilot Systems Development, Integration and Test	4	2018	3	2023
Navigation Systems Development, Integration, and Test	2	2018	2	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons				Project (Number/Name) 674788 / F-22 Tactical Mandates			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
674788: F-22 Tactical Mandates	0.000	186.424	197.793	196.936	0.000	196.936	76.160	178.037	0.000	0.000	0.000	835.350
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2015, a separate Budget Program Activity Code (BPAC 674788) within Program Element (PE) 0207138F was created for F-22 Tactical Mandates. Under this BPAC, the F-22 TACLink 16 and F-22 Tactical Mandates (TACMan) programs are managed.

A. Mission Description and Budget Item Justification

The F-22 TACLink 16 and F-22 Tactical Mandates programs are follow-on modernization efforts to Increment 3.2B and Update 6. The programs will provide Open Systems Architecture (OSA), Link 16 Transmit and Mode 5 Identification Friend or Foe (IFF) Transpond/Interrogate on the F-22 Block 30/35 combat coded F-22 fleet.

In FY 2017 the budget began to reflect the TACLink 16 program. The F-22 recognized a valuable opportunity to field OSA and Link 16 Transmit earlier than originally planned under the F-22 Tactical Mandates. The Link 16 Transmit enables 5th generation F-22 fighter aircraft to transmit tactical information through datalink to the 5th generation F-35 (a.k.a. 5th-to-5th), as well as to 4th generation aircraft (a.k.a. 5th-to-4th). Transmitting tactical data to other aircraft types via datalink is a top Air Force priority. With Link 16 Transmit, the F-22's superior 5th Generation sensor suite will critically support the situational awareness of all participants in the operational environment. The TACLink 16 program accelerates the installation of this key data link capability. Additionally, the TACLink 16 will enable future life cycle savings opportunities for the F-22 and provide risk reduction effort for the F-22 Tactical Mandates program.

The F-22 Tactical Mandates program (product line) is conducted using AGILE system development environments. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence for capabilities as they mature.

The F-22 Tactical Mandates program will field Mode 5 IFF on the TACLink 16 baseline. Mode 5 IFF is a Joint Requirements Oversight Council-mandated Blue Force identification capability that improves Raptor survivability and reduces fratricide risk DoD-wide. Mode 5 IFF brings significantly enhanced combat identification in both quality and security over the F-22's legacy Mode 4 capability. This update is particularly critical given Mode 4 functionality may be unavailable when F-22 Tactical Mandates fields.

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

	FY 2017	FY 2018	FY 2019
Title: TACLink 16	93.194	130.400	79.710
Description: The TACLink 16 program consists of software and hardware development necessary to field Link 16 Transmit capability on the F-22. Link 16 Transmit will be accomplished via an OSA architecture integrated with F-22 legacy avionics. The OSA implementation will provide a pathway to more competitive and open future F-22 modernization. Includes mission support requirements for the F-22 Program Office to include, but not be limited to, travel, computer costs, and other miscellaneous contract support. The TAClink 16 program is conducted using AGILE system development environments. The AGILE environment			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674788 / F-22 Tactical Mandates		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence for capabilities as they mature.				
<p>FY 2018 Plans: The program will complete Preliminary Design Review (PDR) and enter Engineering, Manufacturing, and Development (EMD). Coding and sub-system lab test will continue. Open Mission Systems and associated hardware will deliver to labs. The program will progress to system lab test of its iterative software drops.</p> <p>FY 2019 Plans: Program will continue EMD and system lab test. Hardware for Development Test (DT) flight will deliver, DT aircraft will be modified, and DT flights will commence.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$50.69M decrease from FY18 to FY19, See above for details.</p>				
<p>Title: F-22 Tactical Mandates (TACMAN)</p> <p>Description: The F-22 TACMAN program consists of software development and hardware necessary to provide tactical Mode 5 IFF on the F-22. The program also provides an opportunity to incorporate other updates to Link 16 capabilities into the Raptor. Includes mission support requirements for the F-22 Program Office to include, but not be limited to, travel, computer costs, and other miscellaneous contract support. The F-22 TACMAN program is conducted using AGILE system development environments. The AGILE environment allows the F-22 Raptor program to develop, test, and field software/hardware from multiple programs using a schedule cadence for capabilities as they mature.</p> <p>FY 2018 Plans: The program will continue design, software modeling, prototyping and test. The program will complete PDR and enter EMD and developmental hardware, to include Crypto, Identify Friend or Foe, and antenna electronic units, will deliver to sub-systems labs.</p> <p>FY 2019 Plans: Program will continue EMD. Production representative hardware will deliver to system labs, followed by the beginning of system lab test of hardware and iterative software releases.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$33.85M increase from FY18 to FY19, See above for details.</p>		93.230	59.700	92.066
<p>Title: Lab and Combined Test Force (CTF)</p> <p>Description: The Lab Test and Operations (LTO) is a continuous activity that plans and conducts development, integration, test, and verification of F-22 TACMan and TACLink 16 OFPs and hardware. The LTO provides maintenance, staffing, and operation of 18 development labs including five unique major SILs: the AIL, RaIL, ACS, VIF, and VSS. The F-22 Combined Test Force, located</p>		0.000	7.693	25.160

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / <i>F-22A Squadrons</i>	Project (Number/Name) 674788 / <i>F-22 Tactical Mandates</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
at Edwards Air Force Base, conducts full-up weapons system testing to assess the effect of the F-22 combined characteristics of stealth speed, maneuverability, and integrated avionics upon mission accomplishment. The CTF uses operationally significant ground and flight test scenarios to identify system performance deficiencies of TACMAN and TACLink 16 early before they are more difficult and costly to resolve.			
<i>FY 2018 Plans:</i> Continue lab testing and planning for CTF testing for TACMan and TACLink 16.			
<i>FY 2019 Plans:</i> Continue lab testing and planning for CTF testing for TACMan and TACLink 16.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> \$17.47M increase from FY18 to FY19, See above for details.			
Accomplishments/Planned Programs Subtotals	186.424	197.793	196.936

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE 07 PE 0207138F: <i>F-22A Squadrons*</i>	178.267	413.149	406.617	-	406.617	420.138	481.526	473.243	481.862	Continuing	Continuing
• APAF 05 Line Item F02200: <i>F-22A Squadrons, PE 0207138F**</i>	253.390	306.581	338.611	-	338.611	358.086	496.972	494.086	549.196	Continuing	Continuing
• RDTE 05 PE 0605213F: <i>F-22A Increment 3.2B***</i>	70.290	13.600	0.000	-	0.000	0.000	-	-	-	0.000	83.890
• APAF 05 Line Item F2232B: <i>F-22A Increment 3.2B, PE 0207138F****</i>	78.410	105.756	13.081	-	13.081	20.373	6.013	-	-	0.000	223.633

Remarks

*F-22 Squadrons, RDT&E/PE 0207138F, includes funding for F-22A Squadrons modernization and development BPAC 674785.

**F-22A Squadrons, APAF/PE 0207138F, includes funding for F-22A Squadrons BPs 11 (Aircraft Modifications), 13 (Post-Production Support), 16 (Initial Spares), and 19 (Depot Activation) only.

***F-22 Increment 3.2B, RDT&E/PE 0605213F, includes funding for the development of F-22A, Increment 3.2B and share lab and infrastructure costs across the F-22 enterprise.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / <i>F-22A Squadrons</i>	Project (Number/Name) 674788 / <i>F-22 Tactical Mandates</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
****F-22 Squadrons, APAF/PE 0207138F/F2232B, includes funding for F-22 Increment 3.2B BPs 11 (Aircraft Modifications) and 16 (Initial Spares) only.											

D. Acquisition Strategy

The Raptor Enhancement Development & Integration II (REDI) II contract is an Indefinite Delivery/Indefinite Quantity contract that maximizes flexibility to start, stop accelerate and reaccelerate projects as required. manage various modernization projects. The REDI II contract is a follow-on to the initial REDI contract. REDI II provides maximum flexibility to manage various modernization projects. The REDI II contract allows for the issuance of orders for efforts associated with the planning, analysis, design, development, qualification, test and documentation of F-22 weapon system performance enhancements, life-cycle improvements, Operational Flight Program (OFP) upgrades, and associated efforts essential to accomplishing the F-22 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674788 / F-22 Tactical Mandates
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
F-22 Tactical Mandates	SS/CPIF	Lockheed Martin : Ft Worth, TX	-	93.230	Nov 2017	59.700	Mar 2018	92.066	Mar 2019	-		92.066	308.656	553.652	-
F-22 TACLink 16	SS/CPIF	Lockheed Martin : Ft Worth, TX	-	93.194	Nov 2017	130.400	Mar 2018	79.710	Mar 2019	-		79.710	106.345	409.649	-
Subtotal			-	186.424		190.100		171.776		-		171.776	415.001	963.301	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Execution	Various	Various : Various	-	-		7.693	Nov 2017	25.160	Nov 2018	-		25.160	39.527	72.380	-
Subtotal			-	-		7.693		25.160		-		25.160	39.527	72.380	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	186.424	197.793	196.936	-	196.936	454.528	1,035.681	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / F-22A Squadrons	Project (Number/Name) 674788 / F-22 Tactical Mandates
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

F-22 TACTICAL MANDATES																												
TACLink 16 Development , Integration & Test																												
TACLink 16 Preliminary Design Review (PDR)																												
TACLink 16 Production Decision																												
TACLink 16 Installs																												
F-22 Tactical Mandates Development , Integration & Test																												
F-22 Tactical Mandates Preliminary Design Review (PDR)																												
F-22 Tactical Mandates Production Decision																												
F-22 Tactical Mandates Installs																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / <i>F-22A Squadrons</i>	Project (Number/Name) 674788 / <i>F-22 Tactical Mandates</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>F-22 TACTICAL MANDATES</i>				
TACLink 16 Development , Integration & Test	2	2017	3	2020
TACLink 16 Preliminary Design Review (PDR)	1	2018	1	2018
TACLink 16 Production Decision	3	2019	3	2019
TACLink 16 Installs	3	2020	4	2023
F-22 Tactical Mandates Development , Integration & Test	2	2017	3	2021
F-22 Tactical Mandates Preliminary Design Review (PDR)	1	2018	1	2018
F-22 Tactical Mandates Production Decision	4	2020	4	2020
F-22 Tactical Mandates Installs	2	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207142F / <i>F-35 Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	97.877	73.905	334.530	549.501	0.000	549.501	598.498	510.184	315.860	292.958	Continuing	Continuing
675346: <i>F-35</i>	75.951	48.162	299.408	472.067	0.000	472.067	507.159	415.855	278.532	281.315	Continuing	Continuing
676011: <i>JSF DUAL CAPABLE AIRCRAFT</i>	21.926	25.743	35.122	77.434	0.000	77.434	91.339	94.329	37.328	11.643	Continuing	Continuing

Program MDAP/MAIS Code: 198

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the United States Air Force, United States Navy, United States Marine Corps and International Partners countries. There are three variants the F-35A Conventional Takeoff and Landing variant; F-35B Short Take Off and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. Maximum commonality among the variants, consistent with National Disclosure Policy, will minimize total air system life cycle costs. Planning and pre-development systems engineering for Block 4 continues as Initial Operational Capability (IOC) is met for each variant during System Development and Demonstration (SDD).

The JSF Continuous Capability Development & Delivery(C2D2) efforts provide incremental warfighting capability improvements to maintain joint air dominance against evolving threats. Block 4 capability requirements were initiated through ongoing Service-led operational analysis of warfighting gaps identified in the Fifth Generation Fighter Modernization Initial Capabilities Document (ICD), and through F-35 JSF Block 4 Mission Decomposition analysis completed in FY2014. These analyses serve as the basis for the Block 4 (CDD), staffed through the Air Force Requirements Oversight Council (AFROC) and signed by the USAF Chief of Staff in January 2015. Joint Requirements Oversight Council (JROC) approved the CDD 21 March 2017. Modernization activities in FY2017 and FY2018 include systems engineering, risk reduction, and infrastructure required to deliver full air system Block 4 capabilities to support initial fleet availability of Block 4 upgrades in FY2021.

C2D2 efforts designated as Block 4 include a robust weapons integration portfolio and provide new opportunities for International Partners to assess, integrate, and field unique capabilities based on global sovereign requirements. Additionally, the F-35 JSF Operational Requirements Document (ORD) calls for the F-35A to have the capabilities and provisions for Dual-Capable Aircrafts (DCA) operations in the first post-SDD block upgrade. DCA refers to the capability to carry and deliver conventional and non-conventional weapons. DCA operations for the F-35A is internal carriage of up to two B-61s. Due to extensive certification requirements, the DCA capability planning and design, testing and certification will continue throughout Block 4.

The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark and Norway are participants in F-35 modernization. The program shown here reflects United States Air Force funding. Total funding for all Service and International Partners is reported at the accomplishment/planned program level since activities support all aircraft variants. Foreign Military Sales are ongoing separately.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207142F / <i>F-35 Squadrons</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-35 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.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	153.045	334.530	510.637	0.000	510.637
Current President's Budget	73.905	334.530	549.501	0.000	549.501
Total Adjustments	-79.140	0.000	38.864	0.000	38.864
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-76.332	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-2.808	0.000			
• Other Adjustments	0.000	0.000	38.864	0.000	38.864

Change Summary Explanation

FY 2017: -\$76.332M Congressional Reduction; -2.808M SBIR Reduction

FY 2019: \$30.418M Dual Capable Aircraft (DCA) B61-12 integration; \$8.446M Autonomic Logistics Information System (ALIS) Global Support Solution (GSS) Enablers

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons				Project (Number/Name) 675346 / F-35			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675346: F-35	75.951	48.162	299.408	472.067	0.000	472.067	507.159	415.855	278.532	281.315	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Total cost, including International partner contributions, USN, USMC, and USAF funding: FY2017 \$167.902M; FY2018 \$738.389M; FY2019 \$1,141.901M.

R-2A table shown above reflects service funding only.

R-2A (section B)/R-3 displays combined program for JSF C2D2.

F-35 C2D2 Includes:

USAF PE 0207142F BPAC 675346

FY13: USN PE 0604800N Project Unit 2261

FY14: USN PE 0604800N Project Unit 9999

FY15-18: USN PE 0604810N Project Unit 2936

FY19: USN PE 0604840N Project Unit 2936

FY13: USMC PE 0604800M Project Unit 2262

FY14: USMC PE 0604800M Project Unit 9999

FY15-18: USMC PE 0604810M Project Unit 2935

FY19: USMC PE 0604840M Project Unit 3410

International Partner Contributions

A. Mission Description and Budget Item Justification

F-35 C2D2 provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential capabilities for Air Interdiction and Strategic Attack, Close Air Support, Suppression and Destruction of Enemy Air Defenses, Offensive and Defensive Counter Air and expanded Surface Warfare. The C2D2 acquisition strategy is based upon incremental deliveries of capabilities. The strategy includes periodic deliveries with a focus on hardware, tech refresh and software. C2D2 capability planning includes an efficient transition from F-35 SDD to C2D2. As SDD development activities ramp down C2D2 will assume responsibility for improvements and modernization efforts.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Block 4 Planning and System Engineering	36.716	314.240	420.931	0.000	420.931

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Block 4 Planning and Systems Engineering preliminarily design and delta System Requirements Review (SRR) for all variants of the F-35 Aircraft. Modernization efforts is the Requirements Decomposition of capabilities for the entire Block 4 upgrade to include sub-blocks 4.1 and 4.2. This is a continuation of the previous Block 4 Requirements Decomposition effort which will include activities leading up to a successful System Functional Review (SFR) and select facility upgrades required for Block 4 research, development, test and evaluation. Included in Block 4 are upgraded capabilities and continuous improvements to maintain Air System viability against evolving threats indicated in the Electronic Warfare Initial Capabilities Document (ICD), the Fifth Generation Fighter Modernization ICD, and the Block 4 Capability Development Document (CDD), reduce life cycle cost, and improve operational suitability. Expected completion of a Block 4.1 Preliminary Design Review (PDR) and a Block 4.2 System Requirements Review (SRR) will address additional Block 4 capabilities requirements. Post-PDR risk reduction, preplanning for subsequent Block 4 Modernization events, and investments to deliver the full Block 4 Air System capabilities are included.</p> <p>FY 2018 Plans: Conduct a Block 4.1 System Functional Review (SFR). Award Phase II contract for Block 4.1 PDR, Block 4.2 SRR, and Post-PDR risk reduction and Planning. Continuing development and maturity of key long lead capabilities and service unique weapons.</p> <p>FY 2019 Base Plans: Continue Block 4 Phase II contract development. Conduct Block 4.1 PDR and Block 4.2 SRR, as well as continuing Post-PDR risk reduction and planning.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$106.691M; see above for details.</p>					
<p>Title: Technology Refresh 3 (TR-3)</p> <p>Description: Technology Refresh 3 (TR-3) Design Competition, Development, Integration, and Test. This is the design phase of TR-3 program fully supports Block 3F functionality and allows incorporation of all Block 4 capabilities documented in the System Requirements Document (SRD). TR-3 hardware redesign is required to support 4X processing growth factor based on the current processing estimates for all 3F capabilities. Redesign of TR-3 subsystems Integrated Core Processor (ICP), Aircraft Memory System (AMS), and Panoramic Cockpit</p>	77.177	96.025	175.696	0.000	175.696

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Display (PCD)) configurations will contain new backplane technology, commercial operating systems, and modified middleware necessary to take the design of the TR-3 System through Critical Design Review (CDR).

FY 2018 Plans:

The TR-3 program will continue design toward Critical Design Review of the Integrated Core Processor (ICP), Panoramic Cockpit Display (PCD), and Aircraft Memory System (AMS). In addition the TR-3 program will prototype the middleware software that will enable F-35's new messaging architecture delivered as part of TR-3 and ensure compatibility with current F-35 sensors. Additionally the initial lab stand up will occur to ensure timely first article delivery to the production line in FY23.

FY 2019 Base Plans:

The TR-3 program will continue design toward Critical Design Review of the Integrated Core Processor (ICP), Panoramic Cockpit Display (PCD), and Aircraft Memory System (AMS). In addition the TR-3 program will prototype the middleware software that will enable F-35's new messaging architecture delivered as part of TR-3 and ensure compatibility with current F-35 sensors. Additionally the initial lab stand up will occur to ensure timely first article delivery to the production line in FY23.

FY 2019 OCO Plans:

N/A

FY 2018 to FY 2019 Increase/Decrease Statement:

Increase of \$79.671M; see above for details.

<i>Title:</i> Infrastructure and Support Costs	52.009	132.026	244.520	0.000	244.520
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Description: Funding will support infrastructure investment planning and other test planning activities required for Block 4 development, integration, test and evaluation. Funding related to the Integrated Test Force, government, and contractor labor. Other costs in support of ranges, chase planes and DT site operations.

FY 2018 Plans:

Continue development support for defining, managing and acquiring the F-35 capability enhancements identified in approved requirements documents. Transfer of integrated test force requirement to C2D2 F-35 as SDD draws to closure. USAF only will fund additional PMA to transition to a final hybrid product support integrator (HPSI) which will support sustainment analysis with product support managers, focused on long term strategic planning and transition to a final integrated support plan. Conduct strategic basing analysis to determine permanent location for core of HPSI.

FY 2019 Base Plans:

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Continue development support for defining, managing and acquiring the F-35 capability enhancements identified in approved requirements documents. Transfer of integrated test force requirement to C2D2 as F-35 SDD draws to closure. USAF only will fund additional PMA to transition to a final hybrid product support integrator (HPSI) which will support sustainment analysis with product support managers, focused on long term strategic planning and transition to a final integrated support plan. Conduct strategic basing analysis to determine permanent location for core of HPSI.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$112.494M; see above for details.</p>					
<p>Title: Test and Evaluation</p> <p>Description: Developmental Test activities in support of Block 4. Non-recurring engineering required to plan for the service life extension of existing DT aircraft and modification necessary to bring DT aircraft fleet to a more production representative and sustainable configuration. Additional upgrades required to support development and evaluation of improvements driven by changes in the threat environment and as identified in the Electronic Warfare ICD, the Fifth Generation Fighter Modernization ICS, and the Block 4 Capability Development Document (CDD).</p> <p>FY 2018 Plans: Funding will support investment planning and prioritization required to maintain future development capability. This funding supports the non-recurring engineering (NRE) for capability upgrades and service life extension modifications to include engine, structural and mission systems updates to maintain the viability of DT fleet for C2D2 efforts. This funding also supports laboratory upgrades required to support development and verification of capabilities in a relevant environment.</p> <p>FY 2019 Base Plans: Funding will support flight test execution to ensure Block 4 capabilities are delivered as designed. Funding also supports investment planning and prioritization required to maintain future development capabilities. This includes instrumenting new DT aircraft, ordering the replacement of pre-LRIP aircraft engines, continuing the FY18 NRE work, and delivery and install of upgraded hardware as a part of the DT aircraft viability effort.</p>	2.000	196.098	300.754	0.000	300.754

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Additionally, this funding supports laboratory upgrades required to support development and verification of capabilities in a relevant environment.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$104.656M; see above for details.					
Accomplishments/Planned Programs Subtotals	167.902	738.389	1,141.901	0.000	1,141.901
Other Service Funding Adjustment	119.740	438.981	669.834	-	669.834
Air Force Subtotals	48.162	299.408	472.067	0.000	472.067

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE 07 PE 0207142F 6011: Dual Capable Aircraft (DCA), BPAC 676011	25.743	35.122	77.434	-	77.434	91.339	94.329	37.328	11.643	Continuing	Continuing
• RDTE 05 PE 0604810N 2936: F-35C Follow-on Modernization (CV)	25.041	143.855	-	-	-	-	-	-	-	0.000	168.896
• RDTE 07 PE 0604840N 2936: F-35C Follow-on Modernization (CV)	-	-	252.360	-	252.360	223.901	184.210	117.189	119.602	Continuing	Continuing
• RDTE 05 PE 0604810M 2935: F-35B Follow-on Modernization (STOVL)	29.691	144.958	-	-	-	-	-	-	-	0.000	174.649
• RDTE 07 PE 0604840M 3410: F-35B Follow-on Modernization (STOVL)	-	-	259.122	-	259.122	228.719	189.038	122.592	125.044	Continuing	Continuing
• International: International FoM	65.008	150.168	158.352	-	158.352	160.705	166.023	158.811	158.811	Continuing	Continuing

Remarks
This is a joint program with no executive service. Service Acquisition Executive (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Air Force.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / <i>F-35 Squadrons</i>	Project (Number/Name) 675346 / <i>F-35</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Program Element 0604800N/0604800M continues USN development efforts budgeted in 0603800N prior to FY2002. The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark, and Norway are participants in the SDD phase of JSF.

PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.

D. Acquisition Strategy

The C2D2 acquisition strategy is to employ both Cost and Fixed Price Incentive contracts for the Block 4 engineering and development efforts. A new modernization contract structure will be established for all post SDD Block 4 efforts. In addition, a separate Basic Ordering Agreement or Indefinite Quantity/Indefinite Delivery contract is planned to provide a long term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future C2D2 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prime LM 18-C-1004 PHASE II	SS/CPFF	Lockheed Martin : Ft Worth, TX	0.000	28.140	Feb 2018	276.520	Dec 2017	278.448	Dec 2018	-		278.448	1,031.289	1,614.397	1,614.161
Prime LM 14-G-0020 TR3	C/CPFF	Lockheed Martin : Ft Worth, TX	19.660	77.177	Mar 2017	96.025	Dec 2017	175.696	Dec 2018	-		175.696	510.000	878.558	878.558
Prime LM BOA 0020 (Nimble Lightning+Pilot Training)	C/CPFF	Lockheed Martin : Ft Worth, TX	1.206	3.500	Sep 2017	4.250	Sep 2018	4.760	Mar 2019	-		4.760	17.500	31.216	31.216
Prime LM Flight Test Asset	Various	Various : TBD	0.000	-		37.548	Mar 2018	85.346	Jan 2019	-		85.346	406.000	528.894	528.894
Prime LM ECASE	SS/CPFF	Lockheed Martin : Ft Worth, TX	0.000	-		15.670	Feb 2018	69.850	Jan 2019	-		69.850	168.000	253.520	253.520
Prime LM TBD DT AC Viability	C/CPFF	Lockheed Martin : Ft Worth, TX	0.000	-		65.205	Feb 2018	100.100	Jan 2019	-		100.100	415.000	580.305	580.305
Product Development Sys Engineering	Various	Various : TBD	0.266	5.076	Dec 2016	17.800	Feb 2018	18.423	Jan 2019	-		18.423	88.000	129.565	129.565
Prime PW Propulsion	SS/CPFF	Pratt Whitney : TBD	0.000	-		-		49.450	Feb 2019	-		49.450	220.000	269.450	269.450
Prime LM Infrastructure	C/CPFF	Lockheed Martin : Ft Worth, TX	0.000	-		-		100.550	Nov 2018	-		100.550	345.000	445.550	445.550
Prior Year no longer funded in FYDP	Various	Various : TBD	144.540	-		-		-		-		-	0.000	144.540	144.540
Subtotal			165.672	113.893		513.018		882.623		-		882.623	3,200.789	4,875.995	N/A

Remarks

Block 4 Modernization R-2A includes Phase II, Nimble Lightning, ECASE, Systems Engineering & Propulsion.
 Added Prior Year No Longer Funded in FYDP line in Product Development section.
 Added Prime LM Phase 0 & Phase I Prior Year amounts to Prior Year No Longer Funded in FYDP line .

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NAWC Paxutent River	WR	NAWCAD : Paxutent River, MD	7.903	8.195	Dec 2016	15.750	Dec 2017	16.839	Dec 2018	-		16.839	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NAWC China Lake	WR	NAWCWD : China Lake, CA	0.429	0.600	Dec 2016	8.150	Dec 2017	9.574	Dec 2018	-		9.574	43.083	61.836	-
Edwards Air Force Base	Various	Edwards AFB : Various	0.986	0.000		3.802	Dec 2017	4.050	Dec 2018	-		4.050	14.175	23.013	-
AFFTC / Eglin AFB	Various	Eglin : Various	0.015	2.250	Dec 2016	3.450	Jan 2018	3.393	Dec 2018	-		3.393	15.268	24.376	-
AFLCMC/Wright Patterson AFB	MIPR	AFLCMC : Wright Patterson AFB, OH	0.281	1.005	Dec 2016	1.125	Dec 2017	3.978	Dec 2018	-		3.978	13.923	20.312	-
Development Support	Various	Various : TBD	7.903	8.682	Dec 2016	8.852	Dec 2017	9.861	Dec 2018	-		9.861	34.513	69.811	-
Subtotal			17.517	20.732		41.129		47.695		-		47.695	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NAWC Paxutent River	Various	Various : Paxutent River, MD	0.000	-		34.995	Feb 2018	43.744	Dec 2018	-		43.744	174.872	253.611	-
NAWC China Lake	WR	NAWCWD : China Lake, CA	0.000	-		10.350	Feb 2018	11.563	Dec 2018	-		11.563	40.470	62.383	-
Edwards/AFB	Various	Edwards AFB : Edwards AFB, CA	0.000	-		25.250	Feb 2018	31.563	Dec 2018	-		31.563	110.470	167.283	-
Developmental Test & Evaluation	Various	Various : TBD	0.000	-		10.250	Feb 2018	12.813	Dec 2018	-		12.813	57.087	80.150	-
AFOTEC	MIPR	AFOTEC : Kirtland AFB, NM	0.700	2.000	Feb 2017	12.500	Feb 2018	15.625	Dec 2018	-		15.625	72.500	103.325	-
Subtotal			0.700	2.000		93.345		115.308		-		115.308	455.399	666.752	N/A

Remarks
Increase in Test and Evaluation funding due to transfer of Integrated Test Force (ITF) requirements from SDD to C2D2 budget.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AFLCMC Civilian Pay	Various	AFLCMC CIV PAY : Wright Patterson AFB, OH	0.000	29.377	Oct 2016	44.700	Oct 2017	46.265	Dec 2018	-		46.265	231.610	351.952	-
Financial Mgmt Database Support IDS	C/CPAF	IDS : Arlington, VA	0.000	-		0.800	Jan 2018	0.850	Dec 2018	-		0.850	4.301	5.951	-
Earned Value/Finance/ Cost ACT-I	C/CPAF	ACT-I : Arlington, VA	0.000	-		4.500	Jan 2018	5.100	Dec 2018	-		5.100	23.518	33.118	-
CIO BOS	C/CPAF	Various : TBD	0.000	-		20.000	Jan 2018	22.500	Dec 2018	-		22.500	95.066	137.566	-
Systems System High BOS	Various	Various : TBD	0.000	-		9.336	Jan 2018	9.500	Dec 2018	-		9.500	45.342	64.178	-
Other CIO Services	Various	Not specified. : TBD	0.000	-		8.239	Jan 2018	8.622	Dec 2018	-		8.622	22.579	39.440	-
Travel	Various	Not specified. : TBD	0.000	1.900	Oct 2016	3.322	Oct 2017	3.438	Oct 2018	-		3.438	8.569	17.229	-
Subtotal			0.000	31.277		90.897		96.275		-		96.275	430.985	649.434	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	183.889	167.902	738.389	1,141.901	-	1,141.901	Continuing	Continuing	N/A
Other Service Funding Adjustment	107.938	119.740	438.981	669.834	-	669.834			-
Project Cost Totals	75.951	48.162	299.408	472.067	-	472.067	0.000	0.000	-

Remarks
 The Project information shown here reflects USN, USMC, USAF and International Partner funding total for each contract. By agreement, USN and USMC funding shares are approximately equal and when combined are equal to the USAF share. Partner funding share is based upon future aircraft procurement numbers updated annually in accordance with the Production, Sustainment, C2D2 (formerly Follow-on Modernization (FoM)) Memorandum of Agreement.

Subtotals and totals may not add due to rounding.

Prior Year reflects \$75.951M USAF/\$30.286M USN/\$29.726M USMC/\$47.926M International/Total \$183.889M
 FY 2017 reflects \$ 48.162M USAF/\$ 25.041M USN/\$29.691M USMC/\$ 65.008M International/Total \$167.902M
 FY 2018 reflects \$299.408M USAF/\$143.855M USN/\$144.958M USMC/\$150.168M International/Total \$738.389M
 FY 2019 reflects \$472.067M USAF/\$252.360 USN/\$259.122M USMC/\$158.352M International/Total \$1,141.901M

F-35 C2D2 Includes:
 USAF PE 0207142F BPAC 675346

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / <i>F-35 Squadrons</i>	Project (Number/Name) 675346 / <i>F-35</i>
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	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
FY13: USN PE 0604800N Project Unit 2261 FY14: USN PE 0604800N Project Unit 9999 FY15-18: USN PE 0604810N Project Unit 2936 FY19: USN PE 0604840N Project Unit 2936 FY13: USMC PE 0604800M Project Unit 2262 FY14: USMC PE 0604800M Project Unit 9999 FY15-18: USMC PE 0604810M Project Unit 2935 FY19: USMC PE 0604840M Project Unit 3410 International Partner Contributions									

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
675346 / F-35				
Requirements: Final CDD (JROC)	3	2017	3	2017
Aquisition: Block 4 Phase II Contract Award	2	2018	2	2018
Acquisition: Interim Program Review (IPR) FY18	1	2018	1	2018
Acquisition: Interim Program Review (IPR) FY19	1	2019	1	2019
Acquisition: Interim Program Review (IPR) FY20	1	2020	1	2020
Acquisition: Interim Program Review (IPR) FY21	1	2021	1	2021
Acquisition: Interim Program Review (IPR) FY22	1	2022	1	2022
Acquisition: Interim Program Review (IPR) FY23	1	2023	1	2023
Contracting: Block 4 Phase I	1	2017	2	2018
Contracting: Block 4 Phase II	2	2018	4	2023
Systems Engineering: 4.1 Initial Preliminary Design Review (PDR)	2	2019	2	2019
Systems Engineering: 4.2 Initial Preliminary Design Review (PDR)	3	2020	3	2020
Systems Engineering: 4.1 Initial System Requirements Review (SRR)	1	2017	1	2017
Systems Engineering: 4.1 Initial System Functional Review (SFR)	1	2018	1	2018
Systems Engineering: 4.2 Initial System Requirements Review (SRR)	4	2019	4	2019
Test & Evaluation: 4.1 Test	4	2019	4	2020
Test & Evaluation: 4.2 Test	2	2021	4	2022
Fielding: Block 4.1 Fleet Availability	1	2021	1	2021
Fielding: Block 4.2 Fleet Availability	1	2023	1	2023

Note

Schedule details reflect fiscal years

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676011: JSF DUAL CAPABLE AIRCRAFT	21.926	25.743	35.122	77.434	0.000	77.434	91.339	94.329	37.328	11.643	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

F-35 C2D2 Includes:

USAF PE 0207142F BPAC 675346

FY13: USN PE 0604800N Project Unit 2261

FY14: USN PE 0604800N Project Unit 9999

FY15-18: USN PE 0604810N Project Unit 2936

FY19: USN PE 0604840N Project Unit 2936

FY13: USMC PE 0604800M Project Unit 2262

FY14: USMC PE 0604800M Project Unit 9999

FY15-18: USMC PE 0604810M Project Unit 2935

FY19: USMC PE 0604840M Project Unit 3410

International Partner Contributions

F-35 DCA Includes:

USAF PE 0207142F BPAC 676011

A. Mission Description and Budget Item Justification

F-35 C2D2 provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential capabilities for Air Interdiction and Strategic Attack, Close Air Support, Suppression and Destruction of Enemy Air Defenses, Offensive and Defensive Counter Air and expanded Surface Warfare. The C2D2 acquisition strategy is based upon incremental deliveries of capabilities. The strategy includes periodic deliveries with a focus on hardware, tech refresh, and software. C2D2 capability planning includes an efficient transition from F-35 SDD to C2D2. As SDD development activities ramp down, C2D2 will assume responsibility for improvements and modernization efforts.

Additionally, the F-35 Joint Strike Fighter (JSF) Operational Requirements Document (ORD) calls for the F-35A variant to have the capabilities and provisions for Dual Capable Aircraft (DCA) operations in the first post SDD block upgrade. DCA refers to the capability to carry and deliver conventional and non-conventional weapons. DCA operation for the F-35A is internal carriage of either one or two B-61-12 weapons.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Dual Capable Aircraft (DCA)(F-35 JSF)	25.743	35.122	77.434	-	77.434

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: This effort provides for the assessment of Dual-Capable Aircraft (DCA) weapon integration and certification impacts on the Joint Strike Fighter (JSF) aircraft. It identifies and mitigates potential technical and cost risks, as well as defines the integration and certification trade-space to field the DCA capability with the B61-12 weapon. This effort also supports follow-on risk reduction efforts that will ensure future integration alignment with the earliest feasible post-SDD block upgrade, and is expected to include full integration efforts pending Service decisions.</p> <p>FY 2018 Plans: Complete Static Ejection and Wind Tunnel Tests for initial Separation Analysis. Perform additional data analysis to support Block 4 System Functional Review and Preliminary Design Review. F-35A is an objective platform and maintains responsibility for integration/certification costs of the B61-12; as such, the program will continue to resource planning and execution for integration/certification of B61-12 on F-35A. Complete preliminary design reports, nuclear safety evaluation plans, and nuclear analysis reports. Conduct sub-block 4.1 System Functional Review (SFR).</p> <p>FY 2019 Base Plans: Continue execution of the Phase 2 Block 4 contract executing: Early DCA Software Development and resource recovery, Development of the Preliminary EICD and MICD, continued NSAR and PDR development, IV&V Plan Development Survivability Analysis, FRIU upgrade development and production, Wiring Mods for additional Mission Select Switch and Nuclear Consent Switch, DT aircraft Mod Kits. Conduct early flight science testing of B61-12 (i.e. Environmental, Loads and separation testing and analysis). F-35A is an objective platform and maintains responsibility for integration/certification costs of the B61-12; as such, the program will continue to resource planning and execution for integration/certification of B61-12 on F-35A.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$42.312M; see above for details.</p>					
Accomplishments/Planned Programs Subtotals	25.743	35.122	77.434	-	77.434

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE 07 PE 0207142F 5346: JSF Follow on Modernization, BPAC 675346	48.162	299.408	472.067	-	472.067	507.159	415.855	278.532	281.315	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 05 PE 0604810N 2936: F-35C Follow on Modernization (CV)	25.041	143.855	-	-	-	-	-	-	-	0.000	168.896
• RDTE 07 PE 0604840N 2936: F-35C Follow on Modernization (CV)	-	-	252.360	-	252.360	223.901	184.210	117.189	119.602	Continuing	Continuing
• RDTE 05 PE 0604810M 2935: F-35B Follow-on Modernization (STOVL)	29.691	144.958	-	-	-	-	-	-	-	0.000	174.649
• RDTE 07 PE 0604840M 3410: F-35B Follow-on Modernization (STOVL)	-	-	259.122	-	259.122	228.719	189.038	122.592	125.044	Continuing	Continuing
• International: <i>International FOM</i>	65.008	150.168	158.352	-	158.352	160.705	166.023	158.811	158.811	Continuing	Continuing

Remarks

D. Acquisition Strategy

The DCA effort will leverage contracting vehicles for the overall Block 4 F-35 C2D2 effort. The C2D2 acquisition strategy is to employ both Cost and Fixed Price Incentive contracts for the Block 4 engineering and development efforts. A new modernization contract structure will be established for all post SDD Block 4 efforts. In addition, a separate Basic Ordering Agreement or Indefinite Quantity/Indefinite Delivery contract is planned to provide a long term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future C2D2 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Block 4 Phase 1 - DCA Requirements Decomposition	SS/CPFF	Lockheed Martin : Ft. Worth, TX	19.654	9.000	Sep 2017	5.100	Feb 2018	2.950	Dec 2018	-		2.950	Continuing	Continuing	-
Block 4 Phase 2.1 - DCA to PDR	SS/CPFF	Lockheed Martin : Ft. Worth, TX	0.000	10.675	Nov 2017	12.072	Feb 2018	15.752	Feb 2019	-		15.752	Continuing	Continuing	-
Block 4 Phase 2.3 - DCA to DT Complete	SS/CPFF	Lockheed Martin : Ft. Worth, TX	0.000	-		6.000	Jun 2018	29.650	Feb 2019	-		29.650	Continuing	Continuing	-
Prior Year - no longer funded in FYDP	Various	Not specified. : TBD	0.948	-		-		-		-		-	0.000	0.948	-
Subtotal			20.602	19.675		23.172		48.352		-		48.352	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
B61-12/F-35 Certification	Various	Various : TBD	0.500	4.688	Aug 2017	8.950	Feb 2018	25.350	Feb 2019	-		25.350	Continuing	Continuing	-
Tail-kit Program Office	MIPR	TKA SPO : Eglin AFB, FL	-	0.020	Feb 2018	3.000	Feb 2018	2.350	Dec 2018	-		2.350	Continuing	Continuing	-
AFNWC/AFSEC Support	MIPR	Various : TBD	-	1.360	Jan 2018	-		1.382	Feb 2018	-		1.382	Continuing	Continuing	-
Subtotal			0.500	6.068		11.950		29.082		-		29.082	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Year - no longer funded in FYDP	Various	Not specified. : TBD	0.824	-		-		-		-		-	0.000	0.824	-
Subtotal			0.824	-		-		-		-		-	0.000	0.824	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT
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	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.926	25.743	35.122	77.434	-	77.434	Continuing	Continuing	N/A

Remarks

F-35 C2D2 Includes:
 USAF PE 0207142F BPAC 675346
 FY13: USN PE 0604800N Project Unit 2261
 FY14: USN PE 0604800N Project Unit 9999
 FY15-18: USN PE 0604810N Project Unit 2936
 FY19: USN PE 0604840N Project Unit 2936
 FY13: USMC PE 0604800M Project Unit 2262
 FY14: USMC PE 0604800M Project Unit 9999
 FY15-18: USMC PE 0604810M Project Unit 2935
 FY19: USMC PE 0604840M Project Unit 3410
 International Partner Contributions

F-35 DCA Includes:
 USAF PE 0207142F BPAC 676011

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
676011: JSF Dual Capable Aircraft																												
DCA Risk Reduction - B61/12 Development																												
Nuclear Certification - NNSA & TKA SPO																												
Phase 1 (Nuclear Certification Tasks) Requirements Decomposition																												
Phase 2.1 (Nuclear Certification Tasks) DCA to Preliminary Design Review (PDR)																												
Phase 2.3 (Nuclear Certification Tasks) DCA to DT Complete																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / <i>F-35 Squadrons</i>	Project (Number/Name) 676011 / <i>JSF DUAL CAPABLE AIRCRAFT</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
676011: JSF Dual Capable Aircraft				
DCA Risk Reduction - B61/12 Development	1	2017	4	2017
Nuclear Certification - NNSA & TKA SPO	1	2017	4	2023
Phase 1 (Nuclear Certification Tasks) Requirements Decomposition	1	2017	2	2019
Phase 2.1 (Nuclear Certification Tasks) DCA to Preliminary Design Review (PDR)	1	2018	4	2021
Phase 2.3 (Nuclear Certification Tasks) DCA to DT Complete	3	2018	4	2023

Note

Schedule details reflect fiscal years

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	122.125	51.499	34.952	37.230	0.000	37.230	28.305	19.452	16.006	14.029	0.000	323.598
674132: <i>AIM-9 Product Improvement</i>	122.125	51.499	34.952	37.230	0.000	37.230	28.305	19.452	16.006	14.029	0.000	323.598
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 442

Note

Funding in FY11 and out is for the Block II program only. The AIM-9X Block I program costs for FY11 and prior are \$233.583M.

A. Mission Description and Budget Item Justification

AIM-9X is a long-term evolution of the AIM-9, a fielded system, qualifying this as a research category operational systems development. The AIM-9X short range air-to-air missile modification program provides a launch and leave, air combat munition that uses passive Infra-Red (IR) energy for acquisition and tracking of enemy aircraft and complements the Advanced Medium Range Air-to-Air Missile (AMRAAM). Air superiority in the short range air-to-air missile arena is essential and includes first shot, first kill opportunity against an enemy employing IR countermeasures. The AIM-9X employs several components common with the AIM-9M (fuze, rocket motor and warhead). The AIM-9X Block II missile is critical to project power and win decisively in accordance with the Fiscal Year 2015 Defense Planning Guidance. The missile is essential to Pacific Command plans to counter threats employed by advanced Digital Radio Frequency Memory (DRFM) electronic attack, cruise missiles, and Unmanned Aerial Vehicles.

This line item continues Technical Refresh of components and software, as well as incorporates advanced development products and capabilities, to meet threshold requirements of the capabilities production document. Specifically, the program will redesign, develop and integrate components facing obsolescence, implement cost reduction initiatives, enhance insensitive munitions performance, incrementally improve operational flight software to fully utilize capabilities of the missile, and implement improvements in anti-tamper and cyber security technology.

The program strategy is to first redesign the control actuation system (CAS) battery, along with the AIM-9X Block II Plus (AIM-9X-3) and incorporate it into the Lot 17 (FY 2017) production missile. Next, the program will complete missile software improvements (software version 9.4) and release it into Lot 19 (FY 2019) and prior missiles. The software will provide improved infrared counter-countermeasures, partial and degraded cueing, improved lock on after launch capability, improved small target acquisition, and surface attack capability. Finally, the program will insert a redesigned dome, inertial measurement unit, and processor in Lot 20 (FY2020) production missiles.

The AIM-9X Block I concluded in FY 2011 and all funding/quantity data in the documents are associated with Block II activities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver AIM-9X 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

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	52.898	34.952	24.711	0.000	24.711
Current President's Budget	51.499	34.952	37.230	0.000	37.230
Total Adjustments	-1.399	0.000	12.519	0.000	12.519
• 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	0.150	0.000			
• SBIR/STTR Transfer	-1.549	0.000			
• Other Adjustments	0.000	0.000	12.519	0.000	12.519

Change Summary Explanation

FY 2017 change due to SBIR and \$150K reprogramming for FTS.
 FY 2019 increase of \$12.519M for AIM-9 SIP III Upgrade.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AIM- 9X Product Development	51.003	31.940	32.830	-	32.830
Description: Continuation of Primary Hardware Development/Pre-Planned Product Improvement (Tech Refresh) efforts for the AIM-9X weapon system. This includes Systems Engineering / Program management, as well as support required, to ensure AIM-9X missile integration with threshold US Air Force aircraft platforms. This also includes efforts to redesign missile components in order to resolve Block II component obsolescence to ensure missile producibility and increase reliability beyond Lot 20. Incorporate anti-tamper and cyber security technology improvements, and implement cost reduction initiatives, and to comply with the Insensitive Munitions (IM) requirements as established by Joint Requirements Oversight Council memo dated 11 February 2009.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>			
C. Accomplishments/Planned Programs (\$ in Millions)					
FY 2018 Plans: Complete v9.317 software release to resolve F-22 aircraft deficiencies discovered during Block II integration testing. Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Incorporate anti-tamper and cyber security technology improvements. Continue to develop v9.4 Block II software improvements to utilize full capability of the missile. Continue to develop missile hardware design improvements necessary to enhance IM performance.					
FY 2019 Base Plans: Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Continue to develop v9.4 Block II software improvements to utilize full capability of the missile. Incorporate anti-tamper and cyber security technology improvements. Continue to develop missile hardware design improvements necessary to enhance IM performance. Complete Critical Design Review necessary to incorporate IMU, dome and processor redesigns into Lot 20 production.					
FY 2018 to FY 2019 Increase/Decrease Statement: The decrease in Primary Hardware & Software Development between FY 2018 and FY2019 reflects curtailing the development activities associated with the obsolescence redesign of missile components and v9.4 software upgrade.					
Title: AIM- 9X, Test and Evaluation					
Description: Test and Evaluation (T&E) and associated governmental support required to ensure the AIM-9X missile integration with threshold US Air Force aircraft platforms (F-15). Developmental and Operational testing of the next tech refresh version of software improvements to the missile, Operation Flight Software version 9.4.					
FY 2018 Plans: Continue Developmental Testing and Integrated Testing (DT/IT-D1) planning of Operational Flight Software version 9.4 including improvements associated with further integrating threshold aircraft to utilize full capability of the Block II missile.					
FY 2019 Base Plans:					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	0.496	3.012	4.400	-	4.400

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue Developmental Testing and Integrated Testing (DT/IT-D1) of Operational Flight Software version 9.4 including improvements associated with further integrating threshold aircraft to utilize full capability of the Block II missile. <i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Increase in Operational Test and Evaluation between FY 2018 and FY2019 reflects DT/IT-D1 efforts to incorporate software v9.4 into the missile in accordance with the test and evaluation master plan (TEMP) revision after Block II.					
Accomplishments/Planned Programs Subtotals	51.499	34.952	37.230	-	37.230

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• MPAF 02 Line Item M09HAI: <i>Sidewinder (AIM-9X)</i>	127.438	125.350	121.253	-	121.253	122.108	164.987	108.441	118.413	33.290	921.280
• MPAF 04 Line Item 000999: <i>Replen Spares, USAF</i>	11.015	11.222	11.248	-	11.248	11.454	11.644	20.976	15.634	Continuing	Continuing
• MPAF 04 Line Item 000999 <i>(2)...: Inital Spares, USAF</i>	7.684	5.720	4.255	-	4.255	4.290	1.864	1.902	1.936	0.000	27.651
• RDTE 07 PE 0207161N: <i>Tactical AIM Missile</i>	54.678	42.884	40.121	-	40.121	20.053	7.571	0.424	0.446	Continuing	Continuing
• WPN Line Item 2209: <i>Sidewinder</i>	70.912	79.692	77.927	0.381	78.308	81.170	88.680	90.444	92.286	409.142	990.634

Remarks

E. Acquisition Strategy
 Milestone C decision for LRIP was held June 24, 2011. The program received USN Initial Operational Capability (IOC) in March 2015 and Full Rate Production (FRP) Approval in August 2015 followed by contract award for FRP-1 in September 2015. The Air Force achieved IOC in September 2016. The program awarded the FRP-3 contract in March 2017, and will award the option for FRP-4 in May 2018. The program plans to award FRP-5 in February 2019.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
RMS Software/OFP Upgrade	SS/CPFF	RMS : Tucson, AZ	83.933	46.483	Jan 2017	27.801	Mar 2018	26.727	Mar 2019	-		26.727	58.448	243.392	312.877
Flight Termination System	MIPR	NAWC WD : China Lake, CA	0.000	0.150		0.000		0.000		-		0.000	8.494	8.644	-
Munitions Improvement Study (USG)	MIPR	NAWC WD : China Lake, CA	6.125	3.218	Nov 2016	3.302	Nov 2017	3.260	Nov 2018	-		3.260	3.319	19.224	-
Systems Engineering (USG)	MIPR	NAWC WD : China Lake, CA	2.293	0.330	Nov 2016	0.321	Nov 2017	0.343	Nov 2018	-		0.343	0.707	3.994	-
Aircraft Integration	SS/CPFF	Boeing : St. Louis, MO	-	0.612	Dec 2016	0.500	Dec 2017	0.500	Dec 2018	-		0.500	0.500	2.112	2.112
Subtotal			92.351	50.793		31.924		30.830		-		30.830	71.468	277.366	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DT&E/OT&E	PO	Eglin AFB : Eglin, FL	22.636	0.496	Mar 2017	2.558	Mar 2018	5.683	Mar 2019	-		5.683	4.961	36.334	-
IT/OT Support F-15	SS/CPAF	RMS : Tuscon, AZ	-	0.000		0.194	Jan 2018	0.457	Jan 2019	-		0.457	0.343	0.994	0.994
Subtotal			22.636	0.496		2.752		6.140		-		6.140	5.304	37.328	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA	Various	Eglin AFB : Eglin, MD	7.138	0.210	Mar 2017	0.276	Mar 2018	0.260	Mar 2019	-		0.260	1.020	8.904	8.904
Subtotal			7.138	0.210		0.276		0.260		-		0.260	1.020	8.904	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		122.125	51.499	34.952	37.230	-	37.230	77.792	323.598	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>
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	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

AIM-9X Production Milestones

Contract Award: Lot 17 (FRP 3)																												
Contract Award: Lot 18 (FRP 4)																												
Contract Award: Lot 19 (FRP 5)																												
Contract Award: Lot 20 (FRP 6)																												
Contract Award: Lot 21 (FRP 7)																												
Contract Award: Lot 22 (FRP 8)																												
Contract Award: Lot 23 (FRP 9)																												
Production Deliveries: Lot 15 (FRP 1)																												
Production Deliveries: Lot 16 (FRP 2)																												
Production Deliveries: Lot 17 (FRP 3)																												
Production Deliveries: Lot 18 (FRP 4)																												
Production Deliveries: Lot 19 (FRP 5)																												
Production Deliveries : Lot 20 (FRP 6)																												
Production Deliveries: Lot 21 (FRP 7)																												

AIM-9X Block II System Improvement Program (SIP) II

Engineering Manufacturing Development Contract																												
AIM-9X Block II: Hardware & Software (v9.3) Improvements: Air Force Initial Operational Capability																												
Operational Flight Software Release v9.316																												
Operational Flight Software Release v9.317																												

AIM-9X Block II Tech Refresh (SIP III): Hardware

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
AIM-9X Production Milestones				
Contract Award: Lot 17 (FRP 3)	2	2017	2	2017
Contract Award: Lot 18 (FRP 4)	3	2018	3	2018
Contract Award: Lot 19 (FRP 5)	2	2019	2	2019
Contract Award: Lot 20 (FRP 6)	2	2020	2	2020
Contract Award: Lot 21 (FRP 7)	2	2021	2	2021
Contract Award: Lot 22 (FRP 8)	2	2022	2	2022
Contract Award: Lot 23 (FRP 9)	2	2023	2	2023
Production Deliveries: Lot 15 (FRP 1)	2	2017	1	2018
Production Deliveries: Lot 16 (FRP 2)	3	2018	2	2019
Production Deliveries: Lot 17 (FRP 3)	3	2019	2	2020
Production Deliveries: Lot 18 (FRP 4)	3	2020	2	2021
Production Deliveries: Lot 19 (FRP 5)	3	2021	2	2022
Production Deliveries : Lot 20 (FRP 6)	3	2022	2	2023
Production Deliveries: Lot 21 (FRP 7)	3	2023	4	2023
AIM-9X Block II System Improvement Program (SIP) II				
Engineering Manufacturing Development Contract	1	2017	4	2017
AIM-9X Block II: Hardware & Software (v9.3) Improvements: Air Force Initial Operational Capability	1	2017	1	2017
Operational Flight Software Release v9.316	2	2017	2	2017
Operational Flight Software Release v9.317	3	2018	3	2018
AIM-9X Block II Tech Refresh (SIP III): Hardware				
System Improvement Program III Engineering Manufacturing Development Contract	1	2017	4	2020

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Lot 17 Hardware (CAS Battery & Block 2+)	1	2017	4	2017
Lot 17 Hardware Cut In: Engineering Change Proposal	1	2018	1	2018
Lot 20 Hardware (IMU, Dome & Processor)	1	2017	2	2020
Lot 20 Hardware Preliminary Design Review	1	2018	1	2018
Lot 20 Hardware Critical Design Review	1	2019	1	2019
Lot 20 Hardware Cut In: Engineering Change Proposal	2	2020	2	2020
<i>AIM-9X Block II Tech Refresh (SIP III): Software</i>				
Software v9.4 Improvements: Development Testing (DT-D1)	1	2017	4	2017
Software v9.4 Improvements: Development Test / Integrated Testing (DT/IT-D1)	4	2017	1	2020
Software v9.4 Improvements: Operational Test Readiness Review (OTRR)	1	2020	1	2020
Software v9.4 Improvements: Operational Testing (OT-D1)	1	2020	4	2020
Software v9.4 Improvements: Software v9.4 Release	2	2021	2	2021
Software v10.4 Rehost: Development Testing (DT-D2)	4	2017	4	2021
Software v10.4 Rehost: Software v10.4 Release	3	2022	3	2022
<i>AIM-9X Block II Tech Refresh (SIP IV)</i>				
Hardware and Software Obsolescence	1	2020	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	502.562	53.320	61.322	61.393	0.000	61.393	65.965	67.114	68.508	69.756	21.800	971.740
673777: <i>AMRAAM</i>	502.562	53.320	61.322	61.393	0.000	61.393	65.965	67.114	68.508	69.756	21.800	971.740
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 185

A. Mission Description and Budget Item Justification

The Air Force and Navy continue to develop improvements to the Advanced Medium Range Air-to-Air Missile (AMRAAM) to counter existing and emerging air vehicle threats operating at high or low altitude, and having advanced Electronic Attack (EA) capabilities. The development program also enables AMRAAM compatibility with advanced fighters, enhances AMRAAM capability and operational flexibility against current and projected threats, incorporates high payoff technology development, performs risk reduction activities, and investigates new variants and/or alternate missions which may use AMRAAM attributes. The latest AMRAAM variant, the AIM-120D, delivers improved performance via Global Positioning System (GPS)-aided navigation; two-way datalink capability for enhanced aircrew survivability and improved network compatibility; and incorporates new guidance software which improves kinematic performance and weapon effectiveness. Operational Testing (OT) was completed in Jul 14 and the Air Force and Navy authorized operational fielding in Jan 15. The Navy declared Initial Operational Capability (IOC) in Jan 15 and the Air Force declared IOC in Jul 15. The program continues to address aircraft integration efforts to maintain compatibility/performance of the missile with changes occurring on threshold AMRAAM platforms per Capability Production Document (CPD). To keep the existing inventory as effective as possible, the Air Force and Navy also develop, test, and field improvements that are implemented via software upgrades reprogrammed into fielded AMRAAMs, and/or hardware upgrades inserted into production units. AMRAAM is a joint Air Force/Navy, Acquisition Category IC (ACAT IC) program with Air Force as lead service.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AMRAAM 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	62.470	61.322	65.254	0.000	65.254
Current President's Budget	53.320	61.322	61.393	0.000	61.393
Total Adjustments	-9.150	0.000	-3.861	0.000	-3.861
• 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	-7.207	0.000			
• SBIR/STTR Transfer	-1.943	0.000			
• Other Adjustments	0.000	0.000	-3.861	0.000	-3.861

Change Summary Explanation

FY17 changes consist of -\$7.207M of below threshold reprogrammings to higher Air Force priorities and \$1.943M for Small Business Innovative Research (SBIR)
 FY19 adjustment of -\$3.861M for better program phasing

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: System Improvement Program (SIP) / Electronic Protection Improvement Program (EPIP)	35.223	23.755	35.179	-	35.179
Description: Provide system improvements/electronic protection improvements					
FY 2018 Plans:					
1. EPIP Advanced: Conduct Tape 2 dedicated OT live fire shots, complete residual OT tasks, and field Tape 2 EPIP Advanced capability improvements in AIM-120C-7 missiles (Tape 9 Rev 6).					
2. AIM-120D SIP: Complete SIP-2 Functional Configuration Audit (FCA) and begin support of dedicated OT. Begin SIP-3 captive testing of development software builds and continue EMD to Critical Design Review (CDR). Continue the AIM-120D SIP Candidate Selection Process to analyze solutions to the warfighters' priority deficiencies, develop enhancements, and integrate solutions.					
FY 2019 Base Plans:					
1. EPIP Advanced: Support Advanced EPIP fielding recommendation.					
2. AIM-120D SIP: Complete SIP-2 OT and support USAF and USN fielding decisions. Continue SIP-3 EMD to include Developmental Testing (DT) of SIP-3 incremental software builds. Begin SIP-4 Technology					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>			
C. Accomplishments/Planned Programs (\$ in Millions)					
Maturation and Risk Reduction (TMRR) and conduct a System Requirements Review. Continue the AIM-120D SIP Candidate Selection Process to analyze solutions of the warfighters' priority deficiencies and enhancements.					
FY 2018 to FY 2019 Increase/Decrease Statement: Budget increase due to SIP 4 starting in FY19.					
Title: Test and Evaluation					
Description: Test and evaluation; Provides support to Developmental Testing/Operational Testing (DT/OT); Develop test resources equipment necessary to complete DT/OT events; Provide field team support personnel and services					
FY 2018 Plans: Continue infrastructure investments to support AIM-120D SIP and AEPIP DT/OT activities. Develop new test equipment necessary to meet SIP-3 and beyond requirements. Procurement of a new dual variant AMRAAM Captive Equipment (ACE) pod in support of flight test. Provide support personnel and test resources to complete AEPIP OT. Continue to provide support personnel and test resources to complete AIM-120D SIP DT and OT events.					
FY 2019 Base Plans: Continue infrastructure investments to support AIM-120D SIP, AEPIP and Form, Fit, and Function (F3R) DT/OT activities. Continue to develop new equipment necessary to meet SIP-3 and beyond requirements. Provide support personnel and test resources to complete the AEPIP program and support a fielding recommendation. Continue to provide support personnel and test resources to complete AIM-120D SIP DT and OT events.					
FY 2018 to FY 2019 Increase/Decrease Statement: Budget decreased as spike in FY18 was due to a one time purchase of a dual variant ACE pod.					
Title: Aircraft Integration					
Description: Aircraft Integration - Integrate AIM-120D on multiple aircraft platforms					
FY 2018 Plans: Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.					
FY 2019 Base Plans:					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	16.281	33.067	21.314	-	21.314
	1.816	4.500	4.900	-	4.900

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Budget increase due to increased costs associated with bench test support of new F3R capability.					
Accomplishments/Planned Programs Subtotals	53.320	61.322	61.393	-	61.393

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• MPAF 02 Line Item MAMRA0: <i>Missile Procurement, Air Force</i>	325.944	304.327	337.886	-	337.886	392.150	464.324	421.970	425.182	1,443.786	4,115.569
• MPAF 04 Line Item 000999: <i>Initial Spares/Repair Parts</i>	1.793	2.067	2.023	-	2.023	2.060	2.094	2.136	2.175	6.849	21.197
• MPAF 04 Line Item 000999 <i>Replen: Replen Spares/Repair Parts</i>	0.707	0.834	0.839	-	0.839	0.854	0.869	0.887	0.903	2.843	8.736
• MPAF 02 Line Item 2206: <i>Weapons Procurement, Navy</i>	197.229	197.109	211.058	1.183	212.241	284.895	348.246	359.433	367.486	385.083	2,351.722
• RDTE 07 Line Item 0981: <i>RDTE, Navy</i>	34.010	25.364	32.473	-	32.473	35.853	38.499	29.394	26.866	49.446	271.905

Remarks

E. Acquisition Strategy
 The EPIP Advanced program is underway to keep AIM-120C missiles capable against the growing electronic attack threat environment. This effort was awarded in Jun 12 as a Cost Plus Fixed Fee (CPFF) with performance awards. This development effort is planned for completion in Mar 18.

System Improvement Program (SIP) is underway as part of the AIM 120D missile upgrade program. SIP Increment 1 (SIP-1) was a CPFF effort to improve baseline AIM-120D capabilities and was fielded in May 17. SIP-2 EMD, which incorporates basic EPIP in the AIM-120D, was awarded in Jul 15. This Cost Plus Incentive Fee (CPIF) effort was awarded for 40 months. SIP-3 TMRR was awarded in Sep 15 as a 19-month CPFF effort, completing in Jul 17. SIP-3 EMD was awarded in Sep 17 and primarily incorporates AEPIP software capabilities in the AIM-120D.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>	Project (Number/Name) 673777 / AMRAAM
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Improvement Program (SIP)/Electronic Protection (EP)	SS/CPFF	Raytheon : Tucson, AZ	218.683	33.952	Jun 2017	21.714	Jun 2018	33.082	Jun 2019	-		33.082	191.348	498.779	498.779
F-22 Aircraft Integration	MIPR	Wright-Patterson AFB : Dayton, OH	114.890	-		-		-		-		-	0.000	114.890	114.890
RMS Aircraft Integration	SS/CPFF	Raytheon : Tucson, AZ	6.662	1.815	May 2017	4.500	May 2018	4.900	May 2019	-		4.900	26.000	43.877	43.877
Subtotal			340.235	35.767		26.214		37.982		-		37.982	217.348	657.546	N/A

Remarks
SIP/EP Cost Plus Fixed Fee (CPFF) software development design implementation contracts include incentive events which must be achieved in order to earn full fixed fee amount.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Test	Various	Various : Various	65.371	4.220	Jan 2017	9.882	Jan 2018	7.154	Jan 2019	-		7.154	25.855	112.482	112.482
RMS Test	SS/CPFF	Raytheon : Various	83.523	12.062	Jan 2017	23.185	Jan 2018	14.160	Jan 2019	-		14.160	42.450	175.380	175.380
Subtotal			148.894	16.282		33.067		21.314		-		21.314	68.305	287.862	N/A

Remarks
Various = T&E activities take place at numerous locations across the US. Too many activities and locations to list.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration	Various	Various : Various	13.433	1.271	Jan 2017	2.041	Jan 2018	2.097	Jan 2019	-		2.097	7.490	26.332	26.332
Subtotal			13.433	1.271		2.041		2.097		-		2.097	7.490	26.332	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>	Project (Number/Name) 673777 / AMRAAM

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
AMRAAM Development Program																												
AIM-120D SIP-1 IOC			■																									
AIM-120D SIP-2 EMD	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
AIM-120D SIP-2 IOC												■																
AIM-120D SIP-3 TMRR	■	■	■	■																								
AIM-120D SIP-3 EMD		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
AIM-120D SIP-3 CDR							■																					
AIM-120D SIP-3 IOC																			■									
AIM-120D SIP-4 TMRR												■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
AIM-120D SIP-4 EMD																		■	■	■	■	■	■	■	■	■	■	
AIM-120D SIP-4 CDR																						■						
EPIP Adv Tape 2 IOC													■															

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>	Project (Number/Name) 673777 / <i>AMRAAM</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
AMRAAM Development Program				
AIM-120D SIP-1 IOC	3	2017	3	2017
AIM-120D SIP-2 EMD	1	2017	4	2019
AIM-120D SIP-2 IOC	4	2019	4	2019
AIM-120D SIP-3 TMRR	1	2017	4	2017
AIM-120D SIP-3 EMD	4	2017	4	2021
AIM-120D SIP-3 CDR	4	2018	4	2018
AIM-120D SIP-3 IOC	4	2021	4	2021
AIM-120D SIP-4 TMRR	1	2019	2	2021
AIM-120D SIP-4 EMD	3	2021	4	2023
AIM-120D SIP-4 CDR	2	2022	2	2022
EPIP Adv Tape 2 IOC	3	2019	3	2019

Note

Actual Dates:

- SIP-1 IOC occurred 02 May 2017
- SIP-2 EMD began 03 Jul 2015
- SIP-3 TMRR began 30 Sep 2015
- SIP-3 EMD began 05 Sep 2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207227F / <i>Combat Rescue - Pararescue</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.350	0.693	0.647	0.000	0.647	0.658	0.670	0.684	0.696	Continuing	Continuing
675352: <i>Guardian Angel RDT&E</i>	-	0.350	0.693	0.647	0.000	0.647	0.658	0.670	0.684	0.696	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Guardian Angel (GA) is an Air Force non-aircraft weapon system within the overarching Battlefield Airmen Modernization program. GA is a Family of Systems (FoS) based in both human and equipment capabilities formulated to execute Air Force Personnel Recovery (PR) across the full spectrum of military operations. Established by the Air Force Chief of Staff in 2003 and officially captured in AFPD 10-9, the GA FoS is employed by three distinct Air Force specialties: Pararescuemen (PJ), Combat Rescue Officer (CRO), and Survival, Evasion, Resistance, Escape (SERE). The GA FoS is comprised of nine critical mission areas: Precision Aerial Insertion, Information Management, Force Application, Visual Augmentation, Maritime Recovery, Ground Mobility, Technical Rescue, Medical, and SERE. GA focus is on maintaining legacy weapon system capability while modernizing/improving subsystems for better mission effectiveness.

Funds will be used to obtain significant improvements in operational capability and develop items within the GA FoS to include but not limited to: Sound Navigation and Ranging (SONAR), Maritime Recovery, Ground Mobility, Technical Recovery, Oxygen Systems, Medical Monitoring, Aerial Insertion, Information Management (including Preservation of the Force and Family (POTFF) Tracking System), and the Battlefield Air Operations Kit. This may be conducted through industry technology demonstrations, prototypes and associated engineering support to posture the GA program for technology insertion. The Guardian Angel weapon system development activities also include studies, analysis, requirements development and developmental testing to support both current and future program planning and execution. Funding will deliver enhanced capability for the dismounted Guardian Angel soldier in terms of dramatic weight reduction and increased mission effectiveness across the conflict spectrum. This funding request will support potential DMS and obsolescence solutions, to include if optimal, life of type buys or bridge buys limited to the program of record quantity. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Guardian Angel 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. Due to rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207227F / <i>Combat Rescue - Pararescue</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.362	0.693	0.652	0.000	0.652
Current President's Budget	0.350	0.693	0.647	0.000	0.647
Total Adjustments	-0.012	0.000	-0.005	0.000	-0.005
• 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	-0.012	0.000	-0.005	0.000	-0.005

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: Guardian Angel Family of Systems (FoS)	0.350	0.693	0.647
Description: Standardize, modernize and develop additional capability for the Guardian Angel (GA) weapon system used by Combat Rescue Officers and Pararescuemen. Development efforts provide enhanced and improved capabilities for execution of Air Force combat search and rescue and personnel recovery. This weapon system is utilized across the full spectrum of Personnel Recovery (PR) military operations to include patient treatment, extrication, surface/underwater search and recovery, airborne infil/exfil, and ground recovery operations.			
FY 2018 Plans:			
-Will work with AFRL (711 HPW) to determine funding required to mature the Preservation of the Force and Family (POTFF) Tracking System.			
-Will continue to complete studies, strategic planning, and development activities for increased capability.			
-Will continue necessary software upgrades to BAO kit(G) information management system given ACC/A5/8R decision to switch to the Android Tactical Assault Kit (ATAK).			
-Will conduct oxygen system testing for parachutist oxygen system.			
-Will conduct development and system enhancements on existing and future systems through incorporating test feedback and user inputs into subsequent iterations for better capability and mission success.			
FY 2019 Plans:			
-Will continue to complete studies, strategic planning, and development activities for increased capability.			
-Will continue necessary software upgrades to BAO kit(G) information management system given ACC/A5/8R decision to switch to the Android Tactical Assault Kit (ATAK).			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207227F / <i>Combat Rescue - Pararescue</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
-Will conduct oxygen system testing for parachutist oxygen system. -Will conduct development and system enhancements on existing and future systems through incorporating test feedback and user inputs into subsequent iterations for better capability and mission success. -Will work with AFRL (711 HPW) to determine if additional funding is required to mature the Preservation of the Force and Family (POTFF) Tracking System. -Will meet with AFRL periodically to monitor ongoing RDT&E efforts and determine the best use of such funds.			
FY 2018 to FY 2019 Increase/Decrease Statement: Funds decreased slightly and reflect no impact to the program.			
Accomplishments/Planned Programs Subtotals	0.350	0.693	0.647

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 04 Line Item 842990: <i>Items Less than \$5M (Safety)</i>	28.317	25.880	21.915	-	21.915	22.295	22.702	23.105	23.516	Continuing	Continuing
• OPAF 02 Line Item 823230: <i>Security and Tactical Vehicles</i>	3.920	0.090	0.061	-	0.061	0.131	0.205	0.281	0.287	Continuing	Continuing
• WPN test: <i>test</i>	-	-	1.000	-	1.000	-	-	-	-	0.000	1.000

Remarks

E. Acquisition Strategy
 The Guardian Angel (GA) program will address warfighter immediate needs to standardize, modernize, and develop additional capability for the weapon system used by Combat Rescue Officers and Pararescuemen. The program will also address future requirements for the weapon system that will encompass the needs of all three GA career fields.

The GA program is an incremental evolutionary acquisition effort in which requirements are fulfilled through further sub-system development and integration. These are being identified through updates to the Core Function Support Plan and GA Concept of Employment by HQ Air Combat Command. The program has been divided into phases to more rapidly meet the user's immediate need to standardize and modernize the weapon 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
3600 / 7				PE 0207227F / Combat Rescue - Pararescue						675352 / Guardian Angel RDT&E					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GA Family Of Systems	Various	Various : Various	-	0.007	Dec 2016	0.313	Apr 2018	0.507	Apr 2019	-		0.507	Continuing	Continuing	-
Human Performance Organization Support (POTFF)	Various	Various : Various	-	0.281	Feb 2018	0.380	Feb 2019	0.140	Feb 2019	-		0.140	Continuing	Continuing	-
Subtotal			-	0.288		0.693		0.647		-		0.647	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
BAO Kit (G) Software	C/Various	413 TS : Eglin AFB, FL	-	-		-		-		-		-	Continuing	Continuing	-
Test Agency Support	RO	46TS : Eglin AFB, FL	-	-		-		-		-		-	Continuing	Continuing	-
Test Agency Support Other	RO	418 TS : Edwards AFB, CA	-	0.062	Dec 2016	-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.062		-		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			-	0.350		0.693		0.647		-		0.647	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207227F / <i>Combat Rescue - Pararescue</i>	Project (Number/Name) 675352 / <i>Guardian Angel RDT&E</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Events By Sub Project				
BAO Kit (G) Software	1	2017	4	2022
Test Support	1	2017	2	2022
GA Equipment Upgrades	2	2017	2	2022
Human Performance Organization Support (POTFF)	2	2018	1	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207247F / AF TENCAP
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	28.412	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
670001: <i>Air Force TENCAP</i>	-	28.412	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 FY2018, PE 0207247F, AF TENCAP efforts were transferred to PE 1202247F, AF TENCAP, due to the creation of a new Major Force Program for Space. FY2016 and FY2017 funding is now documented in the exhibits for PE 1202247F.

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	28.413	0.000	0.000	0.000	0.000
Current President's Budget	28.412	0.000	0.000	0.000	0.000
Total Adjustments	-0.001	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	-0.001	0.000	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207249F / <i>Precision Attack Systems Procurement</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.625	1.714	14.891	0.000	14.891	10.696	11.104	12.283	12.507	Continuing	Continuing
675347: <i>Advanced Targeting Pod</i>	-	0.625	1.714	14.891	0.000	14.891	10.696	11.104	12.283	12.507	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Targeting Pods (ATPs) provide long-range target acquisition and expanded weapon delivery envelopes for greater aircraft survivability. ATPs feature an infrared (IR) sensor, charged coupled device television (CCD-TV), laser designator, eye-safe laser, laser spot tracker, infrared marker, and real-time video data link for connectivity with ground forces. As non-developmental items, the majority of improvements to ATPs are the result of investments made by industry Internal Research and Development (IRAD). In addition to operational flight program (OFP) development, this funding provides for the development and integration of capabilities which are either above the capabilities of the industrial base or that require accelerated development timelines in order to meet operational requirements. It also includes program management support, technical analysis, studies and assessments necessary to support the development and integration of future capabilities. Data-linking is one such area where there is an identified gap between industrial capabilities and operational requirements. Additional development efforts will be structured to support the documented ATP requirements as well as urgent operational needs (UONs) as they become known. This program element may include necessary civilian pay expenses required to manage, execute, and deliver ATP weapon system capability.

"This program element may include necessary civilian pay expenses required to manage, execute, and deliver precision attack 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."

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207249F / <i>Precision Attack Systems Procurement</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.649	1.714	15.004	0.000	15.004
Current President's Budget	0.625	1.714	14.891	0.000	14.891
Total Adjustments	-0.024	0.000	-0.113	0.000	-0.113
• 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	-0.024	0.000	-0.113	0.000	-0.113

Change Summary Explanation

No Significant Changes

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Advanced Targeting Pod - Sensor Enhancement (ATP-SE) Requirements	0.625	1.714	14.891	0.000	14.891
Description: ATP-SE technology improvements, requirements definition (studies, analysis and assessments).					
FY 2018 Plans: Accomplish further ATP-SE technology improvements, requirements definition, studies, analysis and assessments.					
As the pod fleet meets the user requirement and updates near completion, the funding for OFP updates was redirected from 3010 to 3600 funds.					
N/A					
FY 2019 Base Plans: Accomplish further ATP-SE technology improvements, requirements definition, studies, analysis and assessments.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207249F / <i>Precision Attack Systems Procurement</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
As the pod fleet meets the user requirement and updates near completion, the funding for OFP updates was redirected from 3010 to 3600 funds.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Continue improvements					
Accomplishments/Planned Programs Subtotals	0.625	1.714	14.891	0.000	14.891

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 05 Line Item 057: <i>Other Aircraft, Precision Attack Systems Modifications</i>	0.821	43.857	42.489	-	42.489	43.482	44.908	15.129	-	Continuing	Continuing
• APAF 06 Line Item 000999: <i>Initial Spares/Repair Parts</i>	1.445	3.284	3.310	-	3.310	3.367	3.428	3.497	-	Continuing	Continuing
• APAF 07 Line Item 000751: <i>Other Production Charges</i>	24.149	-	0.000	-	0.000	0.000	0.000	0.000	-	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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207249F / Precision Attack Systems Procurement	Project (Number/Name) 675347 / Advanced Targeting Pod
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Technology Improvement, Tech Analysis, Studies & Assessments	C/FFP	Multiple : Various	-	0.625	Feb 2017	-		13.241		-		13.241	Continuing	Continuing	-
Subtotal			-	0.625		-		13.241		-		13.241	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Not specified.	C/FFP	Multiple : Various	-	-		1.714		1.650		-		1.650	Continuing	Continuing	-
Subtotal			-	-		1.714		1.650		-		1.650	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Support	C/FFP	Multiple : Various	-	-		-		-		-		-	Continuing	Continuing	-
Subtotal			-	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	0.625	1.714	14.891	-	14.891	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207249F / <i>Precision Attack Systems Procurement</i>	Project (Number/Name) 675347 / <i>Advanced Targeting Pod</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>No project title.</i>				
Sniper ATP-SE Digital Video	1	2017	3	2017
Future ATP-SE Enhancements	1	2017	4	2020
FY18 OFP Integration	2	2018	1	2020
FY19 OFP Integration	2	2019	1	2021
FY20 OFP Integration	2	2020	1	2022
FY21 OFP Integration	2	2021	1	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	13.723	14.040	13.901	0.000	13.901	15.888	15.883	15.924	16.215	Continuing	Continuing
674804: <i>Compass Call</i>	-	13.723	14.040	13.901	0.000	13.901	15.888	15.883	15.924	16.215	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

COMPASS CALL is the USAF's wide-area, airborne Command and Control Warfare/Information Operations (C2W /IO) weapon system. The employment of this system interrupts adversary's use of the electronic battlespace and is a key active component in the information battlespace and prosecution of Overseas Contingency Operations (OCO). COMPASS CALL's sophisticated electronic attack system is capable of surgical denial and/or disruption of adversary Radio Frequency (RF) communications, radar and sensor systems. The system was fielded in 1983 and to date has evolved through the fielding of the Baseline 2 (BL2) configuration and the mid-Baseline 2 (MBL2) enhancements. The BL2 configuration and MBL2 enhancements currently being fielded have advanced COMPASS CALL's electronic attack capabilities significantly over the two previously fielded baselines (BL0 and BL1). Baseline 3 (BL3) activities address new target-specific techniques, selective capability against advanced commercial communications, digital voice recognition and digital mission crew systems. Due to the rapid advances in electronic attack techniques and technology, COMPASS CALL was designed to be adaptable and must continuously modernize and evolve to keep pace with adversary tactics and emerging technologies. Continuous system development is required to maintain battlespace superiority. The two COMPASS CALL Mission Crew Simulators (CCMCS #1 and CCMCS #2) are upgraded per the Baseline schedule to ensure training capacity keeps pace and matches the operational and technological upgrades delivered in the fielded aircraft. The Weapons System Trainer (WST) mirrors the capabilities of the fielded aircraft's cockpit avionics and communications equipment as well to ensure training provides the worldwide operational proficiency needed to comply with continually evolving Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) enhancements, parameters, and guidance.

The COMPASS CALL program employs an incremental development and fielding strategy that puts capability into the warfighter's hands as soon as practical and ensures each iteration of the weapon system is effective against the highest priority threats. To sustain that process requires a steady stream of system development funds. Development funds are required to accomplish subsystem additions and improvements such as the Digital Signal Analysis and Exciter Subsystem (AXE), the third generation of Special Purpose Emitter Array (SPEAR), new modern communications receiver technologies, new IR and counter radar technologies, the Human-to-Machine Interface (HMI), digital cockpit avionics with multi-function displays (a.k.a. glass cockpits), network centric operations, phased array transmit and receive apertures and other classified hardware, firmware and software developments necessary to counter military and commercial communications evolutions, command and control operations enhancements, and new/emerging sensor developments.

FY 2019 RDT&E efforts will concentrate on Baseline 3 (BL3) and Baseline 4 (BL4) Prime Mission Equipment (PME) upgrades and integration. The programmed BL3 upgrades will advance the PME capabilities as the 2019 development efforts address the evolving electronic attack requirement for the foreseeable future. Obsolescence and Diminishing Manufacturing Sources (DMS)/Vanishing Vendor Items (VVI) are addressed with each baseline upgrade/enhancement as well as annually as part of the sustainment responsibilities. FY 2019 RDT&E efforts include studies and analyses to support current program planning and execution including, but not limited to development efforts for future baseline capability planning to include power expansion, self-protection system development, transmit and receive

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</i>
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development, upgraded navigation systems, software defined radios, size/weight/power and cost (SWAP-C) reductions and common Quick Reaction Capability (QRC) clip-ins.

Due to the rapidly changing threat environment encountered during COMPASS CALL's prolonged commitment to OCO, the acquisition program manager has the authority to redirect funding as necessary to meet current stated and emerging requirements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver COMPASS CALL 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.

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

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	23.923	14.040	14.006	0.000	14.006
Current President's Budget	13.723	14.040	13.901	0.000	13.901
Total Adjustments	-10.200	0.000	-0.105	0.000	-0.105
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-10.200	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	-0.105	0.000	-0.105

Change Summary Explanation

FY 2017 Decrease due to adjustments:
Request for Additional Appropriation (RAA) \$10.2M denied in FY 2017 Appropriations Act.

C. Accomplishments/Planned Programs (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Title: Baseline Upgrade Development	13.723	14.040	13.901	-	13.901
Description: Supports development of new PME baseline, other subsystem, and platform upgrades in order to ensure COMPASS CALL capabilities remain ahead of emerging adversary tactics and technologies.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2018 Plans:</i> Continuing efforts for BL3 development and initiating efforts for BL4 development on upgraded platform for:</p> <ul style="list-style-type: none"> • Updates to PME infrastructure • Advanced Radar Countermeasures & Receiver Technologies • Environmental Characterization • New Counter Radar and Receiver Technologies • New Array and Target Development • Advanced Commercial and Military Communications • Counter Satellite Navigation Techniques • Platform upgrades and associated non-recurring engineering • Studies and analysis for current/future baseline development planning <p><i>FY 2019 Base Plans:</i> Will continue efforts for BL3 and BL4 development on upgraded platform for:</p> <ul style="list-style-type: none"> • Cybersecurity risk management framework • Low Band antenna concepts • Advanced Military Communications Offensive capabilities • Software defined radios for modularity and extensibility objectives • Platform Self Protection concepts • Emerging and Modern Targets • Open Architecture Migration • Platform integration and certification data for added capabilities • Updates to PME infrastructure • Platform upgrades and associated non-recurring engineering • Studies and analysis for current/future baseline development planning <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding decreased due adjustment in inflation estimate.</p>					
Accomplishments/Planned Programs Subtotals	13.723	14.040	13.901	-	13.901

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</i>
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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 04 Line item CALL00: <i>Compass Call Aircraft</i>	103.000	108.173	108.113	0.000	108.113	114.095	117.014	121.221	123.423	Continuing	Continuing
• APAF 05 Line item CALL00: <i>Compass Call Mods</i>	212.657	58.368	49.885	36.400	86.285	44.754	41.954	38.461	39.159	Continuing	Continuing
• APAF 06 Line item CALL00: <i>Compass Call Mod Spares</i>	50.172	10.228	10.618	0.000	10.618	10.805	10.999	11.219	11.424	Continuing	Continuing

Remarks

E. Acquisition Strategy

COMPASS CALL capability is maintained with incremental upgrades per the baseline acquisition strategy plus Quick Reaction Capability (QRC) developments acquired through the 645th Aeronautical Systems Group (645 AESG) in accordance with their Program Management Directive (PMD), Class Justification and Approval (J&A) document for acquisition of supplies and services using other than full and open competition criteria, 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 Combatant Commander (CCDR) 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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</i>	Project (Number/Name) 674804 / <i>Compass Call</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

Compass Call																												
Mid Baseline 2 Integration and Test																												
Mid Baseline 2 Fielding																												
Baseline 3 Development																												
Baseline 3 Integration and Test																												
Baseline 3 Fielding																												
Baseline 4 Development																												
Baseline 4 Integration and Test																												
Future Baseline Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</i>	Project (Number/Name) 674804 / <i>Compass Call</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Compass Call</i>				
Mid Baseline 2 Integration and Test	1	2017	3	2017
Mid Baseline 2 Fielding	1	2017	2	2018
Baseline 3 Development	1	2017	2	2019
Baseline 3 Integration and Test	4	2019	1	2022
Baseline 3 Fielding	4	2021	4	2023
Baseline 4 Development	2	2018	2	2022
Baseline 4 Integration and Test	2	2021	4	2023
Future Baseline Development	3	2020	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207268F / <i>Aircraft Engine Component Improvement Program</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	106.049	109.243	121.203	0.000	121.203	112.505	114.617	116.996	119.126	Continuing	Continuing
671012: <i>Aircraft Engine Component Improvement Program</i>	-	75.523	76.969	88.646	0.000	88.646	79.342	80.879	82.558	84.061	Continuing	Continuing
675365: <i>F135 Aircraft Engine Component Improvement Program</i>	-	30.526	32.274	32.557	0.000	32.557	33.163	33.738	34.438	35.065	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical sustaining engineering support for in-service Air Force engines to maintain flight safety (highest priority) to correct deficiencies, improve system operational readiness (OR) and reliability & maintainability (R&M), reduce engine Life Cycle Cost (LCC), and sustain engines throughout their service life.

Changes in aircraft operational parameters caused by changing missions and tasks accelerate new engine problems; Engine CIP provides the means to develop fixes for these problems. Engine CIP funding is driven by field events and types/maturity of engines, not by the total engine quantity. The program starts with government acceptance of the first procurement-funded engine and continues over the engine's life, gradually decreasing to a minimum level (safety/depot repairs) sufficient to keep older engines operational. Engine CIP testing identifies and fixes engine-related problems ahead of operational impacts. R&M related Engine CIP efforts significantly reduce out year Operations and Maintenance (O&M) and spares costs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CIP 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207268F / <i>Aircraft Engine Component Improvement Program</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	109.859	109.243	111.116	0.000	111.116
Current President's Budget	106.049	109.243	121.203	0.000	121.203
Total Adjustments	-3.810	0.000	10.087	0.000	10.087
• 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	-3.810	0.000	10.087	0.000	10.087

Change Summary Explanation

FY17 reduction of \$3.810M for Small Business Innovative Research (SBIR)
 FY19 includes \$11M increase for Engine CIP priorities along with inflation adjustments

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program				Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
671012: Aircraft Engine Component Improvement Program	-	75.523	76.969	88.646	0.000	88.646	79.342	80.879	82.558	84.061	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical sustaining engineering support for in-service Air Force engines to maintain flight safety (highest priority) to correct deficiencies, improve system operational readiness (OR) and reliability & maintainability (R&M), reduce engine Life Cycle Cost (LCC), and sustain engines throughout their service life.

Changes in aircraft operational parameters caused by changing missions and tasks accelerate new engine problems; Engine CIP provides the means to develop fixes for these problems. Engine CIP funding is driven by field events and types/maturity of engines, not by the total engine quantity. The program starts with government acceptance of the first procurement-funded engine and continues over the engine's life, gradually decreasing to a minimum level (safety/depot repairs) sufficient to keep older engines operational. Engine CIP testing identifies and fixes engine-related problems ahead of operational impacts. R&M related Engine CIP efforts significantly reduce out year Operations and Maintenance (O&M) and spares costs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CIP 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.

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019
Title: F100 Aircraft Engine Component Improvement Program	7.006	6.480	7.463
Description: The F100-220 and F100-229 Engine CIP provides critical developmental engineering support for approximately 4085 engines (including foreign military sales [FMS]) to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>FY 2018 Plans: F100-220 and F100-229: - Will execute 30+ tasks. Budget will address engine issues associated with the F-15 and F-16 aircraft. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2019 Plans: F100-220 and F100-229: - Will execute 30+ tasks. Budget will address engine issues associated with the F-15 and F-16 aircraft. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Budget increased due to inflationary changes.</p>				
<p>Title: F110 Aircraft Engine Component Improvement Program</p> <p>Description: The F101, F110-100, F110-129, F118-100, and F118-101 Engine CIP provides critical developmental engineering support for approximately 2732 engines (including foreign military sales [FMS]) to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2018 Plans: F101, F110-100, F110-129, F118-100, and F118-101: - Will execute 35+ tasks. The budget will address engine issues associated with the B1, B-2, F-15, F-16, and U-2 aircraft. - Address safety of flight, engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures.</p>		17.403	15.657	18.032

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>- Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life.</p> <p>- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2019 Plans: F101, F110-100, F110-129, F118-100, and F118-101:</p> <p>- Will execute 35+ tasks. The budget will address engine issues associated with the B1, B-2, F-15, F-16, and U-2 aircraft.</p> <p>- Address safety of flight, engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis.</p> <p>- Validate redesigned parts and new repair procedures.</p> <p>- Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life.</p> <p>- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Budget increased due to inflationary changes.</p>				
<p>Title: F119 Aircraft Engine Component Improvement Program</p> <p>Description: The F119 Engine CIP provides critical developmental engineering support for approximately 475 engines to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2018 Plans: F119:</p> <p>- Will execute 25+ tasks. The budget will address engine issues associated with the F-22 aircraft.</p> <p>- Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis.</p> <p>- Validate redesigned parts and new repair procedures.</p> <p>- Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life.</p> <p>- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2019 Plans:</p>		31.117	29.068	33.478

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>F119:</p> <ul style="list-style-type: none"> - Will execute 25+ tasks. The budget will address engine issues associated with the F-22 aircraft. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. <p>FY 2018 to FY 2019 Increase/Decrease Statement: Budget increased due to inflationary changes.</p>				
<p>Title: Other Aircraft Engine Component Improvement Program</p> <p>Description: The Other Engines (e.g., T56, T700, T400, J85, F107, APUs) CIP provides critical developmental engineering support for approximately 13000 engines (including foreign military sales [FMS]) to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2018 Plans: Other Engines (e.g., T56, T700, T400, J85, APUs, F107):</p> <ul style="list-style-type: none"> - Will execute 15+ tasks. The budget will address engine issues associated with the C-130, T38, UH-1N, UH/MH-60/60G aircraft, and aircraft APUs. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. <p>FY 2019 Plans: Other Engines (e.g., T56, T700, T400, J85, APUs, F107, TF-34, TF-33):</p> <ul style="list-style-type: none"> - Will execute 15+ tasks. The budget will address engine issues associated with the C-130, T38, UH-1N, UH/MH-60/60G, A-10, B-52 aircraft, cruise missiles and aircraft APUs. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. 		19.997	25.764	29.673

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. <p>FY 2018 to FY 2019 Increase/Decrease Statement: Budget increased due to inflationary changes.</p>			
Accomplishments/Planned Programs Subtotals	75.523	76.969	88.646

C. Other Program Funding Summary (\$ in Millions)											
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE 07 0205633N: <i>Aviation Improvements</i>	1.274	1.301	1.326	-	1.326	-	-	-	-	Continuing	Continuing
• RDTE 07 0203752A: <i>Army Aircraft Engine CIP</i>	0.118	0.120	0.123	-	0.123	-	-	-	-	Continuing	Continuing

Remarks
Other APPN RELATED ACTIVITIES

(U) - PEs 0203752A and 0205633N, Army/Navy Aircraft Engine CIPs

D. Acquisition Strategy
Sole Source Indefinite Delivery/Indefinite Quantity (IDIQ) contracts to 3 Original Equipment Manufacturers (OEMs), and DoD agencies with a 5-year ordering period and 7-year delivery period. Supports multiple tasks to accomplish CIP for more than 23 engine models.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Engine CIP: Develop aircraft engine improvements - F110/F101/F118	SS/CPFF	GE : Evendale, OH	-	17.403	Dec 2016	15.657	Dec 2017	18.032	Dec 2018	-		18.032	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-F100/F119/TF33	SS/CPFF	Pratt & Whitney : Hartford, CT	-	40.288	Dec 2016	40.548	Dec 2017	46.700	Dec 2018	-		46.700	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-TF34/J85/T700	SS/CPFF	GE : Lynn, MA	-	3.824	Dec 2016	5.381	Dec 2017	6.198	Dec 2018	-		6.198	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-T56	SS/CPFF	Rolls Royce : Indianapolis, IN	-	1.063	Dec 2016	1.783	Dec 2017	2.053	Dec 2018	-		2.053	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft auxiliary power unit improvements	SS/CPFF	Honeywell : Phoenix, AZ	-	4.806	Dec 2016	3.984	Dec 2017	4.588	Dec 2018	-		4.588	Continuing	Continuing	-
Aircraft Engine CIP: Develop engine improvements-F107	SS/CPFF	Teledyne : Toledo, OH	-	1.909	Dec 2016	5.038	Dec 2017	5.802	Dec 2018	-		5.802	Continuing	Continuing	-
Subtotal			-	69.293		72.391		83.373		-		83.373	Continuing	Continuing	N/A

Remarks
FY18 increases due to inflation adjustments.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Engine CIP: Non-OEM CIP Tasks	Various	Various : Various	-	1.635	Oct 2016	0.135	Oct 2017	0.155	Oct 2018	-		0.155	Continuing	Continuing	-
Subtotal			-	1.635		0.135		0.155		-		0.155	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
Non-OEM CIP Tasks refer to work in support of Engine CIP.
FY18 increases due to inflation adjustments.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Engine CIP: Ground test and validate engine improvements	PO	AEDC : Arnold AFB, TN	-	1.860	Oct 2016	0.000	Oct 2017	-		-		-	Continuing	Continuing	-
Subtotal			-	1.860		0.000		-		-		-	Continuing	Continuing	N/A

Remarks
Fuel costs for contractor-performed T&E are included in the applicable contract.
FY18 increases due to inflation adjustments.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Engine CIP: PMA	Various	Various : Various	-	1.360	Oct 2016	1.927	Oct 2017	2.220	Oct 2018	-		2.220	Continuing	Continuing	-
Aircraft Engine CIP: In House Support/Misc	Various	Various : Various	-	1.375	Oct 2016	2.516	Oct 2017	2.898	Oct 2018	-		2.898	Continuing	Continuing	-
Subtotal			-	2.735		4.443		5.118		-		5.118	Continuing	Continuing	N/A

Remarks
PMA Description: Program Management support, travel, and A&AS.
FY18 increases due to inflation adjustments.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force							Date: February 2018				
Appropriation/Budget Activity 3600 / 7			R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program				Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program				
	Prior Years	FY 2017	FY 2018		FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	75.523	76.969		88.646	-	88.646	Continuing	Continuing	N/A	

Remarks
FY18 increases due to inflation adjustments.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

CIP Legacy Activities	
F-100 Engine CIP activities	
F-110 Engine CIP Activities	
F-119 Engine CIP Activities	
Other Legacy Engine CIP Activities	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 671012 / Aircraft Engine Component Improvement Program

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>CIP Legacy Activities</i>				
F-100 Engine CIP activities	1	2017	4	2023
F-110 Engine CIP Activities	1	2017	4	2023
F-119 Engine CIP Activities	1	2017	4	2023
Other Legacy Engine CIP Activities	1	2017	4	2023

Note

Traditional schedule does not lend itself to Engine CIP activities.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program				Project (Number/Name) 675365 / F135 Aircraft Engine Component Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675365: F135 Aircraft Engine Component Improvement Program	-	30.526	32.274	32.557	0.000	32.557	33.163	33.738	34.438	35.065	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The F135 Aircraft Engine Component Improvement Program (CIP) supports F-35 single-engine fighter propulsion system. It provides the only source of critical developmental engineering support for the F135 propulsion system. F135 CIP maintains flight safety (highest priority), corrects service revealed deficiencies, improves system Operational Readiness (OR) and Reliability & Maintainability (R&M), reduces propulsion system Life Cycle Cost (LCC), and sustains the propulsion system throughout its service life. Historically, aircraft systems change missions, tactics, and environment (including new fuels) and meet changing threats throughout their lives. New technical problems can develop in the propulsion system through actual use and the F135 CIP provides the means to develop fixes for these problems. F135 CIP funding is driven by field events and type/maturity of the propulsion system, not by the total quantity of engines. The program starts with government acceptance of the first procurement-funded engine and continues over the propulsion system's life, gradually decreasing to a minimum level (safety/depot repairs) sufficient to keep older engines operational. F135 CIP, through "Lead the Fleet" operational use and accelerated mission testing, identifies and fixes propulsion-related problems ahead of operational impacts. F135 CIP ensures continued improvements in R&M, which reduce out year support costs. Historically, R&M related CIP efforts significantly reduce out year O&M and spares costs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CIP 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 2017	FY 2018	FY 2019
Title: F135 Aircraft Engine Improvement Program	30.526	32.274	32.557
Description: The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical developmental engineering support for F-35 propulsion systems to maintain flight safety (highest priority) for this single-engine fighter, correct service revealed deficiencies, improve system operational readiness (OR) and reliability & maintainability (R&M), reduce engine Life Cycle Cost (LCC), and sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.			
FY 2018 Plans:			
- Execute approximately 25+ AF-funded F135 engine tasks supporting initial flying operations.			
- Conduct accelerated mission test and analytical condition inspection.			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 675365 / F135 Aircraft Engine Component Improvement Program

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Address safety of flight, engine component redesign, repair/rework procedures and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain/improve engine flight safety, improve system operational readiness and reliability & maintainability, reduce engine life cycle cost, and sustain engine throughout service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Execute approximately 25+ AF-funded F135 engine tasks supporting F-35 flying operations. - Conduct accelerated mission test and analytical condition inspection. - Address safety of flight, engine component redesign, repair/rework procedures and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain/improve engine flight safety, improve system operational readiness and reliability & maintainability, reduce engine life cycle cost, and sustain engine throughout service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. <p>FY 2018 to FY 2019 Increase/Decrease Statement: Budget increased due to inflationary changes.</p>			
Accomplishments/Planned Programs Subtotals	30.526	32.274	32.557

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 07 0205633N: <i>Aviation Improvements</i>	10.050	-	-	-	-	-	-	-	-	-	Continuing Continuing

Remarks
Program Element 0205633N provides US Navy funding support for the F135 propulsion system.

D. Acquisition Strategy
Contracts within this program are projected to be awarded sole source to engine manufacturer. F-135 Engine CIP tasks are generally assigned to the original engine manufacturer based on available funding and prioritization of candidates.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / <i>Aircraft Engine Component Improvement Program</i>	Project (Number/Name) 675365 / <i>F135 Aircraft Engine Component Improvement Program</i>

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 675365 / F135 Aircraft Engine Component Improvement Program
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Engine CIP: Develop F135 engine improvements	SS/CPFF	Pratt & Whitney : Hartford, CT	-	25.331	Jan 2017	26.973	Jan 2018	27.210	Jan 2019	-		27.210	Continuing	Continuing	-
Subtotal			-	25.331		26.973		27.210		-		27.210	Continuing	Continuing	N/A

Remarks
FY18 Cost increase (\$93K) due to adjustment for inflation

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Engine CIP: Ground test and validate engine improvements	PO	AEDC : Arnold AFB, TN	-	5.000	Oct 2016	5.000	Oct 2017	5.044	Oct 2018	-		5.044	Continuing	Continuing	-
Subtotal			-	5.000		5.000		5.044		-		5.044	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Engine CIP: PMA	Various	Various : Various	-	0.195	Oct 2016	0.301	Oct 2017	0.303	Oct 2018	-		0.303	Continuing	Continuing	-
Subtotal			-	0.195		0.301		0.303		-		0.303	Continuing	Continuing	N/A

Remarks
PMA Description: Program Management support, travel, and A&AS.

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	30.526	32.274	32.557	-	32.557	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 675365 / F135 Aircraft Engine Component Improvement Program

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

CIP JSF Activities	
F-135 Engine CIP Tasks	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / Aircraft Engine Component Improvement Program	Project (Number/Name) 675365 / F135 Aircraft Engine Component Improvement Program

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>CIP JSF Activities</i>				
F-135 Engine CIP Tasks	1	2017	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207277F / <i>ISR Innovations</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	5.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675373: <i>ISR Innovations Program</i>	-	0.000	5.750	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 family of systems providing high-impact, quick-reaction capabilities to Warfighters for mission planning, rehearsal, visualization, and intelligence gathering purposes. Program components include: Eagle Vision, DoD's only world-wide deployable commercial imagery ground station capability, and ISR Innovations, rapid prototyping, operational evaluation and fielding of short-notice, high-payoff capabilities addressing immediate gaps and/or shortfalls identified by Warfighting activities.

FY18 funds support NOWcasting, Atmospheric Sensing and Prediction System (ASAPS), and Caldera Event.

1. NOWcasting: NOWcasting is an automated system that provides intuitive, animated, machine-to-machine weather forecasts directly to warfighter computer applications every 15 minutes. NOWcasting expands on current weather models by incorporating non-traditional sources of weather information (the most significant being Space Based Infrared System [SBIRS] data) that significantly increases forecast resolution and accuracy. Its exploitation of SBIRS PoR data sources helps maximize the effectiveness of existing OPIR architecture and data sources.

2. ASAPS: Atmospheric Sensing and Prediction System (ASAPS) is a platform-integrated sensor for detecting adverse weather conditions such as clouds and icing. Sensing of other adverse weather phenomena, specifically lightning, would further protect valuable airborne assets and support mission success. While initially envisioned to improve environmental awareness for Remotely Piloted Aircraft--which are particularly susceptible to lightning damage due to their composite structure--the technology could expand to contribute to the distributed, collaborative, and self-organizing sensor systems providing environmental threat detection for autonomous swarming aircraft.

3. Caldera Event: Caldera Event is a non-GPS system that provides Position, Navigation, Timing (PNT), and Geolocation Capabilities in an fully GPS-denied or jammed environment. The prototype system provides insight and experimentation for the future of combined PNT, Electronic Warfare, and communications systems.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207277F / <i>ISR Innovations</i>				
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	
Previous President's Budget	0.000	5.750	0.000	0.000	0.000	
Current President's Budget	0.000	5.750	0.000	0.000	0.000	
Total Adjustments	0.000	0.000	0.000	0.000	0.000	
• Congressional General Reductions	0.000	0.000				
• Congressional Directed Reductions	0.000	0.000				
• Congressional Rescissions	0.000	0.000				
• Congressional Adds	0.000	0.000				
• Congressional Directed Transfers	0.000	0.000				
• Reprogrammings	0.000	0.000				
• SBIR/STTR Transfer	0.000	0.000				
• Other Adjustments	0.000	0.000	0.000	0.000	0.000	
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019
Title: ISR Innovations				0.000	5.750	-
Description: NOWcasting, ASAPS, and Caldera.						
FY 2018 Plans: N/A						
NOWcasting: Improve the transfer and use of non-traditional weather data to optimize NOWcasting. Conduct an Operational Utility Evaluation to verify NOWcasting's accuracy. Develop new windows for the Afghanistan and Africa.						
ASAPS: Develop ASAPS lightning sensing ability.						
Caldera Event: Expand Advantaged Reference Node Test Network OCONUS with partners. Iterate build to print designs. Integrate with Open Systems Architecture. Define performance parameters for Military Grade Equipment.						
FY 2018 to FY 2019 Increase/Decrease Statement: N/A						
Accomplishments/Planned Programs Subtotals				0.000	5.750	-
D. Other Program Funding Summary (\$ in Millions) N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207277F / <i>ISR Innovations</i>	
D. Other Program Funding Summary (\$ in Millions)		
Remarks		
E. Acquisition Strategy		
NOWcasting: Developmental partnership with Air Force Space Command's Space and Missile Systems Center in pursuit of their Space Modernization Initiative (Project 657009) within the Space Based Infrared System (SBIRS) High EMD program (Program Element 0604441F). Specific contract TBD.		
ASAPS: Developmental partnership with Air Force Research Laboratory's Sensor's Directorate in pursuit of their Sensor Fusion Technology Project (Project 626095) within the Aerospace Sensors Program (Program Element 0602204F). Specific contract TBD.		
Caldera Event: Developmental partnership with Air Force Research Lab and Air Force Tactical Exploitation of National Capabilities through AFLCMC C3I and Networks Directorate, Special Programs Division.		
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.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207277F / <i>ISR Innovations</i>	Project (Number/Name) 675373 / <i>ISR Innovations Program</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NOWcasting: Optimize SBIRS ingestion	TBD	PEMDAS Technologies and Innovations : Alexandria, VA	-	-		0.100		-		-		-	Continuing	Continuing	0.100
NOWcasting: Window development	TBD	PEMDAS Technologies and Innovations : Alexandria, VA	-	-		0.900		-		-		-	Continuing	Continuing	0.900
ASAPS: Develop lightning sensing technology	TBD	PEMDAS Technologies and Innovations : Alexandria, VA	-	-		2.300		-		-		-	Continuing	Continuing	2.300
Caldera Event: Advantaged Reference Node and Precision Navigation Development	TBD	SPGlobal : Chantilly, VA	-	-		0.800		-		-		-	Continuing	Continuing	0.800
Caldera Event: System Analysis and Improvement	TBD	SPGlobal : Chantilly, VA	-	-		0.200		-		-		-	Continuing	Continuing	0.200
Caldera Event: Envelope Analysis	TBD	SPGlobal : Chantilly, VA	-	-		0.200		-		-		-	Continuing	Continuing	0.200
Caldera Event: Mission and System Integration	TBD	SPGlobal : Chantilly, VA	-	-		0.625		-		-		-	Continuing	Continuing	0.625
Caldera Event: Operations Mission Assessment and Demonstration	TBD	SPGlobal : Chantilly, VA	-	-		0.625		-		-		-	Continuing	Continuing	0.625
Subtotal			-	-		5.750		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	-	5.750	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207277F / <i>ISR Innovations</i>	Project (Number/Name) 675373 / <i>ISR Innovations Program</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
675373 <i>ISR Innovations Program</i>																												
NOWcasting: Optimize SBIRS ingestion					■	■	■	■																				
NOWcasting: Conduct Operational Utility Evaluation								■	■	■																		
NOWcasting: Develop Afghanistan Window								■	■																			
NOWcasting: Develop Africa Window										■	■																	
ASAPS: Develop lightning sensing capability					■	■	■	■																				
Caldera Event: Advantaged Reference Node and Precision Navigation Development					■	■																						
Caldera Event: System Analysis and Improvement					■	■	■																					
Caldera Event: Envelope Analysis					■	■	■	■																				
Caldera Event: Mission and System Integration					■	■	■	■																				
Caldera Event: Operations Mission Assessment and Demonstration								■	■	■																		

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207277F / <i>ISR Innovations</i>	Project (Number/Name) 675373 / <i>ISR Innovations Program</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
675373 ISR Innovations Program				
NOWcasting: Optimize SBIRS ingestion	1	2018	2	2018
NOWcasting: Conduct Operational Utility Evaluation	3	2018	4	2018
NOWcasting: Develop Afghanistan Window	3	2018	3	2018
NOWcasting: Develop Africa Window	4	2018	4	2018
ASAPS: Develop lightning sensing capability	1	2018	4	2018
Caldera Event: Advantaged Reference Node and Precision Navigation Development	1	2018	1	2018
Caldera Event: System Analysis and Improvement	1	2018	2	2018
Caldera Event: Envelope Analysis	1	2018	4	2018
Caldera Event: Mission and System Integration	1	2018	4	2018
Caldera Event: Operations Mission Assessment and Demonstration	2	2018	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207325F <i>Joint Air-to-Surface Standoff Missile (JASSM)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	218.433	23.108	29.932	60.062	0.000	60.062	79.198	36.210	19.868	20.230	19.721	506.762
675356: <i>JASSM Extended Range (JASSM-ER)</i>	218.433	23.108	29.932	60.062	0.000	60.062	79.198	36.210	19.868	20.230	19.721	506.762
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 555

A. Mission Description and Budget Item Justification

This program provides a long range (over twice the range of JASSM Baseline), conventional air-to-surface, autonomous, precision-guided, low observable, standoff cruise missile compatible with fighter and bomber aircraft. The requirement is in the JASSM-ER Capability Production Document (CPD), dated 16 Apr 2010. Aircraft integration of JASSM-ER is complete on the B-1B. Objective aircraft are B-52H, F-16C/D (Block 40-52), B-2, and F-15E. JASSM-ER provides the capability to attack a variety of high value fixed or relocatable targets with precision, through preplanned missions or target-of-opportunity, deeper into enemy territory than JASSM Baseline while minimizing the threat to launch aircraft. The Air Force developed JASSM-ER based on a contractor-developed, government-approved System Performance Specification (SPS). The program continues development/integration efforts on the Intelligent Telemetry Instrumentation Kit (ITIK), the Electronic Safe Arm and Fuze (ESAF), the Military Code (M-Code) receiver, and Flight Termination System Telemetry Integration Kit (FTS-ITIK) batteries. FY16/17 studies led to survivability improvements via Wing Replacement/Chine Development/Integration and Warfighting Capability Enhancement (Software) to improve performance against emerging threats. Potential future efforts include Anti-Radiation Homing System (ARHS), improved Data Link capability for relocatable target attack, alternate payloads, improved Guidance Navigation Control (GNC), alternative FTS-ITIK power source evaluations, advanced JASSM survivability, and a smaller warhead. The program is also evaluating Diminishing Manufacturing Sources Material Shortages (DMSMS) and reviewing obsolescence issues.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver JASSM 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207325F <i>Joint Air-to-Surface Standoff Missile (JASSM)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	30.002	29.932	60.514	0.000	60.514
Current President's Budget	23.108	29.932	60.062	0.000	60.062
Total Adjustments	-6.894	0.000	-0.452	0.000	-0.452
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-8.100	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.000	0.000			
• SBIR/STTR Transfer	-0.794	0.000			
• Other Adjustments	0.000	0.000	-0.452	0.000	-0.452

Change Summary Explanation

FY17: -8.100M Congressional Directed Reduction for department requested realignment of M-Code funds and -\$794K for Small Business Innovative Research (SBIR) along with a \$2M reprogramming action.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Warfighting Capability Enhancement	0.000	4.846	11.072	0.000	11.072
Description: Begin design, development and preparation for a primary contract for software and mission planning changes to enable the missile to maintain operational effectiveness in classified scenarios.					
FY 2018 Plans: Begin design, development and preparation for a primary contract for software and mission planning changes to enable the missile to maintain operational effectiveness in classified scenarios.					
FY 2019 Base Plans: Continue design and development efforts for software and mission planning changes to enable the missile to maintain operational effectiveness in classified scenarios.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018						
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207325F <i>I Joint Air-to-Surface Standoff Missile (JASSM)</i>								
C. Accomplishments/Planned Programs (\$ in Millions)										
The increased funding is required for software coding of precision target module (PTM) and JASSM unique program component (UPC), both essential to the functionality of the enhanced software.										
<p>Title: Wing Replacement/Chine Development, survivability enhancement, and Integration</p> <p>Description: Provides increased standoff range, survivability, and improved vehicle stability/control across all operational scenarios.</p> <p>FY 2018 Plans: Continue to initiate design and development of replacement wings.</p> <p>FY 2019 Base Plans: Continue design and development efforts for wing sub-systems.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The increased funding is required to accelerate the Wing Replacement/Chine development, survivability enhancement and integration efforts, which are necessary to continue holding JASSM's current target set at risk. The reduced timeline for development and integration into production ensures more missiles are equipped with these improvements.</p>						FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
						0.000	8.251	22.157	0.000	22.157
<p>Title: JASSM ER Electronic Safe and Arm Fuze (ESAF) - Common to JASSM baseline and JASSM-ER (cost shared by both projects)</p> <p>Description: ESAF will resolve FMU-156 obsolescence and reliability issues, improve yield, and potentially lower costs.</p> <p>FY 2018 Plans: Continue ESAF environmental, safety, and qualification testing.</p> <p>FY 2019 Base Plans: Continue ESAF environmental, safety, and qualification testing.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>						4.159	6.783	6.365	0.000	6.365

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207325F <i>Joint Air-to-Surface Standoff Missile (JASSM)</i>			
C. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding decreased from FY2018 to FY2019 due to ramp down of environmental, safety, and qualification testing for Electronic Safe and Arm Fuze efforts.					
Title: Military Code (M-Code) receiver					
Description: Development and integration of a GPS receiver capable of receiving Military Code (M-Code)					
FY 2018 Plans: Continue Pre-Engineering, Manufacturing and Development (EMD) efforts focused on risk reduction. EMD efforts will begin early design and integration work late FY18.					
FY 2019 Base Plans: Continue EMD early design and integration efforts.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased from FY2018 to FY2019 due to receiver development funding residing in a common PE. In FY19 funding transitioned to program PE.					
	0.200	1.645	17.594	0.000	17.594
Title: JASSM ER Other Development/Safety/Survivability					
Description: Develop and integrate advanced precision, navigation, and timing (PNT) capabilities (e.g. GPS, non-GPS, optical, passive, active, etc.), evaluations (study analysis), survivability enhancements to include safety certification, flight testing, DMSMS, improved Data Link, ARHS, improved GNC, alternate payloads, and obsolescence issues.					
FY 2018 Plans: Continue development/evaluations activities addressing JASSM's obsolescence plan directed activities: Improved GNC, anti-jam/anti-spoofing system, and survivability enhancements, evaluate smaller warhead. Support ground and flight test activity required to verify changed hardware before cutting into production. Evaluate long-term FTS-TIK alternate power source. Accomplish ITIK interoperability/compatibility testing and accomplish any remaining qualification efforts.					
FY 2019 Base Plans: Continue development/evaluations activities addressing JASSM's obsolescence plan directed activities: Improved GNC, anti-jam/anti-spoofing system, and survivability enhancements, evaluate smaller warhead.					
	18.535	5.075	2.496	0.000	2.496

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207325F <i>Joint Air-to-Surface Standoff Missile (JASSM)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Support ground and flight test activity required to verify changed hardware before cutting into production. Continue evaluation for long-term FTS-TIK alternate power source. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased from FY2018 to FY2019 due to ramp down of other development, safety, survivability efforts.					
Title: JASSM ER Test Support Description: Government Test Support for ESAF, Wing Replacement, and M-Code. Includes flight test equipment, targets, test wing and range support for threshold aircraft, and other ground/flight test support. FY 2018 Plans: Continue ESAF, Warfighting Capability Enhancement, and Wing Replacement/Chine development and Integration (Wind Tunnel Testing). Begin ESAF Qual, redesign, and flight test support to include test equipment, targets, range support, sled and cannon test, and other ground test support. FY 2019 Base Plans: Continue ESAF, Warfighting Capability Enhancement, and Wing Replacement/Chine development and Integration (Wind Tunnel Testing). Continue ESAF Qual, redesign, and flight test support to include test equipment, targets, range support, sled and cannon test, and other ground test support. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased from FY2018 to FY2019 due to ramp down of qualification testing for Electronic Safe and Arm Fuze efforts.	0.214	3.332	0.378	0.000	0.378
Accomplishments/Planned Programs Subtotals	23.108	29.932	60.062	0.000	60.062

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• MPAF 02 0207325F: JASSM	431.645	441.367	430.708	61.600	492.308	458.525	396.550	438.335	450.234	218.869	3,327.833

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207325F / <i>Joint Air-to-Surface Standoff Missile (JASSM)</i>
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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

E. Acquisition Strategy

JASSM's Acquisition Strategy was amended and approved on September 8, 2017. This amendment enables the JASSM program to introduce upgrades which ensure its viability as the threat environment evolves. All current development contracts utilize a Cost Plus type 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force											Date: February 2018				
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0207325F / Joint Air-to-Surface Standoff Missile (JASSM)					Project (Number/Name) 675356 / JASSM Extended Range (JASSM-ER)				

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Warfighting Capability Enhancement	SS/CPAF	Lockheed Martin : Orlando, FL	-	0.000		4.846	May 2018	11.072	Nov 2018	0.000		11.072	43.470	59.388	67.724
Wing Replacement/Chine Development, survivability enhancements, and Integration	SS/CPFF	Lockheed Martin : Orlando, FL	-	0.000		8.251	Jan 2018	21.857	Nov 2018	-		21.857	67.200	97.308	84.000
ESAF	SS/CPFF	Lockheed Martin : Orlando, FL	8.173	4.159	Dec 2016	6.783	Nov 2017	6.365	Nov 2018	-		6.365	6.305	31.785	18.872
Military Code (M code)	SS/CPFF	Lockheed Martin : Orlando, FL	0.905	0.200	Mar 2017	1.645	Nov 2017	17.594	Nov 2018	-		17.594	48.979	69.323	74.610
JASSM-ER Phase ,/I/II development Test Missile Procurement (for DT/IT), parts upgrade, software updates, product improvements, survivability enhancements, LTIK, ITIK, and obsolescence.	Various	Lockheed Martin : Orlando, FL	143.757	18.391	Apr 2017	4.775	Mar 2018	2.496	Mar 2018	-		2.496	5.773	175.192	192.109
Subtotal			152.835	22.750		26.300		59.384		0.000		59.384	171.727	432.996	N/A

Remarks

- Intelligent Telemetry Instrumentation Kit (ITIK)
- Legacy Telemetry Instrumentation Kits (L-TIK)
- Electronic Safe and Arm Fuze (ESAF)

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Test Support. Includes flight test equipment, targets, 96th Test Wing and Range support, AEDC test	Various	96 TW : Eglin AFB, FL	26.489	0.214		3.332	Feb 2018	0.378	Mar 2019	-		0.378	2.100	32.513	31.644

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207325F / Joint Air-to-Surface Standoff Missile (JASSM)	Project (Number/Name) 675356 / JASSM Extended Range (JASSM-ER)
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
support, and other ground/flight test support as necessary.															
6 IT/6 OT assets	SS/CPAF	Lockheed Martin : Orlando, FL	12.733	0.000		-		-		-		-	0.000	12.733	12.733
12 Operational Test (OT) assets	SS/FFP	Lockheed Martin : Orlando, FL	24.642	0.000		-		-		-		-	0.000	24.642	24.643
Subtotal			63.864	0.214		3.332		0.378		-		0.378	2.100	69.888	N/A

Remarks
AEDC: Arnold Engineering Development Complex located at Arnold AFB, TN

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration (PMA). Provides program office oversight of development and upgrade activities.	Various	PMA : Eglin AFB, FL	1.734	0.144	Mar 2017	0.300	Mar 2018	0.300	Mar 2019	-		0.300	1.400	3.878	3.771
Subtotal			1.734	0.144		0.300		0.300		-		0.300	1.400	3.878	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		218.433	23.108	29.932	60.062	0.000	60.062	175.227	506.762	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207325F / Joint Air-to-Surface Standoff Missile (JASSM)	Project (Number/Name) 675356 / JASSM Extended Range (JASSM-ER)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>RDT&E Schedule Details</i>				
Warfighting Capability Enhancement	3	2018	4	2021
Wing Replacement/Chine Development, survivability enhancements, and Integration	3	2017	2	2022
ITIK Battery Development and Qualification (Phase 1,2, and 3)	1	2017	1	2020
ITIK Integration with JASSM and Test Equipment Development	1	2017	3	2018
ITIK EMI	1	2017	3	2017
ITIK Flight Testing (LRASM)	1	2018	4	2018
ESAF Prototyping	1	2017	3	2019
ESAF Critical Design Review (CDR)	2	2019	4	2019
ESAF Sled Testing	1	2019	3	2021
ESAF Qualification Testing	3	2019	2	2020
ESAF Flight Testing	1	2021	4	2021
ESAF Production Readiness Review (PRR)	3	2020	3	2020
M-Code brass board development and testing	1	2017	2	2018
M-Code Pre-EMD	1	2018	4	2019
M-Code Engineering and Manufacturing Development (EMD)	4	2018	4	2022
Diminishing Manufacture Sources and Obsolescence Evaluation/Development	1	2017	3	2022

Note

Prototype development/component level testing.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207410F / <i>Air & Space Operations Center (AOC)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	29.916	26.956	106.102	0.000	106.102	113.050	102.429	93.920	90.166	Continuing	Continuing
674596: <i>AOC WS Modifications</i>	0.000	4.854	7.700	106.102	0.000	106.102	113.050	102.429	93.920	90.166	Continuing	Continuing
675218: <i>Applications Development</i>	0.000	15.755	15.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	31.184
675220: <i>Unit Level</i>	0.000	6.975	3.827	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.802
675221: <i>Personnel Recovery Command and Control (PRC2)</i>	0.000	2.332	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.332

Note

This program, BA 7, PE 0207410F, project 674596, Multi-Domain Command and Control (MDC2) Development, is a new start.

In FY 2019, 0207410F, Air & Space Operations Center (AOC), Project Number 675218, Applications Development, and Project Number 675220, Unit Level, were transferred to PE 0305015F, C2 Air Operations Suite - C2 Information Services (C2AOS-C2IS), Project Number 675218, Applications Development, and Project Number 675220, Unit Level, in order to improve transparency of development programs.

A. Mission Description and Budget Item Justification

The Air and Space Operations Center Weapon System (AOC WS) program element provides development of Command and Control (C2) capabilities across the entire spectrum of air and space operations from the strategic to the tactical level. There are four funded projects within the AOC WS program element:

AOC WS Modifications allow for the consolidation to a single baseline across the AOC WS enterprise and provide required modifications and pathfinder efforts for the AOC WS to remain interoperable, certified, supportable, and compliant through the development, integration, testing, fielding, and sustainment of new capabilities and upgrades; to include the utilization of commercial cloud environment providers with hosting equipment provided by the program. Modifications are required for the AOC WS to keep pace with evolving Government Off the Shelf (GOTS) components, integrated Commercial Off the Shelf (COTS) components, Department of Defense (DoD) directives, and changes in the underlying Information Technology (IT) environment, as well as to deliver effective training solutions for the user.

Applications Development provides worldwide operational level C2 capabilities, which include: air battle planning, management, and execution; operational level C2 of Integrated Air and Missile Defense (C2 of IAMD); in support of DoD, Coalition Partners, and other government agencies.

Unit Level: Unit Command and Control (UC2) provides both scheduling and mission preparation activities at the wing and squadron level, and the capabilities to report and track the success of each mission and influence decisions of future Air Battle Planning.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207410F / <i>Air & Space Operations Center (AOC)</i>
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Personnel Recovery Command and Control (PRC2) provides an adaptive, networked, decentralized and situationally-appropriate personnel recovery C2 system which supports personnel accountability and recovery missions worldwide. PRC2 delivers a globally accessible, collaborative, interoperable and integrated system to prevent, prepare for and respond to isolating events across the Range of Military Operations in the joint/coalition operating environment. 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 for predictive, preventive and personnel vulnerability analysis/assessment in support of Personnel Recovery across DoD and other national and international entities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AOC WS, Applications Development, Unit Level and PRC2 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.

BA7 - 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	37.621	26.956	8.673	0.000	8.673
Current President's Budget	29.916	26.956	106.102	0.000	106.102
Total Adjustments	-7.705	0.000	97.429	0.000	97.429
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-7.278	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.350	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.777	0.000			
• Other Adjustments	0.000	0.000	97.429	0.000	97.429

Change Summary Explanation

FY 2017 funding decreased \$7.278M due to AOC WS Modification new start early to need.

FY 2019 funding increased \$97.429M due to new program structure; adds funds to continuously integrate service/joint applications into baseline via Agile DevOps efforts for the AOC WS to remain interoperable, certified, supportable, and compliant through the development, integration, testing, fielding, and sustainment of new capabilities and upgrades.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 674596 / AOC WS Modifications
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
674596: AOC WS Modifications	0.000	4.854	7.700	106.102	0.000	106.102	113.050	102.429	93.920	90.166	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207410F, project 674596, Multi-Domain Command and Control (MDC2) Development, is a new start.

A. Mission Description and Budget Item Justification

The Air Operations Center Weapon System (AOC WS), AN/USQ-163 Falconer, the senior element of the Theater Air Control System (TACS), is the weapon system the Commander, Air Force Forces (COMAFFOR) provides the Combined/Joint Force Air Component Commander (C/JFACC) for planning, executing, and assessing theater-wide air and space operations. The C/JFACC provides air, space and cyber support to the Combined/Joint Forces Commander (C/JFC) by coordinating, deconflicting and assessing the progress of various weapon systems to advance the C/JFC's campaign. The AOC WS develops operations strategy and planning documents. The weapon system also disseminates tasking orders; executes day-to-day peacetime and combat air, space and cyber operations; and provides rapid reaction to immediate situations by exercising positive control of friendly forces.

In FY 2019, funding increased development capacity needed for AOC WS Modifications and are required to enable the retirement of Theater Battle Management Core System Force Level (TBMCS FL) and the legacy AOC 10.1 system while moving the AOC baseline toward a cloud-based commercially managed Infrastructure and Platform as a Service (IaaS/PaaS) hosting platform/environment. Also, AOC WS Modifications are required for the AOC to keep pace with evolving COTS/GOTS components, DoD directives, changes in the underlying IT environment, and to remain interoperable, certified, supportable, and compliant through the development, integration, testing, fielding, training, and sustainment of new capabilities and upgrades to the AOC WS; to include the utilization of commercial cloud environment providers with hosting equipment provided by the program. Additionally, in FY 2019 AOC WS Modifications activities evolve the AOC through Agile Software Development and Operations (DevOps) development, integration, and test of progressively improving capabilities in support of mission requirements at Geographic and Global (formerly Functional) AOCs, as well as Support and Manpower Augmentation units, keeping the AOC current and interoperable with the Combatant Commands (CCMDs), cyber requirements, and next generation weapon systems/weapons. Furthermore, in FY 2019 AOC WS Modifications funding increased to support the Multi-Domain Command and Control (MDC2) capability, 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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AOC WS 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.

BA7 - This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 674596 / AOC WS Modifications

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: AOC WS Modifications Development</p> <p>Description: Conduct AOC WS infrastructure development and mission capability integration. Leverage agile development methodology to develop, integrate, and test modification updates to the AOC WS leveraging a robust, open, Net-Centric infrastructure with a Service Oriented Architecture (SOA). Develop, test, and deliver effective training solutions with agile continuous integration and continuous development (CI/CD) processes. Conduct system maintenance and interoperability updates utilizing CI/CD.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct combined Developmental Testing (DT) of the five projects (Airspace Management Application - Airspace Information Service [ASMA-ASIS], Request Information Services for Command and Control [RISC2], C2 of Integrated Air Missile Defense [IAMD] Planner, Air Tasking Order Management System [ATOMS], and Air Execution Information System [AXIS]) - Plan for combined Operational Testing (OT) - Continue to modify to 10.1 legacy system to cloud-enabled environment; migrating or developing applications to perform in the cloud environment - Continue to evolve the AOC through Agile DevOps development, integration, and test of progressively improving capabilities in support of mission requirements <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Continue combined DT of the five projects (ASMA-ASIS, RISC2, C2 of IAMD, ATOMS, and AXIS) - Continue planning for combined OT - Continue to modify to 10.1 legacy system to cloud-enabled environment; migrating or developing applications to perform in the cloud environment - Continue to evolve the AOC through Agile DevOps development, integration, and test of progressively improving capabilities in support of mission requirements <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to new program structure; adds funds to continuously integrate service/joint apps into baseline and for the utilization of commercial cloud environment providers with hosting equipment provided by the program.</p>	4.854	6.416	90.764	0.000	90.764
<p>Title: AOC WS Modifications Test and Evaluation</p>	0.000	1.128	0.300	0.000	0.300

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 674596 / AOC WS Modifications

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Plan and implement appropriate comprehensive contractor testing (integration and test, functional testing, security testing, etc.), Developmental Test and Evaluation (DT&E), and Operational Test and Evaluation (OT&E) on AOC WS modification baseline updates, to include test planning, test conduct, and documentation review as necessary.</p> <p>FY 2018 Plans: - Conduct frequent contractor and developmental testing, including Warfighter Assessment Workshops, Risk Reduction Events, Information Assurance Assessments, etc.</p> <p>FY 2019 Base Plans: - Conduct DT and OT events of 10.1.16 and the integration of C2AOS-C2IS and its applications</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to type/frequency of testing using Agile DevOps methodology.</p>					
<p>Title: AOC WS Modifications Training</p> <p>Description: Plan and conduct AOC WS modification training analysis, planning, and development, to include both contractor-developed capabilities and supplemental training for contractor modified 3rd party capabilities. This includes development of effective training solutions and baseline updates to provide more effective training capabilities. This also includes curriculum and course ware / material development, instructor training, class / Computer Based Training conduct, and training surveys / analysis / updates / enhanced simulation capabilities.</p> <p>FY 2018 Plans: - Training in advance of FY 2019 10.1.16 DT/OT testing events</p> <p>FY 2019 Base Plans: - Training in support of 10.1.16 DT/OT testing events</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	0.000	0.156	0.150	0.000	0.150

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 674596 / AOC WS Modifications

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Cost decrease due to reduced training costs.					
Title: Multi-Domain Command and Control (MDC2) Development	0.000	0.000	14.888	0.000	14.888
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 2018 Plans: N/A					
FY 2019 Base Plans: - Begin to evolve the MDC2 capability through Agile DevOps development, integration, and test of progressively improving capabilities in support of mission requirements					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to new start effort.					
Accomplishments/Planned Programs Subtotals	4.854	7.700	106.102	0.000	106.102

C. Other Program Funding Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Line Item											
• OPAF 03 Line Item 834520: <i>Theater Battle Mgt C2 System</i>	5.674	4.976	2.923	-	2.923	5.514	5.284	4.739	4.823	Continuing	Continuing
• OPAF 03 Line Item 834530: <i>Air and Space Operations Ctr-WPN SYS</i>	15.325	25.533	40.066	-	40.066	40.583	5.190	5.228	5.247	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / <i>Air & Space Operations Center (AOC)</i>	Project (Number/Name) 674596 / <i>AOC WS Modifications</i>

D. Acquisition Strategy

The acquisition strategy builds on the agile development and modification of existing capabilities using evolutionary acquisition to standardize and modify the AOC WS. The initial capability was AOC WS Increment 10.0, which fielded the 10.0 configuration to five operational sites, plus a Help Desk and a Formal Training Unit. The second increment, Increment 10.1, upgraded these locations to an integrated baseline and fielded the baseline to additional operational and reserve units worldwide. The AOC 10.2, sought to evolve the AOC to a Net-Centric environment, compliant with DoD SOA standards but proved late to need using legacy approaches. The AOC WS Modifications program, using commercial best practices of agile Dev Ops Development builds upon these evolutionary weapon system updates to develop, integrate, test, train, deliver, and sustain new capabilities and baseline updates to the AOC WS. The AOC WS Modifications program will leverage an AOC WS Long-Term Modification and Sustainment (LTM&S) contract, awarded in Apr 2017, which will provide for government led integration of the AOC WS enterprise. The AOC WS Program Management Office (PMO) will provide technical oversight to the AOC WS Modification program, led by a Government AOC Weapon System (WS) Chief Engineer. Activities are also accomplished via Military Interdepartmental Purchase Requests (MIPR). Additionally, significant technical expertise will be provided by MITRE and Engineering & Technology Acquisition Support Services contractors as well as commercial industry 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)						Project (Number/Name) 674596 / AOC WS Modifications					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AOC WS Modifications Development	C/CPFF	Raytheon : Waltham, MA	-	1.500	Apr 2017	1.092	Oct 2017	35.458	Oct 2018	-		35.458	Continuing	Continuing	-
AOC WS Modifications	MIPR	Pivotal : Multiple	-	0.000		0.000		47.210	Oct 2018	-		47.210	Continuing	Continuing	-
Multi-Domain Command and Control (MDC2)	MIPR	Various : Multiple	-	0.000		0.000		14.888	Apr 2019	-		14.888	Continuing	Continuing	-
Subtotal			-	1.500		1.092		97.556		-		97.556	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AOC WS Modifications Training	C/TBD	Various : Various	-	-		0.150	Jul 2018	0.150	Dec 2018	-		0.150	Continuing	Continuing	-
Subtotal			-	-		0.150		0.150		-		0.150	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AOC WS Modifications Test	Various	Various : Various	-	-		1.128	Mar 2018	0.300	Nov 2018	-		0.300	Continuing	Continuing	-
Subtotal			-	-		1.128		0.300		-		0.300	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Services	Various	Various : Various	-	0.624	Oct 2016	3.472	Oct 2017	3.500	Oct 2018	-		3.500	Continuing	Continuing	-
Program Management Administration	C/Various	Various : Various	-	2.730	Nov 2016	1.858	Nov 2017	4.596	Nov 2018	-		4.596	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 674596 / AOC WS Modifications

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
AOC WS Modifications																												
AOC WS Modifications Phase 1																												
AOC WS Modifications Phase 2																												
AOC WS Modifications Phase 3																												
AOC WS Modifications Phase 4																												
AOC WS Modifications Phase 5																												
AOC WS Modifications Phase 6																												
AOC WS Modifications Testing																												
AOC 10.1.16 DT/OT Test																												
Multi-Domain Command and Control (MDC2)																												
MDC2 Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / <i>Air & Space Operations Center (AOC)</i>	Project (Number/Name) 674596 / <i>AOC WS Modifications</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
AOC WS Modifications				
AOC WS Modifications Phase 1	4	2017	3	2018
AOC WS Modifications Phase 2	3	2018	1	2019
AOC WS Modifications Phase 3	2	2019	1	2020
AOC WS Modifications Phase 4	2	2020	1	2021
AOC WS Modifications Phase 5	2	2021	1	2022
AOC WS Modifications Phase 6	2	2022	1	2023
AOC WS Modifications Testing				
AOC 10.1.16 DT/OT Test	2	2018	3	2019
Multi-Domain Command and Control (MDC2)				
MDC2 Development	3	2019	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)					Project (Number/Name) 675218 / Applications Development		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675218: Applications Development	0.000	15.755	15.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	31.184
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, 0207410F, Air & Space Operations Center (AOC), Project Number 675218, Applications Development, was transferred to PE 0305015F, C2 Air Operations Suite - C2 Information Services (C2AOS-C2IS), Project Number 675218, Applications Development, in order to improve transparency of development programs.

A. Mission Description and Budget Item Justification

In FY 2018, C2AOS-C2IS Modifications was a new start.

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 modular 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.

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

No FY 2019 funding requested; FY 2019 project efforts are detailed in PE 0305015F, C2AOS-C2IS.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Applications Development 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.

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

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675218 / Applications Development			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: C2AOS-C2IS Development</p> <p>Description: C2AOS-C2IS Development effort develops modular net-centric C2 applications for air battle planning, execution and management functions and creates web-enabled information services to expose air operations data in Theater Battle Management Core System (TBMCS) applications and systems using standardized schemas including Capability Packages (CP) 1, 2, & 3.</p> <ul style="list-style-type: none"> - CP 1: Air Tasking Order Management System (ATOMS), Request Information Services for Command and Control (RISC2) and Network Enabled Weapons (NEW) - CP 2: C2 of Integrated Air Missile Defense (IAMD) Planner and Airspace Management Application - Airspace Information Service (ASMA-ASIS) - CP 3: Air Execution Information System (AXIS) <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Accomplish bug fixes from testing and integration events - Prioritize Baseline Change Requests (BCR) - Conduct integration activities - Maintain cybersecurity posture - Support integration into AOC WS - Conduct C2AOS-C2IS Developmental Test (DT) - Turn Software (S/W) over to AOC for integration <p>FY 2019 Base Plans:</p> <p>See PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675218, Applications Development.</p> <p>FY 2019 OCO Plans:</p> <p>N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <p>Funding decreased due to transfer to PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675218, Applications Development.</p>	14.444	13.588	0.000	0.000	0.000
<p>Title: C2AOS-C2IS Modifications</p> <p>Description: The C2AOS-C2IS Modifications effort updates the fielded C2AOS-C2IS baseline to remain interoperable, certified, supportable, and compliant through the development, integration, testing, fielding, of new</p>	0.000	0.300	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675218 / Applications Development

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>capabilities and upgrades. C2AOS-C2IS Modifications fine tunes capabilities for C2 of 5th and 4th Generation Fighter Platforms, maintains Information Assurance (IA) posture via cyber updates, and updates user interfaces as needed.</p> <p>FY 2018 Plans: - Prioritize and work requirements for modification contract - Develop modification contract documentation, perform market research</p> <p>FY 2019 Base Plans: See PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675218, Applications Development.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to transfer to PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675218, Applications Development.</p>					
<p>Title: Test and Evaluation</p> <p>Description: Test and Evaluation</p> <p>FY 2018 Plans: - Conduct C2AOS-C2IS Risk Reduction Integration Event (RRIE) - Conduct C2AOS-C2IS DT - Prepare for C2AOS-C2IS and AOC combined DT and Operational Test (OT)</p> <p>FY 2019 Base Plans: See PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675218, Applications Development.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	1.311	1.541	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / <i>Air & Space Operations Center (AOC)</i>	Project (Number/Name) 675218 / <i>Applications Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding decreased due to transfer to PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675218, Applications Development.					
Accomplishments/Planned Programs Subtotals	15.755	15.429	0.000	0.000	0.000

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

N/A

Remarks

D. Acquisition Strategy

Projects will be awarded following full and open competition and will use an evolutionary acquisition strategy based on incremental development leveraging the C2 Applications and Information Services Development Indefinite Delivery/Indefinite Quantity contract. The Air Force Life Cycle Management Center, Operations C2 Division manages the integration of C2AOS-C2IS efforts into the AOC WS.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675218 / Applications Development
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Air Tasking Order Management System (ATOMS)	C/FPIF	Lockheed Martin : Colorado Springs, CO	-	2.876	Dec 2016	-		-		-		-	0.000	2.876	-
Request Information Services for Command and Control (RISC2)	C/Variou	Leidos, Inc. : Reston, VA	-	0.091	Nov 2016	-		-		-		-	0.000	0.091	-
Air Space Management Application-Air Space Information Service (ASMA-ASIS)	C/Variou	Leidos, Inc. : Reston, VA	-	0.131	Dec 2016	-		-		-		-	0.000	0.131	-
Command and Control of Integrated Air and Missile Defense (C2 of IAMD)	C/Variou	Lockheed Martin : Colorado Springs, CO	-	0.347	Jan 2017	-		-		-		-	0.000	0.347	-
Air Execution Information System (AXIS)	C/CPFF	Leidos, Inc. : Reston, VA	-	1.488	Dec 2016	-		-		-		-	0.000	1.488	-
C2AOS-C2IS Test and Integration 1	C/T&M	Leidos, Inc. : Reston, VA	-	1.538	Mar 2017	2.272	Jan 2018	-		-		-	0.000	3.810	-
C2AOS-C2IS Test and Integration 2	C/T&M	Lockheed Martin : Colorado Springs, CO	-	1.697	Feb 2017	5.597	Nov 2017	-		-		-	0.000	7.294	-
Mobility Enterprise Information Services (MEIS)	MIPR	DISA : Scott AFB, IL	-	0.855	Apr 2017	0.442	Jan 2018	-		-		-	0.000	1.297	-
Red Hat SW Development Support	C/FFP	Carahsoft Technology Corp : Reston, VA	-	0.439	Nov 2017	-		-		-		-	0.000	0.439	-
Subtotal			-	9.462		8.311		-		-		-	0.000	17.773	N/A

Remarks
 FINANCIAL PERFORMANCE: ATOMS is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs the ATOMS development contract is a FPIF contract with progress payments. Twenty percent (20%) of incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations and progress payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675218 / Applications Development
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Support (Joint)	MIPR	Joint Interoperability Test Command : Fort Huachuca, AZ	-	-		0.058	Jan 2018	-		-		-	0.000	0.058	-
Lead Developmental Test and Evaluation Organization	PO	96th Test Wing : Eglin AFB, FL	-	1.311	Mar 2017	1.483	Feb 2018	-		-		-	0.000	2.794	-
Subtotal			-	1.311		1.541		-		-		-	0.000	2.852	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	SS/ Various	MITRE : Bedford, MA	-	3.051	Oct 2016	2.777	Oct 2017	-		-		-	0.000	5.828	-
Program Management Administration	C/Various	Various : Hanscom AFB, MA	-	1.815	Oct 2016	2.290	Oct 2017	-		-		-	0.000	4.105	-
Program Management Administration Modification	C/Various	Various : Hanscom AFB, MA	-	-		0.300	Jul 2018	-		-		-	0.000	0.300	-
Cyber Support	MIPR	Various : Hanscom AFB, MA	-	0.116	Jul 2017	0.210	Jan 2018	-		-		-	0.000	0.326	-
Subtotal			-	4.982		5.577		-		-		-	0.000	10.559	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	15.755	15.429	-	-	-	31.184	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675218 / Applications Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Applications Development				
C2AOS-C2IS Test and Integration 1 (TI1) - Leidos	2	2017	4	2018
C2AOS-C2IS Test and Integration 2 (TI2) - Lockheed Martin	2	2017	4	2018
C2AOS-C2IS Modifications	4	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675220: Unit Level	0.000	6.975	3.827	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.802
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, 0207410F, Air & Space Operations Center (AOC), Project Number 675220, Unit Level, was transferred to PE 0305015F, C2 Air Operations Suite - C2 Information Services (C2AOS-C2IS), Project Number 675220, Unit Level, in order to improve transparency of development programs.

A. Mission Description and Budget Item Justification

Project funds are used to develop and integrate Unit Command and Control (UC2) as an evolving sequence of increasing software capabilities that support the execution of the air battle plan and the air tasking order message received from the AOC. UC2 operations software systems meet needs identified in the TBMCS Operational Requirements Document (ORD) (2001), the UC2 Baseline System Requirements Document (SRD) by providing both the scheduling and mission preparation activities at the wing, group and squadron level, and the capabilities to report and track the success of each mission and influence decisions on future air battle planning. UC2 is fielded to the Wing Operations Center (WOC), the Maintenance Operations Center (MOC), the Emergency Operations Center (EOC), Crisis Action Team (CAT), and many other work-centers.

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

No FY 2019 funding requested; FY 2019 project efforts are detailed in PE 0305015F, C2AOS-C2IS.

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

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Software Development	6.787	3.257	0.000	0.000	0.000
Description: UC2 capabilities development/integration.					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Complete development of UC2 Rel 1.3 and field FY 2019 Base Plans: See PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675220, Unit Level. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to transfer to PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675220, Unit Level.					
Title: Testing and Test Support Description: UC2 Testing and test support activities. FY 2018 Plans: - Support UC2 Warfighter Assessments - Complete testing of UC2 Rel 1.3 FY 2019 Base Plans: See PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675220, Unit Level. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to transfer to PE 0305015F, C2 Air Operations Suite - C2 Info Services, Project Number 675220, Unit Level.	0.188	0.570	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	6.975	3.827	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)			FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Line Item • OPAF 03 Line Item 834520: Theater Battle Management C2 System	FY 2017	FY 2018	3.420	-	3.420	3.481	3.544	3.608	3.671	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

Projects will be awarded following full and open competition and will use an evolutionary acquisition strategy based on incremental development while incorporating agile development and testing principals. The contracting strategy is Cost Plus Fixed Fee. The acquisition and contracting strategies were approved by Program Executive Officer, Battle Management, on 20 March 2014.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Unit Command & Control (UC2)	C/CPFF	Leidos Inc. : Reston, VA	-	5.204	Jan 2017	1.874	Jan 2018	-		-		-	0.000	7.078	10.530
Subtotal			-	5.204		1.874		-		-		-	0.000	7.078	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Support	PO	46TS : Eglin AFB, FL	-	0.188	Dec 2016	0.570	Dec 2017	-		-		-	0.000	0.758	-
Subtotal			-	0.188		0.570		-		-		-	0.000	0.758	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	C/CPAF	MITRE : Bedford, MA	-	0.712	Oct 2016	0.659	Oct 2017	-		-		-	0.000	1.371	-
Program Management Administration	C/Various	Various : Hanscom AFB, MA	-	0.749	Nov 2016	0.542	Nov 2017	-		-		-	0.000	1.291	-
Cyber Support	MIPR	Various : Hanscom AFB, MA	0.000	0.122	Dec 2016	0.182	Dec 2017	-		-		-	0.000	0.304	-
Subtotal			0.000	1.583		1.383		-		-		-	0.000	2.966	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	6.975	3.827	-	-	-	10.802	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Unit Command and Control (UC2)																												
UC2 Rel 1.1 Fielding			■																									
UC2 Rel 1.1.1 Development	■																											
UC2 Rel 1.1.1 Testing	■	■	■																									
UC2 Rel 1.1.1 Fielding			■																									
UC2 Rel 1.2 Development	■	■	■																									
UC2 Rel 1.2 Testing			■	■	■																							
UC2 Rel 1.2 Fielding							■	■	■																			
UC2 Rel 1.3 Development				■	■	■																						
UC2 Rel 1.3 Testing						■	■	■																				
UC2 Rel 1.3 Fielding								■																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Unit Command and Control (UC2)				
UC2 Rel 1.1 Fielding	3	2017	3	2017
UC2 Rel 1.1.1 Development	1	2017	1	2017
UC2 Rel 1.1.1 Testing	1	2017	3	2017
UC2 Rel 1.1.1 Fielding	3	2017	3	2017
UC2 Rel 1.2 Development	1	2017	4	2017
UC2 Rel 1.2 Testing	3	2017	1	2018
UC2 Rel 1.2 Fielding	2	2018	4	2018
UC2 Rel 1.3 Development	4	2017	3	2018
UC2 Rel 1.3 Testing	2	2018	4	2018
UC2 Rel 1.3 Fielding	4	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)			Project (Number/Name) 675221 / Personnel Recovery Command and Control (PRC2)				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675221: <i>Personnel Recovery Command and Control (PRC2)</i>	0.000	2.332	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.332
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. 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, interoperable 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 Personnel Recovery across 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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver PRC2 capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828, 0605829F, 0605830F, 0605832F, and 0605898F.

BA7 - 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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Personnel Recovery Command and Control (PRC2)	1.998	0.000	0.000	0.000	0.000
Description: PRC2 is developing and delivering tools and services for planning and managing search and rescue efforts, and disseminating related information.					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675221 / Personnel Recovery Command and Control (PRC2)
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>See PE 0305984F, Personnel Recovery Command & Ctrl (PRC2), Project Number 675221, Personnel Recovery Command and Control (PRC2).</p> <p>FY 2019 Base Plans: See PE 0305984F, Personnel Recovery Command & Ctrl (PRC2), Project Number 675221, Personnel Recovery Command and Control (PRC2).</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>					
<p>Title: Test and Evaluation</p> <p>Description: Test and Evaluation</p> <p>FY 2018 Plans: See PE 0305984F, Personnel Recovery Command & Ctrl (PRC2), Project Number 675221, Personnel Recovery Command and Control (PRC2).</p> <p>FY 2019 Base Plans: See PE 0305984F, Personnel Recovery Command & Ctrl (PRC2), Project Number 675221, Personnel Recovery Command and Control (PRC2).</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>	0.334	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	2.332	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675221 / Personnel Recovery Command and Control (PRC2)
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 834520: Theater Battle Management C2 System	1.252	1.286	1.301	-	1.301	1.323	1.347	1.372	1.396	Continuing	Continuing

Remarks

D. 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 Battle Management, 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.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675221 / Personnel Recovery Command and Control (PRC2)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PRC2 Follow on Development	PO	Ogden ALC : Hill AFB, UT	-	1.598	Dec 2016	0.000		-		-		-	0.000	1.598	-
Subtotal			-	1.598		0.000		-		-		-	0.000	1.598	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation.	PO	46th Test Squadron : Eglin AFB, FL	-	0.334	Oct 2016	0.000		-		-		-	0.000	0.334	-
Subtotal			-	0.334		0.000		-		-		-	0.000	0.334	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration	C/Variou	Various : Hill AFB, UT	-	0.400	Dec 2016	0.000		-		-		-	0.000	0.400	-
Subtotal			-	0.400		0.000		-		-		-	0.000	0.400	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	2.332	0.000	-	-	-	0.000	2.332	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675221 / Personnel Recovery Command and Control (PRC2)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Personnel Recovery Command and Control (PRC2)				
Personnel Recovery Mission Manager (PRMM) Ver 2.0.0 Development (formerly PRC2 Inc 5 Build 5.0.0 MM Inc 2)	1	2017	3	2017
PRMM Ver 2.0.0 Testing (formerly PRC2 Inc 5 Build 5.0.0 MM Inc 2)	4	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207412F <i>I Control and Reporting Center (CRC)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	12.854	2.450	6.413	0.000	6.413	9.414	16.070	9.779	9.956	Continuing	Continuing
67485L: <i>Theater Air Control System Imp (TACSI)</i>	-	12.854	2.450	6.413	0.000	6.413	9.414	16.070	9.779	9.956	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 This program, BA 7, PE 0207412F, project 67485L, CRC Modernization Phase 2, is a new start.

A. Mission Description and Budget Item Justification

CONTROL AND REPORTING CENTER (CRC)

The CRC is a mobile, ground-based theater air control system (TACS) surveillance and battle management command and control (BMC2) element. It is a customizable, modular, transportable, and persistent weapon system employed at the tactical level to support air and surface operations to provide direct command and control to all air assets in an assigned Area of Responsibility (AOR) and to report back to the Joint Force Air Combat Commander (JFACC). The CRC is a family of systems which include: AN/TYQ-23A(V)1 Tactical Air Operations Module (TAOM), AN/TSC-147 Joint Tactical Information Distribution System (JTIDS) Module (JM) (to be replaced by Link 16 Upgrade Multifunctional Information Distribution System Joint Tactical Radio System (MIDS JTRS)), AN/TRC-213/214 Remote Radio Secure Voice System (RRSVS), and the AN/TPS-75 Radar, CRC's organic radar, which will be replaced by the Three Dimensional Expeditionary Long Range Radar (3DELRR) (PE0207455). Air Combat Command (ACC) CRC Capability Roadmap provides for the modernization of this family of systems and will be programmed into phased updates through 2037.

CRC Phase 1 addresses, but is not limited to, AN/TYQ-23A(V)1 OM Multiple Source Correlator Tracker (MSCT) software upgrades, Diminishing Manufacturing Sources and Material Shortages (DMSMS).

CRC Phase 2 development efforts include AN/TRC-213/214 RRSVS radio modernization upgrade and Ground Moving Target Indicator MSCT software upgrades. Phase 2 is a New Start.

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 0207412F.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207412F <i>I Control and Reporting Center (CRC)</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	13.292	2.450	0.009	0.000	0.009
Current President's Budget	12.854	2.450	6.413	0.000	6.413
Total Adjustments	-0.438	0.000	6.404	0.000	6.404
• Congressional General Reductions	-0.438	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	6.404	0.000	6.404

Change Summary Explanation

FY19 - Air Force increased funding into CRC for Phase 2 efforts

C. Accomplishments/Planned Programs (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Title: CRC Modernization Phase 1	12.854	2.450	0.000	0.000	0.000
Description: CRC Modernization continues Phase 1 (Multiple Source Correlator Tracker (MSCT) software upgrades and 3 Dimensional Expeditionary Long Range Radar(3DELRR) Integration, Secret Internet Protocol Network (SIPR integration) and JM Link 16 Upgrade) will meet AOR user requirements for the CRC system.					
FY 2018 Plans: - Provides for 3DELRR Integration testing, cyber security updates, future phase updates planning and program support.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Air Force added funding for CRC Phase 2 efforts.					
Title: CRC Modernization Phase 2	-	0.000	6.413	-	6.413

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207412F <i>I Control and Reporting Center (CRC)</i>	

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: TRC-213/214 Radio Modernization will be upgraded from Serial to IP comm upgrade and Ground Moving Target Indicators (GMTI) MSCT software will be upgraded.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: - Will begin development of CRC Phase 2 capability. TRC-213/214 Radio Modernization will be upgraded from Serial to IP comm upgrade and Ground Moving Target Indicators (GMTI) MSCT software will be upgraded.					
FY 2018 to FY 2019 Increase/Decrease Statement: Air Force added funding for CRC Phase 2 efforts.					
Accomplishments/Planned Programs Subtotals	12.854	2.450	6.413	0.000	6.413

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 833040: <i>Theater Air Control Sys Improvements</i>	1.163	28.203	19.989	-	19.989	11.852	13.393	18.879	8.579	Continuing	Continuing

Remarks

E. Acquisition Strategy

The CRC Capability Roadmap provides for the modernization of the CRC family of systems and will be programmed into phased updates through 2023 to further advance current and future battlespace awareness and tactical battle management command and control capabilities. A variety of contract and organic vehicles will be used depending on type of effort and skills required. Management strategy relies on Air Force Program Executive Office for Battle Management (AFPEO BM) as the Milestone Decision Authority and the Air Force Life Cycle Management Center (AFLCMC) as the Contracting Authority.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207412F / <i>Control and Reporting Center (CRC)</i>	Project (Number/Name) 67485L / <i>Theater Air Control System Imp (TACSI)</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CRC Modernization Phase 1	C/Various	Various : Various, UT	-	12.066	Jan 2017	1.700	Feb 2018	-		-		-	Continuing	Continuing	-
CRC Modernization Phase 2	C/Various	Various : Various, MD	-	-		-		5.493	Jul 2019	-		5.493	Continuing	Continuing	-
Subtotal			-	12.066		1.700		5.493		-		5.493	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Support	PO	Various : Various, MA	-	0.488	Jun 2017	0.450	Feb 2018	0.620	Feb 2019	-		0.620	Continuing	Continuing	-
Subtotal			-	0.488		0.450		0.620		-		0.620	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration - Hill AFB	Various	Hill AFB : Hill AFB, UT	-	0.300	Jan 2017	0.300	Jan 2018	0.300	Feb 2019	-		0.300	Continuing	Continuing	-
Subtotal			-	0.300		0.300		0.300		-		0.300	Continuing	Continuing	N/A

Remarks
Task orders against ETAAS and EPAAS; organic depot as well

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	12.854	2.450	6.413	-	6.413	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207412F / <i>Control and Reporting Center (CRC)</i>	Project (Number/Name) 67485L / <i>Theater Air Control System Imp (TACSI)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>CRC Modernization Phase 1</i>				
CRC Modernization Phase 1	3	2017	4	2018
JM Link 16 Upgrades Prototypes	3	2017	3	2017
Test OM Mod Increment 1 5X & SIPRnet Software Integration	2	2017	1	2018
JM Link 16 Kit DT/OT	4	2017	1	2018
Integrate and Test Future Organic Baseline Radar (3DELRR)	4	2017	2	2018
Continue to Integrate and Test Future Organic Radar (3DELRR)	2	2018	4	2018
<i>CRC Modernization Phase 2</i>				
Development & Integration	4	2019	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207417F / <i>Airborne Warning and Control System (AWACS)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	85.727	151.726	120.664	0.000	120.664	153.600	181.614	172.908	203.121	Continuing	Continuing
67411L: <i>Airborne Warning & Control System (AWACS)</i>	-	85.727	151.726	120.664	0.000	120.664	153.600	181.614	172.908	203.121	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207417F, project 67411L, E-3 Advanced Battle Management and Surveillance (ABMS) Bridge Capabilities, is a new start.

A. Mission Description and Budget Item Justification

Mission: E-3 Airborne Warning and Control System (AWACS) is the premier airborne platform providing Battle Management (BM)/Command and Control (C2) for Commander In Chief and combatant commander tasking in joint, allied, and coalition operations, humanitarian relief, and homeland defense. AWACS provides a real-time picture of friendly, neutral, and hostile air activity. Its capabilities include all-altitude/all-weather surveillance of the battle space; early warning of enemy actions; a real-time ability to find, fix, track, and assess airborne or maritime threats; and detection, location, and identification of electronic emitters.

1. E-3 DMS Replacement of Avionics for Global Operations and Navigation (DRAGON): DRAGON completes the Federal Aviation Administration (FAA), International Civil Aviation Organization (ICAO), and European Organization for the Safety of Air Navigation (EUROCONTROL) air traffic control mandated safety of flight capabilities. This program will provide the E-3 fleet with the flight instruments and other avionics for the Required Navigation Performance (RNP), and the surveillance and communication capabilities necessary to maintain continued critical unrestricted access to global airspace. Non-compliance will result in airspace restrictions and denials that will impact AWACS ability to support worldwide responses to situations requiring immediate on-scene BM/C2. DRAGON replaces the existing Diminishing Manufacturing Sources (DMS) Global Positioning System (GPS) Integrated Navigation System (GINS) with a modern Flight Management System (FMS) that will accommodate new capabilities including Mode 5 Identification Friend or Foe (IFF) and Joint Mission Planning System (JMPS). Also included as part of the modification is the addition of data link communications, voice and data link digital radios, and improved visual displays. Additionally, the acquisition of DRAGON flight simulators also contains DMS efforts which 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. The simulator effort also implements requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative. Emphasis on employment of Commercial-Off-The-Shelf (COTS) avionics is expected to lower cost, reduce the tech refresh cycle, and enhance life cycle management. DRAGON will provide development of support and test equipment needed for DRAGON production; DRAGON will also provide initial DMS and Initial Contractor Support (ICS) needed to support the first US developmental test aircraft (i.e., D-1) prior to the contract award of the DRAGON production effort. The Engineering and Manufacturing Development (EMD) phase of DRAGON was being executed as a Cooperative Program between the US and NATO.

2. E-3 Electronic Protection (EP): EP will provide improved radar processing in a specific flight environment to meet a classified requirement. Processing will initially address radar modes comprising 90% of operational AWACS radar usage. EP will install an adjunct processor that works in parallel with the current Radar System Improvement Program (RSIP) system. The EP-processed radar picture will appear on the battle manager's display in place of the current RSIP output when the EP radar modes are selected.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207417F / <i>Airborne Warning and Control System (AWACS)</i>	
<p>3. E-3 Training, Support, and Infrastructure (TSI): TSI provides continuing management support for AWACS modernization and enhancement. These activities include managing the AWACS Development Test and Evaluation (DT&E) and Production infrastructure and tracking and monitoring the AWACS vendor's core mission and aircrew training, support equipment and program Government Furnished Property. The overall DT&E test infrastructure supports development, production, and sustainment projects and maintains facilities to support AWACS aircraft during system and sub-system testing at Boeing Field, WA, Baltimore, MD, and Oklahoma City, OK. The TSI assets also support multiple international Airborne Early Warning and Control (AEW&C) projects on a maintenance fee basis, not limited to projects for France, Saudi Arabia, United Kingdom, Japan, and North Atlantic Treaty (NATO) AEW&C efforts. Key programs include contractual management of the AWACS Avionics Integration Laboratory (AIL) integrated with the Block 40/45 Functional Group configured lab and the AWACS Radar Systems Integration Lab/Software Development Facility (SIL/SDF). These labs provide US, Foreign Military Sales (FMS), and international customers with a configured development and qualification system and subsystem environment supporting all AWACS system and radar development and sustainment. TSI efforts allow new support equipment technologies and test strategies to be analyzed to ensure concurrent capability to sustain existing, modified, and upgraded E-3 equipment.</p> <p>4. E-3 Command and Control, Intelligence, Surveillance, and Reconnaissance (C2ISR): C2ISR system improvements investigate and develop future capabilities of the AWACS weapon system. These efforts also include but are not limited to investigation, analysis, and development to ensure that AWACS successfully integrates with joint and coalition forces in a net-centric environment. C2ISR primarily supports pre-systems acquisition in the areas of materiel solution analysis and technology development. This is accomplished by prototyping and demonstrating capabilities required by the warfighter but also includes developing an E-3 Modernization & Sustainment Roadmap that projects user capability needs, as well as materiel solutions for the user needs. C2ISR will also support an analytical comparison of the operational effectiveness, suitability, and life-cycle cost of alternative materiel solutions beyond the current AWACS that satisfy an established capability need identified in an Initial Capabilities Document (ICD).</p> <p>5. E-3 Internet Protocol Enabled Communication (IPEC): IPEC will provide the Block 40/45 E-3 with a medium-bandwidth Internet Protocol (IP) communications capability to connect to the Global Information Grid and will support net-centric operations/warfare. IPEC will provide a reliable IP-enabled communication capability to support a shortened digitized kill-chain of time-sensitive targets. The modification will provide a permanent Inmarsat-based IP-enabled communications package supporting warfighter identified requirements for increased bandwidth Secret Internet Protocol Router Network (SIPRNet) and multi-domain networks. IPEC was originally planned for accomplishment as a traditional acquisition program, but due to warfighter demand, the effort has been re-classified as an Urgent Operational Need (UON).</p> <p>6. E-3 Combat Identification (CID) DMS: AWACS' current CID capability is based upon 1960's era technology that has become unsustainable, and requires an update to retain a significant part of AWACS overall mission capability. AWACS will address C2 CID shortfalls with a modern, persistent Airborne Moving Target Indication (AMTI) BM/C2 combat ID. CID DMS supports the kill chain and decision superiority.</p> <p>7. E-3 Communication Network Upgrade (CNU): CNU will provide a Link 16 capability with high-jam-resistance, high-speed, crypto-secure computer-to-computer connectivity in support of every type of military platform from Air Force fighters to Navy submarines. The current 20 year old Class 2 terminal has sustainability/DMS issues and does not support mandated Crypto Mod (CM) & Freq. Remap (FR). CNU resolves DMS issues, provides CM & FR, Link 16 enhancements & growth for Next Gen Tactical Data Link (TDL). Risk reduction activities are being executed in cooperation with foreign partners.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207417F / <i>Airborne Warning and Control System (AWACS)</i>
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8. E-3 Automatic Dependent Surveillance Broadcast (ADS-B) Out Acceleration: Updates flight deck to address known Air Traffic Management restrictions; replaces analog equipment with modern digital avionics to include ADS B Out and Mode 5 transponder since DRAGON's IOC 2020/FOC 2026 does not meet ADS B out or Mode 5 mandates. This subset accelerates the ADS-B Out and Mode 5 transponder FOC independent of DRAGON.

9. E-3 Advanced Battle Management and Surveillance (ABMS) Bridge Capabilities: E-3 Bridge strategy addresses near-to mid-term gaps identified in Advanced Battle Management & Surveillance Capabilities Based Assessment (CBA) Initial Capabilities Document (ICD). Fields advanced communications, networking & sensor capabilities on E-3G to mitigate operational risk prior to arrival of ABMS in the early 2040s. Adds RDT&E funding to develop and integrate E-3G advanced communications/networking, adjunct sensors, and integration of off board sensors.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver E-3 AWACS 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.

The FY19 funding request was reduced by \$3.403 million to account for the availability of prior year execution balances.

BA7 - 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	86.644	151.726	124.067	0.000	124.067
Current President's Budget	85.727	151.726	120.664	0.000	120.664
Total Adjustments	-0.917	0.000	-3.403	0.000	-3.403
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.000	0.000			
• SBIR/STTR Transfer	-2.917	0.000			
• Other Adjustments	0.000	0.000	-3.403	0.000	-3.403

Change Summary Explanation

FY17: Received \$2 million to fund Internet Protocol Enabled Communications (IPEC) development

FY19: Reduced by \$3.403 million to account for the availability of prior year execution balances.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207417F / <i>Airborne Warning and Control System (AWACS)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Title: E-3 DMS Replacement of Avionics for Global Operations and Navigation (DRAGON) Description: DRAGON FY 2018 Plans: - Develop Motion Trainer Simulator FY 2019 Plans: - Continue development of Motion Trainer Simulator FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to the continued Dragon Motion Trainer Simulator development		27.762	6.500	8.600
Title: E-3 Electronic Protection (EP) Description: EP FY 2018 Plans: - Complete Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) - Continue Engineering and Manufacturing Development (EMD) FY 2019 Plans: - Continue EMD FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to the EP program continuation in EMD		18.365	38.191	38.400
Title: E-3 Training, Support and Infrastructure (TSI) Description: TSI FY 2018 Plans: - Maintain and provide DT&E labs to AWACS programs - Support AWACS development and production programs lab integration & test efforts - Provide system lab support to EP, Block 40/45, DRAGON, NGIFF, IPEC, CID, ADSB-Out, and CNU improvement, integration and test - Support AWACS and other OSD mandated interoperability testing and support mandatory E-3 Operational, Safety, and Suitability and Effectiveness program FY 2019 Plans:		9.761	11.735	12.978

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207417F / <i>Airborne Warning and Control System (AWACS)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Will continue to maintain and provide DT&E labs to AWACS programs - Will support AWACS development and production programs lab integration & test efforts - Will provide system lab support to EP, Block 40/45, DRAGON, NGIFF, IPEC, CID, ADSB-Out, and CNU improvement, integration and test - Will support AWACS and other OSD mandated interoperability testing and support mandatory E-3 Operational, Safety, and Suitability and Effectiveness program <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to additional testing requirements</p>				
<p>Title: E-3 Command and Control, Intelligence, Surveillance and Reconnaissance (C2ISR)</p> <p>Description: C2ISR</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct engineering / integration studies to determine required modifications and associated costs to upgrade and support risk reduction activities for program planning - Execute cooperative Independent Research and Development <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Will continue to conduct engineering / integration studies to determine required modifications and associated costs to upgrade and support risk reduction activities for program planning - Will continue to execute cooperative Independent Research and Development <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funds decreased due to a decrease in requirements for risk reduction studies</p>		9.657	11.265	6.188
<p>Title: E-3 Internet Protocol Enabled Communication (IPEC)</p> <p>Description: IPEC</p> <p>FY 2018 Plans: Complete Engineering, Manufacturing & Development (EMD), Functional Configuration Audit (FCA)/ Physical Configuration Audit (PCA), and Technical Order (TO) Certification and Verification (C&V).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to the IPEC program moving into production.</p>		18.604	33.665	-
<p>Title: E-3 Combat Identification (CID) Diminishing Manufacturing Sources (DMS)</p>		0.127	27.572	14.712

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207417F <i>I Airborne Warning and Control System (AWACS)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Description: CID DMS</p> <p>FY 2018 Plans: - Conduct Risk Reduction for system-level integration, AWACS-specific modifications to the SEU, AWACS-specific antenna solutions, and integration prototyping.</p> <p>FY 2019 Plans: - Will complete Phase II Risk Reduction activities including Risk Reduction for system-level integration, AWACS-specific modifications to the SEU, AWACS-specific antenna solutions, and integration prototyping.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased for reduced risk reduction efforts</p>				
<p>Title: E-3 Communication Network Upgrade (CNU)</p> <p>Description: CNU</p> <p>FY 2018 Plans: - Award risk reduction contracts and Open Mission System activities</p> <p>FY 2019 Plans: - Will award Engineering and Manufacturing Development contract</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased for EMD efforts</p>		1.451	21.113	15.233
<p>Title: Automatic Dependent Surveillance-Broadcast Out Acceleration</p> <p>Description: ADS-B Acceleration</p> <p>FY 2018 Plans: - Complete RFP documentation and releasing EMD plans</p> <p>FY 2019 Plans: - Will integrate new CDU and APX-119 on flight deck of E-3 Sentry - Will design series of flight deck alert lights</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>		0.000	1.685	18.803

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207417F / <i>Airborne Warning and Control System (AWACS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Funding increased for EMD contract			
Title: E-3 Advanced Battle Management and Surveillance (ABMS) Bridge Capabilities	-	0.000	5.750
Description: E-3 ABMS Bridge Capabilities			
FY 2018 Plans: N/A			
FY 2019 Plans: Risk Reduction Activities			
FY 2018 to FY 2019 Increase/Decrease Statement: New Program			
Accomplishments/Planned Programs Subtotals	85.727	151.726	120.664

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line Item E00300: E-3	88.699	179.632	133.199	-	133.199	176.473	158.263	196.766	242.996	Continuing	Continuing
• APAF 05 Line Item E34045: <i>Airborne Warning and Control System</i>	245.227	164.786	57.780	-	57.780	41.777	39.566	28.758	0.000	0.000	577.894
• APAF 06 Line Item 000999: <i>Initial Spares/Repair Parts</i>	22.061	23.539	13.563	-	13.563	24.175	21.293	21.720	22.114	Continuing	Continuing

Remarks

E. Acquisition Strategy
 The modernization of the AWACS weapon system consists of multiple capability upgrades that are developed and fielded on existing sole source contracts. Full and open competition is explored for all new efforts where market research indicates opportunities exist.

Air Force Program Executive Officer (PEO) for Battle Management (AFPEO/BM) is the PEO and Milestone Decision Authority (MDA) for all AWACS Programs, with the exception of the E-3 Block 40/45 Upgrade. The E-3 Block 40/45 Upgrade MDA is the Secretary of the Air Force, with authority delegated to the Assistant Secretary of the Air Force (Acquisition) [SAF/AQ]. Of note, E-3 Block 40/45 Upgrade has completed development activities, so it has no 3600 funding and thus not otherwise referenced in this document. Air Force Life Cycle Management Center (AFLCMC) is the Contracting Authority for the AWACS portfolio and provides Contracts, Legal, and Comptroller Support.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207417F / <i>Airborne Warning and Control System (AWACS)</i>	

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207417F / Airborne Warning and Control System (AWACS)	Project (Number/Name) 67411L / Airborne Warning & Control System (AWACS)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
E-3 DMS Replacement of Avionics for Global Operations and Navigation (DRAGON)	SS/FPIF	Boeing : Seattle, WA	-	23.625	Jan 2017	9.225	Jan 2018	8.600	Jan 2019	-		8.600	Continuing	Continuing	-
E-3 Electronic Protection (EP)	SS/CPIF	Boeing : Seattle, WA	-	15.509	Jan 2017	34.767	Jan 2018	34.560	Jan 2019	-		34.560	Continuing	Continuing	-
E-3 Command and Control, Intelligence, Surveillance, and Reconnaissance	SS/ Various	Boeing : Seattle, WA	-	6.896	Jan 2017	10.514	Jan 2018	5.225	Jan 2019	-		5.225	Continuing	Continuing	-
E-3 Internet Protocol Enabled Communication (IPEC)	SS/ Various	Boeing : Oklahoma City, OK	-	16.728	Jan 2017	29.181	Jan 2018	-		-		-	Continuing	Continuing	-
E-3 Combat Identification (CID) Diminishing Manufacturing Sources (DMS) Risk Reduction Study	SS/CPFF	Raytheon : Fort Wayne, IN	-	-		15.561	May 2018	12.062	Nov 2018	-		12.062	Continuing	Continuing	-
E-3 Combat Identification (CID) Diminishing Manufacturing Sources (DMS) Prototype Development	TBD	TBD : TBD	-	0.000		10.000	May 2018	-		-		-	Continuing	Continuing	-
E-3 Communication Network Upgrade (CNU)	SS/ Various	Space & Naval Warfare Sys : San Diego, CA	-	1.095	Jan 2017	18.334	Jan 2018	11.723	Jan 2019	-		11.723	Continuing	Continuing	-
ADS-B Acceleration	TBD	TBD : TBD	-	0.000		0.600	Jan 2018	15.803	Jan 2019	-		15.803	Continuing	Continuing	-
E-3 ABMS Bridge Capabilities	TBD	TBD : TBD	-	0.000		0.000		5.750	Jan 2019	-		5.750	Continuing	Continuing	-
Subtotal			-	63.853		128.182		93.723		-		93.723	Continuing	Continuing	N/A

Remarks
Total Program does not include NATO funds.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207417F / Airborne Warning and Control System (AWACS)	Project (Number/Name) 67411L / Airborne Warning & Control System (AWACS)
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

E-3 ABMS Bridge Capabilities Risk Reduction																												
E-3 ABMS Bridge Capabilities EMD																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207417F / Airborne Warning and Control System (AWACS)	Project (Number/Name) 67411L / Airborne Warning & Control System (AWACS)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
AWACS PE 0207417F				
DRAGON EMD	1	2017	1	2018
DRAGON IOT&E	3	2019	2	2020
DRAGON Milestone C (Jul 2017)	4	2017	4	2017
EP EMD	1	2017	1	2020
EP Milestone C (Dec 2019)	1	2020	1	2020
EP DT/OT	2	2019	4	2019
TSI	1	2017	4	2023
C2ISR	1	2017	4	2023
IPEC EMD	1	2017	1	2018
IPEC DT/OT (Sep 2017)	4	2017	4	2017
IPEC Milestone C (Apr 2018)	3	2018	3	2018
CID DMS TD	3	2018	3	2020
CID DMS Milestone B (Apr 2020)	3	2020	3	2020
CID DMS EMD	3	2020	2	2022
CID DT/OT	3	2020	3	2022
CID DMS Milestone C (Jul 2022)	4	2022	4	2022
CNU TMRR Phase	4	2017	3	2019
CNU Milestone B (Oct 2019)	1	2020	1	2020
CNU EMD	1	2020	4	2021
CNU Milestone C (Sep 2021)	4	2021	4	2021
ADS-B Accel Milestone B (Jul 2018)	4	2018	4	2018

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207417F / Airborne Warning and Control System (AWACS)	Project (Number/Name) 67411L / Airborne Warning & Control System (AWACS)
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
ADS-B EMD	2	2019	2	2021
ADSB Milestone C (Mar 2021)	2	2021	2	2021
E-3 ABMS Bridge Capabilities Risk Reduction	1	2019	4	2020
E-3 ABMS Bridge Capabilities EMD	1	2021	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207418F / <i>Tactical Airborne Control Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	2.353	3.656	2.659	0.000	2.659	4.374	4.231	3.900	3.970	Continuing	Continuing
675234: <i>TACP Support</i>	-	2.353	3.656	2.659	0.000	2.659	4.374	4.231	3.900	3.970	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Terminal Control Training and Rehearsal (JTC TRS) Program, under the Tactical Airborne Control System, funds development necessary to provide a Distributed Mission Operations (DMO) capable, high-fidelity simulator for Battlefield Airmen, to include Joint Terminal Attack Controller (JTAC) operations, Special Tactics Combat Control Team (CCT) Air Traffic Control (ATC), Assault Zone operations, and Air Support Operations Center (ASOC) operations.

JTC TRS is essential to provide initial training, mission qualification training, continuation training, and currency control requirements to JTACs and Special Tactics personnel. JTAC control training requirements exceed the ability of live-fly aircraft to meet, and JTC TRS is the only capability enabling JTACs to achieve and maintain minimum required training for both qualification and proficiency in accordance with the U.S and Partner Nation Memorandum of Agreement for JTAC certification and qualification.

The JTC TRS Program provides research and development to facilitate interoperability with joint and sister Service air-ground simulation using industry standards. Future JTC TRS development will provide the capability to network aircrew full mission trainers and training centers in a live-virtual-constructive network. This development effort will also integrate ASOCs with the Joint Theater Air Ground Simulation System (JTAGSS) trainer for Joint Fires integration. The simulator will supplement live field training and live-fly sorties to provide realistic introductory, proficiency, currency, and upgrade training in a simulated battlefield, disaster, or humanitarian relief environment.

b. JTAGSS is a continuation of the ASOC simulation trainer initially funded in 2009 and complements the JTC TRS trainer by providing a total air-ground constructive simulation environment for integrated networked training and mission rehearsal capability that will develop JTAC/CCT and ASOC/Special Operations Forces (SOF) Command and Control (C2) battle staff skills. JTAGSS will provide the ASOC, SOF, and TACP (Tactical Air Control Party) with the vertical and horizontal C2 communications and coordination training and mission rehearsal required for mission effectiveness. There are insufficient exercises and live training events available to meet mandated readiness requirements. The system will include a secure network connection, a constructive simulation environment generator with sharable databases, computer work stations that have synthetic reflex agent applications for each ASOC/SOF crew position to execute the air tasking order.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts for systems, fielded or approved, for production, that have been fully validated through formal Operation Utility Evaluation (OUE) and anticipate production funding in the current or subsequent fiscal year. Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. 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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207418F / <i>Tactical Airborne Control Systems</i>
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requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative. This program element may include necessary civilian pay expenses required to manage, execute, and deliver the JTC TRS weapon system capability.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver JTC TRS 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.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts for systems, fielded or approved, for production, that have been fully validated through formal Operation Utility Evaluation (OUE) and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.442	3.656	3.715	0.000	3.715
Current President's Budget	2.353	3.656	2.659	0.000	2.659
Total Adjustments	-0.089	0.000	-1.056	0.000	-1.056
• 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	-0.089	0.000	-1.056	0.000	-1.056

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: JTC TRS Trainer Development	0.600	1.200	0.319
Description: Development and test of Engineering Change Proposals (ECPs) for TACP-Close Air Support System (CASS) and Small Diameter Bomb (SDB) II.			
FY 2018 Plans: Development and test of Engineering Change Proposals (ECPs) for TACP-CASS and SDB II.			
FY 2019 Plans: Development of air traffic control ECP.			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207418F / <i>Tactical Airborne Control Systems</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Development of air traffic control ECP.			
Title: JTAGSS Trainer Development	1.753	2.456	2.340
Description: Develops high fidelity simulation system for ASOC/SOF Command and Control System that supports JTAC training. Currently an AFRL program funded by Air Combat Command			
FY 2018 Plans: Continue JTAGSS 3.0. Integrate TACP Close Air Support System 1.4.4. and internal agents.			
FY 2019 Plans: Continue JTAGSS 3.0. Integrate TACP Close Air Support System 1.4.4. and internal agents.			
FY 2018 to FY 2019 Increase/Decrease Statement: Due to inflation			
Accomplishments/Planned Programs Subtotals	2.353	3.656	2.659

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 837100: <i>Tactical C-E Equipment</i>	15.599	1.181	13.023	-	13.023	3.891	3.961	-	-	Continuing	Continuing

Remarks

E. Acquisition Strategy

a. The JTC TRS acquisition is a single step to full capability as defined in the CPD. A small business set-aside competitive lowest price technically acceptable source selection was conducted and resulted in the award of a single contract to produce and sustain JTC TRS. The contract includes pre-priced production options for additional JTC TRS production, Emulated Military Equipment (EME) program management, cybersecurity support, Contractor Logistic Support (CLS), Training System Support Center (TSSC), training, relocation, a legacy system compatibility study and an Air Traffic Control upgrade. The pre-price production options include credit to the government for use of existing equipment when updating current fielded active duty immersive JTAC training systems (Air National Guard (ANG) Advanced JTAC Training System (AAJTS)) to the JTC TRS baseline. The contract structure allows for maintaining concurrency, implementing system improvements/technical refresh, and other modifications as required. JTC TRS awarded a competitive contract in January 2016 to procure up to 32 devices. The JTC TRS received a Full Rate Production (FRP) decision in February 2017 and is currently fielding production units. . Development will be required for engineering changes related to Legacy System Compatibility, Air Traffic Control (ATC), TACP-Close Air Support System (TACP-CASS) and Small Diameter Bomb II (SDB II).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force Date: February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207418F / <i>Tactical Airborne Control Systems</i>
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b. The acquisition strategy for the JTAGSS trainer will be to field advance technology demonstration units to continue to perform proof of concept and technology validation of mission simulations for all ASOC crew positions including detailed communications planning, asset deconfliction, integration of joint fires, and other critical mission areas required for integrated TACP/ASOC C2 mission success. At the completion of the technology validation, a contract will be competitively awarded to complete JTAGSS development, deployment and integration. Current software is Government or Commercial Off-the-Shelf technologies (GOTS/COTS) allowing almost any training technology development company to compete, which lowers technical risk, schedule risk, and cost.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207418F / <i>Tactical Airborne Control Systems</i>	Project (Number/Name) 675234 / <i>TACP Support</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JTC TRS Trainer Development	C/FFP	AFLCMC/WNS, AFMC : Wright Patterson AFB, OH	-	0.600	Mar 2017	1.200	Apr 2018	0.319	Jan 2019	-		0.319	Continuing	Continuing	-
JTAGSS Development	C/CPFF	AFRL, AFMC : Wright Patterson AFB, OH	-	1.753	Dec 2016	2.456	Dec 2017	2.340	Jan 2019	-		2.340	Continuing	Continuing	-
Subtotal			-	2.353		3.656		2.659		-		2.659	Continuing	Continuing	N/A

Remarks
 JTC TRS 2.0
 - Adds Air Traffic Control and Assault Zone operations for Special Operations Special Tactics personnel and TACP-CASS.

JTAGSS 2.0. This effort: a) Will increase the autonomous functionality and capability using reflex agents; b) improve internal ASOC crew capacity with increased voice recognition capabilities; c) make the JTAGSS system DMO ready and capable; and d) provide joint and coalition full mission rehearsal capability.
 -ASOC/JTAGSS Metric Development.
 -Scenario Authoring Tool.
 -Distributed Mission Operations Ready
 -Internal Reflex Agent Research and Development.
 -Instructor Operator Station.
 -After Action Review.
 -JTAGSS Documentation and Rapid Transition Documentation.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	2.353	3.656	2.659	-		2.659	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207418F / <i>Tactical Airborne Control Systems</i>	Project (Number/Name) 675234 / <i>TACP Support</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Tactical Simulators</i>				
JTC TRS RFP - for DACAS	4	2017	2	2018
JTC TRS Contract Award for DACAS	2	2018	2	2018
JTC TRS Study Options and Engineering Change Proposals (ECPs)	2	2017	3	2020
JTC TRS RFP - for SDB II	4	2017	1	2018
JTC TRS Contract Award for SDB II	3	2018	3	2018
JTC TRS Contract Award for ATC	2	2019	2	2019
JTAGSS Development	1	2017	4	2020
JTAGSS Production	4	2017	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	15.461	13.420	10.316	0.000	10.316	10.368	10.557	10.783	10.981	Continuing	Continuing
675306: <i>Analysis Enterprise</i>	-	0.000	1.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675307: <i>TARGETING ENTERPRISE RESEARCH</i>	-	5.813	11.717	9.451	0.000	9.451	9.622	9.797	10.007	10.191	Continuing	Continuing
675309: <i>GEO Info & Serv Software</i>	-	9.648	0.700	0.865	0.000	0.865	0.746	0.760	0.776	0.790	Continuing	Continuing

Note
This program, BA 07 PE 0207431F, project 675306, Fund Acq/Intel STAR VOLT, is a new start.

A. Mission Description and Budget Item Justification

The mission of Combat Air Intelligence Systems (CAIS) is to process, analyze, and disseminate intelligence for air component and unit operations worldwide by providing key intelligence infrastructure and production capabilities for the supported and supporting forces with true backbone type of intelligence support for air operations and air support to joint operations. CAIS is focused on providing the intelligence infrastructure and funding to Air Force Major Commands, Intelligence, Cyber and Space Squadrons, Field Operating Agencies, and subordinate units.

This program is in Budget Activity 7, Operational System Development, because this budget activity includes development efforts to upgrade and integrate 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	10.911	13.420	10.393	0.000	10.393
Current President's Budget	15.461	13.420	10.316	0.000	10.316
Total Adjustments	4.550	0.000	-0.077	0.000	-0.077
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	4.550	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	-0.077	0.000	-0.077

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675306 / <i>Analysis Enterprise</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675306: <i>Analysis Enterprise</i>	-	0.000	1.003	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

Supports increase in System Threat Assessment Reports (STARs) production. The Validated Online Lifecycle Threat (VOLT) supports acquisition of weapons systems that are tailored to defeat future threats. This Project meets DoD 5000.02-mandated requirement for increase in STAR.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Fund Acq/Intel STAR VOLT	-	1.003	-	-	-
Description: DoD 5000.02 mandated a 100% increase in System Threat Assessment Reports (STARs) production. The Validated Online Lifecycle Threat (VOLT), STAR replacement, supports acquisition of weapon systems that are more effective against future threats.					
FY 2018 Plans: Provides RDT&E support required to meet DoDI 5000.02 STAR mandate and create specialized software to automatically extract/compile data from intel databases.					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to completion of software development.					
Accomplishments/Planned Programs Subtotals	-	1.003	-	-	-

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 832070: <i>Intelligence Comm Equipment</i>	6,242.000	6,549.000	6,286.000	-	6,286.000	4,396.000	4,475.000	4,557.000	4,639.000	Continuing	Continuing
• RDTE 07 PE 0207431F: <i>Combat Air Intelligence Systems</i>	10,911.000	13,420.000	10,393.000	0.000	10,393.000	10,446.000	10,637.000	10,862.000	11,059.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675306 / <i>Analysis Enterprise</i>

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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675306 / <i>Analysis Enterprise</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	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				
STAR VOLT																																
Begin VOLT Software upgrade																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675306 / <i>Analysis Enterprise</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
STAR VOLT				
Begin VOLT Software upgrade	1	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>			Project (Number/Name) 675307 / <i>TARGETING ENTERPRISE RESEARCH</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675307: <i>TARGETING ENTERPRISE RESEARCH</i>	-	5.813	11.717	9.451	0.000	9.451	9.622	9.797	10.007	10.191	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Provides support to personnel utilizing Target Development, Planning, and Execution applications; Unit Level Intelligence; Tactical Intelligence Applications; and direct support to national, combatant command, and Air Force intelligence missions. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Targeting 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Targeting Enterprise Research	5.813	11.717	9.451	0.000	9.451
Description: Continue to conduct Targeting Enterprise research and advancement for projects such as Information for Operational and Tactical Analysis (IOTA), Joint Targeting Toolbox (JTT), Global Command and Control System Integrated Imagery and Intelligence (GCCS-I3), Intelligence, Surveillance and Reconnaissance (ISR) Strategy-to-Task Assessment of Kill-chain Effectiveness (STAKE), and Imagery Analyst (IA) Pioneer Electronic Light Table (ELT), and Full Spectrum Targeting (FST). This budget item also funds emerging targeting capabilities (such as Target System Analysis, 4D visualization, etc.) and modernization efforts.					
FY 2018 Plans: Continued the phased modernization of capabilities within the T&G portfolio, expand test automation, and migrate to a true Continuous Integration/DevOps environment to support continuous delivery to the warfighter.					
FY 2019 Base Plans: Continue the phased modernization of capabilities within the T&G portfolio, expand test automation, and migrate to a true Continuous Integration/DevOps environment to support continuous delivery to the warfighter.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease reflects return to baseline levels after FY18 ramp-up to support initial Modernization efforts.					
Accomplishments/Planned Programs Subtotals	5.813	11.717	9.451	0.000	9.451

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675307 / <i>TARGETING ENTERPRISE RESEARCH</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>			<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 832070: <i>Intelligence Comm Equipment</i>	6.294	6.534	6.273	-	6.273	4.384	4.464	-	-	Continuing	Continuing

Remarks

Combat Air Intelligence System (CAIS) procurement funds.

D. Acquisition Strategy

All contracts are awarded based on 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0207431F / Combat Air Intelligence System Activities				675307 / TARGETING ENTERPRISE RESEARCH								
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Targeting Enterprise Research	Various	TBD : TBD, NV	-	4.634	Dec 2016	9.374	Dec 2017	7.701		-		7.701	Continuing	Continuing	-	
Subtotal			-	4.634		9.374		7.701		-		7.701	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Targeting Systems Support	Various	SPAWAR : Phili, PA	-	0.598	Dec 2016	0.603	Dec 2017	0.600	Dec 2018	0.000		0.600	Continuing	Continuing	-	
DMS, MilCloud	Various	Various : NA	-	0.174		0.920		0.350		-		0.350	Continuing	Continuing	-	
Subtotal			-	0.772		1.523		0.950		0.000		0.950	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
46th Test Squadron	PO	46th Test Squadron : Eglin, FL	-	0.295	Dec 2016	0.351	Dec 2017	0.300	Dec 2018	0.000		0.300	Continuing	Continuing	-	
Subtotal			-	0.295		0.351		0.300		0.000		0.300	Continuing	Continuing	N/A	
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Targeting Research Enterprise	Various	Program Management Office : Hanscom, MA	-	0.112	Dec 2016	0.469	Dec 2017	0.500	Nov 2018	0.000		0.500	Continuing	Continuing	-	
Subtotal			-	0.112		0.469		0.500		0.000		0.500	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force							Date: February 2018			
Appropriation/Budget Activity 3600 / 7			R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>			Project (Number/Name) 675307 / <i>TARGETING ENTERPRISE RESEARCH</i>				
	Prior Years	FY 2017	FY 2018		FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.813	11.717		9.451	0.000	9.451	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675307 / <i>TARGETING ENTERPRISE RESEARCH</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Targeting	
Software/Hardware Development	
Test and Evaluation	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675307 / <i>TARGETING ENTERPRISE RESEARCH</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Targeting				
Software/Hardware Development	1	2017	4	2021
Test and Evaluation	1	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>			Project (Number/Name) 675309 / <i>GEO Info & Serv Software</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675309: <i>GEO Info & Serv Software</i>	-	9.648	0.700	0.865	0.000	0.865	0.746	0.760	0.776	0.790	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Provides support to personnel using Geospatial resources utilized in Geospatial Intelligence (GEOINT) databasing applications, unit level intelligence, technology exploration and refresh initiatives, management and dissemination architecture, geospatial information and services modernization, and enablers for targeting capabilities. Provides support to the MAJCOMs to ensure requisite and available target intelligence and GEOINT tools for information directly available to warfighters.

The GEOINT information and service software program funds the Air Force Geospatial Product Library (GPL) which is currently fielded to all combatant command air components and subordinate units supporting global air operations. The GPL provides digital GEOINT data to support mission planning, targeting & intelligence in support of mission objectives.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Geospatial Intelligence 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Enhanced Geospatial Product Library (EGPL)	9.648	0.700	0.865	-	0.865
Description: Provide continuing support for EGPL software and storage to meet future and evolving IT and GEOINT standards and support.					
FY 2018 Plans: Continue to develop EGPL software and initiate modernization efforts.					
FY 2019 Base Plans: Continue to develop EGPL software and continue modernization efforts.					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase required to provide additional EGPL software enhancements and to continue modernization efforts.					
Accomplishments/Planned Programs Subtotals	9.648	0.700	0.865	-	0.865

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675309 / <i>GEO Info & Serv Software</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 832070: <i>Intelligence Comm Equipment</i>	6.294	6.534	6.273	-	6.273	4.384	4.464	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

All major contracts within this project will be awarded after 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675309 / <i>GEO Info & Serv Software</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Enhanced Geospatial Product Library	Various	TBD : TBD, NV	-	4.576	Jan 2017	0.700	Jan 2018	0.865	Jan 2019	0.000		0.865	Continuing	Continuing	-
Arc GIS	Reqn	Multiple : Multiple	-	5.000	Mar 2018	0.000		-		-		-	Continuing	Continuing	-
Subtotal			-	9.576		0.700		0.865		0.000		0.865	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Not specified.	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Subtotal			-	-		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
46 Test Squadron	PO	46th Test Squadron : Eglin, FL	-	0.029	Dec 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			-	0.029		0.000		0.000		0.000		0.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Office Support	Various	Not Specified : Hanscom, MA	-	0.043	Jan 2017	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			-	0.043		0.000		0.000		0.000		0.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force								Date: February 2018		
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>			Project (Number/Name) 675309 / <i>GEO Info & Serv Software</i>			
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	9.648	0.700	0.865	0.000	0.865	Continuing	Continuing	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675309 / <i>GEO Info & Serv Software</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Targeting	
Software Development	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207431F / <i>Combat Air Intelligence System Activities</i>	Project (Number/Name) 675309 / <i>GEO Info & Serv Software</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Targeting</i>				
Software Development	1	2017	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	11.437	10.623	6.149	0.000	6.149	13.652	12.931	11.336	11.543	Continuing	Continuing
674934: <i>Tactical Air Control Party (TACP)*</i>	-	0.000	0.000	0.000	0.000	0.000	2.738	1.826	0.000	0.000	Continuing	Continuing
676013: <i>Equipment Modernization</i>	-	11.437	10.623	6.149	0.000	6.149	10.914	11.105	11.336	11.543	Continuing	Continuing

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019

A. Mission Description and Budget Item Justification

Tactical Air Control Partys (TACP) are Air Force units manned by airmen who advise Army Ground Commanders and plan, request and control air power in support of army ground maneuver operations. TACPs also coordinate, request, and control airlift support and intelligence, surveillance, and reconnaissance (ISR) support for Army combat operations, and they provide ground communications support for federal disaster response and Homeland Defense operations. TACPs deploy with their aligned Army units and operate in a variety of environments including fixed operations from Tactical Operations Centers (TOC), mobile operations in tactical vehicles, and dismounted (on foot) operations with Army infantry patrols.

The purpose of the TACP-Modernization program is to upgrade TACP voice, data and video communications capabilities, upgrade targeting capabilities, and improve TACP battlefield awareness capabilities. These capabilities are employed at all echelons of Army organizations by: Air Support Operation Centers (ASOC), Division TACPs, Brigade TACPs, Battalion TACPs, and Joint Terminal Attack Controllers (JTAC) deployed with Army companies or scout teams on the front lines. Improved targeting and data communications capabilities provide more accurate target coordinates, reduce Close Air Support (CAS) response times, and reduce the probability of fratricide or collateral damage through the use of networked data communications.

The TACP-M program provides and modernizes capabilities in three major categories/areas:(1) ASCOC/TOC Systems (used in fixed ASOCs and Army TOCs), (2) Dismounted and Mobile Systems (used by JTACs during infantry operations and vehicle-mounted mobile operations), and (3) Close Air Support System (CASS) software. CASS v1.4.5 software comes in two versions: A) Dismounted version for dismounted mission operations and a B) ASOC, TOC, and Mounted (ATM) version for ASOC, TOC, and Mobile systems.

CASS software segment interfaces with all TACP-M components and provides interoperability with joint strike aircraft (F-35, A-10, F-16, F-15, F/A-18, AV-8B, B-52, etc.), remotely piloted aircraft (RPA), artillery fire support systems, network-enabled weapons, and C2 nodes. To enable data communications with those systems / nodes, CASS incorporates several communications protocols including Variable Message Format (VMF), Link 16, Situational Awareness Data Link (SADL), Marine Tactical System (MTS), and U.S. Message Text Format (USMTF). CASS software will provide advanced communication, advanced targeting capability, and significant interoperability improvements for mobile computing devices used by Dismounted JTACs, for vehicle-mounted systems, and for stationary systems used in operations centers. Future upgrades necessary to maintain interoperability with strike aircraft, joint fire support systems, and emerging data networking waveforms will be guided by

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>
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the TACP CASS Information System Initial Capabilities Document (IS ICD) approved by the Air Force Requirement Oversight Council (AFROC), Functional Capabilities Board (FCB), and Joint Capabilities Board (JCB).

CASS v2.0 provides a modular architecture for digital communications, messaging, data handling, hardware management, and targeting, and battle space awareness capabilities. The architecture includes a Core Module, an HMI module, and an Application Logic module with multiple mission plug-in features. The software is being developed in two versions ASOC/TOC (A/T) and Dismounted/Mounted (D/M) to support a wide variety of radio systems (including but not limited to AN/PRC-117F, AN/PRC-117G, AN/ PRC-148, AN/PRC-152A, AN/PRC-154, AN/PRC-158, Harris RF-335M-HH, AN/PRC-150C, and other emerging systems that are expected to be employed by TACPs in the future). The key characteristic of the software will be the Open System, Modular architecture that will enable rapid integration with new external devices (such as laser range finders and radios) and rapid development, testing and fielding of new mission capability modules to meet future requirements.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development effort to upgrade systems that have 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	11.843	10.623	10.794	0.000	10.794
Current President's Budget	11.437	10.623	6.149	0.000	6.149
Total Adjustments	-0.406	0.000	-4.645	0.000	-4.645
• 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	-0.406	0.000			
• Other Adjustments	0.000	0.000	-4.645	0.000	-4.645

Change Summary Explanation

FY2019 funding decreased due to higher Air Force priorities

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>				Project (Number/Name) 676013 / <i>Equipment Modernizaton</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676013: <i>Equipment Modernizaton</i>	-	11.437	10.623	6.149	0.000	6.149	10.914	11.105	11.336	11.543	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Air Control Party(s) (TACP) are Air Force units manned by airmen who advise Army Ground Commanders and plan, request and control air power in support of army ground maneuver operations. TACPs also coordinate, request, and control airlift support and intelligence, surveillance, and reconnaissance (ISR) support for Army combat operations, and they provide ground communications support for federal disaster response and Homeland Defense operations. TACPs deploy with their aligned Army units and operate in a variety of environments including fixed operations from Tactical Operations Centers (TOC), mobile operations in tactical vehicles, and dismounted operations with Army infantry patrols.

The purpose of the TACP-Modernization program is to upgrade TACP voice, data and video communications, targeting, and battlefield awareness capabilities. These capabilities are employed at all echelons of Army organizations by: Air Support Operation Centers (ASOC), Division TACPs, Brigade TACPs, Battalion TACPs, and Joint Terminal Attack Controllers (JTAC) deployed with Army companies or scout teams on the front lines. Improved targeting and data communications capabilities provide more accurate target coordinates, reduce Close Air Support (CAS) response times, and reduce the probability of fratricide or collateral damage through the use of networked data communications.

The TACP-M program provides and modernizes capabilities in four major categories/areas: (1) ASOC/TOC Systems (used in fixed ASOCs and Army TOCs), (2) Dismounted,(3) Mobile Systems (used by JTACs during infantry operations and vehicle-mounted mobile operations), and (4) the Close Air Support System (CASS) software that resides on and interfaces with the TACP-M hardware systems. CASS software is a Fires centric solution which consists of Close Air Support (CAS) and artillery fire support on the battlefield where digitally aided CASS enables efficient execution of a Joint Terminal Attack Controllers mission tasks utilized on all TACP-M systems.

The CASS software provides interoperability with joint strike aircraft (F-35, A-10, F-16, F-15, F/A-18, AV-8B, B-52, etc.), Remotely Piloted Aircraft (RPA), Unmanned Aircraft System (UAS), artillery fire support systems, network-enabled weapons, and C2 nodes. To enable data communications with those systems / nodes, CASS incorporates several communications protocols including Variable Message Format (VMF), Link 16, Situational Awareness Data Link (SADL), Marine Tactical System (MTS), and U.S. Message Text Format (USMTF). CASS software will provide advanced communication, advanced targeting capability, and significant interoperability improvements for mobile computing devices used by Dismounted JTACs, for vehicle-mounted systems, and for stationary systems used in operations centers. Future upgrades necessary to maintain interoperability with strike aircraft, joint fire support systems, and emerging data networking waveforms will be guided by the TACP CASS Information System Initial Capabilities Document (IS ICD) approved by the Air Force Requirement Oversight Council (AFROC), Functional Capabilities Board (FCB), and Joint Capabilities Board (JCB).

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>	Project (Number/Name) 676013 / <i>Equipment Modernization</i>
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CASS v1.4.5 fields critical updates for communicating with CAS aircraft, improves the interface with the Army Tactical Network (ATN), and provides a new Dismounted version for dismounted mission operations. CASS v2.0 provides a modular architecture for digital communications, messaging, data handling, hardware management, targeting, and battle space awareness capabilities. The new architecture will utilize Windows and Android equipment to provide Data Management, Human-Machine Interface (HMI), and Application Logic software modules with multiple mission plug-in features. The software is being developed in two versions ASOC/TOC (A/T) and Dismounted/Mounted (D/M) to support a wide variety of radio systems (including but not limited to AN/PRC-117F, AN/PRC-117G, AN/ PRC-148, AN/PRC-152A, AN/PRC-154, AN/PRC-158, Harris RF-335M-HH, AN/PRC-150C, and other emerging systems that are expected to be employed by TACPs in the future). The key characteristic of the software will be the open system, modular architecture that will enable rapid integration with new external devices (such as laser range finders and radios) and rapid development, testing and fielding of new mission capability modules to meet future requirements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CASS 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Close Air Support System (CASS)</p> <p>Description: The CASS Software program will modernize software for Communications, Command and Control (C3) processing systems for multiple TACP mission areas, i.e., the Air Support Operations Centers (ASOC), Tactical Operation Centers (TOC), Mounted operations, and Dismounted operations.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - This includes, but is not limited to: - Complete fielding of Dismount software, including the software modem, for use with the Dismounted OCS kits. - Complete fielding of ATM software. - Continue risk reduction, prototyping and initiate test activities for developing of the initial CASS v2.0 software. - Initiate migration from Theater Battle Management Core Systems (TBMCS) to Command and Control Air Operations Suite and Command and Control Information Services (C2AOS-C2IS). - Establish TACP common software architecture for further development to meet other battlefield airman operational needs. - Continue upgrades and fixes to Dismounted CASS v1.4.5 software. - Continue design and development of CASS software v2.0 architecture and software in preparation for government testing. - Continue to integrate, and test CASS data communications interfaces with C2 Nodes, CAS aircraft, ATN, SRW networks, and MUOS SATCOM networks to enhance interoperability between TACPs, and other joint warfighters. 	11.437	10.623	6.149	0.000	6.149

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>	Project (Number/Name) 676013 / <i>Equipment Modernization</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> - Continue to develop training and simulation integration capabilities and develop Tactics, Training, and Protocols (TTPs). - Continue to develop CFF and SDBII control messages. <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - This includes, but is not limited to: - Will support development of BAO Program's BA-TAK Dismount Android software. - Will complete migration from TBMCS to C2AOS-C2IS. - Will continue to complete update of CASS software for new and emerging mobile TACP vehicles. - Will establish TACP common software architecture for further development to meet other battlefield airman operational needs. - Will complete upgrades and fixes to Dismounted CASS v1.4.5 software. - Will conduct source selection activities to provide additional feature (capabilities) for the CASS software. - Will complete design and development of CASS software v2.0 architecture and software in preparation for government testing. - Will continue to integrate, and test CASS data communications interfaces with C2 Nodes, CAS aircraft, ATN, SRW networks, and MUOS SATCOM networks to enhance interoperability between TACPs, and other joint warfighters. - Will complete development of training and simulation capabilities to integrate and test CASS data communications interfaces. <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to higher AF priorities</p>					
Accomplishments/Planned Programs Subtotals	11.437	10.623	6.149	0.000	6.149

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line item 837100: <i>Tactical C-E Equipment</i>	41.823	43.084	48.252	-	48.252	34.983	32.873	31.020	31.570	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>	Project (Number/Name) 676013 / <i>Equipment Modernizat</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

TACP-M is executing an incremental development for the TACP-M CASS software. CASS v2.0 strategy continues the incremental development through risk reduction efforts with DoD's Defense Innovation Unit Experimental (DIUx) and coordinating with the BAO program office on developing the next Dismount solution. CASS v2.0 Acquisition Strategy Panel (ASP) and start of source selection are planned for the 3rd Qtr.of FY18 with contract award in the 2nd Qtr of FY19. CASS v2.0 contract will provide new open-system, modular software to support Android and/or Windows Operating System platforms, with additional capabilities interfacing with the ATN as well. PEO for Special Operations Forces/ISR will be exercising management control.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>	Project (Number/Name) 676013 / <i>Equipment Modernization</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CASS 2.0 Sys INT Software Dev't	TBD	TBD : TBD	-	6.109	Jul 2017	6.197	Jun 2018	2.204	Feb 2019	-		2.204	Continuing	Continuing	-
CASS 1.4.5 NSWC Crane (Naval Surface Warfare Center)	MIPR	NSWC Crane : Crane, IN	-	1.686	Jun 2017	1.844	Jan 2018	1.823	Jan 2019	-		1.823	Continuing	Continuing	-
CASS 2.0 JTAGGS TTP Development	MIPR	AFRL : WPAFB, OH	-	0.740	Aug 2017	0.500	Mar 2018	-		-		-	Continuing	Continuing	-
CASS 1.4.5 Risk Reduction (DIUx)	MIPR	Rockwell Collins : Richardson, TX	-	1.190	Dec 2016	-		-		-		-	Continuing	Continuing	-
Subtotal			-	9.725		8.541		4.027		-		4.027	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Agency Support	MIPR	Various : Multiple, NV	-	0.249	Jan 2017	0.896	Jan 2018	0.915	Apr 2019	-		0.915	Continuing	Continuing	-
Subtotal			-	0.249		0.896		0.915		-		0.915	Continuing	Continuing	N/A

Remarks
Development, operational and interoperability testing

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration	C/CPFF	PMO : Bedford, MA	-	1.463	Jan 2017	1.186	Oct 2017	1.207	Oct 2018	-		1.207	Continuing	Continuing	-
Subtotal			-	1.463		1.186		1.207		-		1.207	Continuing	Continuing	N/A

Remarks
PMA funds MITRE, ETASS, PASS, SCS, all

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>	Project (Number/Name) 676013 / <i>Equipment Modernizat</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Close Air Support System(CASS)																												
Close Air Support System (CASS) v2.0 Risk Reduction (DIUX) - capabilities, modem, and apps																												
Close Air Support System (CASS) v1.4.5 FOC																												
Close Air Support System (CASS) v2.0 Contract Award A/T																												
Close Air Support System (CASS) v2.0 ASOC/TOC Design and Development																												
Close Air Support System (CASS) v2.0 Contract Award D/M																												
Close Air Support System (CASS) v2.0 Dismount/Mount Design and Development																												
Close Air Support System (CASS) v2.1 Dismount/Mount Design and Development																												
Close Air Support System (CASS) v2.0 IOC/ FOC																												
Close Air Support System (CASS) v2.1 ASOC/TOC Design and Development																												
Close Air Support System (CASS) v2.1 IOC/ FOC																												
Future Close Air Support System (CASS) Risk Reduction/Prototyping																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207444F / <i>Tactical Air Control Party-Mod</i>	Project (Number/Name) 676013 / <i>Equipment Modernizatton</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Close Air Support System(CASS)				
Close Air Support System (CASS) v2.0 Risk Reduction (DIUX) - capabilities, modem, and apps	2	2017	2	2018
Close Air Support System (CASS) v1.4.5 FOC	2	2018	3	2018
Close Air Support System (CASS) v2.0 Contract Award A/T	3	2018	3	2018
Close Air Support System (CASS) v2.0 ASOC/TOC Design and Development	3	2018	3	2020
Close Air Support System (CASS) v2.0 Contract Award D/M	2	2019	2	2019
Close Air Support System (CASS) v2.0 Dismount/Mount Design and Development	3	2019	1	2021
Close Air Support System (CASS) v2.1 Dismount/Mount Design and Development	3	2020	3	2021
Close Air Support System (CASS) v2.0 IOC/FOC	3	2020	2	2022
Close Air Support System (CASS) v2.1 ASOC/TOC Design and Development	4	2020	4	2021
Close Air Support System (CASS) v2.1 IOC/FOC	4	2020	4	2022
Future Close Air Support System (CASS) Risk Reduction/Prototyping	1	2023	4	2023

Note

IOC & FOC dates are based on Objective and not Threshold dates.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207448F / <i>C2ISR Tactical Data Link</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	1.406	1.754	1.738	0.000	1.738	1.770	1.800	1.839	1.873	Continuing	Continuing
675045: <i>C2ISR Tactical Data Link</i>	-	1.406	1.754	1.738	0.000	1.738	1.770	1.800	1.839	1.873	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Data Links (TDL), as a subset of the broader airborne network, are used in a combat environment to exchange information such as messages, data, radar tracks, target information, platform status, imagery, and command assignments. TDLs provide interoperability, local and global connectivity, and situational awareness to the user when operating under rapidly changing operational conditions. TDLs provide a jam-resistant; secure digital data transfer network capability with new and standardized waveforms and data formats allowing Line-of-Sight (LOS) and Beyond-Line-of-Sight (BLOS) intra- and inter-flight communications. TDLs increase mission effectiveness, provide positive identification of aircraft in the network, correlate on and off-board sensor data sharing, target, and threat information, and provide the data link to accomplish time critical targeting and other mission update functions. TDLs are used by all service theater Command and Control (C2) elements, weapons platforms, and sensors.

TDLs include, but are not limited to: Link 16, Link 11, Situation Awareness Data Link (SADL), Multifunction Advanced Data Link (MADL) Variable Message Format (VMF), Integrated Broadcast Service (IBS), Intra-Flight Data Link (IFDL), and Tactical Targeting Network Technology (TTNT). TDL efforts include incorporating changes and additions to the Link-16 message standard (MIL-STD-6016F) and applicable Interface Change Proposals (ICPs), assisting with Air Force and joint interoperability certification testing with the Air Combat Command (ACC) and Joint Interoperability Test Center (JITC); future development, integration, and verification of Operational Flight Program (OFP) upgrades due to TDL integration; support of data gathering processes; studying and incorporating data link technologies to ensure effectiveness and efficiency of the Global Strike and Global Persistent Attack CONOPS.

This effort provides critical capability and enhancements to the airborne network by creating common development, integration and interoperability among ground and C2 platforms and responds to quick reaction capability integration and demonstration including, but not limited to, Airborne Warning and Control System (AWACS), Joint Surveillance Target Attack Radar System (JSTARS), the Air and Space Operations Center (AOC), the Control and Reporting Center (CRC), Global Hawk, Predator, Reaper, Rivet Joint, Combat Sent, and Cobra Ball. TDLs keep all Command and Control Intelligence, Surveillance, and Reconnaissance (C2ISR) platforms and data linked weapons current/interoperable in the airborne network to enable Global Strike, Global Persistent Attack, Offensive and Defensive Counterair (OCA / DCA) and Suppression of Enemy Air Defenses (SEAD) missions. Due to new/evolving Link 16 User identified Interface Changes Proposals (ICPs), studies and analysis will be performed to identify impacts to current and future systems, and to identify the required changes and impacts of implementing these new capabilities. The activities will include studies and analysis to support both current program planning and execution, as well as future program planning.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207448F / <i>C2ISR Tactical Data Link</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver TDL 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.

This program is in BA 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	1.515	1.754	1.751	0.000	1.751
Current President's Budget	1.406	1.754	1.738	0.000	1.738
Total Adjustments	-0.109	0.000	-0.013	0.000	-0.013
• Congressional General Reductions	-0.109	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	-0.013	0.000	-0.013

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: MIL-STD- 6016F Link 16 Enhancements	0.732	0.930	0.930
Description: Improve Link 16 interoperability and compatibility by incorporating key changes to communications software baseline.			
FY 2018 Plans:			
- Integrate a more advanced MIDS terminal.			
-- This includes required Human/Computer Interface (HCI) changes and advanced terminal capabilities such as Concurrent Multinetting (CMN4) for AWACS).			
FY 2019 Plans:			
- Will continue to integrate a more advanced MIDS terminal.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207448F / <i>C2ISR Tactical Data Link</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>-- This will include required Human/Computer Interface (HCI) changes and advanced terminal capabilities such as Concurrent Multinetting (CMN4) for ground and C2 platforms including but not limited to AWACS, JSTARS, the AOC, Global Hawk, Predator, Reaper and Rivet Joint.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>				
<p>Title: Aerial Network Engineering Lab</p> <p>Description: C2-focused airborne networking studies supporting data link enhancements to include, but not limited to, Link-16 Pathfinder and strength track reporting and fusion/correlation.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Perform C2-focused airborne networking studies to support data link enhancements. - Conduct lab demonstrations to better understand impacts of advanced Link-16 radio terminal modernization. -- This will include strengthening the network against jamming. - Provide reports that highlight most promising Link 16 anti-jam technologies to pursue for further operational development. <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Will continue performing C2-focused airborne networking studies to support data link enhancements. - Will continue lab demonstrations to better understand impacts of advanced Link-16 radio terminal modernization. -- This will include strengthening the network against jamming. - Will continue to provide reports that highlight most promising Link 16 anti-jam technologies to pursue for further operational development. <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>		0.332	0.332	0.332
<p>Title: User Identified Critical Interface Change Proposals (ICPs)</p> <p>Description: User-identified critical ICP implementation includes time slot reallocation, strength track reporting and correlation, Global Area Reference System (GARS), and MIL-STD updates.</p> <p>This effort was previously titled "E-3 AWACS Block 40/45 Critical User Identified Interface Change Proposals." However, these ICPs apply to multiple C2ISR platforms. These plans were outlined in previous PB/BES document submissions. They include, but are not limited to those listed under the Mission Description and Budget Item Justification found in Exhibit R-2, Section A.</p> <p>FY 2018 Plans:</p>		0.342	0.492	0.476

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207448F / <i>C2ISR Tactical Data Link</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
- Implement user-identified critical ICPs and MIL-STD updates.			
FY 2019 Plans: - Will continue to implement user-identified critical ICPs and MIL-STD updates.			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to a minimal taper in development.			
Accomplishments/Planned Programs Subtotals	1.406	1.754	1.738

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 05 PE 0604281F: <i>TDN Enterprise</i>	78.167	38.250	207.746	-	207.746	261.742	202.483	202.505	192.550	Continuing	Continuing
• APAF 05 Line Item F01500: <i>F-15</i>	0.000	0.000	3.698	-	3.698	0.000	0.000	0.000	0.000	Continuing	Continuing
• APAF 05 Line Item F01600: <i>F-16</i>	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• APAF 05 Line Item B00200: <i>B-2A</i>	0.000	1.718	2.296	-	2.296	0.200	0.204	0.208	0.211	Continuing	Continuing
• APAF 05 Line Item B01B00: <i>B-1B</i>	1.380	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• OPAF 03 Line Item 834010: <i>General Information Technology</i>	1.842	0.312	0.176	-	0.176	0.179	9.439	11.613	42.727	Continuing	Continuing

Remarks

E. Acquisition Strategy
Air Force Program Executive Officer for Command, Control, Communications, Intelligence, Surveillance, Reconnaissance and Networks (PEO C3I&N) is the PEO for C2ISR TDL. PEO C3I&N manages activities for the common development, integration, and interoperability across the entire airborne network. These actions ensure TDLs are procured and maintained as a joint, end-to-end C2 system. This program executes various types of contract types to provide technical expertise necessary to test, evaluate and provide recommended solutions to modernize C2 platform data links. The program delivers annual lab-tested software implementations of AWACS Link 16 ICPs. Additionally, the program participates in annual lab demonstrations that produce reports as required to assist with platform integration of Link 16 modernization efforts.

The E-3 Platform architecture utilizes a JTIDS Class 2H Link 16 radio with defined environmental and physical cabinet constraints. An Investigation Report (IR) was initiated to investigate the integration of an Ethernet-enabled CMN4 MIDS JTRS variant into the E-3 platform. A separate IR was issued to understand the dynamics of the L-16 enhancements and facilitate integration of new Link 16 capabilities onto the E-3 platform to ensure cross-service interoperability.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity
3600: *Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 0207448F / *C2ISR Tactical Data Link*

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207448F / C2ISR Tactical Data Link	Project (Number/Name) 675045 / C2ISR Tactical Data Link
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C2ISR Tactical Data Link Software Enhancements	Various	AFLCMC Hanscom AFB : Bedford, MA	-	0.761	Mar 2017	1.000	Mar 2018	1.171	Mar 2019	-		1.171	Continuing	Continuing	-
Subtotal			-	0.761		1.000		1.171		-		1.171	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C2ISR Tactical Data Link Aerial Network Engineering Lab	SS/ Various	AFLCMC Hanscom AFB : Bedford, MA	-	0.332	Oct 2016	0.337	Oct 2017	0.337	Oct 2018	-		0.337	Continuing	Continuing	-
Subtotal			-	0.332		0.337		0.337		-		0.337	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C2ISR Tactical Data Link PMA - Program Office and Contractor Support	Various	AFLCMC : Bedford, MA	-	0.220	Dec 2016	0.238	Dec 2017	0.230	Dec 2018	-		0.230	Continuing	Continuing	-
C2ISR Tactical Data Link FFRDC Support	SS/ Various	MITRE : Bedford, MA	-	0.093	Oct 2016	0.179	Oct 2017	-		-		-	Continuing	Continuing	-
Subtotal			-	0.313		0.417		0.230		-		0.230	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	1.406	1.754	1.738	-	1.738	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207448F / C2ISR Tactical Data Link	Project (Number/Name) 675045 / C2ISR Tactical Data Link
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

C2ISR Tactical Data Link	
Mode 5 Link 16 Software Enhancements	
Aerial Network Engineering Lab	
User Identified Critical ICPs	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207448F / <i>C2ISR Tactical Data Link</i>	Project (Number/Name) 675045 / <i>C2ISR Tactical Data Link</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>C2ISR Tactical Data Link</i>				
Mode 5 Link 16 Software Enhancements	1	2017	4	2019
Aerial Network Engineering Lab	1	2017	4	2023
User Identified Critical ICPs	1	2017	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207452F / DCAPES
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COST (\$ in Millions)	Prior Years ⁽⁺⁾	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	197.895	13.286	17.382	13.297	0.000	13.297	21.910	17.260	4.377	7.914	24.380	317.701
674801: <i>DCAPES INC 2B</i>	10.714	13.286	17.382	13.297	0.000	13.297	21.910	17.260	4.377	7.914	24.380	130.520

Program MDAP/MAIS Code: 500

⁽⁺⁾ The sum of all Prior Years is \$187.181 million less than the represented total due to several projects ending

A. Mission Description and Budget Item Justification

Deliberate and Crisis Action Planning and Execution Segments (DCAPES) is the USAF system used to project air expeditionary forces. It enables the USAF to posture mission ready and equipped forces (organized in effects-based operational capability packages) to deliver air, space and cyberspace capabilities to Joint commanders worldwide. Technical requirements planned for Increment 2B include enabling the system to support Public Key Infrastructure and Public Key enabling as well as elimination of Social Security Account Numbers as the primary key for identifying Air Force military and civilian members by replacing it with the Electronic Data Interchange Personal Identifier.

DCAPES funding will be executed against capabilities packaged into agile development projects for multiple incremental deliveries based on the warfighter's priorities. Additionally, funding will be used to cover downward directed federal mandates.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the DCAPES 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207452F / DCAPES
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	14.979	17.382	14.171	0.000	14.171
Current President's Budget	13.286	17.382	13.297	0.000	13.297
Total Adjustments	-1.693	0.000	-0.874	0.000	-0.874
• 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	-1.156	0.000			
• SBIR/STTR Transfer	-0.537	0.000			
• Other Adjustments	0.000	0.000	-0.874	0.000	-0.874

Change Summary Explanation

FY2017: \$1.156M of FY2017 funding was reprogrammed to support higher Air Force priorities.

FY2019: The FY2019 request was reduced by \$0.874M to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207452F / DCAPES				Project (Number/Name) 674801 / DCAPES INC 2B			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
674801: DCAPES INC 2B	10.714	13.286	17.382	13.297	0.000	13.297	21.910	17.260	4.377	7.914	24.380	130.520
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Deliberate and Crisis Action Planning and Execution Segments (DCAPES) is the USAF system used to project air expeditionary forces. It enables the USAF to posture mission ready and equipped forces (organized in effects-based operational capability packages) to deliver air, space and cyberspace capabilities to Joint commanders worldwide. Technical requirements planned for Increment 2B include enabling the system to support Public Key Infrastructure and Public Key enabling as well as elimination of Social Security Account Numbers as the primary key for identifying Air Force military and civilian members by replacing it with the Electronic Data Interchange Personal Identifier.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the DCAPES 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.

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019
Title: DCAPES INCREMENT 2B	13.286	17.382	13.297
Description: DCAPES Increment 2B includes Infrastructure Support, Business Intelligence, and the development of multiple War Fighter Capabilities; the Program began execution of War Fighter Capabilities 1-3 during the FY17 President's Budget, War Fighter Capability 4 during the FY20 President's Budget, and War Fighter Capabilities 5-6 during the FY21 President's Budget.			
FY 2018 Plans: - Completing Joint Information Environment (JIE) Migration Data Center Optimization Initiative (DCOI)/Legacy Re-Host mandate - Continue to maintain builds for infrastructure - Continue the development of War Fighter Capabilities 1-3			
FY 2019 Plans: - Continue the development of War Fighter Capabilities 1-3			
FY 2018 to FY 2019 Increase/Decrease Statement: - Funding decreased from FY18 to FY19 by \$4.085M due to completion of data center migration			
Accomplishments/Planned Programs Subtotals	13.286	17.382	13.297

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force Date: February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674801 / DCAPES INC 2B
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C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The DCAPES program successfully awarded the DCAPES Development Task Order for a one-year Base Period and four one-year Option Periods using the NETCENTS 2 Application Services Small Business Indefinite delivery Indefinite Quantity (IDIQ) contract. The period of performance started on 6 April 2015 and ends on 5 April 2020, given all option years are exercised.

DCAPES is an Evolutionary Acquisition Program using an incremental development approach (DoDI 5000.02 Model 3) to develop capabilities over several increments. To support the rapid development and delivery of capabilities, DCAPES will transition from a waterfall approach used in Increment 2A to a hybrid agile acquisition strategy in which capabilities are incrementally delivered in time-phased stages based on warfighter priorities and adoption of key architecture and technology requirements as a trade-off for accelerated delivery and risk reduction.

The DCAPES Program Management Office (PMO) will utilize a mix of agreements (Service Level Agreements and Memorandums) with DCAPES interface partners. A Service Level Agreement is in place with the Capabilities Integration Environment (AFLCMC/HNIZ) to conduct software development and testing. Memorandums of Agreement with Joint Interoperability Test Command, Air Force Operational Test and Evaluation Command, and the 45th Test Squadron are in place and outline the test support required before fielding the system.

The DCAPES Increment 2B requirements have been packaged into multiple discreet capabilities which will be developed in multiple smaller increments. Each capability will be developed using several builds and with one or more fieldings to satisfy the approved requirements within each package.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674801 / DCAPES INC 2B
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DCAPES Increment 2B - Risk Reduction	Various	Various : Various	0.718	-		-		-		-		-	0.000	0.718	0.718
DCAPES Increment 2B/ Prime Contract	C/Various	Array Information Technology, Inc. : Greenbelt, MD	2.907	6.191	Apr 2017	9.588	Apr 2018	4.926	Apr 2019	-		4.926	54.274	77.886	40.991
DCAPES Infrastructure/ Integration	C/CPFF	DATUM Software Inc. : John Creek, GA	0.911	0.841	Feb 2017	0.958	Feb 2018	0.977	Feb 2019	-		0.977	2.597	6.284	5.152
DCAPES Architecture Documentation Development	C/FFP	Copper River IT : Anchorage, AK	0.330	0.374	Aug 2017	0.629	Aug 2018	0.641	Aug 2019	-		0.641	1.470	3.444	13.756
DCAPES DCOI Migration	MIPR	DISA : Pensacola, FL	1.133	0.387	Aug 2017	0.975	Jan 2018	0.955	Jan 2019	-		0.955	5.845	9.295	13.230
Subtotal			5.999	7.793		12.150		7.499		-		7.499	64.186	97.627	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DCAPES HIB Integration Contract Support	C/FFP	MacaLogic, LLC : Dayton, OH	1.701	0.702	Apr 2017	0.731	Apr 2018	0.746	Apr 2019	-		0.746	1.275	5.155	3.225
DCAPES Cost Analysis Contract Support	C/CPFF	BTAS, Inc. : Beavercreek, OH	0.294	0.327	May 2017	0.332	May 2018	0.340	May 2019	-		0.340	0.938	2.231	1.908
DCAPES Engineering Contract Support	C/CPFF	Oasis Systems, LLC : Lexington, MA	0.619	1.028	Apr 2017	1.658	Apr 2018	1.658	Apr 2019	-		1.658	2.596	7.559	5.392
DCAPES Requirement Elaboration Contract Support	C/FFP	Certified Tech. Expert : Montgomery, AL	0.178	-		-		-		-		-	0.000	0.178	0.178
DCAPES Contract System Integration/Tech Support	MIPR	AFLCMC/HNIZ CIE : MAFB-Gunter Annex, AL	0.423	0.269	Sep 2017	0.410	Mar 2018	0.418	Mar 2019	-		0.418	0.834	2.354	2.051
DCAPES Development Environment HW	C/Various	Various : Various	0.825	0.040	Aug 2017	0.118	Aug 2018	0.682	Aug 2019	-		0.682	0.982	2.647	0.982

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674801 / DCAPES INC 2B
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DCAPES Licenses (Software/Hardware)	C/Various	Various : Various	0.096	0.078	Feb 2017	0.684	Feb 2018	0.694	Feb 2019	-		0.694	1.580	3.132	1.580
DCAPES Oracle Licenses	C/FFP	Mythics : Vienna, VA	-	2.298	Aug 2017	0.243	Aug 2018	0.248	Aug 2019	-		0.248	0.744	3.533	3.795
DCAPES Government Purchase Card	Reqn	Various : Various	-	0.014	Oct 2016	0.012	Oct 2017	0.012	Oct 2018	-		0.012	0.028	0.066	0.057
Subtotal			4.136	4.756		4.188		4.798		-		4.798	8.977	26.855	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DCAPES Development Test and Evaluation	MIPR	45/46 Test Sqdn : Eglin AFB, FL	0.072	-		0.665	Jan 2018	0.678	Jan 2019	-		0.678	1.562	2.977	1.562
DCAPES Interoperability Testing and Evaluation	MIPR	DISA JITC : Huachuca, AZ	0.000	0.133	Oct 2016	0.159	Oct 2017	0.130	Oct 2018	-		0.130	0.300	0.722	0.767
DCAPES User Test Support	Various	Various : Various	0.071	0.092	Jan 2017	0.155	Jan 2018	0.127	Jan 2019	-		0.127	0.497	0.942	1.010
Subtotal			0.143	0.225		0.979		0.935		-		0.935	2.359	4.641	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DCAPES Travel	Reqn	Various : Various	0.030	0.030	Oct 2016	0.030	Oct 2017	0.030	Oct 2018	-		0.030	0.158	0.278	0.158
DCAPES Business Integration Support	Various	Various : Various	0.035	0.035	Oct 2016	0.035	Oct 2017	0.035	Oct 2018	-		0.035	0.161	0.301	0.161
DCAPES FFRDC Engineering	SS/CPAF	MITRE : Bedford, MA	0.371	0.447	Oct 2017	-		-		-		-	0.000	0.818	0.818
Subtotal			0.436	0.512		0.065		0.065		-		0.065	0.319	1.397	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force								Date: February 2018					
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207452F / DCAPES				Project (Number/Name) 674801 / DCAPES INC 2B					
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.714	13.286		17.382		13.297		-		13.297	75.841	130.520	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674801 / DCAPES INC 2B
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

DCAPES Increment 2B	
DCAPES Increment 2B	
MS B Preparation	
MS B Decision (April 2017)	
--- Increment 2B FDD	
--- Increment 2B FD	
--- Joint Information Environment (JIE) Migration (Infrastructure Re-host)	
---- Capability 1 Electronic Data Interface Personnel Identifier (EDIPI)	
---- Capability 2 Global Force Management Interoperability (GFM-DI)	
---- Capability 3 Enhanced Contingency-Rotational Air Expeditionary Force Scheduling Tool Interface (ECAST)	
---- Capability 4 Manpower & Equipment Force Packaging (MEFPAK)	
---- Capability 5 Logistics Factor File	
---- Capability 6 Force Availability Analysis	
DCAPES Future Modifications	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674801 / DCAPES INC 2B
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
DCAPES Increment 2B				
DCAPES Increment 2B	1	2017	3	2022
MS B Preparation	1	2017	3	2017
MS B Decision (April 2017)	3	2017	3	2017
--- Increment 2B FDD	3	2022	3	2022
--- Increment 2B FD	4	2022	4	2022
--- Joint Information Environment (JIE) Migration (Infrastructure Re-host)	1	2017	2	2018
---- Capability 1 Electronic Data Interface Personnel Identifier (EDIPI)	3	2017	2	2020
---- Capability 2 Global Force Management Interoperability (GFM-DI)	3	2017	1	2021
---- Capability 3 Enhanced Contingency-Rotational Air Expeditionary Force Scheduling Tool Interface (ECAST)	4	2017	4	2020
---- Capability 4 Manpower & Equipment Force Packaging (MEFPAK)	3	2020	3	2022
---- Capability 5 Logistics Factor File	1	2021	3	2021
---- Capability 6 Force Availability Analysis	4	2021	3	2022
DCAPES Future Modifications	1	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207573F / <i>National Technical Nuclear Forensics</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	2.307	1.788	0.000	1.788	1.788	0.397	0.000	0.000	0.000	6.280
674881: <i>Prompt Diagnostics</i>	-	0.000	2.307	1.788	0.000	1.788	1.788	0.397	0.000	0.000	0.000	6.280
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
In FY18, NTNF efforts under PE0604257F, BPAC 644818 were transferred to this PE to continue development of Prompt Diagnostics detection systems.

A. Mission Description and Budget Item Justification
National Technical Nuclear Forensics (NTNF) is the collection, analysis and evaluation of pre- and post-detonation radiological and nuclear materials, devices, and debris as well as the immediate effects created by a nuclear detonation. 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, and 0605898F.

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

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	2.307	1.801	0.000	1.801
Current President's Budget	0.000	2.307	1.788	0.000	1.788
Total Adjustments	0.000	0.000	-0.013	0.000	-0.013
• 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	0.000	0.000	-0.013	0.000	-0.013

C. Accomplishments/Planned Programs (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Title: Nuclear Forensics - Prompt Diagnostics	0.000	2.307	1.788	0.000	1.788

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207573F / <i>National Technical Nuclear Forensics</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Develop diagnostic detection systems to immediately record signals resulting from a nuclear detonation. These event signature elements support weapon and event characterization analysis for the purposes of identifying the weapon classification, magnitude of the detonation (yield), and Reaction Time History (RTH) of the device. The combination of these elements with radiochemical analysis enables analysts to distinguish between wide ranges of nuclear weapon designs and origin, supporting the national attribution assessment process.</p> <p>FY 2018 Plans: Develop of Prompt Diagnostics detection system. Focused areas include but are not limited to prompt output signal detection and nuclear debris collection analysis and evaluation.</p> <p>FY 2019 Base Plans: Will continue to develop Prompt Diagnostics detection system. Focused areas include but are not limited to prompt output signal detection and nuclear debris collection analysis and evaluation.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to reduction in content of the technical data package for Prompt Diagnostics.</p>					
Accomplishments/Planned Programs Subtotals	0.000	2.307	1.788	0.000	1.788

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 834320: <i>National Technical Nuclear Forensics</i>	-	5.711	6.113	-	6.113	5.912	7.215	7.346	7.478	Continuing	Continuing

Remarks

E. Acquisition Strategy

Will continue development of Prompt Diagnostics detection systems. Focus areas include but are not limited to prompt output signal detection and nuclear debris collection analysis, evaluation, technical data package, documentation, revalidate documented design with representative articles, logistics product data, and product support analysis. Using a phased approach with a single integrator to incrementally deliver technical data and logistics product data by funding various nuclear related

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207573F / <i>National Technical Nuclear Forensics</i>
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government organizations/FFRDC's throughout the nation. Phase 1 and 2 are focused on documenting and delivering technical data packages, developing configuration status accounting, and Product Support Analysis/Logistics Product 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207573F / <i>National Technical Nuclear Forensics</i>	Project (Number/Name) 674881 / <i>Prompt Diagnostics</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Nuclear Forensics - Prompt Diagnostics	MIPR	Various : Various	-	0.000		2.061	Mar 2018	1.501	Jan 2019	-		1.501	Continuing	Continuing	-
Subtotal			-	0.000		2.061		1.501		-		1.501	Continuing	Continuing	N/A

Remarks
Multiple nuclear related organizations throughout the nation receive funds to work towards the completion of the prompt diagnostics system.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA: Other Govt Cost	Various	Not specified. : Dayton, OH	-	0.000		0.246	Nov 2017	0.287	Nov 2018	-		0.287	Continuing	Continuing	-
Subtotal			-	0.000		0.246		0.287		-		0.287	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000	2.307	1.788	-	1.788	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207573F / <i>National Technical Nuclear Forensics</i>	Project (Number/Name) 674881 / <i>Prompt Diagnostics</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>United States Prompt Diagnostics</i>	
Nuclear Forensics - Prompt Diagnostics	[REDACTED]
- Milestone Decision Authority Review	[REDACTED]
- Phase 1: Developmental Technical Data Package	[REDACTED]
- Phase 2: Complete Technical Data Package, Configuration Status Accounting, and Product Support Analysis/Logistics Product Data	[REDACTED]
- Milestone Decision Authority Review (FY18)	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207573F / <i>National Technical Nuclear Forensics</i>	Project (Number/Name) 674881 / <i>Prompt Diagnostics</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>United States Prompt Diagnostics</i>				
Nuclear Forensics - Prompt Diagnostics	1	2017	4	2021
- Milestone Decision Authority Review	4	2017	4	2017
- Phase 1: Developmental Technical Data Package	1	2017	4	2018
- Phase 2: Complete Technical Data Package, Configuration Status Accounting, and Product Support Analysis/Logistics Product Data	3	2017	1	2021
- Milestone Decision Authority Review (FY18)	4	2018	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207581F I Joint Surveillance/Target Attack Radar System (JSTARS)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	14.888	0.000	14.888	13.896	0.000	0.000	0.000	Continuing	Continuing
670003: JSTARS	-	0.000	0.000	14.888	0.000	14.888	13.896	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 This program, BA 7, PE 0207581F, project 670003, Secure Common Data Link, is a new start.

A. Mission Description and Budget Item Justification

This line item funds enhancements to support upgrades and modifications to the fielded JSTARS weapon system to meet evolving threats and warfighter requirements. JSTARS was developed for ground surveillance, targeting, and battle management. The E-8C is a modified Boeing 707-300 airframe that provides a unique blend of Battle Management Command and Control(BMC2) and Intelligence, Surveillance, and Reconnaissance (ISR). Air Battle Managers onboard the JSTARS use its wide area ground surveillance radar to build situational awareness and identify targets which are passed to strike assets or crossed cued with ISR platforms. The capability to perform this dual mission at the tactical edge both reduces the time to execute the kill chain and improves ISR collections across the range of military options.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	14.888	0.000	14.888
Total Adjustments	0.000	0.000	14.888	0.000	14.888
• 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	14.888	0.000	14.888

Change Summary Explanation

Funding is necessary to support the Secure Common Data Link modification.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207581F <i>I Joint Surveillance/Target Attack Radar System (JSTARS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Title: Secure Common Data Link</p> <p>Description: Provides a secure, line of sight datalink between the E-8C and common ground stations.</p> <p>FY 2018 Plans: N/A</p> <p>FY 2019 Plans: Begin upgrades to Secure Common Data Link.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: New Start Activity.</p>	0.000	0.000	14.888
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.888

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

N/A

Remarks

E. Acquisition Strategy

Program will use existing production 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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207581F / <i>Joint Surveillance/Target Attack Radar System (JSTARS)</i>	Project (Number/Name) 670003 / <i>JSTARS</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Secure Common Data Link	
Secure Common Data Link	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207581F / <i>Joint Surveillance/Target Attack Radar System (JSTARS)</i>	Project (Number/Name) 670003 / <i>JSTARS</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Secure Common Data Link				
Secure Common Data Link	1	2019	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	28.204	25.397	24.699	0.000	24.699	25.160	25.595	26.128	26.604	Continuing	Continuing
674037: <i>SEEK EAGLE Certifications</i>	-	28.204	25.397	24.699	0.000	24.699	25.160	25.595	26.128	26.604	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force operates a variety of combat aircraft that carry numerous and varied stores (munitions, missiles, fuel tanks, targeting pods, range pods, electronic countermeasures pods, etc.). Stores are carried in countless different loading combinations determined by operational and training scenarios, missions, tactics, and weapon development programs. Aircraft stores combinations change as operational plans and tactics change and as new stores are developed and fielded. Before operational, training, or test use, the Air Force must certify these configurations for safe loading, carriage, and separation (jettison and normal release), as well as verify ballistics accuracy under the user-certified carriage and employment parameters. The Air Force SEEK EAGLE program completes certification recommendations and recommended flight clearances through any combination of engineering analysis, wind tunnel testing, modeling and simulation, and ground/flight test and evaluation. The SEEK EAGLE effort encompasses eight disciplines: Fit and Function, Flutter, Loads, Stability and Control, Electromagnetic Compatibility/Interference (EMC/EMI), Separations, Ballistics, and Safe Escape.

In support of certification, the program recommends about 1000 aircraft/store combinations for flight each year with analysis and testing, requiring from weeks to years depending on the complexity. Integrated solutions for combat aircrew weapon delivery planning problems are developed and provided to combat forces via Combat Weapons Delivery Software (CWDS) and Joint Safe Escape Analysis Solution (JSEAS). SEEK EAGLE works in coordination with the Air Force Safety Center to provide Hazards of Electromagnetic Radiation to Ordnance (HERO) analysis and certification recommendations of ordnance systems containing electro-explosive devices. The program is also responsible for inserting new and emerging technologies into the SEEK EAGLE process as well as providing resources for the sustainment of a viable Air Force aircraft/store certification capability.

SEEK EAGLE funds are currently budgeted to support certification testing and analysis for new and inventory stores including, but not limited to: Small Diameter Bomb I & II (SDB), Laser Joint Direct Attack Munitions (LJDAM), Joint Air-to-Surface Standoff Missile (JASSM), Air Intercept Missile (AIM-9X), Advanced Medium Range Air-to-Air Missile (AIM-120D), Miniature Air-Launched Decoy (MALD), BRU-57 (Smart Bomb Rack), BRU-61 (SDB Bomb Rack), Advanced Precision Kill Weapon System (APKWS), Sniper Targeting Pod with video data link, LITENING Targeting Pod with video data link, laser guided bombs, B61 (Mod 12), penetrator warhead upgrades (BLU-111/BLU-117), practice bomb and aircraft instrumentation pod modifications. SEEK EAGLE funds are also used to support certification of other inventory stores on Combat Air Forces (CAF) and Special Operations Command (SOCOM) aircraft, assist the F-35 JPO with subject matter expertise in the System Development and Demonstration phase (e.g., development of organic store certifications capability to support F-35 in the Production, Sustainment, and Follow-on Development phases), sustain organic F-22 store certifications capability, and to obtain non-inventory stores and store data for post-integration certification requirements.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver seek eagle 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.

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 year.

To ensure the SEEK EAGLE program office completes certification recommendations and recommended flight clearances through any combination of analysis, testing, simulation, and test and evaluation in order to support inventory stores for multiple programs.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	25.308	25.397	24.885	0.000	24.885
Current President's Budget	28.204	25.397	24.699	0.000	24.699
Total Adjustments	2.896	0.000	-0.186	0.000	-0.186
• 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	3.415	0.000			
• SBIR/STTR Transfer	-0.519	0.000			
• Other Adjustments	0.000	0.000	-0.186	0.000	-0.186

Change Summary Explanation

FY17: \$3.415M for AFSEO Mission and Planning

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: F-22A	1.000	0.800	0.600	0.000	0.600
Description: F-22A Capability Development and Weapons Certification.					
FY 2018 Plans: - Continue Aircraft/Store Compatibility (ASC) efforts for requested configurations					
FY 2019 Base Plans:					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>- Continue Aircraft/Store Compatibility (ASC) efforts for requested configurations.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Small reduction in requirement from FY18 to FY19</p>					
<p>Title: F-35</p> <p>Description: F-35 Capability Development for SEEK EAGLE to support Combat Air Force's (CAF's) anticipated requirements after Initial Operational Capability (IOC).</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Continue development of F-35 engineering capability in all eight SEEK EAGLE engineering disciplines by receiving contractor data, tools, and technical support (FOC Toolsets) - Continue implementing high priority user requirements reviewed by ACC <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Continue development of F35 engineering capability in five of eight SEEK EAGLE engineering disciplines not addressed under first contract by receiving contractor data, tools, and technical support (FOC Toolsets) - Continue implementing high priority user requirements reviewed by ACC <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease based on less technical Lockheed Martin support being required at that phase.</p>	3.200	3.715	3.445	0.000	3.445
<p>Title: M&S Capability</p> <p>Description: Modeling and Simulation (M&S) capability development in support of store certification</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Continue development and improvement of M&S capability to support store certification disciplines. - Develop tools necessary to characterize F-22 and F-35 weapons bay environments/wing buffet. <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Continue development and improvement of M&S capability to support store certification disciplines. 	3.558	3.000	3.000	0.000	3.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Develop tools necessary to characterize F-22 and F-35 weapons bay environment/wing buffet. Develop tools necessary to characterize electromechanical interference environment on 4th and 5th gen fighters. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Title: Aircraft/Store Compatibility (ASC) Analysis Description: Evaluate aircraft/store compatibility through analysis, M&S and flight and ground test. Provide flight recommendations to airworthiness authorities. FY 2018 Plans: - Continue to provide compatibility flight recommendations as requested by ACC/A8, AFLCMC, AFSOC, AFGSC and other agencies. - Perform extensive SDB II, AIM-9X and B-61 (MOD 12) flight testing. FY 2019 Base Plans: - Continue to provide compatibility flight recommendations as requested by ACC/A8, AFLCMC, AFSOC, AFGSC, and other agencies. - Perform extensive SDB II, AIM-9X, and B-61 (MOD 12) flight testing. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Reduced flight testing due to less flights required due to modeling and simulation abilities.	3.800	3.820	3.644	0.000	3.644
Title: AFSEO Mission and Planning Support Description: AFSEO Mission and Planning Support for all disciplines. Previously titled "Organic F-35 and CWDS Capabilities" FY 2018 Plans:	16.646	14.062	14.010	0.000	14.010

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- AFSEO Mission and Planning support for all disciplines to include, but not limited to, mission planning, loads, flutter, separations, safe escape, engineering analysis, and information assurance for B21, 5th generation aircraft, and immediate warfighter support.					
<i>FY 2019 Base Plans:</i> - AFSEO Mission and Planning support for all disciplines to include, but not limited to, mission planning, loads, flutter, separations, safe escape, engineering analysis, and information assurance for B21, 5th generation aircraft, and immediate warfighter support.					
<i>FY 2019 OCO Plans:</i> N/A					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Slight reduction to requirement costs for information assurance due to investment into software in prior year.					
Accomplishments/Planned Programs Subtotals	28.204	25.397	24.699	0.000	24.699

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

N/A

Remarks

E. Acquisition Strategy

The SEEK EAGLE program does not execute in accordance with established acquisition program milestones. For initial aircraft-weapons integration, the aircraft or weapon program office is responsible for budgeting and providing the test assets to AFSEO for the store certification requirements. For post integration certification requirements, AFSEO funds are used to obtain the non-inventory test assets.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>	Project (Number/Name) 674037 / <i>SEEK EAGLE Certifications</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
F-22 Capabilities Lockheed	C/CPFF	Lockheed Martin : Marietta, GA	-	0.600	Mar 2017	0.450	Mar 2018	0.350	Mar 2019	0.000		0.350	Continuing	Continuing	-
F-22 Capabilities Raytheon	C/CPFF	Raytheon : Waltham, MA	-	0.400	Mar 2017	0.350	Mar 2018	0.250	Mar 2019	0.000		0.250	Continuing	Continuing	-
AFSEO Mission and Planning Support	C/CPFF	Survive : Ft. Walton Beach, FL	-	13.533	Mar 2017	13.246	Mar 2018	13.069	Mar 2019	0.000		13.069	Continuing	Continuing	-
F-35 Capabilities	C/CPFF	Lockheed Martin : Marietta, GA	-	3.200	Nov 2016	3.715	Nov 2017	3.650	Nov 2018	0.000		3.650	Continuing	Continuing	-
Multiple fighter and weapon capability support	C/CPFF	Lockheed Martin : Marietta, GA	-	0.200	Nov 2016	0.150	Nov 2017	0.150	Nov 2018	0.000		0.150	Continuing	Continuing	-
F15 Test Support	C/CPFF	Boeing : St Louis, MO	-	0.010	Jan 2017	0.010	Jan 2018	0.010	Jan 2019	0.000		0.010	Continuing	Continuing	-
Enhance Existing and Develop Organic Electro EMI Capabilities	C/CPFF	Applied Research : Baltimore, MD	-	0.250	Mar 2017	0.250	Mar 2018	0.250	Mar 2019	0.000		0.250	Continuing	Continuing	-
Subtotal			-	18.193		18.171		17.729		0.000		17.729	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
96th Test Wing	RO	Eglin AFB : Eglin AFB, FL	-	8.961	Oct 2016	6.300	Oct 2017	6.090	Oct 2018	0.000		6.090	Continuing	Continuing	-
AEDC	PO	Arnold Engineering Dev Complex : Arnold AFB, TN	-	0.530	Jan 2017	0.515	Jan 2018	0.520	Jan 2019	0.000		0.520	Continuing	Continuing	-
412th Test Wing	Various	Edwards AFB : Edward AFB, CA	-	0.500	Aug 2017	0.400	Aug 2018	0.350	Aug 2019	0.000		0.350	Continuing	Continuing	-
Various: Navy, other AF	Various	China Lake, Patuxent River, other : Multiple, NV	-	0.020	Aug 2017	0.011	Aug 2018	0.010	Aug 2019	0.000		0.010	Continuing	Continuing	-
Subtotal			-	10.011		7.226		6.970		0.000		6.970	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>	Project (Number/Name) 674037 / <i>SEEK EAGLE Certifications</i>
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

SEEK EAGLE	
Store compatabilty analysis on legacy fighter/bomber/RPA aircraft and weapons modifications	
F-35 Capability Development: Initial Operational Capability	
F-35 Capability Development: Full Operational Capability	
F-22A Capability Development and Weapons Certification	
Modeling and Simulation Capability: development and refresh of analysis tools	
AFSEO Mission and Planning Support	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207590F / <i>Seek Eagle</i>	Project (Number/Name) 674037 / <i>SEEK EAGLE Certifications</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SEEK EAGLE				
Store compatabilty analysis on legacy fighter/bomber/RPA aircraft and weapons modifications	1	2017	4	2023
F-35 Capability Development: Initial Operational Capability	1	2017	4	2017
F-35 Capability Development: Full Operational Capability	4	2017	4	2023
F-22A Capability Development and Weapons Certification	1	2017	4	2023
Modeling and Simulation Capability: development and refresh of analysis tools	1	2017	4	2023
AFSEO Mission and Planning Support	1	2017	4	2023

Note

Note: The SEEK EAGLE program does not execute in accordance with established acquisition program milestones. Rather, user requirements trigger the SEEK EAGLE process for requested aircraft-store configurations for flight clearances. AFSEO work is completed in accordance with the designated user priority established through the SEEK EAGLE Prioritization List process.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207601F / <i>USAF Modeling and Simulation</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	14.828	10.175	17.078	0.000	17.078	17.397	17.699	18.067	18.396	Continuing	Continuing
674567: <i>M&S Foundations</i>	-	5.626	0.000	6.814	0.000	6.814	6.943	7.063	7.210	7.341	Continuing	Continuing
675135: <i>Warfighter Readiness</i>	-	9.202	10.175	10.264	0.000	10.264	10.454	10.636	10.857	11.055	Continuing	Continuing

Note
 In FY 2019, PE 0207605F, Wargaming and Simulation Centers, Project 672888, Distributed Mission Operations Center (DMOC); Air, Space, and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS) efforts were transferred to PE 0207601F, USAF Modeling and Simulation, Project 674567, M&S Foundations to support Air Force Space Command's information operation simulations.

A. Mission Description and Budget Item Justification

Modeling and Simulation support to our Warfighter's Readiness is a United States Air Force (USAF) corporate imperative to ensure air, space, cyberspace training, and mission rehearsal activities are supported with realistic, interoperable, and readily available, tools, data, services and environments. Warfighter readiness supports Department of Defense (DoD) Training Transformation (T2) and Joint National Training Capability (JNTC) along with the USAF priorities and core functions. Activities also include studies and analysis to support both current program planning, execution, and future program planning.

It includes several complimentary programs, initiatives and areas for investment: Warfighter and Joint Training Integration supports the Chief of Staff of the Air Force (CSAF) directed Live, Virtual, and Constructive (LVC) integration efforts and is a critical piece to the USAF's implementation of the Strategic Plan for Transforming DoD Training. The goal of LVC training and mission rehearsal is to prepare our warfighters for the full range of military operations and maintain the combat readiness levels required by the Combatant Commanders'. This can only be accomplished by training and rehearsing in realistic operational environments. These environments include live training ranges and virtual simulators enhanced with constructive entities. Specific training and mission rehearsal events can include some or all of these simultaneously; making the ability to integrate LVC capabilities a necessity.

The Air, Space, and Cyberspace Constructive Environment (ASCCE) is the USAF's authoritative federation of constructive training models and tools realistically representing the tactical and operational capabilities the USAF brings to the joint fight. In Project 675135, Warfighter Readiness, it includes the Air Force Modeling and Simulation Training Toolkit (AFMSTT), which provides the authoritative representation of AF and joint theater-level air and space power and is used to train Air and Space Operations Center (AOC) personnel and Combatant Commanders' battle staffs. The primary models in the AFMSTT are the Air Warfare Simulation (AWSIM) and Air Base Simulation (ABS).

The program element also contains in Project 674567, M&S Foundations, the Air, Space and Cyberspace Collaborative Environment - Information Operations Suite (ACE-IOS). ACE-IOS is a federation of constructive models for the authoritative representation of Air Force information operations. ACE-IOS is developed and operated by the Air Force Cyber Simulation Center (CSC) to support training and mission rehearsal for the Air Force, Joint Task Force commanders, and Combatant Commanders' battle staffs during Joint and Service exercises, tests and experiments. The CSC provides cyber live-virtual-constructive (LVC) environments to support

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207601F / <i>USAF Modeling and Simulation</i>
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the development and fielding of offensive and defensive cyber capabilities for the AF, DoD, and national agencies. This program also supports the DoD Training Transformation Initiative.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AFMSTT and ACE-IOS 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.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	16.666	10.175	10.341	0.000	10.341
Current President's Budget	14.828	10.175	17.078	0.000	17.078
Total Adjustments	-1.838	0.000	6.737	0.000	6.737
• 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	-1.410	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.428	0.000	6.737	0.000	6.737

Change Summary Explanation

FY17: reduction of \$1.410M due to higher AF priorities.

FY19: increased \$6.737M to support ACE-IOS efforts in Project 674567.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 674567 / M&S Foundations
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
674567: M&S Foundations	-	5.626	0.000	6.814	0.000	6.814	6.943	7.063	7.210	7.341	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, PE 0207605F, Wargaming and Simulation Centers, Project 672888, Distributed Mission Operations Center (DMOC); Air, Space and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS) efforts were transferred to PE 0207601F, USAF Modeling and Simulation, Project 674567, M&S Foundations to support Air Force Space Command's information operation simulations.

A. Mission Description and Budget Item Justification

Modeling and Simulation Foundations (MSF) focuses on integrating foundational capabilities needed to improve the usefulness of Modeling and Simulation (M&S) capabilities derived from the Warfighter Readiness (WR) thrust. The efforts supporting the MSF thrust include both concept exploration and development. MSF provides the capability to rapidly and efficiently create realistic and accurate synthetic operational battlespaces to support the full spectrum of activities associated with concept development to acquisition and testing through composite training and mission rehearsals.

Air, Space and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS) project is a federation of constructive models for the authoritative representation of Air Force information operations. ACE-IOS is developed and operated by the Air Force Cyber Simulation Center (CSC) to support training and mission rehearsal for the Air Force, Joint Task Force commanders, and Combatant Commands battle staffs during Joint and Service exercises, tests and experiments.

The CSC provides cyber live-virtual-constructive (LVC) environments to support the development and fielding of offensive and defensive cyber capabilities for the AF, DoD, and national agencies. The CSC is managed by the 90th Cyberspace Operations Squadron, a unit of the 318th Cyberspace Operations Group, 688th Cyberspace Wing, 24th Air Force (AFCYBER). The Distributed Mission Operations Center for Cyberspace (DMOC-C) is a subset of the CSC focused on training and exercising tactical cyber mission forces (CMF) and cyber service providers (CSP) and operational-level command and control, intelligence, and cyber planners and operators. DMOC-C provides the ACE-IOS to support Air Force information operations. DMOC-C, using ACE-IOS, directly supports Air Force, Joint, Coalition composite training and rehearsal, concept development, and acquisition and testing for use by Major and Combatant Commands. DMOC-C thrust areas develop and modernize models and simulations covering cyberspace, intelligence and command and control activities as part of the constructive backbone of Air Force capabilities within DOD and coalition LVC environments.

DMOC-C's development and integration efforts on ACE-IOS are imperative to ensure that air, space, and cyberspace training and mission rehearsal activities are supported with realistic, interoperable, and readily available tools, data, and services. LVC environments today are used as one of the most cost effective and practical means to meet mission needs. These efforts enable more efficient delivery of effective capabilities to the warfighter while reducing the time and resources required for design, development, test and evaluation, maintainability and sustainment.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 674567 / M&S Foundations
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Authorization and Accreditation and Networthiness is maintained via the Information Technology (IT) systems Risk Management Framework (RMF) for seven classified systems and five supported cross domain solutions, which includes code and ruleset development, testing, and fielding, and meets AF Joint Worldwide Intelligence Communications System (JWICS) and AF Secret Internet Protocol Router Network (SIPRNET) net worthiness standards and evaluations.

This program also supports the DoD Training Transformation Initiative.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Air, Space and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS)</p> <p>Description: Provides the authoritative representation of Air Force information operations. ACE-IOS is comprised of models that support training and mission rehearsal for the Air Force, Joint Task Force commanders, and Combatant Commander battle staffs during Joint and Service exercises and experimentations.</p> <p>FY 2018 Plans: N/A</p> <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Will commence ACE-IOS version 5.0.20 - Will complete model Graphical User Interfaces (GUIs) for model and scenario control, orders entry, and all map displays - Will complete the implementation of Supervisory Control and Data Acquisition (SCADA) and cascading battlefield effects - Will complete database and data file build and populate tools for template and scenario development - Will complete track database, the store and playback capability requested by AOC and the Intel Schoolhouse - Will commence the move to new Windows operating system for cross domain solution - Will commence migration to latest version of Red Hat Enterprise Linux (RHEL) operating system for ACE-IOS - Will commence to acquire Certification to Field awards (separate but parallel to A&A effort) <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase supports the transfer of ACE-IOS efforts from PE 0207605F, Wargaming & Simulation Centers</p>	5.626	0.000	6.814	0.000	6.814
Accomplishments/Planned Programs Subtotals	5.626	0.000	6.814	0.000	6.814

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / <i>USAF Modeling and Simulation</i>	Project (Number/Name) 674567 / <i>M&S Foundations</i>

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

N/A

Remarks

N/A

D. Acquisition Strategy

The Acquisition goals of the Air, Space and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS) are achieved through incremental development of the project's M&S activities; all contracts are awarded using full and open competition. To meet evolving M&S technology, and the challenges of new requirements arriving almost daily, DMOC-C is an on-going, evolutionary effort to keep pace with those changes by continuously developing and upgrading environment generators, systems, and tools and to ensure integration and interoperability with other LVC systems to provide the best warfighter training 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 674567 / M&S Foundations
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Air, Space and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS)	C/Various	90th IOS : Lackland AFB, TX	-	5.606	Dec 2016	-		6.814	Dec 2018	-		6.814	Continuing	Continuing	-
Subtotal			-	5.606		-		6.814		-		6.814	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration	C/CPFF	AFLCMC : Hanscom AFB, MA	-	0.020	Apr 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.020		-		-		-		-	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	5.626	0.000	6.814	-	6.814	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 674567 / M&S Foundations

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

Air, Space and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS)

- ACE-IOS v5.0.18	██████████		
- ACE-IOS v5.0.20		██████████	
- ACE-IOS v5.0.21			██████████
- ACE-IOS v5.0.22			██████████
- ACE-IOS v5.0.23			██████████
- ACE-IOS v5.0.24			██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / <i>USAF Modeling and Simulation</i>	Project (Number/Name) 674567 / <i>M&S Foundations</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Air, Space and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS)</i>				
- ACE-IOS v5.0.18	1	2017	4	2017
- ACE-IOS v5.0.20	1	2019	4	2019
- ACE-IOS v5.0.21	1	2020	4	2020
- ACE-IOS v5.0.22	1	2021	4	2021
- ACE-IOS v5.0.23	1	2022	4	2022
- ACE-IOS v5.0.24	1	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 675135 / Warfighter Readiness
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675135: <i>Warfighter Readiness</i>	-	9.202	10.175	10.264	0.000	10.264	10.454	10.636	10.857	11.055	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Modeling and Simulation support to our Warfighter's Readiness is a United States Air Force (USAF) corporate imperative to ensure air, space, cyberspace training, and mission rehearsal activities are supported with realistic, interoperable, and readily available, tools, data, services and environments. Warfighter Readiness supports Department of Defense (DoD) Training Transformation (T2) and Joint National Training Capability (JNTC) along with the USAF priorities and core functions. Activities also include studies and analysis to support both current program planning, execution, and future program planning.

It includes several complimentary programs, initiatives and areas for investment: Warfighter and Joint Training Integration supports the Chief of Staff of the Air Force (CSAF) directed Live, Virtual, and Constructive (LVC) integration efforts and is a critical piece to the USAF's implementation of the Strategic Plan for Transforming DoD Training. The goal of LVC training and mission rehearsal is to prepare our warfighters for the full range of military operations and maintain the combat readiness levels required by the Combatant Commands. This can only be accomplished by training and rehearsing in realistic operational environments. These environments include live training ranges and virtual simulators enhanced with constructive entities. Specific training and mission rehearsal events can include some or all of these simultaneously; making the ability to integrate LVC capabilities a necessity.

The Air, Space, and Cyberspace Constructive Environment (ASCCE) is the USAF's authoritative federation of constructive training models and tools realistically representing the tactical and operational capabilities the USAF brings to the joint fight. It includes the Air Force Modeling and Simulation Training Toolkit (AFMSTT), which provides the authoritative representation of AF and joint theater-level air and space power and is used to train Air and Space Operations Center (AOC) personnel and Combatant Commanders' battle staffs. The primary models in the AFMSTT are the Air Warfare Simulation (AWSIM) and Air Base Simulation (ABS).

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AFMSTT and ACE-IOS 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Air, Space, and Cyberspace Constructive Environment (ASCCE)/Air Force Modeling & Simulation Training Toolkit (AFMSTT)	9.202	10.175	10.264	0.000	10.264
Description: Provides the authoritative representation of AF and joint theater-level air and space power and is used to train Air and Space Operations Center (AOC) personnel and Combatant Commanders' battle staffs.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 675135 / Warfighter Readiness

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Complete and field AFMSTT Version 5.13 - Initiate the development of Version 6.1 - Continue Risk Management Framework (RMF) accreditation; Java Message System (JMS) broker and distribution - Address new joint requirements and model interface changes to the Federate Object Models (FOMs) - Implement first stage of Graphical Interface Aggregate Controller (GIAC) replacement software - Address User Change Request (CRs) - Complete transition to AFMSTT Unified Mission Control (UMC) architecture with early deprecation of additional legacy point to point - Continue long lead prototyping to thin client interfaces <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Will complete the development, test, and fielding of AFMSTT Version 6.1 - Will commence AFMSTT Version 6.3 development - Will continue Risk Management Framework (RMF) accreditation; Java Message System (JMS) broker and distribution - Will complete the transition to the AFMSTT GIAC replacement mission control functionality and internal architecture - Will address User Change Requests (CRs) - Will commence integration with spiral Joint Live Virtual Constructive (JLVC) developments and new core Command & Control (C2) System interfaces associated with Command & Control Air Operations Service - Command & Control Air Information Services (C2AOS-C2IS) - Will complete long lead prototyping to thin client interfaces <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Normal contract inflation</p>					
Accomplishments/Planned Programs Subtotals	9.202	10.175	10.264	0.000	10.264

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

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / <i>USAF Modeling and Simulation</i>	Project (Number/Name) 675135 / <i>Warfighter Readiness</i>

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

Remarks

N/A

D. Acquisition Strategy

The Air Force Life Cycle Management Center (AFLCMC) at Hanscom AFB, MA manages the project's acquisition process. AFLCMC develops the Air C2 constructive M&S models in direct support of AFAMS and the warfighter simulation centers. Their acquisition goals are achieved through incremental development in a sustainment through modernization approach. All major contracts are awarded using 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 675135 / Warfighter Readiness
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AFMSTT/AWSIM	C/CPFF	Cole Engineering Services, Inc : Orlando, FL	-	8.119	Feb 2017	8.816	Feb 2018	9.142	Feb 2019	-		9.142	Continuing	Continuing	-
Subtotal			-	8.119		8.816		9.142		-		9.142	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Verification and Validation	C/Various	AFLCMC : Hanscom AFB, MA	-	0.191	Oct 2016	0.235	Oct 2017	0.233	Oct 2018	-		0.233	Continuing	Continuing	-
Subtotal			-	0.191		0.235		0.233		-		0.233	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration	C/Various	AFLCMC : Hanscom AFB, MA	-	0.892	Oct 2016	1.124	Oct 2017	0.889	Oct 2018	-		0.889	Continuing	Continuing	-
Subtotal			-	0.892		1.124		0.889		-		0.889	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	9.202	10.175	10.264	-	10.264	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 675135 / Warfighter Readiness

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Air, Space, and Cyberspace Constructive Environment (ASCCE)</i>				
- AFMSTT v5.13	2	2017	2	2018
- AFMSTT v6.1	2	2018	2	2019
- AFMSTT v6.3	2	2019	2	2020
- AFMSTT v6.5	2	2020	2	2021
- AFMSTT v6.7	2	2021	2	2022
- AFMSTT v6.9	2	2022	2	2023
- AFMSTT v6.11	2	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.090	12.839	6.141	0.000	6.141	6.256	6.365	6.496	6.615	Continuing	Continuing
672888: <i>Distributed Mission Operations Center (DMOC)</i>	-	4.090	12.839	6.141	0.000	6.141	6.256	6.365	6.496	6.615	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
In FY19, PE 0207605F (Wargaming and Simulation Centers), Project 672888, Distributed Mission Operations Center (DMOC) realigns Air, Space, and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS), Project 674567, Modeling and Simulation Foundations funds to PE 0207601F (USAF Modeling and Simulation) in order to support execution of Air Force Space Command's information operations simulation efforts.

A. Mission Description and Budget Item Justification

Distributed Mission Operations Center (DMOC) - The DMOC provides comprehensive Live, Virtual, and Constructive (LVC) simulation capabilities which prepare warfighters to conduct dominant operations in air, space, and cyber domains for theater-level, full spectrum combat training for Air Force, joint service, and coalition partners. The DMOC training capabilities reach 31 geographically separated LVC locations across 17 time zones representing such assets as real-world weapon systems, operator-in-the-loop, and constructive or computer-driven simulations. It is responsible for development and integration of scenarios, models, and databases and the integration of participating sites into Virtual Flag (VF) training events via numerous network connections, DMOC-developed interoperability tools, and controlled interfaces in support of Air Force, joint, and coalition warfighter readiness. In addition, activities include Distributed Mission Operations (DMO) technology and capability studies/analyses which support both current and future program planning and execution by:

1. Distributed Mission Operations Capability/Battlespace Systems Development: The DMOC upgrades and enhances the capabilities of various systems, tools, and simulators to incorporate ever-changing technology and emerging training requirements into DMO events; such as, Virtual Flag (VF) and Coalition VF (CVF) to enhance the quality of warfighter training. Activities include Environment Generator development, DMO Tool Development, and Simulator Enhancement. DMOC is in partnership with the US Naval Air Warfare Center-Aircraft Division (NAWCAD) to enhance the capabilities of the Next Generation Threat System (NGTS). The NGTS is the primary environment generator for both Blue and Red Air in DMOC White Force. DMO Tool development includes: a. DMOC Replay Tool (DRT) facilitates a more complete mission review and debrief capability of the exercises as more sites and systems are added to events, b. enhancement & improvement of the Distributed Interactive Simulation (DIS) Filter and the Doctor-J (Dr. J) tools to enable tactical datalinks to be communicated and translated between disparate simulator and operationally fielded (i.e. live aircraft) communication formats, c. Development of Intelligence, Surveillance, and Reconnaissance (ISR)/Battle Damage Assessment (BDA) to improve damage state models used by intelligence analysts in exercises, and d. development of solutions for integrating Contested Degraded Operations (geographical and communications jamming) into DMO events; and simulator enhancement efforts to incorporate Mission Package standards upgrades into the Control and Reporting Center (CRC) Simulation Package (CSP) to allow a real-world system to be used as a simulator when needed in DMO events.

2. Assessment & Authorization (A&A)/Software Certification: The DMOC supports cybersecurity requirements definition, integration/test support, analysis, systems engineering support, A&A of core systems, and support software certification. The DMOC implements cybersecurity requirements and is working towards the application

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>
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of the Risk Management Framework (RMF) and Continuous Monitoring. Efforts include Cross-Domain Information Sharing / Multi-national Information Sharing (CDIS/MNIS) ruleset development, load sharing, and testing; integration and testing of various newly developed / updated systems such as the DMOC Replay Tool, Dr. J, DIS Filter, and the DMOC Battlespace; and support of AFNIC software certification.

3. Distributed Training Sites & Systems Integration: DMOC integrates up to 30 geographically separated LVC training locations and 50+ systems into LVC DMO training events such as VF and CVF by resolving interoperability issues between disparate systems and networks so that all exercise participants can interact in the DMO environment. New sites and systems are incorporated into LVC DMO events each year based on higher headquarters and Combatant Commander's (CCDRs) emerging requirements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the DMOC 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.

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 anticipated production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.245	12.839	13.054	0.000	13.054
Current President's Budget	4.090	12.839	6.141	0.000	6.141
Total Adjustments	-0.155	0.000	-6.913	0.000	-6.913
• 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	-0.155	0.000			
• Other Adjustments	0.000	0.000	-6.913	0.000	-6.913

Change Summary Explanation

In FY19, PE 0207605F (Wargaming and Simulation Centers), Project 672888, Distributed Mission Operations Center (DMOC) is reduced \$6.913M to transfer funds to PE 0207601F (Air, Space, and Cyberspace Constructive Environment - Information Operations Suite, ACE-IOS), Project 674567, Modeling and Simulation Foundations.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Title: Distributed Mission Operations (DMO) Capability / Battlespace Systems Development Description: Simulation software/hardware development in support of users conducting RDT&E, mission rehearsal, and concepts of operation development.	3.025	4.548	4.589	0.000	4.589
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FY 2018 Plans:

- Continue DMO tool enhancements
- Complete testing of software and DMO tools for Win 10/Red Hat Enterprise Linux (RHEL) 6 conversion
- Strengthen DMOC/NAWCAD Partnership: Enhance Next Generation Threat System (NGTS) source code to implement Air Force DMO requirements; develop and install NGTS 3.2.0
- Develop & execute proof of concept for a virtualization suite; with future goal of full virtualization of the battlespace

FY 2019 Base Plans:

- Continue DMO tool enhancements
- Continue DMOC/NAWCAD Partnership: Enhance NGTS source code to implement future Air Force DMO requirements, Develop/Install NGTS 3.2.X
- Continue to explore, improve, and execute the plan for battlespace virtualization
- Provide support to Virtual Test and Training Center (VTTC) at Nellis AFB as needed to provide interoperability, integration, and testing of high end advanced training and tactics capabilities

FY 2019 OCO Plans:
None

FY 2018 to FY 2019 Increase/Decrease Statement:
Normal Contract Inflation

Title: Assessment and Authorization (A&A)/Software Certification Description: Support requirements definition, integration test support, scenario development, analysis, systems engineering support, and Certification and Accreditation (C&A) and Networkiness of core systems. Implement requirements of Cybersecurity, Risk Management Framework, and Continuous Monitoring.	0.353	0.505	0.514	0.000	0.514
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FY 2018 Plans:
- Support integration/testing for the following A&A activities:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>			
C. Accomplishments/Planned Programs (\$ in Millions)					
<ul style="list-style-type: none"> -- Initial and Phase 1 RMF ATO from HAF/A3 for Battlespace -- Renewal of ATO for Jumper Room with accompanying Systems Security Plan (SSP) modifications for new facility requirements -- Implement architecture design changes to improve cybersecurity measures (fiber upgrade, virtualization, tech refresh) -- Conduct high-side and low-side operations for simultaneous event, utilizing both DMOC enclaves - Successfully test and certify DMOC software through AFNIC Enterprise/Approved Products List (E/APL) process with new Windows 10 standard - Support CVF and RED KITE with CDIS ruleset development, testing, and implementation 					
FY 2019 Base Plans:					
<ul style="list-style-type: none"> - Will continue testing for the following Assessment and Authorization activities: -- Will obtain Phase 2 and final ATO from HAF/A3 for Battlespace -- Will maintain ATO for Jumper Room with accompanying SSP modifications for even-driven needs - Will continue to assess DMOC software for AFNIC E/APL process viability and test accordingly- Continue support of CVF and RED KITE with CDIS ruleset development, testing, and implementation 					
FY 2019 OCO Plans:					
None					
FY 2018 to FY 2019 Increase/Decrease Statement:					
Normal Contract Inflation					
Title: Distributed Training Sites and Systems Integration					
0.712 1.018 1.038 0.000 1.038					
Description: Establish distributed training site system integration and interoperability between DMOC, operational units, and modeling & simulation facilities.					
FY 2018 Plans:					
<ul style="list-style-type: none"> - Continue development of LVC concepts in support of VF/CVF/RED FLAG (RF) integration efforts - Continue integration of 5th generation capabilities and infrastructure into DMOC Jumper Room -- VF 18-2, NORTHCOM homeland defense in depth of the CONUS with advanced systems integration (4th/5th generation fighters, AEGIS, and Patriot) - Support/leverage/collaborate DMOC efforts with Virtual Test and Traing Center (VTTC) at Nellis to enable a high end advanced testing and tactics (HEAT2) capability - Support emerging higher headquarters/Combatant Commander's (CCDR) requirements 					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue Virtual-into-Live integration and testing with Nellis Test and Training Range (NTTR)/Virtual Test and Training Center (VTTC)/Red Flag (RF) to include virtual Rivet Joint, virtual JSTARS, Battle Space Command and Control Center (BC3), etc. FY 2019 Base Plans: - Will continue the development of LVC concepts in support of VF/CVF/RF integration efforts - Will continue to support/leverage/collaborate DMOC efforts with Virtual Test and Training Center at Nellis to enable a high end advanced testing and tactics (HEAT2) capability - Continue to support emerging higher headquarters/CDDR requirements - Continue Virtual-into-Live integration and testing with NTTR/VTTC/RF FY 2019 OCO Plans: None FY 2018 to FY 2019 Increase/Decrease Statement: Normal Contract Inflation					
Title: Air, Space and Cyberspace Collaborative Environment - Information Operations Suite (ACE-IOS) Description: Air, Space and Cyberspace Collaborative Environment - Information Operations Suite (ACE-IOS) provides the authoritative representation of Air Force information operations. ACE-IOS is comprised of models that support training and mission rehearsal for the Air Force, Joint Task Force commanders, and Combatant Commander's battle staffs during Joint and Service exercises and experimentations. FY 2018 Plans: - Complete ACE-IOS version 5.0.19 open systems architecture design and underlying communication infrastructure, evolving from 5.0.18 - Complete development of license-free replacements for two commercial licensed applications - Complete control Graphical User Interfaces (GUIs) and run-time scripts for process monitoring and control of the system - Complete design of Supervisory Control and Data Acquisition (SCADA) and cascading battlefield effects - Replace National Wargaming System - Complete the capability for initial intelligence paint and fused intelligence reporting - Will maintain Certification and Accreditation to achieve certificate to field award FY 2019 Base Plans:	0.000	6.768	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to ACE-IOS efforts being transferred to PE 0207601F, USAF Modeling and Simulation.					
Accomplishments/Planned Programs Subtotals	4.090	12.839	6.141	0.000	6.141

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

N/A

Remarks

N/A

E. Acquisition Strategy

Distributed Mission Operations Center (DMOC):

The DMOC supports AF/Joint/Coalition DMO and the Joint National Training Capability (JNTC) through the development and integration of DMO training and test events, networks, scenarios, and databases. Due to evolving modeling & simulation technology, the DMOC is an on-going, evolutionary effort to keep pace with those changes by continuously developing/upgrading DMO environment generators, systems, and tools and ensuring integration/interoperability of new systems into DMO to provide the best warfighter training possible.

DMOC has the following two primary contracts that manage the acquisition, development, testing, and integration of DMO standards, training, modeling and simulation, cross-domain information sharing testbed, and exercises on AF/Joint/Coalition DMO networks. Additionally, Military Interdepartmental Purchase Requests (MIPRs) are sent to other external organizations (i.e. NAWCAD and DMOC-S) to fund development of DMO tools that support DMOC efforts.

Infrastructure, Development, and Engineering (IDE) Contract: Develops/upgrades various DMOC tools, systems, and simulators that are needed to conduct DMO training events. Develops, implements, and tests technical solutions for the integration of sites/systems into VF, CVF, and other DMO events. The current IDE contract is cost-plus-fixed-fee with multiple task orders awarded for individual projects over the course of the fiscal year, and the follow-on IDE contract, which is scheduled to be awarded in the 2nd quarter of FY17, will be firm-fixed-price.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	PE 0207605F / <i>Wargaming and Simulation Centers</i>

Command and Control Technical Support Contract (C2TSC): Supports government by assisting with development of technical requirements for upgrades to various systems and tools that will be developed by the IDE contractor and then performs acceptance testing of the those products. Develops requirements for site/system integration of sites/systems into VF, CVF, and other DMO events. C2TSC is a firm-fixed-price 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207605F / Wargaming and Simulation Centers	Project (Number/Name) 672888 / Distributed Mission Operations Center (DMOC)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Distributed Mission Operations (DMO) Capability / Battlespace Systems Development, Certification & Accreditation (C&A) and Networkiness, and Distributed Training Sites& Systems Integration	C/CPFF	Lockheed Martin : Kirtland AFB, NM	-	3.225	Jan 2017	0.165	Mar 2018	-		-		-	Continuing	Continuing	94.000
Follow-on Distributed Mission Operations (DMO) Capability / Battlespace Systems Development, Certification & Accreditation (C&A) and Networkiness, and Distributed Training Sites & Systems Integration	C/FFP	TBD : Kirtland AFB, NM	-	-		3.355	May 2018	3.656	May 2019	-		3.656	Continuing	Continuing	75.000
NAWCAD NGTS Development	C/CPFF	J.F. Taylor, Inc. : Patuxent River, MD	-	0.340	Mar 2017	0.450	Mar 2018	-		-		-	Continuing	Continuing	-
ACE-IOS	C/T&M	CACI, Inc : Lackland AFB, TX	-	-		6.193	Dec 2017	-		-		-	Continuing	Continuing	50.665
Subtotal			-	3.565		10.163		3.656		-		3.656	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Technical requirements development, integration/ acceptance testing, and engineering support	C/FFP	Alpha-Omega : Kirtland AFB, NM	-	0.148	Jul 2017	0.562	Dec 2017	-		-		-	Continuing	Continuing	30.000
Follow-on requirements development, integration/	C/FFP	TBD : Kirtland AFB, NM	-	-		1.043	Apr 2018	2.185	Apr 2019	-		2.185	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>	Project (Number/Name) 672888 / <i>Distributed Mission Operations Center (DMOC)</i>
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
acceptance testing, and engineering support															
Subtotal			-	0.148		1.605		2.185		-		2.185	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DMOC Program Management Office Support	Various	705 CTS : Kirtland AFB, NM	-	0.377	Oct 2016	0.280	Oct 2017	0.300	Oct 2018	-		0.300	Continuing	Continuing	-
ACE-IOS Program Management Office Support	Various	90 COS : Lackland AFC, TX	-	-		0.791	Oct 2017	-		-		-	Continuing	Continuing	-
Subtotal			-	0.377		1.071		0.300		-		0.300	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	4.090	12.839	6.141	-	6.141	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>	Project (Number/Name) 672888 / <i>Distributed Mission Operations Center (DMOC)</i>	

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
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

DMO	
DMO Capability / Battlespace Systems Development	
Virtual Flag (VF)	
Virtual Flag / Coalition Virtual Flag exercises	
ACE-IOS	
ACE-IOS Version 5.0.19	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207605F / <i>Wargaming and Simulation Centers</i>	Project (Number/Name) 672888 / <i>Distributed Mission Operations Center (DMOC)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
DMO				
DMO Capability / Battlespace Systems Development	1	2017	4	2023
Virtual Flag (VF)				
Virtual Flag / Coalition Virtual Flag exercises	1	2017	4	2023
ACE-IOS				
ACE-IOS Version 5.0.19	1	2018	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.000	42.349	42.349	0.000	0.000	4.964	11.916	Continuing	Continuing
671201: <i>E-11 Development*</i>	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.964	11.916	Continuing	Continuing
675383: <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>	-	0.000	0.000	0.000	42.349	42.349	0.000	0.000	0.000	0.000	Continuing	Continuing

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019

Note

This program, BA 7, PE 0207610F, project 675383, Military GPS, E-11A & Deployable Program Control Element (PCE), is a new start.

A. Mission Description and Budget Item Justification

Battlefield Airborne Communications Node (BACN) enables tactical edge Joint and Coalition information interoperability via air, space, and surface systems; Backbone Network for high capacity data transfer.

Military GPS is required for BACN fleet to fly in increasingly contested AORs. Safety of flight considerations, including performance, integrity, availability, and continuity of service requirements for long range reference, local area reference, and landing/terminal reference, are directly affected by how GPS sensors are used. This effort will include an Engineering Change Proposal (ECP) that will develop and integrate Military GPS on the E-11A BACN platform.

Deployable Program Control Elements (PCEs) are required to provide agile deployment support to establish remote and full ground control locations in a timely manner to shorten the kill-chain. This effort will include an Engineering Change Proposal (ECP) that will develop a Deployable PCE.

Protected Tactical Waveform (PTW) is a waveform designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments. PTW provides worldwide, beyond line of sight, Anti-Jam (AJ), Low Probability of Intercept communications, via military and commercial satellite systems for tactical users in all Services. This effort funds PTW modem development and aperture development on suitable platforms. PTW provides communication path diversity by increasing SATCOM resilience through satellite, spectral, and waveform diversity.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver BACN 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.

BA7- This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	0.000	42.349	42.349
Total Adjustments	0.000	0.000	0.000	42.349	42.349
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	42.349	42.349

Change Summary Explanation

This effort will include an Engineering Change Proposal (ECP) that will develop and integrate Military GPS on the E-11A BACN platform.

This effort will include an Engineering Change Proposal (ECP) that will develop a Deployable PCE.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>			Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675383: <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>	-	0.000	0.000	0.000	42.349	42.349	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207610F, project 675383, Military GPS, E-11A & Deployable Program Control Element (PCE), is a new start.

A. Mission Description and Budget Item Justification

Battlefield Airborne Communications Node (BACN) enables tactical edge Joint and Coalition information interoperability via air, space, and surface systems; Backbone Network for high capacity data transfer.

Military GPS is required for BACN fleet to fly in increasingly contested AORs. Safety of flight considerations, including performance, integrity, availability, and continuity of service requirements for long range reference, local area reference, and landing/terminal reference, are directly affected by how GPS sensors are used.

This effort will include an Engineering Change Proposal (ECP) that will develop and integrate Military GPS on the E-11A BACN platform.

Deployable Program Control Elements (PCEs) are required to provide agile deployment support to establish remote and full ground control locations in a timely manner to shorten the kill-chain.

This effort will include an Engineering Change Proposal (ECP) that will develop a Deployable PCE.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver BACN 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Military GPS, E-11A & Deployable Program Control Element (PCE)	-	0.000	0.000	42.349	42.349
Description: Battlefield Airborne Communications Node (BACN) enables tactical edge Joint and Coalition information interoperability via air, space, and surface systems; Backbone Network for high capacity data transfer.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Military GPS is required for BACN fleet to fly in increasingly contested AORs. Safety of flight considerations, including performance, integrity, availability, and continuity of service requirements for long range reference, local area reference, and landing/terminal reference, are directly affected by how GPS sensors are used.</p> <p>This effort will include an Engineering Change Proposal (ECP) that will develop and integrate Military GPS on the E-11A BACN platform.</p> <p>Deployable Program Control Elements (PCEs) are required to provide agile deployment support to establish remote and full ground control locations in a timely manner to shorten the kill-chain.</p> <p>This effort will include an Engineering Change Proposal (ECP) that will develop a Deployable PCE.</p> <p>FY 2018 Plans: N/A</p> <p>FY 2019 Base Plans: N/A</p> <p>FY 2019 OCO Plans: Will conduct an Engineering Change Proposal (ECP) that will develop and integrate Military GPS on the E-11A BACN platform.</p> <p>Will conduct an Engineering Change Proposal (ECP) that will develop a Deployable PCE.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to FY19 new start</p>					
Accomplishments/Planned Programs Subtotals	-	0.000	0.000	42.349	42.349

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

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>

D. Acquisition Strategy

BACN, a JUON directed program and currently fielded system, has provided quick reaction capability for the last decade. The Communication Systems Quick Reaction Capability Branch (AFLCMC/HNAA) will utilize all contracting options available to develop and integrate Military GPS on the E-11A in addition to developing the Deployable Program Control Element (PCE) as expeditiously as 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 7				PE 0207610F / Battlefield Abn Comm Node (BACN)				675383 / BATTLEFIELD AIRBORNE COMM NODE (BACN)							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Military GPS, E-11A	C/CPFF	AFLCMC/HNA : Hanscom AFB, MA	-	-		-		0.000		32.557	Apr 2019	32.557	Continuing	Continuing	-
Deployable Program Control Element (PCE)	SS/CPFF	AFLCMC/HNA : Hanscom AFB, MA	-	-		-		0.000		8.606	Apr 2019	8.606	Continuing	Continuing	-
Subtotal			-	-		-		0.000		41.163		41.163	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MilGPS PM, Eng A&AS	Various	Not specified. : TBD	-	-		-		0.000		0.595	Apr 2019	0.595	Continuing	Continuing	-
MilGPS Travel	Various	Not specified. : TBD	-	-		-		0.000		0.027	Apr 2019	0.027	Continuing	Continuing	-
Rapidly Deployable PCE A&AS	Various	Not specified. : TBD	-	-		-		0.000		0.531	Apr 2019	0.531	Continuing	Continuing	-
Rapidly Deployable PCE Travel	Various	Not specified. : TBD	-	-		-		0.000		0.033	Apr 2019	0.033	Continuing	Continuing	-
Subtotal			-	-		-		0.000		1.186		1.186	Continuing	Continuing	N/A
Project Cost Totals			-	-		0.000		0.000		42.349		42.349	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>	

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Battlefield Airborne Comm Node (BACN)</i>																												
Military GPS, E-11A																												
Deployable Program Control Element (PCE)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Battlefield Airborne Comm Node (BACN)</i>				
Military GPS, E-11A	1	2019	4	2019
Deployable Program Control Element (PCE)	1	2019	1	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207697F / <i>Distributed Training and Exercises</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.241	4.190	4.225	0.000	4.225	4.303	4.377	4.467	4.549	Continuing	Continuing
675190: <i>JFCOM Wargaming</i>	-	4.241	4.190	4.225	0.000	4.225	4.303	4.377	4.467	4.549	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding supports the CSAF Title 10 wargaming efforts to test concepts, capabilities, programming choices, and plans using simulation and other techniques, otherwise known as wargaming. Based on the Department and Air Force direction, there is a concerted effort in these periods of fiscal restraint to reinvigorate, institutionalize, and systematize wargaming across the Department. This effort requires continued funding to maintain the level of effort to most effectively pursue an innovative strategy, avoid operational and technical surprise and make best use of limited resources. The Air Force continues to refine the wargame process and design to better integrate and synergize those efforts in support of the new Air Force Strategy, Planning, and Programming (SP3) process. Specifically, in addition to maintaining a robust Title 10 Wargame series, Global Engagement, servicing Chief of Staff of the Air Force (CSAF) objectives. The HAF Wargaming Enterprise is executing on-call Wargaming in support of the AF/A5/8, the Agile series, along with quick-turning wargame support to the USAF Enterprise Capability Collaboration Team (ECCT) requirements, the Enterprise series, Plan Blue, and to service AF/A5S strategy and concept development objectives; all to better address the requirements of the SP3 process and cycles. Additionally, HAF Wargaming provides and coordinates Air Force representation at other Service and Joint wargames as they execute across the department. These efforts are providing decision support to senior Air Force leaders involving investment strategies and develop concepts to best employ U.S. forces in future conflicts.

The Wargame Information Environment (WIE) is a continually evolving system that provides an array of services to game players which enables the accomplishment of game objectives. The backbone of the WIE is GameNet, a deployable, standalone, Local Area Network (LAN) with servers and laptops that host applications to support virtual battlespace collaboration, decision making, three-dimensional visualizations & mapping, and services. Behind these applications are cutting edge technologies and database architectures from both commercial off-the-shelf and government developed software that assures relevance to the wargame. The modeling, simulation, and analysis applications allow participants, adjudicators, and control team members to effectively and efficiently collaborate, make decisions, present those decisions, and execute moves within the wargame; documenting each step in the process. This information capture enables discovery during the wargame and permits postgame analysis. These findings inform portfolio rebalancing exercises, concept and strategy development, and very senior leader decision making.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207697F / <i>Distributed Training and Exercises</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	3.886	4.190	4.257	0.000	4.257
Current President's Budget	4.241	4.190	4.225	0.000	4.225
Total Adjustments	0.355	0.000	-0.032	0.000	-0.032
• 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	0.355	0.000	-0.032	0.000	-0.032

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Develop/ Upgrade M&S Tools for WIE	1.284	1.463	1.490	-	1.490
Description: Develop air, space and cyber space wargaming specific functionality in existing modeling and simulation and analysis tools and integrate into the latest version of the WIE					
FY 2018 Plans:					
- Continue to refine and provide tailored wargame support and analytic decision support to Air Force, Joint, and Senior Defense leaders. To include development of processes tailored to enable participation of senior leaders.					
- Upgrade GameNet and the WIE. At the conclusion of Global Engagement 18, the current wargaming cycle, the next version of the WIE expected to be instantiated to better support the new charter and SP3 process along with supporting greater number and more diverse wargames.					
FY 2019 Base Plans:					
- Extend the WIE to include either the Lemay Center Wargaming Institute BubbleNet or Air Force Space Command Schriever Wargame System in support of an Air Force Title 10 Game event.					
- Integrate tools to capture implications of force structures and capabilities employed in wargames to influence budgeting and programming choices.					
- Continue to expand and develop the WIE, incorporating latest technology and tools, in support of a more flexible and agile wargaming enterprise; quicker to respond and tailorable for a wider range of wargaming. This					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0207697F / <i>Distributed Training and Exercises</i>				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
will require analysis of utility and functionality of additional models and analytical tools used by other wargames, to include creation of custom interfaces to allow interaction within the WIE.						
FY 2018 to FY 2019 Increase/Decrease Statement: Not Applicable						
Title: Joint Concept Development & Experimentation (JCD&E) Tools		2.957	2.727	2.735	0.000	2.735
Description: Develop scenarios and data for future synthetic environment that grounded in truth to support several wargames and mini-wargames.						
FY 2018 Plans: - Continue to refine and provide tailored wargame support and analytic decision support to Air Force, Joint, and Senior Defense leaders. To include development of processes tailored to enable participation of senior leaders. - Upgrade GameNet and the WIE. At the conclusion of Global Engagement 18, the current wargaming cycle, the next version of the WIE expected to be instantiated to better support the new charter and SP3 process along with supporting greater number and more diverse wargames.						
FY 2019 Base Plans: HAF Wargaming will conclude Global Engagement 18 post-game analysis and report writing, as well as, execute Futures Game 18, along with post-game analysis and report writing. HAF Wargaming will design, develop models, research concepts, and conduct workshops for Global Engagement 20 (USAF Foundation wargame). HAF Wargaming will conduct quick-turn wargames in support of senior leaders (Agile, ECCT) as directed.						
FY 2019 OCO Plans: Not Applicable						
FY 2018 to FY 2019 Increase/Decrease Statement: Not Applicable						
Accomplishments/Planned Programs Subtotals		4.241	4.190	4.225	0.000	4.225
D. Other Program Funding Summary (\$ in Millions) N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207697F / <i>Distributed Training and Exercises</i>	
D. Other Program Funding Summary (\$ in Millions)		
Remarks		
E. Acquisition Strategy In order to achieve an innovative strategy, avoid operational and technical surprise and make best use of limited resources, wargaming requires an evolutionary acquisition approach for every wargame. Contract support is required as wargame and IT specialized expertise resides with industry and is not available organically. The requirements constantly evolve and a challenge to be accurately defined at the outset of the contract; however, we will continue to pursue a firm fixed price (FFP) contract awarded under a 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.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207697F / <i>Distributed Training and Exercises</i>	Project (Number/Name) 675190 / <i>JFCOM Wargaming</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Various	C/CPFF	TBD : TBD	-	4.241	Mar 2017	4.190	Mar 2018	4.225		0.000		4.225	Continuing	Continuing	-
Subtotal			-	4.241		4.190		4.225		0.000		4.225	Continuing	Continuing	N/A
Project Cost Totals			-	4.241		4.190		4.225		0.000		4.225	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207697F / <i>Distributed Training and Exercises</i>	Project (Number/Name) 675190 / <i>JFCOM Wargaming</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

No project title.	
Develop and Integrate M&S Tools	
Enhance ViewPoint	
Improve GamePoint	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207697F / <i>Distributed Training and Exercises</i>	Project (Number/Name) 675190 / <i>JFCOM Wargaming</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>No project title.</i>				
Develop and Integrate M&S Tools	1	2018	4	2021
Enhance ViewPoint	1	2018	4	2021
Improve GamePoint	1	2018	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	391.096	69.104	85.531	63.653	0.000	63.653	81.131	90.334	85.733	91.334	Continuing	Continuing
675302: <i>Precision Aerial Delivery Systems (PADS)</i>	37.431	7.245	8.397	8.845	0.000	8.845	7.021	3.090	1.896	1.931	Continuing	Continuing
675380: <i>Mission Planning Systems (MPS) Modernization</i>	353.665	57.480	76.316	54.808	0.000	54.808	74.110	87.244	83.837	89.403	Continuing	Continuing
675385: <i>MPS Increment 5</i>	0.000	4.379	0.818	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.197

Program MDAP/MAIS Code: 509

Note

Prior costs for Inc 5 is \$59.9M and are included in Project 675380 as those programs were under MPS Modernization. Total Cost for Inc 5 in Project 675385 is \$5.197 this does not include TWCF (Transportation Capital Working Fund).

A. Mission Description and Budget Item Justification

Mission planning involves the creation of a flight plan based on multiple inputs including threats, targets, terrain, weather, aircraft performance capability, and configuration. It is an essential task that must be completed prior to any fixed- or rotary wing aircraft sortie. The planner must have the ability to plan weapon, cargo, passenger, and/or fuel delivery, calculate fuel requirements, and assess the route based on known enemy threat location and type. Mission planners must be able to optimize and de-conflict flight routes with other aircraft; review, print, and brief the plan; download pertinent flight information to on-board aircraft avionics; and, conduct dynamic/in-flight re-planning as applicable.

The Mission Planning Systems (MPS) program is a collaborative program with the Navy to leverage technical solutions and business practices for all Department of Defense (DoD) platforms. It provides automated mission planning tools and support for fixed- and rotary wing aircraft and guided munitions. It replaces two closed architecture legacy mission planning systems (UNIX-based MPS (UNIX-MPS) and the PC-based Portable Flight Planning Software (PFPS)), with a single multi-service, open architecture system, frequently referred to as the Joint Mission Planning System (JMPS). MPS will compress the mission planning cycle by providing an improved integrated planning environment, reducing the time required to respond to changing situations and urgent needs such as striking time sensitive/critical targets and conducting combat search and rescue. MPS products have the potential to support all DoD fixed-wing and rotary wing aircraft and is shared with the selected programs in the Navy. MPS will deliver significant benefits to command and control performance by enhancing information superiority for the warfighter and by providing unique capabilities in support of both precision engagement and dominant maneuver.

FY19 funding will continue MPS Inc 5 project which will complete the initial migration of select Air Force platforms from their legacy planning systems to the new Mission Planning System (aka (JMPS)). MPS Inc 5 is comprised of three efforts originally started as separate and individual projects with the MPS Modernization development effort. Those projects are: 1) Mobility Air Forces Automated Flight Planning Service (MAFPS); 2) Air Mobility Command (AMC) Transition; and 3) Special Mission Air Combat Command, Combat Search and Rescue (SMACC CSAR). These projects, and their associated platforms, are now included in the overarching program known

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	
<p>as MPS Inc 5 to improve transparency and oversight. As such, MPS Inc 5 is a continuation of efforts previously stated under the development umbrella of the MPS Modernization project. Inc 5, formally an Acquisition Category (ACAT) IAC Program, was reclassified to ACAT III by the Milestone Decision Authority on 17 October 2017.</p> <p>In addition, FY19 funding will continue the MPS Modernization project. It will develop pre-, post-, and in-flight mission planning capabilities for Air Force aircraft Global Positioning System (GPS) and weapons migrating from legacy mission planning systems to the Joint Mission Planning System (JMPS), as well as, continuing to provide new capabilities and updates for Air Force platforms/weapon systems that have already migrated to JMPS. These platforms/weapon systems include, but are not limited to, the B-1, EC-130, E-3, E-8, F-15, F-16, F-22A, RC-135, and their associated weapons (e.g., Small Diameter Bomb (SDB), Joint Direct Attack Munitions (JDAM), Joint Air-to-Surface Standoff Munitions (JASSM), Network Enabled Weapons (NEW)) Development of NEW modules support the configuration of this class of weapons, thereby; enabling warfighters to enter and execute missions using data links used by US and coalition aircraft. It will support the development of follow on modernization efforts for MAFPS, SMACC CSAR (HC/MC-130, HH-60)and Global Mobility (C-5,C-17,C-130, KC-10, KC-135, KC-46) to be delivered after the initial MPS Inc 5 releases are fielded.</p> <p>Finally, FY19 funding will be utilized to continue the development of the Joint Precision Airdrop System- Mission Planning (JPADS-MP)system in conjunction with the Army. This program includes the JPADS-MP airdrop software (and other system components) to provide a precision airdrop capability for the C-17, C-130 and other selected platforms as necessary and deliver a planning capability for DoD airdrop requirements. It is the primary airdrop mission planning system for all ballistic airdrop missions, as well as, precision guided airdrops that are required when the mission profile or surface-to-air threat assessment warrants a high-altitude and/or standoff precision delivery. JPADS-MP enables high-altitude, precise airdrop delivery to forward ground forces, mitigating surface-to-air threats, reducing risk of Improvised Explosive Device (IED) and insurgent attack on ground convoys. JPADS allows the warfighter to consider weather, terrain, aircraft capabilities, threat, and other data to accurately deliver payloads to keep the warfighter supplied and in the fight.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver Mission Planning 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.</p> <p>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.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	71.785	85.531	75.318	0.000	75.318
Current President's Budget	69.104	85.531	63.653	0.000	63.653
Total Adjustments	-2.681	0.000	-11.665	0.000	-11.665
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-2.681	0.000			
• Other Adjustments	0.000	0.000	-11.665	0.000	-11.665

Change Summary Explanation

The FY2019 funding request was reduced by \$11.665M to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>				Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675302: <i>Precision Aerial Delivery Systems (PADS)</i>	37.431	7.245	8.397	8.845	0.000	8.845	7.021	3.090	1.896	1.931	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission planning involves the creation of a flight plan based on multiple inputs including threats, targets, terrain, weather, aircraft performance capability, and configuration. It is an essential task that must be completed prior to any fixed- or rotary wing aircraft sortie. The planner must have the ability to plan weapon, cargo, passenger, and/or fuel delivery, calculate fuel requirement and assess the route based on known enemy threat location and type. Mission planners must be able to optimize and de-conflict flight routes with other aircraft; review, print and brief the plan; download pertinent flight information to on-board aircraft avionics; and, conduct dynamic/in-flight re-planning as applicable.

This project continues the development of a Joint Precision Airdrop System-Mission Planner (JPADS-MP) capability in conjunction with the Army. JPADS provides a planning capability for DoD airdrop requirements. It is the primary airdrop mission planning system for all ballistic airdrop missions as well as precision guided airdrops that are required when the mission profile or surface-to-air threat assessment warrants a high-altitude and/ or standoff precision delivery. It enables high-altitude, precise airdrop delivery to forward ground forces, while mitigating surface-to-air threats, reducing risk of exposure to Improvised Explosive Devices (IEDs) and insurgent attack on ground convoys. JPADS allows the warfighter to consider weather, terrain, aircraft capabilities, threat, and other data to accurately deliver payloads to combat and other friendly forces.

Consolidated Airdrop Tool (CAT) is the key JPADS-MP software deliverable. It will increase the accuracy of airdrop mission planning by improving aircraft, payload, and chute specific calculations along with weather analysis visualization tools specifically adapted for airdrop. Future initiatives are designated to achieve automation of airdrop planning and execution to reduce task saturation in the cockpit and support Air Mobility Command's (AMC) objective of moving to a two-man cockpit. These efforts include the ability to automatically receive and use real-time winds in any location, calculation of a release point and airdrop in a single pass, the ability to conduct real-time objective area analysis to calculate probable damage estimates and execute dynamic re-tasking, the ability to conduct post-drop assessments, and the implementation of new technologies (e.g. Service Oriented Architecture (SOA) Touch Screen environment).

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.

FY19 funding continues CAT v6.x and 7.x while beginning 8.x development and testing to provide precision and conventional airdrop capabilities including, but not limited to, Airdrop Damage Estimate (ADE), 3D Hazard and obstruction data for guided delivery system navigation, automation for aircrew in-flight airdrop workflow, Extracted Container Delivery Systems (ExCDS), data services to multiple mission planning devices, and calculations to maximize payload impact success on drop zones.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver Mission Planning 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 2017	FY 2018	FY 2019
Title: JPADS-MP Phase I	7.245	8.397	8.845
Description: Continues development of a JPADS capability for precise, high altitude delivery of material to forward ground forces.			
FY 2018 Plans:			
- Complete testing and field CAT v4.1, v4.2 and v5.0			
- Continue development of CAT v6.x which will include but is not limited to: Failure Footprint and Impact Point optimization, Software User Notifications, JPADS Mission Reconstruction, the addition of new canopy types for the Automated Guidance Unit (AGU). Percent Success Zone, and Date Interface development/optimization			
- Begins development of CAT v7.x, which includes but is not limited to: Visual Navigation and GPS Coverage, Software User Notifications, HUD/SCNS Display/Workflow, Wind Transfer to the AGU, Dry Pass, LT-ADE Integration, initial tablet capabilities, Ensemble Weather and Kalman Filter implementation.			
FY 2019 Plans:			
- Will complete operational testing of CAT v6.x for fielding in FY19			
- Will continue development and testing of CAT v7.x			
- Will begin development of CAT v8.x, which includes but is not limited to: Hazard Avoidance, HALO for JAPADS, Run-n Planning; Terrain Effects, Simulations for Training and Mission Rehearsal, Workflow Updates, and Optimum Dropsonde Release			
FY 2018 to FY 2019 Increase/Decrease Statement:			
\$0.500M increase as CAT 6.x, 7.x and 8.x have overlapping development and test in FY19.			
Accomplishments/Planned Programs Subtotals	7.245	8.397	8.845

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 833170: <i>Mission Planning Systems</i>	13.330	15.486	14.263	-	14.263	16.738	16.754	16.492	16.785	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>

D. Acquisition Strategy

The MPS PADS efforts are developed and fielded using a variety of contracting instruments. Efforts to accomplish activities such as software development, systems engineering and integration, training, and support are completed using competitively awarded contracts (e.g. Cost Plus Award Fee (CPAF), Fixed Price (FP)).

Program Management Administration (PMA) contracts are awarded competitively and consist of various types of contracts at various locations.

MITRE, a Federally Funded Research and Development Center (FFRDC) contractor, provides technical support via a no fee for service contract.

Other efforts are accomplished using Purchase Orders (PO) and Military Interdepartmental Purchase Requests (MIPR).

For the efforts listed above, the Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) is the Contracting Authority and provides Contracts, Legal, and Comptroller Support.

Air Force Program Executive Officer (PEO) for Battle Management (AFPEO/BM) is the PEO and Milestone Decision Authority (MDA) for the PADS 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0208006F / Mission Planning Systems				675302 / Precision Aerial Delivery Systems (PADS)								
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Software Development	MIPR	Various : Various	22.859	6.035	Nov 2016	6.159	Nov 2017	6.569	Nov 2018	-		6.569	Continuing	Continuing	-	
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	6.060	0.716	Jan 2017	1.377	Jan 2018	1.404	Jan 2019	-		1.404	Continuing	Continuing	-	
Subtotal			28.919	6.751		7.536		7.973		-		7.973	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Cost Estimating	C/T&M	Quantech Services : Lexington, MA	0.090	0.064	Nov 2016	0.027	Nov 2017	-		-		-	0.000	0.181	0.181	
Subtotal			0.090	0.064		0.027		-		-		-	0.000	0.181	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Type I Training	C/FP	Spiral Solutions & Technologies : Bellevue, NE	2.172	0.000		-		-		-		-	0.000	2.172	2.172	
Subtotal			2.172	0.000		-		-		-		-	0.000	2.172	N/A	
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Administration	Various	Various : Various	6.250	0.430	Nov 2016	0.834	Nov 2017	0.872	Nov 2018	-		0.872	Continuing	Continuing	-	
Subtotal			6.250	0.430		0.834		0.872		-		0.872	Continuing	Continuing	N/A	

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Precision Aerial Delivery Systems (PADS)																												
JPADS-MP CAT v4.1 Development and Testing	■																											
Testing of CAT v4.2				■	■	■	■																					
Testing of CAT v5.0				■	■	■	■																					
JPADS-MP CAT v4.1 Fielding (C-17)					■	■	■																					
JPADS-MP CAT v4.2 Fielding					■	■	■																					
JPADS-MP CAT v5.0 Fielding						■	■																					
JPADS-MP CAT v6.x Development and Testing					■	■	■	■	■	■	■	■																
JPADS-MP CAT v6.x Fielding												■	■															
JPADS-MP CAT v7.x Development and Testing																												
JPADS-MP CAT v7.x Fielding																												
JPADS-MP CAT v8.x Development and Testing																												
JPADS-MP CAT v8.x Fielding																												
JPADS-MP CAT v9.x Development and Testing																												
JPADS-MP CAT v9.x Fielding																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Precision Aerial Delivery Systems (PADS)</i>				
JPADS-MP CAT v4.1 Development and Testing	1	2017	1	2017
Testing of CAT v4.2	4	2017	1	2018
Testing of CAT v5.0	4	2017	2	2018
JPADS-MP CAT v4.1 Fielding (C-17)	1	2018	2	2018
JPADS-MP CAT v4.2 Fielding	1	2018	2	2018
JPADS-MP CAT v5.0 Fielding	2	2018	2	2018
JPADS-MP CAT v6.x Development and Testing	1	2018	4	2019
JPADS-MP CAT v6.x Fielding	4	2019	4	2019
JPADS-MP CAT v7.x Development and Testing	4	2018	3	2020
JPADS-MP CAT v7.x Fielding	3	2020	3	2020
JPADS-MP CAT v8.x Development and Testing	4	2019	3	2021
JPADS-MP CAT v8.x Fielding	3	2021	3	2021
JPADS-MP CAT v9.x Development and Testing	3	2021	4	2023
JPADS-MP CAT v9.x Fielding	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>				Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675380: <i>Mission Planning Systems (MPS) Modernization</i>	353.665	57.480	76.316	54.808	0.000	54.808	74.110	87.244	83.837	89.403	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission planning involves the creation of a flight plan based on multiple inputs including threats, targets, terrain, weather, aircraft performance capability, and configuration. It is an essential task that must be completed prior to any fixed- or rotary wing aircraft sortie. The planner must have the ability to plan weapon, cargo, passenger, and/or fuel delivery, calculate fuel requirements, and assess the route based on known enemy threat location and type. Mission planners must be able to optimize and de-conflict flight routes with other aircraft; review, print and brief the plan; download pertinent flight information to on-board aircraft avionics; and, conduct dynamic/in-flight re-planning as applicable. This project focuses on modernizing MPS to support Combat Air Forces (CAF) and Mobility Air Forces (MAF), including the development, test and sustainment of Mission Planning Environments (MPEs) to support the B-1, C-5, C-17, C-130, HC-130, EC-130, E-3, E-8, F-15, F-16, F-22A, KC-10, KC-46, KC-135, RC-135, HH-60 other platforms, Framework (FW) and all Common Component (CCs) software tools for mission requirements. Activities also include studies and analysis to support both current program planning and execution and future program planning. MPS Modernization efforts are as follows:

1) CAF MPS Modernization: These development efforts modernize CAF Mission Planning Environments (MPEs). The modernization effort will provide new and improved mission planning capability for individual Operational Flight Program (OFF) requirements, such as new weapons, avionics upgrades, communications systems, etc. The OFFs requiring MPE updates under the CAF modernization effort include, but are not limited to, B-1 (Sustainment Blocks 15, 16, 16a, 17, 17a and 18), F-15 (Suites 7, 8, 9 and 10) and F-22 (Increments 3.2B, 3.2M, and 4.0). CAF modernization also includes updates to mission planning capabilities supporting associated weapons including, but not limited to, Small Diameter Bomb (SDB-II), Joint Direct Attack Munitions (JDAM) and the Joint Air-to-Surface Standoff Missile (JASSM). Finally, CAF modernization will address required improvements to CAF related JMPS MPE CCs, including Weapon Planning Software (WPS), Electronic Warfare CC (EWCC), GPS Crypto (including GPS M-code), Weather CC, etc. CAF MPE Modernization includes, but is not limited to, the following platform efforts:

a. F-15 Modernization Phase II & III: This modernization program consists of multiple software development efforts driven by OFF updates for F-15 Suites 7, 8, and 9.X. Suite 7-9 MPE capabilities include, but are not limited to, Data Transfer Device (DTD) improvements, updates for new features in weapons such as Joint Direct Attack Munition (JDAM), Small Diameter Bomb I and II (SDB I and II), AIM-9X, AIM-120D, and Network Enable Weapon support elements (e.g. key handling, weapon data link and Link 16). It will also include enhancements to the synthetic aperture radar planning tool (SAR-PT) and the global area reference tool as well as radar modernization updates (e.g. combat identification, radar planning tool enhancements). Development efforts for F-15 Suite 8 include, but are not limited to, integration of B61 Life Extension Program (LEP), feature updates for several weapons, and the expansion of Link-16 messages sets. F-15 Suite 9 MPE will include a variety of updates and enhancements for weapons and aircraft systems to include, but are not limited to, Eagle Passive Active Warning Survivability System (EPAWSS), a new Advanced Dual Core Process II (ADCP-II) computer as well as Digital Transfer Device/Modules (DTD/DTM) modernization.

b. F-16 Block 40/50 Modernization Phases I&II: The F-16 Block 40/50 modernization completed fielding and transitioned to full sustainment the 2Q of FY17.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>
<p>c. F-22 Modernization Phase I: The F-22 Modernization program includes OFP-driven software updates v13.1, v14.0 and v14.1. These enhancements include, but are not limited to, the addition of improved capabilities for the AIM-9X and AIM-120D, the incorporation of additional electronic protection tasks, combat identification improvements, addition of an Inter-flight Data Link Gateway, Mode 5 IFF and Combat ID updates, and incorporation of the synthetic aperture radar planning tool. Additionally, other new and emerging OFP-generated requirements will be addressed as identified by the operational user(s). Other Common Component (CC) updates will also be completed as required.</p> <p>d. B-1 Modernization Phase I&II: The B-1 Modernization program includes OFP-driven software updates for Releases 7.0, 8.0, 9.0 and 11.0. It will incrementally update the platform MPE and provide for integration with the Reliability and Maintainability Improvement Program (RMIP)/Inertial Navigation System Replacement (INSR), Laptop Computer Targeting Pod Phase 2 (LCTP), Integrated Battle Station (IBS) elements (including Fully Integrated Data Link(FIDL)/Visual Situation Display Upgrade (VSDU)), Central Integrated Test System Upgrade (CITS), and related follow on enhancements. Additionally, it will migrate the B-1 MPE to the Windows 10 operating system and convert the B-1 Unit Planning Component (UPC) Visual Basic (VB) code to C# .NET.</p> <p>2) MAF MPS Modernization: These development efforts modernize MAF MPEs. The modernization effort will provide new and improved mission planning capability for individual Operational Flight Program (OFP), Global C2, and AMC fuel efficiency requirements.</p> <p>3) The SMACC Modernization Program includes development, testing, and fielding of MP software for the E-3 DRAGON, E-3/E-8, RC-135 and EC-130. Combat Search and Rescue (CSAR) is providing a new JMPS capability to the HH-60 and MC/HC aircraft. The follow-on versions continue that development. The MAF Modernization effort builds upon the fielded E-8 MPE to provide new and improved mission planning capabilities for the MAF fleet (e.g. C-5, C-130, KC-10, etc.) as required to meet OFP, fuel efficiency, and global planning net-centric requirements. It includes, but is not limited to, enhanced capabilities to accommodate avionics upgrades, improved communications systems, interfaces with command and control systems, new parachutes, etc. for various MAF platforms. Development efforts also include, but are not limited to, integrating improvements to MAF related Common Components (CCs). Examples of these CCs include, but are not limited to, MAF tools, such as Assault Zone CC and the Air Refueling Tool (ART) CC. CSAR Release 1.1 program began in FY17 modernizing the efforts begun with the CSAR products developed in MPS Inc 5.</p> <p>Mobility Air Forces Automated Flight Planning Service (MAFPS) Phase Two began in FY17. This effort modernizes the MAFPS products developed in Increment 5. This effort completes the development of a centralized/net-centric global mobility flight planning capability, which will provide significant fuel savings through automated flight route, airspeed, and altitude optimization utilizing aircraft performance, air traffic management, weather, and other data.</p> <p>Test, Training, and Certification: Continues all MPS-related integration, test, and certification activities for all CAF and MAF platforms.</p> <p>Program Support: Continues all program office management operations and support activities to ensure the timely development, testing, and delivery of mission planning systems to the warfighter.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>		
<p>FY19 funding continues the development and modernization of Mission Planning Environments (MPEs). MAFPS and related planning capabilities for a variety of Air Force aircraft and weapons platforms for the CAF, MAF, and other operational users. The modernization programs will be closely aligned and compatible with the capabilities being developed for the platforms within their respective and regularly scheduled Operational Flight Programs (OFPs).</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver Mission Planning 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.</p> <p>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.</p>				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Title: F-15 Modernization Phase II and III</p> <p>Description: Continues the modernization of previously fielded F-15 Mission Planning Environments (MPEs) to enable efficient use of new and improved capabilities being developed in platform Operational Flight Programs (OFPs).</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Complete Developmental Testing (DT) and Operation Testing (OT) of MPE v4.1. MPE v4.1 will support SDB-II OT and B61-12 in FY18, deficiencies found in v4.0 and Suite 8E and Suite 7 requirements. - Continue development of MPE v5.0 which includes: Digital Transfer Device/Modules (DTD/DTM) modernization Radar library updates MIDS-JTRS upgrade - Continue to work requirements and begin development for MPE v6.0 with focus on systems interfacing with the OFP and EPAWSS <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Will complete FQT and DT on MPE v5.0 - Will continue requirements definition and development of MPE v6.0 <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$3.4M decrease, with the ramp down of Ph II and the slow ramp up of Ph III in FY19. F-15 MPE is build to budget. Requirements fluctuate slightly from year to year based on changing F-15 SPO requirements</p>		11.548	14.751	11.265
Title: F-22 Modernization Phase I and II		11.418	7.313	9.148

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Description: Continues the modernization of previously fielded F-22 MPEs to enable efficient use of new and improved capabilities being developed in the OFPs.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Complete Developmental Testing (DT) & Operational Testing (OT) for v13.1 - Continue development for MPE v14.0 - MPE v14.0 will be built from the v13.1 baseline and will integrate with requirements established through OFP Inc 3.2M and will consist of Link 16 Transmit - v14.1 will consist of planning for Mode 5 IFF and Combat ID updates and electronic protection and embedded training which will incorporate electronic protection, combat ID <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Complete FQT of v14.0 - Complete DT of v14.0 - Field v13.1 Update 6 - Complete CDR for v14.0 <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$1.8M increase: F-22 MPE is build to budget. Requirements fluctuate slightly from year to year based on changing F-22 SPO requirements.</p>			
<p>Title: B-1 Modernization Phase I and II</p> <p>Description: Continues the modernization of previously fielded B-1 MPEs to enable efficient use of new and improved capabilities being developed in the OFPs.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Incorporate FIDL Editor and Draw File into Release 9.0 - Award new Delivery Order (DO) for Release 11.0 - Continue development of Release 9.0 - Continue development of LRASM - Perform Final Quality Test (FQT) - Field Release 9 - Formalize Developmental Test (DT) and scenario testing <p>FY 2019 Plans:</p>	12.925	14.783	12.083

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Will continue development of LRASM - Will continue development of Release 11 <p>FY 2018 to FY 2019 Increase/Decrease Statement: \$2.7 decrease: B-1 MPE is build to budget. Requirements fluctuate slightly from year to year based on changing B-1 SPO / requirements.</p>				
<p>Title: MAF Modernization</p> <p>Description: Develops the KC-46 JMPS Mission Planning Environment (MPE). In addition, develop, test, and field the follow on modernization of the Global Mobility (GM) 100 series MPE previously fielded under MPS Inc 5 (e.g. modernization efforts to begin as the GM 200 series) to account for changes in aircraft operational flight profiles account for changes in aircraft operational flight profiles (OFPs) and Global Command and Control Changes.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Complete GM 1.4 (KC-46) development, formal qualification testing, and initiate formal Government developmental testing <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Will complete both operational testing and fielding for the GM 1.4 (KC-46) MPE - Begin development of the GM 200 series <p>FY 2018 to FY 2019 Increase/Decrease Statement: Program increase as KC-46 testing is winding down but MAF Modernization (GM 200 series) is in development and will enter test.</p>		5.855	10.614	5.974
<p>Title: Special Mission ACC (SMACC)</p> <p>Description: Continues the modernization of previously fielded mission planning software environments for the E-3, E-8, E-4, EC-130, and RC-135. In addition, continues modernization efforts for the Inc 5 follow on for SMACC CSAR.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Complete developmental testing, operational testing, and fielding decision for RC-135 V3.2 - Start development of RC-135 V 3.3 - Begin development of E-3/E-8 v2.1.1 - Complete development and testing of EC-130H v2.0 - Complete testing and fielding decision for E-3 DRAGON - Continue development and testing of CSAR v1.1 including an agile development release in the 4th Quarter <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Complete testing and fielding decision for RC-135 V 3.3 		13.190	16.442	15.055

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Start development of RC-135 V 3.4 - Continue development activities for E-3/E-8, and the EC-130 - Continue testing and fielding of CSAR v1.1 agile releases <p>FY 2018 to FY 2019 Increase/Decrease Statement: There is a slight decrease in FY19. This was due to FY18 being in a peak year with all four SMACC aircraft being in development modifications at the same time.</p> <p>Title: MAF Automated Flight Planning Service (MAFPS)</p> <p>Description: Develops a centralized/net-centric global mobility flight planning capability, which will provide significant fuel savings through automated flight route, airspeed, and altitude optimization utilizing aircraft performance, air traffic management, weather, and other data.</p> <p>FY 2018 Plans: - Continue development activities for Release 2 through Critical Design Review and developmental and operational testing.</p> <p>FY 2019 Plans: - Complete testing and field Release 2</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Program funding decrease in FY19 as the major development and test activities were completed in FY18</p>	2.544	12.413	1.283
Accomplishments/Planned Programs Subtotals	57.480	76.316	54.808

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 833170: <i>Mission Planning Systems</i>	9.539	9.403	9.345	-	9.345	9.511	9.681	9.857	-	Continuing	Continuing

Remarks

D. Acquisition Strategy
MPS Modernization consists of multiple capability upgrades across multiple platforms that are developed and fielded using a variety of contracting instruments. The Air Force Life Cycle Management Center at Hanscom AFB AFLCMC/HB) competitively awarded multiple ID/IQ (Indefinite Delivery/Indefinite Quantities) contracts for software development. Currently there are five (5) contractors, one of which is Small Business set aside, who are qualified sources. Each Delivery Order (DO) is competed among the five contractors. Efforts to accomplish program activities such as software development, systems engineering and integration, training, and

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support are competitively awarded using a variety of contract types (e.g. Cost Plus Award Fee (CPAF), Fixed Price (FP), Fixed Price Incentive Fee (FPIF)). Program Management Administration (PMA) contracts are awarded competitively and consist of various types of contracts at various locations. Mitre, a Federally Funded Research and Development Center (FFRDC) contractor provides technical support on a no fee for service contract. Other efforts are accomplished via Purchase Orders (PO) and Military Interdepartmental Purchase Requests (MIPR). For the efforts listed above, the Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) provides program management, contracts, legal, and financial management support. Air Force Program Executive Officer (PEO) for Battle Management (AFPEO/HB) is the PEO and Milestone Decision Authority (MDA) for all MPS Modernization projects (with the exception of those efforts that make up MPS Inc 5 for which the Under Secretary of Defense, Acquisition, Technology, and Logistics is the MDA).

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mission Planning Software Development (MPEC II)	C/Various	Various : Various	131.073	16.667	Nov 2016	29.977	Nov 2017	15.237	Nov 2018	-		15.237	Continuing	Continuing	-
A-10 Modernization	PO	Organic : Hill AFB, UT	1.917	-		-		-		-		-	0.000	1.917	1.917
F-16 Modernization	PO	Organic : Hill AFB, UT	17.961	-		-		-		-		-	0.000	17.961	17.961
EC-130H Modernization	PO	Organic : Robins AFB, GA	4.704	1.011	Jan 2017	1.031	Jan 2018	1.051	Jan 2019	-		1.051	Continuing	Continuing	-
F-22 MilCloud SIL	MIPR	GSA : Washington, DC	0.105	0.459	Dec 2016	-		-		-		-	0.000	0.564	0.564
MAF AMC Transition Tools	MIPR	AMCOM : Redstone Arsenal, AL	4.632	-		-		-		-		-	0.000	4.632	4.632
SMACC CSAR Tools	MIPR	Various : Various	3.997	1.368	Jan 2017	3.173	Jan 2018	2.497	Jan 2019	-		2.497	Continuing	Continuing	-
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	51.441	8.531	Jan 2017	8.367	Jan 2018	8.535	Jan 2019	-		8.535	Continuing	Continuing	-
Framework	C/FPIF	Northrop Grumman : Herndon, VA	8.748	5.991	Jan 2017	10.835	Jan 2018	8.060	Jan 2019	-		8.060	Continuing	Continuing	-
Common Components	C/Various	Various : Various	38.200	8.679	Nov 2016	6.328	Nov 2017	4.844	Nov 2018	-		4.844	Continuing	Continuing	-
Subtotal			262.778	42.706		59.711		40.224		-		40.224	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Software Engineering	C/T&M	SEI : Pittsburgh, PA	0.080	0.000		-		-		-		-	0.000	0.080	0.080
Cost Estimating	C/T&M	Tecolote Inc : Goleta, CA	1.219	0.162	Nov 2016	0.202	Nov 2017	0.021	Nov 2018	-		0.021	Continuing	Continuing	-
Subtotal			1.299	0.162		0.202		0.021		-		0.021	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Responsible Test Organization (RTO)	PO	46TS : Eglin AFB, FL	29.330	3.882	Dec 2016	4.246	Dec 2017	3.775	Dec 2018	-		3.775	Continuing	Continuing	-
Certification and Accreditation	MIPR	JITC : Fort Huachuca, AZ	0.164	0.090	Feb 2017	0.123	Feb 2018	0.115	Feb 2019	-		0.115	Continuing	Continuing	-
Type I Training	C/FP	Summit Technologies Inc : Winter Park, FL	4.567	0.777	Jul 2017	1.212	Jul 2018	1.004	Jul 2019	-		1.004	Continuing	Continuing	-
Field Representative Hardware	C/Various	Various : Various	0.589	0.193	Nov 2016	0.421	Nov 2017	0.164	Nov 2018	-		0.164	Continuing	Continuing	-
Subtotal			34.650	4.942		6.002		5.058		-		5.058	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Support	RO	MITRE Corp : Bedford, MA	17.124	3.231	Oct 2016	4.066	Oct 2017	0.475	Oct 2018	-		0.475	Continuing	Continuing	-
Program Management Administration	Various	Various : Various	37.814	6.439	Nov 2016	6.335	Nov 2017	9.030	Nov 2018	-		9.030	Continuing	Continuing	-
Subtotal			54.938	9.670		10.401		9.505		-		9.505	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	353.665	57.480	76.316	54.808	-	54.808	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Mission Planning Systems (MPS) Modernization																												
F-15 v4.0 Fielding			■																									
F-15 v4.1 Fielding							■																					
F-15 v4.2 Fielding											■																	
F-15 v5.0 Fielding																												
F-15 v6.0 Fielding																												
F-16 Blk 40/50 M7.1 Fielding	■	■																										
F-16 Blk 40/50 M7.2 Fielding																												
F-22 v13.1 Fielding																												
F-22 v14.0 Fielding																												
B-1 Release 9 Fielding																												
B-1 Release 11 Fielding																												
SMACC E-3/ E-8 Release 2.1 Fielding																												
SMACC E-3/E8 Release 2.4 Fielding																												
SMACC E-3/E8 Release 2.5 Fielding																												
SMACC EC-130H Release 2.0																												
SMACC EC-130H Release 2.1 Fielding																												
SMACC EC-130H Release 2.2 Fielding																												
SMACC EC-130H Release 2.3 Fielding																												
SMACC EC-130H Release 2.4 Fielding																												
SMACC E-3 DRAGON Release 3 Fielding																												
SMACC E-3 DRAGON Release 3.1 Fielding																												
SMACC E-3 DRAGON Release 3.2 Fielding																												
SMACC E-3 DRAGON Release 3.3 Fielding																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	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				
SMACC E-3 DRAGON Release 3.4 Fielding																																
SMACC RC-135 Release 3.2 Fielding																																
SMACC RC-135 Release 3.3 Fielding																																
SMACC RC-135 Release 3.4 Fielding																																
SMACC CSAR v1.1 (Rel 3)																																
SMACC CSAR v1.1 (Rel 5)																																
GM 1.4 (KC-46) Release 1 Fielding																																
GM 2.0 Release Fielding																																
MAFPS Release 2 Fielding																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Mission Planning Systems (MPS) Modernization</i>				
F-15 v4.0 Fielding	3	2017	3	2017
F-15 v4.1 Fielding	3	2018	3	2018
F-15 v4.2 Fielding	1	2019	1	2019
F-15 v5.0 Fielding	4	2019	4	2019
F-15 v6.0 Fielding	3	2020	3	2020
F-16 Blk 40/50 M7.1 Fielding	1	2017	2	2017
F-16 Blk 40/50 M7.2 Fielding	3	2019	3	2019
F-22 v13.1 Fielding	4	2018	4	2018
F-22 v14.0 Fielding	1	2020	1	2020
B-1 Release 9 Fielding	2	2018	2	2018
B-1 Release 11 Fielding	3	2020	3	2020
SMACC E-3/ E-8 Release 2.1 Fielding	2	2019	2	2019
SMACC E-3/E8 Release 2.4 Fielding	1	2021	1	2022
SMACC E-3/E8 Release 2.5 Fielding	1	2022	1	2022
SMACC EC-130H Release 2.0	4	2018	4	2018
SMACC EC-130H Release 2.1 Fielding	4	2019	4	2019
SMACC EC-130H Release 2.2 Fielding	4	2020	4	2020
SMACC EC-130H Release 2.3 Fielding	4	2021	4	2021
SMACC EC-130H Release 2.4 Fielding	4	2022	4	2022
SMACC E-3 DRAGON Release 3 Fielding	3	2018	3	2018
SMACC E-3 DRAGON Release 3.1 Fielding	3	2021	3	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SMACC E-3 DRAGON Release 3.2 Fielding	1	2022	1	2022
SMACC E-3 DRAGON Release 3.3 Fielding	2	2023	2	2023
SMACC E-3 DRAGON Release 3.4 Fielding	4	2023	4	2023
SMACC RC-135 Release 3.2 Fielding	4	2018	1	2019
SMACC RC-135 Release 3.3 Fielding	4	2019	4	2020
SMACC RC-135 Release 3.4 Fielding	4	2020	4	2021
SMACC CSAR v1.1 (Rel 3)	4	2018	4	2018
SMACC CSAR v1.1 (Rel 5)	2	2019	2	2019
GM 1.4 (KC-46) Release 1 Fielding	4	2019	4	2019
GM 2.0 Release Fielding	3	2020	3	2020
MAFPS Release 2 Fielding	3	2019	3	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>				Project (Number/Name) 675385 / <i>MPS Increment 5</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
675385: <i>MPS Increment 5</i>	0.000	4.379	0.818	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.197
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior costs for Inc 5 is \$59.9M and are included in Project 675380 as those programs were under MPS Modernization. Total Cost for Inc 5 in Project 675385 is \$5.197 this does not include TWCF.

A. Mission Description and Budget Item Justification

MPS Inc 5 will complete the initial migration of select Air Force platforms from their legacy planning systems to Joint Mission Planning System (JMPS). It will complete development and begin Operational Testing (OT) of three efforts originally started as separate and individual projects within the MPS Modernization development effort. Those projects are:

- 1) Mobility Air Forces Automated Flight Planning Service (MAFPS);
- 2) Air Mobility Command (AMC) Transition; and
- 3) Special Mission Air Combat Command, Combat Search and Rescue (SMACC CSAR)

These projects, and their associated platforms, comprise the overarching program known as MPS Inc 5.

Specific capabilities include but are not limited to the following:

A. Mobility Air Forces Automated Flight Planning Service (MAFPS): The MAFPS component to MPS Inc 5 provides modern flight planning service compliant with current and emerging airspace and air traffic control constraints. Central to the program is an improved route and fuel optimizer. MAFPS replaces the legacy Advanced Computer Flight Planning (ACFP) system. Warfighter benefits include:

- Flight planning calculations for Tanker Airlift Control Center (TACC)-managed missions and AMC aircraft
- Produce and graphically display optimum mission routes, fuel calculations, and aerial refueling activity
- Calculate optimized fuel loads to include Cost Indexing
- Graphical user interface and capability to dynamically re-compute flight plans

B. AMC Transition: The AMC Transition to MPS component will migrate selected Airlift (C-17, C-5), Tanker (KC-135, KC-10) and Air Drop (C-17, C-130) platforms from their legacy Portable Flight Planning Systems (PFPS) mission planning systems which is sun setting at the end of FY2020. Additional warfighter benefits include:

- Color moving map (Digimap) Common Component
- Enhanced Air Refueling Common Component

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675385 / <i>MPS Increment 5</i>
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- Aircraft Flight Performance Module (FPM)/Take-Off and Landing Data (TOLD)/ Vehicle Install Package (VIP) Development
- Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) certified navigation avionics images

C. Special Missions Air Combat Command (SMACC) Combat Search and Rescue (CSAR): This development effort will migrate the CSAR community (HH-60, HC/MC-130 aircraft) from PFPS to the MPS environment. Warfighter benefits include:

- Ability to support a spectrum of missions ranging from simple day-to-day training and proficiency flying to peacetime operational/exercise sorties
- Rapid mission planning
- Mission data transfer to the aircraft via DTD
- In flight situational awareness

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

	FY 2017	FY 2018	FY 2019
<p>Title: MPS Increment 5</p> <p>Description: MPS Inc 5 continues and completes the development of: 1) Mobility Air Forces Automated Planning Service (MAFPS) system; 2) AMC Transition; and 3) Special Mission Air Combat Command, Combat Search and Rescue (SMACC CSAR).</p> <p>FY 2018 Plans: MAF Automated Flight Planning Service (MAFPS): - Will complete MAFPS Release 1 operational testing and provide the release recommendation to the in the AMC enclaves.</p> <p>AMC Transition: - Will complete operational testing and field the C-17 Mission Planning Environment (MPE). - Will complete development and Government developmental testing (DT) for the release that transitioning the remaining Air Mobility Command platforms to JMPS, (Global Movility Release 1.3.300; C-130, C-5, KC-10 and KC-135). - Will develop, test, and field C-17 Sustainment Release.</p> <p>SMACC CSAR: - Will complete the development and integration of the CSAR tools (Search Pattern, Fuel Analysis, and Survivor Broadcast) into the CSAR MPE, developmental testing and; conduct operational testing, for the HH-60 and HC/MC-130.</p> <p>FY 2019 Plans: Complete testing and field CSAR and Global Mobility 1.3.300. This effort was originally programmed and planned in FY18 with FY18 funding. Recent slips have shifted approximately \$300k of effort into FY19. This effort will be budgeted as originally planned.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	4.379	0.818	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675385 / <i>MPS Increment 5</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
There is no funding in FY19 as development is completed as planned in FY18 with FY18 funding.			
Accomplishments/Planned Programs Subtotals	4.379	0.818	0.000

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

N/A

Remarks

D. Acquisition Strategy

MPS Inc 5 will reach the Full Deployment Decision (FDD) by the second quarter of FY18 upon successful completion of the C-17 release testing and fielding release recommendation to AMC.

MPS Inc 5 consists of multiple capability upgrades across multiple platforms that are developed and fielded using a variety of contracting instruments. It leverages strategies and efforts originally established under MPS Increment IV and MPS Modernization. The Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) competitively awarded multiple ID/IQ (Indefinite Delivery/Indefinite Quantities) contracts for software development. Currently there are 5 qualified contractors, one of which is Small Business set aside, and each Delivery Order (DO) is competed among the 5 contractors.

Efforts to accomplish program activities such as software development, systems engineering and integration, training, and support are competitively awarded using a variety of contract types (e.g. Cost Plus Award Fee (CPAF), Fixed Price (FP), Fixed Price Incentive Fee (FPIF)).

Program Management Administration (PMA) contracts are awarded competitively and consist of various types of contracts at various locations.

MITRE, a Federally Funded Research and Development Center (FFRDC) contractor provides technical support on a no fee for service contract.

Other efforts are accomplished via Purchase Orders (PO) and Military Interdepartmental Purchase Requests (MIPR).

For the efforts listed above, the Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) provides program management, contracting, 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675385 / <i>MPS Increment 5</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mission Planning Software Development (MPEC II)	C/CPIF	DCS Corporation : Alexandria, VA	0.000	0.965	Nov 2016	0.050	Nov 2017	-		-		-	0.000	1.015	0.388
HH-60/HC-130J/N/P Release 1	PO	Organic : Robins AFB, GA	0.000	0.148	Nov 2016	0.021	Nov 2017	-		-		-	0.000	0.169	0.169
SM-ACC CSAR Tools	MIPR	Various : Various	0.000	0.296	Dec 2016	-		-		-		-	0.000	0.296	0.296
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	0.000	0.931	Jan 2017	0.271	Jan 2018	-		-		-	0.000	1.202	1.202
Air Refueling Tool	C/FFP	Navy Mission Planning Systems : Point Mugu, CA	0.000	0.359	Feb 2017	-		-		-		-	0.000	0.359	0.359
Subtotal			0.000	2.699		0.342		-		-		-	0.000	3.041	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cost Estimating	C/T&M	Tecolote Inc. : Goleta, CA	0.000	0.028	Nov 2016	-		-		-		-	0.000	0.028	0.028
Subtotal			0.000	0.028		-		-		-		-	0.000	0.028	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Responsible Test Organization (RTO)	PO	46TS : Eglin AFB, FL	0.000	0.301	Dec 2016	0.104	Dec 2017	-		-		-	0.000	0.405	0.405
Type I Training	C/FP	Spiral solutions & Technologies, Inc. : Bellevue, NE	0.000	0.266	Jan 2017	0.104	Jan 2018	-		-		-	0.000	0.370	0.370
Subtotal			0.000	0.567		0.208		-		-		-	0.000	0.775	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675385 / <i>MPS Increment 5</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Support	RO	MITRE Corp. : Bedford, MA	0.000	0.796	Nov 2016	0.170	Nov 2017	-		-		-	0.000	0.966	0.966
Program Management Administration	C/CPFF	Odyssey Systems Consulting Group, LTD. : Wakefield, MA	0.000	0.289	Nov 2016	0.098	Nov 2017	-		-		-	0.000	0.387	0.387
Subtotal			0.000	1.085		0.268		-		-		-	0.000	1.353	N/A
Project Cost Totals			0.000	4.379		0.818		-		-		-	0.000	5.197	N/A

Remarks
 Prior costs for Inc 5 is \$59.9M and are included in Project 675380 as those programs were under MPS Modernization. As well as cost to complete for Inc 5 of \$5.168 are in Project 675380. Total Cost for Inc 5 in Project 675385 is \$5.197 this does not include TWCF (Transportation Capital Working Fund).

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675385 / <i>MPS Increment 5</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>MPS Increment 5</i>																												
MAFPS Release 1 Fielding																												
AMC Transition C-17 Release 1 Fielding																												
AMC Transition (GM 1.3.300)																												
CSAR Rel 1.0																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675385 / <i>MPS Increment 5</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MPS Increment 5</i>				
MAFPS Release 1 Fielding	1	2018	3	2018
AMC Transition C-17 Release 1 Fielding	1	2018	2	2018
AMC Transition (GM 1.3.300)	3	2019	4	2019
CSAR Rel 1.0	1	2018	1	2018

Note
Complete testing and field CSAR and Global Mobility 1.3.300. This effort was originally programmed and planned in FY18 with FY18 funding. Recent slips have shifted approximately \$300k of effort into FY19. This effort will be budgeted as originally planned.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208007F / <i>Tactical Deception</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	3.761	6.949	0.000	6.949	7.446	3.474	0.497	0.506	Continuing	Continuing
674550: <i>Air Base Resiliency</i>	-	0.000	3.761	6.949	0.000	6.949	7.446	3.474	0.497	0.506	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Military Deceptions mission is to execute actions to deliberately mislead adversary military, paramilitary, or violent extremist organization decision makers, thereby causing the adversary to take specific actions (or inactions) that will contribute to the accomplishment of the friendly mission.

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

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	3.761	3.001	0.000	3.001
Current President's Budget	0.000	3.761	6.949	0.000	6.949
Total Adjustments	0.000	0.000	3.948	0.000	3.948
• 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	3.948	0.000	3.948

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

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Title: Non-Kinetic Air Base Defense	-	3.761	6.949	0.000	6.949
Description: Provide non-kinetic air base defense capabilities to include military and civilian personnel to support planning, concept development, experimentation, and operational employment of emerging air base defense capabilities.					
FY 2018 Plans:					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208007F / <i>Tactical Deception</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Provide trained, capable MILDEC planners to combatant commands. FY 2019 Base Plans: Provide trained, capable MILDEC planners to combatant commands. FY 2019 OCO Plans: Funding increased due to requirements. FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to requirements.					
Accomplishments/Planned Programs Subtotals	-	3.761	6.949	0.000	6.949

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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208007F / <i>Tactical Deception</i>	Project (Number/Name) 674550 / <i>Air Base Resiliency</i>
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Non-Kinetic Air Base Defense Development</i>	
Non-Kinetic Defense Development	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208007F / <i>Tactical Deception</i>	Project (Number/Name) 674550 / <i>Air Base Resiliency</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Non-Kinetic Air Base Defense Development</i>				
Non-Kinetic Defense Development	2	2018	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208087F / <i>AF Offensive Cyberspace Operations</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	24.109	39.693	40.526	0.000	40.526	35.178	33.620	33.678	34.292	Continuing	Continuing
670375: <i>Network Warfare Systems and Support</i>	-	24.109	39.693	40.526	0.000	40.526	35.178	33.620	33.678	34.292	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A.1. Mission Description:

AF Offensive Cyberspace Operations (OCO): Includes manpower authorizations, peculiar support equipment, necessary facilities, research, development and testing and the associated costs specifically identified and measureable to the following: development, testing, fielding, operation, maintenance and logistical support of AF Offensive Cyberspace Operations capabilities and systems. Offensive Cyberspace Operations includes but is not limited to activities that through the use of cyberspace, actively gather information from computers, information systems, networks, or manipulate, disrupt, deny, degrade, or destroy targeted computers, information systems, or networks. Offensive Cyberspace Operations include Cyber Operational Preparation of the environment, Offensive Counter-Cyber, cyber attack, and related electronic attack and space control negation.

A.2. Other:

May include expedited development of innovative solutions for existing and emerging technologies.

A.3. Budget Item Justification:

The AF Offensive Cyberspace Operations program develops operations-ready cyberspace superiority capabilities from laboratory, industry, and academia via studies, accelerated prototyping, technology demonstrations, and other Research, Development, Testing and Evaluation (RDT&E) efforts. This program consists of a portfolio of programs and projects called the Offensive Cyber Product Line (OCPL) that contribute to an overall Distributed Cyber Weapons Operations (DCWO) architecture. The OCPL establishes a flexible and balanced approach to the rapid acquisition of operational cyber capabilities. OCPL effectiveness comes from balancing funding among three capability areas required for effective operations: Air Force Platforms, Access and Capabilities.

OCPL provides cyber warfare capabilities to the 24th Air Force in direct support of US Cyber Command (USCYBERCOM), AF Major Commands (MAJCOMs), unified commands, and national agencies. In accordance with AF Policy, the program office develops capabilities in the cyberspace superiority core areas. OCPL efforts also directly support the Joint Network Attack Initial Capabilities Document (ICD), the National Military Strategy for Cyberspace Operations (NMS-CO), the USCYBERCOM operational directives, the latest AF Space Command (AFSPC) Offensive Cyberspace Operations System Flight Plan, and other formal requirements documents. Planned areas of development, prototyping, and technology demonstration will be used to provide warfighters access, platforms, and tools. This includes mission planning, intelligence, cybersecurity products and services and Command and Control/Situational Awareness (C2SA) tools needed to attack enemy networks, telephony, Integrated Air Defense Systems (IADS), command and control systems, and create cyber effects through the Electromagnetic Spectrum (EMS). These advancements

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208087F / <i>AF Offensive Cyberspace Operations</i>
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will be used to develop and deliver AF unique access and cutting-edge technologies to the warfighter. This capability area leverages cyber technology investments by DoD Agencies. Many program activities are protected under AF Network Warfare Special Access Programs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AF Offensive Cyberspace Operations 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.

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	25.025	39.693	40.333	0.000	40.333
Current President's Budget	24.109	39.693	40.526	0.000	40.526
Total Adjustments	-0.916	0.000	0.193	0.000	0.193
• 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	-0.916	0.000			
• Other Adjustments	0.000	0.000	0.193	0.000	0.193

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: Platforms - (Cyber Special Access)	17.455	19.369	12.450
Description: The Cyber Mission Platform (CMP) program is an ACAT III program of record that provides a modular, configurable framework for Cyber Operations. The CMP framework is currently being applied to offensive cyber operations and may also be applied to defensive cyber operations in the future as prioritized by CMP stakeholders. CMP uses an Agile acquisition strategy that allows the USAF to dynamically prioritize the delivery of operational capabilities. Baseline capability deliveries occur every 6 months with the option to field minor releases more rapidly based on user need.			
- Cyber Special Access contains the engineering and technical assistance support services for all of the Offensive Cyber Product Line in FY17 and FY18			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0208087F / <i>AF Offensive Cyberspace Operations</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCP, 210-925-1228</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Complete Contractor Test and Developmental Test of CMP Increment 2 Build 1 - Initiate development of CMP Increment 2 Build 2 with imbedded Agile developmental testing - Accredite and field CMP Increment 2 Build 2 for CRASH HEADER operations - Initiate and complete development of CMP Increment 2 Build 3 to meet prioritized USAF platform requirements - Support Joint Task Force ARES requirements <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Will conduct delta accreditation and Fielding of CMP Increment 2 Build 3 - Will develop, conduct delta accreditation and fielding of CMP Increment 2 Build 4 to meet prioritized USAF platform requirements - Will initiate and complete development of CMP Increment 2 Build 5 to meet prioritized USAF platform requirements <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <ul style="list-style-type: none"> - Funding decreased due to conclusion of FY18 Joint Task Force ARES and their requirements. - Funding decreased due to reallocation of engineering and technical assistance support services for Access - (Cyber Tech Projects) and Capabilities - (Cyber Tech Projects). 				
<p>Title: Access - (Cyber Tech Projects)</p> <p>Description: Access provides operators with the means to enable offensive cyberspace operations.</p> <p>- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO, 210-925-6653</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Develop Air Force unique access and infrastructure programs via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications 		1.716	7.241	7.567

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0208087F / <i>AF Offensive Cyberspace Operations</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Development and delivery of access releases addressing highest priority user requirements to include Electronic Magnetic Spectrum (EMS) requirements - Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO, 210-925-6653 <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Will continue to develop Air Force unique access and infrastructure programs via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications - Will continue development and delivery of access releases addressing highest priority user requirements to include Electronic Magnetic Spectrum (EMS) requirements - Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO,210-925-6653 <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <ul style="list-style-type: none"> - Funding increased due to additional funds required for the AF unique access tools development efforts in FY19 				
<p>Title: Capabilities - (Cyber Tech Projects)</p> <p>Description: The cyber capability area delivers desired effects to the target.</p> <ul style="list-style-type: none"> - Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO, 210-925-6653 <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Develop capability and payload programs via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications - Agile development and delivery of capability releases addressing the highest priority user requirements to include Electronic Magnetic Spectrum (EMS) requirements 		4.135	10.732	18.710

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0208087F / <i>AF Offensive Cyberspace Operations</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO, 210-925-6653</p> <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Will continue to develop capability and payload programs via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications - Will continue to conduct agile development and delivery of capability of tools addressing the highest priority user requirements leveraging industry and DoD-developed applications. - Will acquire required developmental testing capability products prior to fielding - Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO, 210-925-6653 <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <ul style="list-style-type: none"> - Funding increased due to reallocation of engineering and technical assistance support services from Cyber Special Access Platforms and increased tools and Saber Chime development efforts planned in FY19 				
<p>Title: Test & Evaluation (T&E)</p> <p>Description: Test and Evaluation provides both developmental testing of new tool development and a secure network environment for such testing</p> <ul style="list-style-type: none"> - Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO, 210-925-6653 <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Provide the required developmental testing for new platform, access, and capability products prior to fielding - Provide the secure network environment for all tests - Support testing for Joint Task Force ARES requirements 		0.803	2.351	1.799

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208087F / <i>AF Offensive Cyberspace Operations</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO,210-925-6653			
FY 2019 Plans:			
- Will continue to provide the required developmental testing for new platform, access, and capability products prior to fielding			
- Will continue to provide the secure network environment for all tests			
FY 2018 to FY 2019 Increase/Decrease Statement:			
- Funding decreased due to conclusion of FY18 Joint Task Force ARES requirements			
Accomplishments/Planned Programs Subtotals	24.109	39.693	40.526

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 834320: <i>C3 Countermeasures</i>	6.774	16.990	37.329	-	37.329	23.323	22.207	19.949	20.304	Continuing	Continuing
• OPAF 03 Line Item 834010: <i>General Information Technology</i>	1.554	8.781	1.683	-	1.683	1.713	1.743	1.775	1.806	Continuing	Continuing
• OPAF 03 Line Item 831010: <i>COMSEC Equipment</i>	-	-	8.370	-	8.370	2.790	-	-	-	11.131	22.291

Remarks

E. Acquisition Strategy

The Offensive Cyberspace Operations program office will utilize Concept, Development, Risk Management, Production, or Deployment Plans as part of a streamlined approach to acquisition planning. All plans will contain sufficient information for the Milestone Decision Authority (MDA) to determine readiness to enter into the applicable phase of the acquisition process. Offensive Cyberspace Operations will utilize both new and existing contractual vehicles, such as Government-Wide Acquisition Contract (GWAC) vehicles (Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV)), and General Services Administration (GSA) Federal Supply Schedules and a Cyber Indefinite Delivery Indefinite Quantity (IDIQ) contract. The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that should be able to meet many requirements related to Offensive Cyberspace Operations. These multiple-award contractual vehicles have already met the statutory requirements of the Competition in Contracting Act (CICA), which requires a fair opportunity to all contract holders, in accordance with Federal Acquisition Regulation (FAR) 16.505, unless an exception to fair opportunity applies.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208087F / <i>AF Offensive Cyberspace Operations</i>
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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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208087F / AF Offensive Cyberspace Operations	Project (Number/Name) 670375 / Network Warfare Systems and Support
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Platforms - (Cyber Special Access)	C/Variou	Various : Various	-	11.231	Nov 2016	12.947	Dec 2017	9.332	Nov 2018	-		9.332	Continuing	Continuing	-
Access - (Cyber Tech Projects)	Variou	Various : Various	-	1.716	Dec 2016	7.241	Jan 2018	7.567	Jan 2019	-		7.567	Continuing	Continuing	-
Capabilities - (Cyber Tech Projects)	C/Variou	Various : Various	-	4.135	Dec 2016	10.732	Jan 2018	15.075	Jan 2019	-		15.075	Continuing	Continuing	-
Subtotal			-	17.082		30.920		31.974		-		31.974	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test & Evaluation	MIPR	47 CTS : San Antonio, TX	-	0.803	Dec 2016	2.351	Dec 2017	1.799	Dec 2018	-		1.799	Continuing	Continuing	-
Subtotal			-	0.803		2.351		1.799		-		1.799	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PSC - Engineering & Technical Assistance Support Services (ETASS & FFRDC) - (Cyber Special Access)	C/FFP	Various : San Antonio, TX	-	3.285	Oct 2016	4.189	Oct 2017	0.906	Oct 2018	-		0.906	Continuing	Continuing	-
PSC - Acquisition Support - (Cyber Special Access)	C/Variou	Various : San Antonio, TX	-	2.939	Oct 2016	2.233	Oct 2017	2.112	Oct 2018	-		2.112	Continuing	Continuing	-
Various - Engineering & Technical Assistance Support Services (ETASS & FFRDC) - (Cyber Tech Projects)	C/FFP	Various : San Antonio, TX	-	-		-		3.735	Apr 2018	-		3.735	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208087F / AF Offensive Cyberspace Operations	Project (Number/Name) 670375 / Network Warfare Systems and Support
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	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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

Saber Chime Development																												
Tools Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208087F / AF Offensive Cyberspace Operations	Project (Number/Name) 670375 / Network Warfare Systems and Support

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Air Force Cyber Mission Platform (CMP)				
CMP Development Increment 1 Build 1	1	2017	3	2017
CMP DT and OT Events Increment 1 Build 1	2	2017	4	2017
CMP Follow-on Contract Award (APR 2017)	3	2017	3	2017
CMP OA/Fielding (CRASH HEADER) Increment 1 Build 1	4	2017	1	2018
CMP Development Increment 2 Build 1	3	2017	1	2018
CMP Development Increment 2 Build 2	1	2018	3	2018
CMP Development Increment 2 Build 3	3	2018	1	2019
CMP Development Increment 2 Build 4	1	2019	3	2019
CMP Development Increment 2 Build 5	3	2019	1	2020
CMP Development Increment 2 Build 6	1	2020	3	2020
CMP Development Increment 2 Build 7	3	2020	1	2021
CMP Development Increment 2 Build 8	1	2021	3	2021
CMP Development Increment 2 Build 9	3	2021	1	2022
CMP Development Increment 2 Build 10	1	2022	3	2022
CMP Development Increment 2 Build 11	3	2022	1	2023
CMP Development Increment 2 Build 12	1	2023	3	2023
Tech Project - Access				
Access	1	2017	4	2023
AF Unique Access	2	2018	4	2023
Cyber Effects via Electromagnetic Spectrum (EMS)	3	2018	4	2023
Tech Project - Capabilities				

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208087F / AF Offensive Cyberspace Operations	Project (Number/Name) 670375 / Network Warfare Systems and Support
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Capabilities	1	2017	4	2023
Saber Chime Development	3	2018	4	2023
Tools Development	1	2018	4	2023

Note
The Cyber Mission Platform Planning, Generation, Execution, Assessment, Reporting, and Visualization (PGEARV) Services efforts are included within Platforms CMP Versions development

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208088F / <i>AF Defensive Cyberspace Operations</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	38.035	20.964	24.166	0.000	24.166	23.542	16.819	14.594	14.859	Continuing	Continuing
677820: <i>Computer Security RDTE: Firestarter</i>	-	14.151	6.252	6.308	0.000	6.308	6.424	6.536	6.672	6.793	Continuing	Continuing
677821: <i>Cyberspace Vulnerability Assessment</i>	-	22.378	13.176	16.293	0.000	16.293	15.518	8.655	6.261	6.375	Continuing	Continuing
677822: <i>Cyber Defense Analysis</i>	-	0.258	0.265	0.268	0.000	0.268	0.274	0.279	0.285	0.290	Continuing	Continuing
677823: <i>AFCERT</i>	-	1.248	1.271	1.297	0.000	1.297	1.326	1.349	1.376	1.401	Continuing	Continuing

A. Mission Description and Budget Item Justification

AF Defensive Cyberspace Operations (AF DCO) provides defensive cyber capabilities that protect the AFNET and DoD network enclaves, to include their associated computer systems, software applications and sensitive operational information against unauthorized intrusion, corruption, and/or destruction. The emphasis of the program is directed toward defensive cyberspace capabilities; computer and network systems security; damage assessment and recovery; cyber threat recognition, attribution, and mitigation; and active response methodologies in response to evolving threats and changes to cyber environment. These areas of emphasis are realized through research and development, test and acquisition in the areas of proactive defense, defensive counter cyberspace, cyberspace intelligence, surveillance and reconnaissance, command and control situational awareness, persistent network operations, as well as decision support, recovery, and digital forensics.

Firestarter utilizes cyber and Information Assurance (IA) technology investments by US Cyber Command, the Defense Advanced Research Projects Agency (DARPA), the National Security Agency (NSA), Director of National Intelligence (DNI), Intelligence Advanced Research Projects Activity (IARPA), and the Department of Homeland Security (DHS), and various government research laboratories, to jump-start its development of solutions to existing Air Force cyber and IA requirements. This program supports AF Space Command's Cyberspace strategic direction in support of Cyber Defense which provides capabilities to 24th AF, as AF component to Cyber Command (CYBERCOM), Defense Information Systems Agency (DISA), National Security Agency (NSA), and other services to ensure Global Information Grid (GIG) cyber and IA requirements are being met. Activities performed include those designed to identify, analyze, test, rapidly acquire, and integrate emerging IA and cyber technology and defensive cyberspace weapons systems and capabilities into all regions of the GIG - terrestrial, airborne, and space systems. In addition, this effort will support implementation of DoD Enterprise-wide IA & Computer Network Defense (CND) Solutions Steering Group (ESSG) solutions. Current Air Force systems, such as the AFNET NIPRNet Gateways, SIPRNet Modernization program, and Host Based Security System leverage this technology to meet their information assurance and defensive cyberspace needs/requirements.

Cyberspace Vulnerability Assessment/ Hunter Team (CVA/H) weapon system develops new capabilities to provide Air Force Cyber Command (AFCYBER) and Combatant Commanders additional mobile precision in addition to currently fielded protection capabilities to identify, pursue, and mitigate cyberspace threats. The CVA/H weapon system performs defensive sorties world-wide via remote or on-site access. CVA/H executes vulnerability, compliance, defense and non-technical assessments, best practice reviews, penetration testing and Hunter missions on AF and DoD networks & systems. Hunter operations characterize and then eliminate

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208088F / <i>AF Defensive Cyberspace Operations</i>	
<p>threats for the purpose of mission assurance. The Hunter mission focuses on the capability to find, fix, track, target, engage, and assess (F2T2EA) the advanced weapon system to meet scope and scale of the USCYBERCOM directed Cyber Protection Teams.</p> <p>Cyberspace Defense Analysis (CDA) is an assessment of non-secure telecommunications to determine type and amount of sensitive and/or classified information that may have been disclosed to our adversaries and encompasses the following mission subsets: Telephony Communications, Radio Frequency (RF) Communications, E-mail Communications, Internet based Capabilities (IbC), Web Risk Assessment (WRA), and Cyber Operations Risk Assessment (CORA). CDA is the cyberspace weapon system that is used to conduct assessments during peace time and contingency operations. CDA shows its true capability in the force protection realm and helps ensure our adversaries are not provided early warning of our plans, capabilities, or limitations.</p> <p>AF Computer Emergency Response Team (AFCERT) supports the AF Cyberspace Defense (ACD) weapon system and is designed to prevent, detect, and respond to adversarial penetration into AF unclassified and classified networks. ACD supports Air Force and Combatant Commanders by conducting synchronized Defensive Cyber Operations (DCO) and providing 24/7/365 monitoring and defense of USAF and US Central Command Secure/Non-secure Internet Protocol Router Network (SIPRNET/NIPRNET) systems against hostile attack. Daily intrusions to the AF network are analyzed in a forensics manner to identify a multitude of counter defensive and defensive tools and techniques that are required to truly strengthen cyber security. The Air Force Research Laboratory (AFRL) and other Federal R&D entities often have cutting edge solutions, that, with 3600 funding, can be taken to the technology readiness level (TRL) needed for rapid deployment as new capability to counter critical cyber weapon system vulnerabilities. AFCERT funding for this effort will focus on development of capability, capacity, and potential modifications to increase the utility of the ACD weapon system to the warfighter as well as testing requirements for new capabilities.</p> <p>Activities include studies and analysis to support both current program planning and execution and future program planning.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver Air Defensive Cyberspace Operations 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</p> <p>This program is in Budget Activity 7, Operational System Development, because this budget activity includes development efforts to upgrade systems that been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208088F / <i>AF Defensive Cyberspace Operations</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	29.439	20.964	26.888	0.000	26.888
Current President's Budget	38.035	20.964	24.166	0.000	24.166
Total Adjustments	8.596	0.000	-2.722	0.000	-2.722
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	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	0.000	0.000			
• Other Adjustments	-1.404	0.000	-2.722	0.000	-2.722

Change Summary Explanation

Program increase

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677820 / Computer Security RDTE: Firestarter			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677820: Computer Security RDTE: Firestarter	-	14.151	6.252	6.308	0.000	6.308	6.424	6.536	6.672	6.793	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Firestarter program provides newly improved capabilities and technical transition opportunities for Cyber Defense and Information Assurance (IA) technologies and tools needed to defend Air Force Command, Control, Communications, Computer, and Intelligence (C4I) systems from Cyber-attacks, while ensuring recovery in the event of an attack. The emphasis of the program is directed toward defensive cyberspace capabilities; computer and network systems security; damage assessment and recovery; cyber threat recognition, attribution, and mitigation; and active response methodologies in response to evolving threats and changes to cyber environment. These areas of emphasis are realized through research and development, test and acquisition in the areas of proactive defense, defensive counter cyberspace, cyberspace intelligence, surveillance and reconnaissance & situational awareness, persistent network operations, as well as decision support, recovery, and digital forensics. Current Air Force systems, such as the AFNET NIPRNet Gateways, SIPRNet Modernization program, and Host Based Security System leverage this technology to meet their information assurance and defensive cyberspace needs/requirements.

Firestarter utilizes cyber and IA technology investments by US Cyber Command, the Defense Advanced Research Projects Agency (DARPA), the National Security Agency (NSA), Director of National Intelligence (DNI), Intelligence Advanced Research Projects Activity (IARPA), and the Department of Homeland Security (DHS), and various government research laboratories, to jump-start its development of solutions to existing Air Force cyber and IA requirements. This program supports AF Space Command's Cyberspace strategic direction in support of Cyber Defense which provides capabilities to 24th AF, as AF component to Cyber Command (CYBERCOM), Defense Information Systems Agency (DISA), National Security Agency (NSA), and other services to ensure Global Information Grid (GIG) cyber and IA requirements are being met. Activities performed include those designed to identify, analyze, test, rapidly acquire, and integrate emerging IA and cyber technology and defensive cyberspace weapons systems and capabilities into all regions of the GIG - terrestrial, airborne, and space systems. In addition, this effort will support implementation of DoD Enterprise-wide Information Assurance (IA) & Computer Network Defense (CND) Solutions Steering Group (ESSG) solutions.

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

	FY 2017	FY 2018	FY 2019
Title: Cyber Forensic Tools & Methodologies	1.427	1.638	1.612
Description: Cyber forensic tools & methodologies. Includes initial metrics for reliable info assurance; secure coalition cyber data management, collaboration and visualization; analysis of cyber security bots			
FY 2018 Plans: - Continue the development, enhancement, and transition of incident response data gathering and attack attribution technologies			
FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677820 / Computer Security RDTE: Firestarter		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
- Will continue the development, enhancement, and transition of incident response data gathering and attack attribution technologies FY 2018 to FY 2019 Increase/Decrease Statement: N/A				
Title: Cyber Threat Recognition Description: Enhancing cyber platform technology to identify zero-day threats in real time. FY 2018 Plans: - Continue to normalize and automate methods and procedures to identify zero day cyber threats prior to system compromise FY 2019 Plans: - Will continue to normalize and automate methods and procedures to identify zero day cyber threats prior to system compromise FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to another higher priority		9.909	1.821	1.711
Title: Cyber Threat Attribution & Mitigation Description: Includes risk mitigation techniques for wireless networks and systems; active response, dynamic policy enforcement and computer/net attack attribution efforts. FY 2018 Plans: - Continue to mature, enhance, and integrate developmental concepts to attribute cyber patterns, techniques, behaviors, and signatures to specific threat actors and identify mitigation strategies for each FY 2019 Plans: - Will continue to mature, enhance, and integrate developmental concepts to attribute cyber patterns, techniques, behaviors, and signatures to specific threat actors and identify mitigation strategies for each FY 2018 to FY 2019 Increase/Decrease Statement: N/A		1.710	1.494	1.686
Title: Transition of Cyber and Information Assurance Technologies Description: Transition cyber defense technologies that support AFSPC's Defense architecture. Includes space systems cyber solutions; terrestrial net defense technology development; airborne IP network cyber and IA tools; IA/cyber modeling & simulation; secure interoperable distributed agent computing, and others that relate to defending the AF networks.		1.105	1.299	1.299

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677820 / Computer Security RDTE: Firestarter

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p><i>FY 2018 Plans:</i> - Continue enhancing and transitioning customer funded cyber and IA technology to operational USAF components in accordance with rapid requirements documentation provided by AFSPC</p> <p><i>FY 2019 Plans:</i> - Will continue enhancing and transitioning customer funded cyber and IA technology to operational USAF components in accordance with rapid requirements documentation provided by AFSPC</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> N/A</p>			
Accomplishments/Planned Programs Subtotals	14.151	6.252	6.308

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

N/A

Remarks

D. Acquisition Strategy

Firestarter conducts late stage Science and Technology (S&T) for tech demo and tech transition to warfighter employment. All contracts within this project are awarded using full and open competition and utilize evolutionary capability and incremental development. Where appropriate, collaborative efforts are conducted with services and agencies within the USAF to result in more robust and cost effective solutions. Contracting activities are primarily done through other agencies when deemed more advantageous. All aspects of the Firestarter project are managed by the Air Force Research Laboratory.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677820 / Computer Security RDTE: Firestarter
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Testing	C/CPFF	Various : Various	-	0.873	Jan 2017	1.395	Jan 2018	1.369	Jan 2019	-		1.369	Continuing	Continuing	-
Development	C/CPFF	Various : Various	-	11.702	Jan 2017	3.136	Jan 2018	3.218	Jan 2019	-		3.218	Continuing	Continuing	-
Integration	C/CPFF	Various : Various	-	1.140	Jan 2017	1.271	Jan 2018	1.271	Jan 2019	-		1.271	Continuing	Continuing	-
Subtotal			-	13.715		5.802		5.858		-		5.858	Continuing	Continuing	N/A

Remarks
Multiple contractors and multiple universities reflect on-going efforts with over a dozen contractors and universities. Each has a different contract date depending on when that particular contract was awarded.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA	C/CPFF	Various : Various	-	0.436	Jan 2017	0.450	Jan 2018	0.450	Jan 2019	-		0.450	Continuing	Continuing	-
Subtotal			-	0.436		0.450		0.450		-		0.450	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	14.151	6.252	6.308	-	6.308	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677820 / Computer Security RDTE: Firestarter

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Firestarter				
Cyber Forensic Tools & Methodologies	1	2017	4	2023
Cyber Threat Recognition	1	2017	4	2023
Cyber Threat Attribution & Mitigation	1	2017	4	2023
Transition of Cyber/IA Technologies	1	2017	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677821: <i>Cyberspace Vulnerability Assessment</i>	-	22.378	13.176	16.293	0.000	16.293	15.518	8.655	6.261	6.375	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This requirement supports the Cyberspace Vulnerability Assessment / Hunter Team (CVA/H) weapon system development of new capabilities to provide Air Force Cyber Command (AFCYBER) and Combatant Commanders additional mobile precision in addition to currently fielded protection capabilities to identify, pursue, and mitigate cyberspace threats. The CVA/H weapon system performs defensive sorties world-wide via remote or on-site access. CVA/H executes vulnerability, compliance, defense and non-technical assessments, best practice reviews, penetration testing and Hunter missions on AF and DoD networks & systems. Hunter operations characterize and then eliminate threats for the purpose of mission assurance. The Hunter mission focuses on the capability to find, fix, track, target, engage, and assess(F2T2EA) the advanced persistent threat (APT). This effort funds development efforts to enhance command and control situational awareness and to expand the capability of the current weapon system to meet scope and scale of the USCYBERCOM directed Cyber Protection Teams.

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

	FY 2017	FY 2018	FY 2019
Title: Cyber Threat Mitigation	7.239	2.203	0.850
Description: Cyber Threat Mitigation includes vulnerability, compliance, defense and non-technical assessments, best practice reviews, penetration testing and supports Cyberspace Vulnerability Assessment/Hunter (CVA/H) missions in support of Air Force Cyber Command and Combatant Commanders.			
FY 2018 Plans:			
- Continue modernization of CVA/H weapon system with emerging technologies to keep pace with an evolving cyber threat			
- Continue development of technologies to conduct vulnerability assessments, network intrusion analysis and systems vulnerability analysis (i.e, malware analysis capability, forensic analysis, visual analysis environment, distributed source code control vault and mission oriented mapping)			
FY 2019 Plans:			
- Will continue development of technologies to conduct vulnerability assessments, network intrusion analysis and systems vulnerability analysis.			
FY 2018 to FY 2019 Increase/Decrease Statement:			
Funding decreased from FY18 to FY19 due to reduction in vulnerability assessments.			
Title: Defensive Next Generation Development	14.719	9.973	14.443

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Description: Development of solutions supporting defensive cyber modernization and AF Cyber Needs Forms in the area of DCO capabilities and technologies to meet capability gaps required by Cyber Protection Teams.</p> <p>FY 2018 Plans: - Continue providing solutions to support modernization of DCO capabilities and technologies to support Cyber Protection Teams (CPTs); includes multiple efforts (i.e., Data and Analysis and Traffic Inspection of SSL)</p> <p>FY 2019 Plans: - Will continue development to support modernization of DCO capabilities and technologies to support Cyber Protection Teams (CPTs).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase in FY19 to support development training solutions for modernization of capabilities.</p>			
<p>Title: Test & Evaluation</p> <p>Description: Test and Evaluation provides both developmental testing of new development capabilities and a network environment for testing.</p> <p>FY 2018 Plans: - Continue to provide the required developmental testing for new platform, access, and capability products prior to fielding</p> <p>FY 2019 Plans: - Will continue developmental testing for of DCO capability products and technologies prior to fielding.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: N/A</p>	0.420	1.000	1.000
Accomplishments/Planned Programs Subtotals	22.378	13.176	16.293

C. Other Program Funding Summary (\$ in Millions)										
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete Total Cost
• OPAF 03 Line Item 831010: COMSEC Equipment	19.878	19.126	25.318	-	25.318	21.222	21.613	25.002	25.446	Continuing Continuing
Remarks										

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / <i>AF Defensive Cyberspace Operations</i>	Project (Number/Name) 677821 / <i>Cyberspace Vulnerability Assessment</i>

D. Acquisition Strategy

The Cyberspace Vulnerability Assessment/Hunter (CVA/H) program office will utilize Concept, Development, Risk Management, or Production and Deployment Plans as part of a phased approach to acquisition planning. All plans will contain sufficient information for the Milestone Decision Authority (MDA) to determine readiness to enter into the applicable phase of the acquisition process. CVA/H Program office will utilize both new and existing contractual vehicles, in addition to existing Government-Wide Acquisition Contract (GWAC) vehicles (i.e, Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV), and General Services Administration (GSA) Federal Supply Schedules, Network-Centric Solutions (NETCENTs).

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cyber Threat Mitigation-Malware Analysis	C/FFP	Various : Various	-	3.200	Jun 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Forensic Analysis	C/FFP	Various : Various	-	1.617	Jun 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Visual Analysis Environment	C/FFP	Various : Various	-	0.120	Mar 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Distributed Source Code Control Vault	C/FFP	Various : Various	-	0.177	May 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Mission Oriented Mapping	C/CPFF	Various : Various	-	2.125	Jan 2017	0.800	Jan 2018	0.850	Jan 2019	-		0.850	Continuing	Continuing	-
Defensive Next Gen - Data & Analysis	C/CPFF	Various : Various	-	8.105	Mar 2017	1.643	Mar 2018	1.950	Mar 2019	-		1.950	Continuing	Continuing	-
Defensive Next Gen - Training Simulator	C/FFP	Various : Various	-	5.440	Apr 2017	5.000	Apr 2018	7.377	Apr 2019	-		7.377	Continuing	Continuing	-
Defensive Next Gen - Disc Forensics Solution	C/FFP	Various : Various	-	-		1.133	Mar 2018	1.650	Mar 2019	-		1.650	Continuing	Continuing	-
Defensive Next Gen - Data Collection and Correlation	C/FFP	Various : Various	-	-		1.226	Mar 2018	1.092	Mar 2019	-		1.092	Continuing	Continuing	-
Defensive Next Gen - Cloudshield Capabilities	C/FFP	Various : Various	-	-		1.200	Aug 2018	1.200	Aug 2019	-		1.200	Continuing	Continuing	-
Subtotal			-	20.784		11.002		14.119		-		14.119	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Support	MIPR	46 Test Squadron : Eglin, FL	-	0.420	Oct 2016	1.000	Oct 2017	1.000	Oct 2018	-		1.000	Continuing	Continuing	-
Subtotal			-	0.420		1.000		1.000		-		1.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA - Engineering & Technical Assistance Support Services (ETASS & FFRDC)	Various	AFLCMC/PZ : Bedford, MA	-	1.174	Jan 2017	1.174	Jan 2018	1.174	Jan 2019	-		1.174	Continuing	Continuing	-
Subtotal			-	1.174		1.174		1.174		-		1.174	Continuing	Continuing	N/A

Remarks
Provides program engineering continuity, technical maturation and expertise, and access to an extensive professional network for future capabilities.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	22.378	13.176	16.293	-	16.293	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Cyber Vulnerability Assessment	
Cyber Threat Mitigation (Malware Analysis)	[REDACTED]
Cyber Threat Mitigation (Forensic Analysis)	[REDACTED]
Cyber Threat (Visual Analysis Environment)	[REDACTED]
Cyber Threat Mitigation (Distributed Source Code Control Vault)	[REDACTED]
Cyber Threat Mitigation (Mission Oriented Mapping)	[REDACTED]
Defensive Next Generation Development (Data & Analysis)	[REDACTED]
Defensive Next Generation (Training Simulator)	[REDACTED]
Defensive Next Generation (10GB Through put)	[REDACTED]
Defensive Next Generation (Data Collection and Correlation)	[REDACTED]
Defensive Next Generation (Cloudshield Capabilities)	[REDACTED]
Test & Evaluation	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Cyber Vulnerability Assessment				
Cyber Threat Mitigation (Malware Analysis)	3	2017	3	2019
Cyber Threat Mitigation (Forensic Analysis)	3	2017	3	2019
Cyber Threat (Visual Analysis Environment)	2	2017	2	2019
Cyber Threat Mitigation (Distributed Source Code Control Vault)	3	2017	3	2019
Cyber Threat Mitigation (Mission Oriented Mapping)	2	2017	2	2019
Defensive Next Generation Development (Data & Analysis)	2	2017	4	2023
Defensive Next Generation (Training Simulator)	3	2017	4	2023
Defensive Next Generation (10GB Through put)	2	2018	4	2023
Defensive Next Generation (Data Collection and Correlation)	2	2018	4	2023
Defensive Next Generation (Cloudshield Capabilities)	4	2018	4	2023
Test & Evaluation	2	2017	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677822 / Cyber Defense Analysis
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677822: Cyber Defense Analysis	-	0.258	0.265	0.268	0.000	0.268	0.274	0.279	0.285	0.290	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Cyberspace Defense Analysis (CDA) is an assessment of non-secure telecommunications to determine type and amount of sensitive and/or classified information that may have been disclosed to our adversaries and encompasses the following mission subsets: Telephony Communications, Radio Frequency (RF) Communications, E-mail Communications, Internet based Capabilities (IbC), Web Risk Assessment (WRA), and Cyber Operations Risk Assessment (CORA). CDA is the cyberspace weapon system that is used to conduct assessments during peace time and contingency operations. CDA shows its true capability in the force protection realm and helps ensure our adversaries are not provided early warning of our plans, capabilities, or limitations.

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

	FY 2017	FY 2018	FY 2019
Title: Cyber Defense Analysis	0.258	0.265	0.268
Description: Engineering support to conduct Cyberspace Defense Analysis (CDA) assessment of non-secure telecommunications during peace time and contingency operations.			
FY 2018 Plans: - Continue to support CDA technical maturation and development of technologies to prevent disclosure of sensitive and/or classified information to adversaries that attempt to penetrate our networks			
FY 2019 Plans: - Will continue to support CDA technical maturation and development of technologies to prevent disclosure of sensitive and/or classified information to adversaries that attempt to penetrate our networks			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased to support development of technology			
Accomplishments/Planned Programs Subtotals	0.258	0.265	0.268

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 831010: COMSEC Equipment	0.244	3.940	1.259	-	1.259	1.698	1.702	10.498	10.685	0.000	30.026

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677822 / Cyber Defense Analysis

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

The Cyberspace Defense Analysis (CDA) weapon system development of new capabilities to provide additional OPSEC protection capabilities to monitor, collect, analyze, and report cyberspace threats. The CDA program will utilize various contractual vehicles when necessary (i.e., Government-Wide Acquisition Contract (GWAC), Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV), and General Services Administration (GSA) Federal Supply Schedules, Network-Centric Solutions (NETCENTS) (mandatory for all IT services and supplies) and competitive contract (if required). The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that should be able to meet requirements related to Defensive Cyberspace Operations.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677822 / Cyber Defense Analysis
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA - Engineering & Technical Assistance Support Services (ETASS & FFRDC)	Various	AFLCMC/PZ : Hanscom, MA	-	0.258	Jan 2017	0.265	Jan 2018	0.268	Jan 2019	-		0.268	Continuing	Continuing	-
Subtotal			-	0.258		0.265		0.268		-		0.268	Continuing	Continuing	N/A

Remarks
Provides program office subject matter expertise, engineering continuity, technical maturation and expertise, and access to an extensive professional network for future capabilities.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.258	0.265	0.268	-	0.268	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677822 / Cyber Defense Analysis

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Cyber Defense Analysis	
Cyber Defense Analysis (FFRDC)	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677822 / Cyber Defense Analysis

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Cyber Defense Analysis				
Cyber Defense Analysis (FFRDC)	1	2017	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677823 / AFCERT
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677823: AFCERT	-	1.248	1.271	1.297	0.000	1.297	1.326	1.349	1.376	1.401	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

AF Computer Emergency Response Team (AFCERT) supports the AF Cyberspace Defense (ACD) weapons system and is designed to prevent, detect, and respond to adversarial penetration into AF unclassified and classified networks. ACD supports Air Force and Combatant Commanders by conducting synchronized Defensive Cyber Operations (DCO) and providing 24/7/365 monitoring and defense of USAF and US Central Command Secure/Non-secure Internet Protocol Router Network (SIPRNET/NIPRNET) systems against hostile attack. Daily intrusions to the AF network are analyzed in a forensics manner to identify a multitude of counter defensive and defensive tools and techniques that are required to truly strengthen cyber security. The Air Force Research Laboratory (AFRL) and other Federal R&D entities often have cutting edge solutions, that, with 3600 funding, take them to the technology readiness level (TRL) needed for rapid deployment as new capabilities to counter critical cyber weapon system vulnerabilities. AFCERT funding for this effort will focus on development of capability, capacity, and potential modifications to increase the utility of the ACD weapon system to the warfighter as well as testing requirements for new capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AF Cyber Defensive 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 2017	FY 2018	FY 2019
Title: Cyberspace Defense Development	1.248	1.271	1.297
Description: Air Force Computer Emergency Response Team (AFCERT) prevention, detection, and response to adversarial penetration into AF unclassified and classified networks.			
FY 2018 Plans: - Develop and test technologies for the AF Cyberspace Defensive (ACD) weapon system to prevent, detect, and respond adversarial penetration in AF networks			
FY 2019 Plans: - Develop and test technologies for the AF Cyberspace Defensive (ACD) weapon system to prevent, detect, and respond adversarial penetration in AF networks			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to inflation.			
Accomplishments/Planned Programs Subtotals	1.248	1.271	1.297

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677823 / AFCERT

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

Line Item	FY 2017	FY 2018	FY 2019	FY 2019	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Cost To	
			Base	OCO	Total					Complete	Total Cost
• OPAF 03 Line Item 831010: <i>COMSEC Equipment</i>	0.242	-	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing
• OPAF 03 Line Item 835080: <i>AFNET</i>	7.736	30.914	31.543	-	31.543	23.660	24.069	33.578	34.182	Continuing	Continuing

Remarks

D. Acquisition Strategy

The AF Cyberspace Defense (ACD) weapons system office will utilize existing contractual vehicles such as Massachusetts Institute of Technology Research and Engineering (MITRE), General Services Administration (GSA) Federal Supply Schedules, Air Force Research Laboratory (AFRL), Advisory and Assistance Services (A&AS) as well as various Test and Evaluation Enterprises. The ACD weapon system office also intends to utilize the commercial contracting community to lead the Development, Test and Integration of future Cyberspace Defense capabilities. The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that should be able to meet many requirements related to the ACD 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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677823 / AFCERT

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Integrated Cyber Aggregation Tool</i>	
Cyberspace Defense Development	[REDACTED]
Test and Evaluation	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677823 / AFCERT

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Integrated Cyber Aggregation Tool</i>				
Cyberspace Defense Development	2	2017	2	2023
Test and Evaluation	3	2017	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208097F I <i>Joint Cyber Command and Control (JCC2)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	13.000	0.000	13.000	0.000	0.000	0.000	0.000	Continuing	Continuing
676045: <i>Foundational Efforts</i>	-	0.000	0.000	13.000	0.000	13.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

In FY19, PE 0208097F, Joint Cyber Command and Control (JCC2) efforts were transferred from PE 0306250F, Cyber Operations Technology Development to enable Executive Agent oversight and management, and to provide adequate oversight and Service stakeholder transparency.

A. Mission Description and Budget Item Justification

Joint Cyber Command and Control (JCC2) provides Combatant Commanders, Joint Force Commanders and Service Component Commanders with enhanced situational awareness and battle management for cyberspace operations missions and forces. Joint Cyber C2 establishes congressionally directed focal point to provide integrated Joint Cyber C2 solutions to all echelons for execution of cyberspace operations to enable and accelerate planning/collaboration between Cyber Mission Forces and Combatant Commands.

It will integrate Cyber C2 with Joint, Coalition and inter-agency C2 to enhance multi-domain operations and reduce planning time, improve decision quality and speed resulting in a shorter kill chain. Activities include, but are not limited to: Rapid prototyping, development of software/hardware systems; integration and transition of lab developed cyber capabilities to the warfighter; testing and evaluation; program management administration, studies, analysis, pilots, demonstrations, and risk reduction for emerging technologies.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver JCC2 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208097F / <i>Joint Cyber Command and Control (JCC2)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	13.000	0.000	13.000
Total Adjustments	0.000	0.000	13.000	0.000	13.000
• 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	13.000	0.000	13.000

Change Summary Explanation

In FY19, PE 0208097F, Joint Cyber Command and Control (JCC2) efforts were transferred from PE 0306250F, Cyber Operations Technology Development to enable Executive Agent oversight and management, and to provide adequate oversight and Service stakeholder transparency.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208097F / Joint Cyber Command and Control (JCC2)				Project (Number/Name) 676045 / Foundational Efforts			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
676045: Foundational Efforts	-	0.000	0.000	13.000	0.000	13.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY19, PE 0208097F, Joint Cyber Command and Control (JCC2) efforts were transferred from PE 0306250F, Cyber Operations Technology Development to enable Executive Agent oversight and management, and to provide adequate oversight and Service stakeholders transparency.

A. Mission Description and Budget Item Justification

Joint Cyber Command and Control (JCC2) provides Combatant Commanders, Joint Force Commanders and Service Component Commanders with enhanced situational awareness and battle management for cyberspace operations missions and forces. Joint Cyber C2 establishes congressionally directed focal point to provide integrated Joint Cyber C2 solutions to all echelons for execution of cyberspace operations to enable and accelerate planning/collaboration between Cyber Mission Forces and Combatant Commands.

It will integrate Cyber C2 with Joint, Coalition and inter-agency C2 to enhance multi-domain operations and reduce planning time, improve decision quality and speed resulting in a shorter kill chain. Activities include, but are not limited to: Rapid prototyping, development of software/hardware systems; integration and transition of lab developed cyber capabilities to the warfighter; testing and evaluation; program management administration, studies, analysis, pilots, demonstrations, and risk reduction for emerging technologies.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver JCC2 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.

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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019
Title: Foundational Efforts	-	0.000	13.000
Description: Foundational Efforts are program activities, at multiple operating locations, supporting operational prototyping (i.e., Development Operations) and Joint Cyber Command and Control (JCC2) baseline efforts to retain capability. Actions include system and software engineering, risk management, developmental framework management, and the execution of acquisition activities.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208097F / <i>Joint Cyber Command and Control (JCC2)</i>	Project (Number/Name) 676045 / <i>Foundational Efforts</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Efforts reflected in PE 0306250F, Cyber Operations Technology Development.				
<ul style="list-style-type: none"> - Begin program office stand up. - Execute programmatic/acquisition activities. - Transition USCC prototyping to JCC2 Program Management Office. - Pilot tools that automate the sharing of cyber threat data. - Leverage select developed technologies and/or operational capabilities to deliver operational "Quick Win" capabilities. <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Continue stand up a program office. - Continue execution of acquisition activities and development of requisite documentation. - Continue piloting tools to automate the sharing of cyber threat data. - Continue actions to evaluate capabilities for data sharing of cyber threat. <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <p>In FY19, PE 0208097F, Joint Cyber Command and Control (JCC2) efforts were transferred from PE 0306250F, Cyber Operations Technology Development to enable Executive Agent oversight and management, and to provide adequate oversight and Service stakeholder transparency.</p>				
Accomplishments/Planned Programs Subtotals		-	0.000	13.000
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
JCC2 is pre Material Development Decision (MDD). Current efforts include standing up a program management office (PMO), delivering "Quick Win" operational prototypes to Combatant Commanders in accordance with the recommendation of JCC2 early operational assessments (EoAs).				
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.				

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208097F / <i>Joint Cyber Command and Control (JCC2)</i>	Project (Number/Name) 676045 / <i>Foundational Efforts</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Foundational Events				
Transition USCC prototyping to PMO	1	2019	4	2019
Quick Win Dev-Ops Prototyping	2	2019	4	2019
PMO Standup	1	2019	2	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208099F / <i>Unified Platform (UP)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	28.759	0.000	28.759	29.702	33.701	39.713	39.721	Continuing	Continuing
672281: <i>Foundational Efforts</i>	-	0.000	0.000	28.759	0.000	28.759	29.702	33.701	39.713	39.721	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY19, PE 0208099F, Unified Platform (UP) efforts were transferred from PE 0306250F, Cyber Operations Technology Development to enable Executive Agent oversight and management, and to provide transparency to Service stakeholders.

A. Mission Description and Budget Item Justification
 Designated as the Executive Agent, the Secretary of the Air Force will lead the Unified Platform effort.

Unified Platform (UP) provides the Cyber Mission Forces (CMFs), USCYBERCOM, AF Major Commands (MAJCOMs) a Joint cyber operations platform capable of mission planning, data analytics, and decision support for the execution of full-spectrum cyberspace operations at the operational through tactical levels of warfare.

UP integrates existing, but disparate, Service-specific cyber capability, delivering a minimum viable product (MVP). Subsequent build iterations will continue to deliver a flexible, interoperable, and scalable warfighter capability. In order to match the speed-of-need of the highly dynamic cyberspace domain, the UP will implement a scaled agile development framework to facilitate the rapid development, integration, and fielding of capabilities. The UP program will execute the development requirements provided by Army, Navy, Marine Corps, and Air Force in conjunction with US Cyber Command (USCYBERCOM) stakeholders in accordance with the prioritization provided by UP governance. The UP program will exercise a comprehensive, Service agnostic, acquisition approach to include laboratory, industry, and academia.

UP directly supports the Joint Network Attack Initial Capabilities Document (ICD), the National Military Strategy for Cyberspace Operations (NMS-CO), USCYBERCOM operational directives, the latest AF Space Command (AFSPC) Offensive Cyberspace Operations System Flight Plan, and other formal requirements documents.

Foundational efforts ensure that existing UP capability is retained with the evolution threats and the capabilities of adversaries.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver JCC2 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.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force				Date: February 2018		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0208099F / <i>Unified Platform (UP)</i>				
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	
Previous President's Budget	0.000	0.000	0.000	0.000	0.000	
Current President's Budget	0.000	0.000	28.759	0.000	28.759	
Total Adjustments	0.000	0.000	28.759	0.000	28.759	
• Congressional General Reductions	0.000	0.000				
• Congressional Directed Reductions	0.000	0.000				
• Congressional Rescissions	0.000	0.000				
• Congressional Adds	0.000	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	28.759	0.000	28.759	
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019
Title: Foundational Efforts				-	0.000	28.759
Description: Foundational Efforts support program office expertise at multiple operating locations in the areas of cyberspace, systems engineering, risk management framework, scaled agile framework, and acquisition to ensure that agile acquisition development planning and DevOps methodologies are successful.						
FY 2018 Plans: Efforts reflected in PE 0306250F, Cyber Operations Technology Development.						
FY 2019 Plans: - Deliver capability through an agile development model consisting of epics and incremental/limited deployments - Develop and deliver the UP Minimum Viable Product (MVP) leveraging prototyping activities from the Services and United States Cyber Command as well as validated requirement documents. - Some aspects of the effort are classified and will be provided on a need-to-know basis. For further information, please contact AFLCMC/HNCP, 210-977-2683.						
FY 2018 to FY 2019 Increase/Decrease Statement: In FY19, PE 0208099F, Unified Platform (UP) efforts were transferred from PE 0306250F, Cyber Operations Technology Development to enable Executive Agent oversight and management, and to provide transparency to Service stakeholders.						
Accomplishments/Planned Programs Subtotals				-	0.000	28.759

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208099F / <i>Unified Platform (UP)</i>	
D. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
E. Acquisition Strategy The Unified Platform (UP) program office will utilize Concept, Development, Risk Management, Production, or Deployment Plans as part of a streamlined approach to agile acquisition planning. All plans will contain sufficient information to inform acquisition decisions (i.e., authorities to proceed), within the agile framework, to determine readiness to enter into the applicable phase of the acquisition process. UP will utilize both new and existing contractual vehicles, such as Government-Wide Acquisition Contract (GWAC) vehicles (Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV), and General Services Administration (GSA) Federal Supply Schedules and a new Cyber Indefinite Delivery Indefinite Quantity (IDIQ) contract. The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that should be able to meet many requirements related to UP. These multiple-award contractual vehicles have already met the statutory requirements of the Competition in Contracting Act (CICA), which requires a fair opportunity to all contract holders, in accordance with Federal Acquisition Regulation (FAR) 16.505, unless an exception to fair opportunity applies.		
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.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208099F / <i>Unified Platform (UP)</i>	Project (Number/Name) 672281 / <i>Foundational Efforts</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UP Minimum Viable Product (MVP) Efforts and System Technical Coordination	Various	Various : TBD	-	-		-		5.000	Oct 2018	-		5.000	Continuing	Continuing	-
UP Agile Capability Development	Various	Various : TBD	-	-		-		12.579	Apr 2019	-		12.579	Continuing	Continuing	-
Subtotal			-	-		-		17.579		-		17.579	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	TBD	TBD : TBD	-	0.000		0.000		0.750	Apr 2019	0.000		0.750	Continuing	Continuing	-
Subtotal			-	0.000		0.000		0.750		0.000		0.750	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Support Costs	Various	Various : Various	-	-		-		10.430	Dec 2018	-		10.430	Continuing	Continuing	-
Subtotal			-	-		-		10.430		-		10.430	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000	0.000	28.759	0.000	28.759	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208099F / <i>Unified Platform (UP)</i>	Project (Number/Name) 672281 / <i>Foundational Efforts</i>
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
Foundational Efforts																												
UP Minimum Viable Product (MVP) Efforts and System Technical Coordination									█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
UP Agile Capability Development													█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
UP Limited Deployment (Epic 1 Inc 1)									█	█	█	█																
UP Limited Deployment (Epic 1 Inc 2)													█	█	█	█												
UP Limited Deployment (Epic 1 Inc 3)													█	█	█	█												
UP Limited Deployment (Epic 2 Inc 1)																	█	█	█	█								
UP Limited Deployment (Epic 2 Inc 2)																					█	█	█	█				
UP Limited Deployment (Epic 2 Inc 3)																									█	█	█	█
UP Limited Deployment (Epic 3 Inc 1)																												
UP Limited Deployment (Epic 3 Inc 2)																												
UP Limited Deployment (Epic 3 Inc 3)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208099F / <i>Unified Platform (UP)</i>	Project (Number/Name) 672281 / <i>Foundational Efforts</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Foundational Efforts</i>				
UP Minimum Viable Product (MVP) Efforts and System Technical Coordination	1	2019	4	2023
UP Agile Capability Development	3	2019	4	2023
UP Limited Deployment (Epic 1 Inc 1)	3	2019	4	2019
UP Limited Deployment (Epic 1 Inc 2)	1	2020	2	2020
UP Limited Deployment (Epic 1 Inc 3)	3	2020	4	2020
UP Limited Deployment (Epic 2 Inc 1)	1	2021	2	2021
UP Limited Deployment (Epic 2 Inc 2)	3	2021	4	2021
UP Limited Deployment (Epic 2 Inc 3)	1	2022	2	2022
UP Limited Deployment (Epic 3 Inc 1)	3	2022	4	2022
UP Limited Deployment (Epic 3 Inc 2)	1	2023	2	2023
UP Limited Deployment (Epic 3 Inc 3)	3	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208288F / <i>Intel Data Applications</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.000	1.200	1.200	0.000	0.000	0.000	0.000	0.000	1.200
67A051: <i>Space Superiority - Advanced Intelligence Systems</i>	-	0.000	0.000	0.000	1.200	1.200	0.000	0.000	0.000	0.000	0.000	1.200
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funds the application of Intelligence data as datasets/databases, model and simulations, and analysis for combat and combat support users. Provides for the communications infrastructures required to support Intelligence data applications. May include software and contract assistance to ensure system interoperability for Intelligence data discovery, retrieval, and dissemination. Includes manpower, procurement, and operations and maintenance funding.

BA7- 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.

Intel Data Applications PE 0208288F - R2 FY19 Funding provides algorithm development to dynamically cue radar assets to increase collection capability and data relevance.

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	0.000	1.200	1.200
Total Adjustments	0.000	0.000	0.000	1.200	1.200
• 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	1.200	1.200

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Radar Dynamic Cueing	-	0.000	0.000	1.200	1.200

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force **Date:** February 2018

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0208288F / <i>Intel Data Applications</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Develop algorithm to dynamically cue radar assets to increase collection capability and data relevance.</p> <p>FY 2018 Plans: Not Applicable</p> <p>FY 2019 Base Plans: Not Applicable</p> <p>FY 2019 OCO Plans: Utilize multiple data sources/cues to dynamically target the radar in response to high priority Red Force events of interest.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: New Program Requirements</p>					
Accomplishments/Planned Programs Subtotals	-	0.000	0.000	1.200	1.200

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

N/A

Remarks

E. Acquisition Strategy

This effort will be supported via the NASIC ATEP II contract. The project will be delivered 12 months from the date of obligation (approximately May 2019).

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.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208288F / <i>Intel Data Applications</i>	Project (Number/Name) 67A051 / <i>Space Superiority - Advanced Intelligence Systems</i>

FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Radar Dynamic Cueing</i>	
Algorithm Development	████████████████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208288F / <i>Intel Data Applications</i>	Project (Number/Name) 67A051 / <i>Space Superiority - Advanced Intelligence Systems</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Radar Dynamic Cueing</i>				
Algorithm Development	3	2019	3	2020

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