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**Department of Defense
Fiscal Year (FY) 2018 Budget Estimates**

May 2017



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 2018 • RDT&E Program

Volume 3a Table of Contents

Comptroller Exhibit R-1..... Volume 3a - iii

Master Program Element Table of Contents (by Budget Activity then Line Item Number).....Volume 3a - xlix

Master Program Element Table of Contents (Alphabetically by Program Element Title)..... Volume 3a - lxxix

Intro and Explanation of Contents..... Volume 3a - lxxxv

Master Exhibit R-1..... Volume 3a - lxxxvii

Book Split Statement..... Volume 3a - cix

FY18 PB Classified PEs..... Volume 3a - cxi

Exhibit R-2's..... Volume 3a - 1

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Department of Defense
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

Appropriation	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Research, Development, Test & Eval, AF	25,243,981	25,146,562	25,988,644	17,100	89,900		89,900
Total Research, Development, Test & Evaluation	25,243,981	25,146,562	25,988,644	17,100	89,900		89,900

UNCLASSIFIED

Department of Defense
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 Exhibit R-1 FY 2018 President's Budget Request
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04 May 2017

Appropriation	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Research, Development, Test & Eval, AF	25,163,662	26,078,544		26,078,544	34,914,359	135,358	35,049,717
Total Research, Development, Test & Evaluation	25,163,662	26,078,544		26,078,544	34,914,359	135,358	35,049,717

UNCLASSIFIED

Department of Defense
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 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
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04 May 2017

Summary Recap of Budget Activities	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Basic Research	510,673	500,024	500,024				
Applied Research	1,241,501	1,260,152	1,260,152				
Advanced Technology Development	675,737	725,805	725,805				
Advanced Component Development & Prototypes	1,555,274	2,847,833	3,047,833		4,700		4,700
System Development & Demonstration	3,832,399	4,075,804	4,135,704	425	11,425		11,425
Management Support	1,512,458	1,245,577	1,369,377				
Operational Systems Development	15,915,939	17,457,056	17,915,438	32,480	89,580		89,580
Undistributed		-2,965,689	-2,965,689	-15,805	-15,805		-15,805
Total Research, Development, Test & Evaluation	25,243,981	25,146,562	25,988,644	17,100	89,900		89,900

UNCLASSIFIED

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 Exhibit R-1 FY 2018 President's Budget Request
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04 May 2017

Summary Recap of Budget Activities	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Basic Research	500,024	500,024		500,024	505,259		505,259
Applied Research	1,260,152	1,260,152		1,260,152	1,284,114		1,284,114
Advanced Technology Development	725,805	725,805		725,805	794,017		794,017
Advanced Component Development & Prototypes	2,847,833	3,052,533		3,052,533	4,605,030	13,200	4,618,230
System Development & Demonstration	4,076,229	4,147,129		4,147,129	4,476,762		4,476,762
Management Support	1,245,577	1,369,377		1,369,377	2,663,875		2,663,875
Operational Systems Development	17,489,536	18,005,018		18,005,018	20,585,302	122,158	20,707,460
Undistributed	-2,981,494	-2,981,494		-2,981,494			
Total Research, Development, Test & Evaluation	25,163,662	26,078,544		26,078,544	34,914,359	135,358	35,049,717

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Summary Recap of FYDP Programs							
Strategic Forces	551,805	636,723	646,723				
General Purpose Forces	1,608,073	2,203,903	2,382,603				
Intelligence and Communications	1,605,446	1,850,451	1,983,297	4,715	9,415		9,415
Mobility Forces	294,978	505,020	517,020				
Research and Development	8,916,417	9,680,261	10,036,961	425	11,425		11,425
Central Supply and Maintenance	98,763	105,997	105,997				
Training Medical and Other	3,155	3,114	3,114				
Administration and Associated Activities	110,405	-2,935,248	-2,935,248	-15,805	-15,805		-15,805
Support of Other Nations	2,315	4,784	4,784				
Space							
Classified Programs	12,052,624	13,091,557	13,243,393	27,765	84,865		84,865
Total Research, Development, Test & Evaluation	25,243,981	25,146,562	25,988,644	17,100	89,900		89,900

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Summary Recap of FYDP Programs							
Strategic Forces	636,723	646,723		646,723	825,038		825,038
General Purpose Forces	2,203,903	2,382,603		2,382,603	2,962,365	9,750	2,972,115
Intelligence and Communications	1,855,166	1,992,712		1,992,712	1,466,925	5,400	1,472,325
Mobility Forces	505,020	517,020		517,020	602,629		602,629
Research and Development	9,680,686	10,048,386		10,048,386	10,713,989	7,800	10,721,789
Central Supply and Maintenance	105,997	105,997		105,997	109,419		109,419
Training Medical and Other	3,114	3,114		3,114	3,615		3,615
Administration and Associated Activities	-2,951,053	-2,951,053		-2,951,053	121,899		121,899
Support of Other Nations	4,784	4,784		4,784	4,569		4,569
Space					3,165,909		3,165,909
Classified Programs	13,119,322	13,328,258		13,328,258	14,938,002	112,408	15,050,410
Total Research, Development, Test & Evaluation	25,163,662	26,078,544		26,078,544	34,914,359	135,358	35,049,717

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Advanced Component Development & Prototypes	1,555,274	2,847,833	3,047,833		4,700		4,700
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Total Research, Development, Test & Evaluation	25,243,981	25,146,562	25,988,644	17,100	89,900		89,900

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Applied Research	1,260,152	1,260,152		1,260,152	1,284,114		1,284,114
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General Purpose Forces	2,203,903	2,382,603		2,382,603	2,962,365	9,750	2,972,115
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Research and Development	9,680,686	10,048,386		10,048,386	10,713,989	7,800	10,721,789
Central Supply and Maintenance	105,997	105,997		105,997	109,419		109,419
Training Medical and Other	3,114	3,114		3,114	3,615		3,615
Administration and Associated Activities	-2,951,053	-2,951,053		-2,951,053	121,899		121,899
Support of Other Nations	4,784	4,784		4,784	4,569		4,569
Space					3,165,909		3,165,909
Classified Programs	13,119,322	13,328,258		13,328,258	14,938,002	112,408	15,050,410
Total Research, Development, Test & Evaluation	25,163,662	26,078,544		26,078,544	34,914,359	135,358	35,049,717

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
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 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req S e c
1	0601102F	Defense Research Sciences	01	365,276	340,812	340,812					U
2	0601103F	University Research Initiatives	01	132,526	145,044	145,044					U
3	0601108F	High Energy Laser Research Initiatives	01	12,871	14,168	14,168					U
		Basic Research		510,673	500,024	500,024					
4	0602102F	Materials	02	132,768	126,152	126,152					U
5	0602201F	Aerospace Vehicle Technologies	02	118,263	122,831	122,831					U
6	0602202F	Human Effectiveness Applied Research	02	108,784	111,647	111,647					U
7	0602203F	Aerospace Propulsion	02	184,498	185,671	185,671					U
8	0602204F	Aerospace Sensors	02	151,264	155,174	155,174					U
9	0602298F	Science and Technology Management - Major Headquarters Activities	02								U
10	0602601F	Space Technology	02	107,442	117,915	117,915					U
11	0602602F	Conventional Munitions	02	105,296	109,649	109,649					U
12	0602605F	Directed Energy Technology	02	122,835	127,163	127,163					U
13	0602788F	Dominant Information Sciences and Methods	02	171,196	161,650	161,650					U
14	0602890F	High Energy Laser Research	02	39,155	42,300	42,300					U
		Applied Research		1,241,501	1,260,152	1,260,152					
15	0603112F	Advanced Materials for Weapon Systems	03	38,238	35,137	35,137					U
16	0603199F	Sustainment Science and Technology (S&T)	03	17,323	20,636	20,636					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

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1	0601102F	Defense Research Sciences	01	340,812	340,812		340,812	342,919		342,919	U
2	0601103F	University Research Initiatives	01	145,044	145,044		145,044	147,923		147,923	U
3	0601108F	High Energy Laser Research Initiatives	01	14,168	14,168		14,168	14,417		14,417	U
		Basic Research		500,024	500,024		500,024	505,259		505,259	
4	0602102F	Materials	02	126,152	126,152		126,152	124,264		124,264	U
5	0602201F	Aerospace Vehicle Technologies	02	122,831	122,831		122,831	124,678		124,678	U
6	0602202F	Human Effectiveness Applied Research	02	111,647	111,647		111,647	108,784		108,784	U
7	0602203F	Aerospace Propulsion	02	185,671	185,671		185,671	192,695		192,695	U
8	0602204F	Aerospace Sensors	02	155,174	155,174		155,174	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	117,915	117,915		117,915	116,503		116,503	U
11	0602602F	Conventional Munitions	02	109,649	109,649		109,649	112,195		112,195	U
12	0602605F	Directed Energy Technology	02	127,163	127,163		127,163	132,993		132,993	U
13	0602788F	Dominant Information Sciences and Methods	02	161,650	161,650		161,650	167,818		167,818	U
14	0602890F	High Energy Laser Research	02	42,300	42,300		42,300	43,049		43,049	U
		Applied Research		1,260,152	1,260,152		1,260,152	1,284,114		1,284,114	
15	0603112F	Advanced Materials for Weapon Systems	03	35,137	35,137		35,137	37,856		37,856	U
16	0603199F	Sustainment Science and Technology (S&T)	03	20,636	20,636		20,636	22,811		22,811	U

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Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
17	0603203F	Advanced Aerospace Sensors	03	39,794	40,945	40,945					U
18	0603211F	Aerospace Technology Dev/Demo	03	95,266	130,950	130,950					U
19	0603216F	Aerospace Propulsion and Power Technology	03	168,542	94,594	94,594					U
20	0603270F	Electronic Combat Technology	03	45,359	58,250	58,250					U
21	0603401F	Advanced Spacecraft Technology	03	62,278	61,593	61,593					U
22	0603444F	Maui Space Surveillance System (MSSS)	03	12,303	11,681	11,681					U
23	0603456F	Human Effectiveness Advanced Technology Development	03	24,094	26,492	26,492					U
24	0603601F	Conventional Weapons Technology	03	42,204	102,009	102,009					U
25	0603605F	Advanced Weapons Technology	03	37,301	39,064	39,064					U
26	0603680F	Manufacturing Technology Program	03	51,467	46,344	46,344					U
27	0603788F	Battlespace Knowledge Development and Demonstration	03	41,568	58,110	58,110					U
		Advanced Technology Development		675,737	725,805	725,805					
28	0603260F	Intelligence Advanced Development	04	5,032	5,598	5,598					U
29	0603438F	Space Control Technology	04	3,955	7,534	7,534					U
30	0603742F	Combat Identification Technology	04	21,025	24,418	24,418					U
31	0603790F	NATO Research and Development	04	4,566	4,333	4,333					U
32	0603830F	Space Security and Defense Program	04	30,771	32,399	32,399					U
33	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	34,765	108,663	108,663					U

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17	0603203F	Advanced Aerospace Sensors	03	40,945	40,945		40,945	40,978		40,978	U
18	0603211F	Aerospace Technology Dev/Demo	03	130,950	130,950		130,950	115,966		115,966	U
19	0603216F	Aerospace Propulsion and Power Technology	03	94,594	94,594		94,594	104,499		104,499	U
20	0603270F	Electronic Combat Technology	03	58,250	58,250		58,250	60,551		60,551	U
21	0603401F	Advanced Spacecraft Technology	03	61,593	61,593		61,593	58,910		58,910	U
22	0603444F	Maui Space Surveillance System (MSSS)	03	11,681	11,681		11,681	10,433		10,433	U
23	0603456F	Human Effectiveness Advanced Technology Development	03	26,492	26,492		26,492	33,635		33,635	U
24	0603601F	Conventional Weapons Technology	03	102,009	102,009		102,009	167,415		167,415	U
25	0603605F	Advanced Weapons Technology	03	39,064	39,064		39,064	45,502		45,502	U
26	0603680F	Manufacturing Technology Program	03	46,344	46,344		46,344	46,450		46,450	U
27	0603788F	Battlespace Knowledge Development and Demonstration	03	58,110	58,110		58,110	49,011		49,011	U
		Advanced Technology Development		725,805	725,805		725,805	794,017		794,017	
28	0603260F	Intelligence Advanced Development	04	5,598	5,598		5,598	5,652		5,652	U
29	0603438F	Space Control Technology	04	7,534	7,534		7,534		7,800	7,800	U
30	0603742F	Combat Identification Technology	04	24,418	24,418		24,418	24,397		24,397	U
31	0603790F	NATO Research and Development	04	4,333	4,333		4,333	3,851		3,851	U
32	0603830F	Space Security and Defense Program	04	32,399	32,399		32,399				U
33	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	108,663	108,663		108,663	10,736		10,736	U

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34	0603859F	Pollution Prevention - Dem/Val	04								U
35	0604015F	Long Range Strike - Bomber	04	710,390	1,358,309	1,358,309					U
36	0604201F	Integrated Avionics Planning and Development	04								U
37	0604257F	Advanced Technology and Sensors	04		34,818	34,818					U
38	0604288F	National Airborne Ops Center (NAOC) Recap	04								U
39	0604317F	Technology Transfer	04	7,494	3,368	3,368					U
40	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	62,034	74,308	74,308					U
41	0604414F	Cyber Resiliency of Weapon Systems-ACS	04			40,000					U
42	0604422F	Weather System Follow-on	04	46,307	118,953	118,953					U
43	0604425F	Space Situation Awareness Systems	04		9,901	10,901					U
44	0604776F	Deployment & Distribution Enterprise R&D	04		25,890	25,890					U
45	0604857F	Operationally Responsive Space	04	22,123	7,921	17,921					U
46	0604858F	Tech Transition Program	04	264,673	347,304	349,304					U
47	0605230F	Ground Based Strategic Deterrent	04	64,966	113,919	113,919					U
48	0201184F	Counter Narco-Terrorism Program Office	04	1,850							U
49	0207110F	Next Generation Air Dominance	04	32,495	20,595	167,595					U
50	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	7,865	49,491	49,491					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
34	0603859F	Pollution Prevention - Dem/Val	04					2		2	U
35	0604015F	Long Range Strike - Bomber	04	1,358,309	1,358,309		1,358,309	2,003,580		2,003,580	U
36	0604201F	Integrated Avionics Planning and Development	04					65,458		65,458	U
37	0604257F	Advanced Technology and Sensors	04	34,818	34,818		34,818	68,719		68,719	U
38	0604288F	National Airborne Ops Center (NAOC) Recap	04					7,850		7,850	U
39	0604317F	Technology Transfer	04	3,368	3,368		3,368	3,295		3,295	U
40	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	74,308	74,308		74,308	17,365		17,365	U
41	0604414F	Cyber Resiliency of Weapon Systems-ACS	04		40,000		40,000	32,253		32,253	U
42	0604422F	Weather System Follow-on	04	118,953	118,953		118,953				U
43	0604425F	Space Situation Awareness Systems	04	9,901	10,901		10,901				U
44	0604776F	Deployment & Distribution Enterprise R&D	04	25,890	25,890		25,890	26,222		26,222	U
45	0604857F	Operationally Responsive Space	04	7,921	17,921		17,921				U
46	0604858F	Tech Transition Program	04	347,304	349,304		349,304	840,650		840,650	U
47	0605230F	Ground Based Strategic Deterrent	04	113,919	113,919		113,919	215,721		215,721	U
48	0201184F	Counter Narco-Terrorism Program Office	04								U
49	0207110F	Next Generation Air Dominance	04	20,595	167,595		167,595	294,746		294,746	U
50	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	49,491	49,491		49,491	10,645		10,645	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

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Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	U
51	0305164F	NAVSTAR Global Positioning System (User Equipment)	04	143,118	278,147	278,147					U
52	0305236F	Common Data Link Executive Agent (CDL EA)	04		42,338	42,338					U
53	0306250F	Cyber Operations Technology Development	04	91,845	158,002	158,002		4,700		4,700	U
54	0306415F	Enabled Cyber Activities	04		15,842	15,842					U
55	0408011F	Special Tactics / Combat Control	04								U
56	0901410F	Contracting Information Technology System	04		5,782	5,782					U
57	1203164F	NAVSTAR Global Positioning System (User Equipment)	04								U
58	1203710F	EO/IR Weather Systems	04								U
59	1206422F	Weather System Follow-on	04								U
60	1206425F	Space Situation Awareness Systems	04								U
61	1206434F	Midterm Polar MILSATCOM System	04								U
62	1206438F	Space Control Technology	04								U
63	1206730F	Space Security and Defense Program	04								U
64	1206760F	Protected Tactical Enterprise Service (PTES)	04								U
65	1206761F	Protected Tactical Service (PTS)	04								U
66	1206855F	Protected SATCOM Services (PSCS) - Aggregated	04								U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
51	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04	278,147	278,147		278,147				U
52	0305236F	Common Data Link Executive Agent (CDL EA)	04	42,338	42,338		42,338	41,509		41,509	U
53	0306250F	Cyber Operations Technology Development	04	158,002	162,702		162,702	226,287	5,400	231,687	U
54	0306415F	Enabled Cyber Activities	04	15,842	15,842		15,842	16,687		16,687	U
55	0408011F	Special Tactics / Combat Control	04					4,500		4,500	U
56	0901410F	Contracting Information Technology System	04	5,782	5,782		5,782	15,867		15,867	U
57	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04					253,939		253,939	U
58	1203710F	EO/IR Weather Systems	04					10,000		10,000	U
59	1206422F	Weather System Follow-on	04					112,088		112,088	U
60	1206425F	Space Situation Awareness Systems	04					34,764		34,764	U
61	1206434F	Midterm Polar MILSATCOM System	04					63,092		63,092	U
62	1206438F	Space Control Technology	04					7,842		7,842	U
63	1206730F	Space Security and Defense Program	04					41,385		41,385	U
64	1206760F	Protected Tactical Enterprise Service (PTES)	04					18,150		18,150	U
65	1206761F	Protected Tactical Service (PTS)	04					24,201		24,201	U
66	1206855F	Protected SATCOM Services (PSCS) - Aggregated	04					16,000		16,000	U

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
67	1206857F	Operationally Responsive Space	04								U
		Advanced Component Development & Prototypes		1,555,274	2,847,833	3,047,833		4,700		4,700	
68	0604200F	Future Advanced Weapon Analysis & Programs	05								U
69	0604201F	Integrated Avionics Planning and Development	05								U
70	0604222F	Nuclear Weapons Support	05								U
71	0604270F	Electronic Warfare Development	05	813	12,476	12,476					U
72	0604281F	Tactical Data Networks Enterprise	05	49,495	82,380	82,380					U
73	0604287F	Physical Security Equipment	05	5,973	8,458	24,458		11,000		11,000	U
74	0604329F	Small Diameter Bomb (SDB) - EMD	05	27,950	54,838	54,838					U
75	0604421F	Counterspace Systems	05	24,134	34,394	41,494	425	425		425	U
76	0604425F	Space Situation Awareness Systems	05	30,116	23,945	23,945					U
77	0604426F	Space Fence	05	240,692	168,364	168,364					U
78	0604429F	Airborne Electronic Attack	05	8,067	9,187	9,187					U
79	0604441F	Space Based Infrared System (SBIRS) High EMD	05	291,510	181,966	218,766					U
80	0604602F	Armament/Ordnance Development	05	36,266	20,312	20,312					U
81	0604604F	Submunitions	05	2,419	2,503	2,503					U
82	0604617F	Agile Combat Support	05	56,178	53,680	53,680					U
83	0604618F	Joint Direct Attack Munition	05		9,901	9,901					U
84	0604706F	Life Support Systems	05	7,904	7,520	7,520					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
67	1206857F	Operationally Responsive Space	04					87,577		87,577	U
		Advanced Component Development & Prototypes		2,847,833	3,052,533		3,052,533	4,605,030	13,200	4,618,230	
68	0604200F	Future Advanced Weapon Analysis & Programs	05					5,100		5,100	U
69	0604201F	Integrated Avionics Planning and Development	05					101,203		101,203	U
70	0604222F	Nuclear Weapons Support	05					3,009		3,009	U
71	0604270F	Electronic Warfare Development	05	12,476	12,476		12,476	2,241		2,241	U
72	0604281F	Tactical Data Networks Enterprise	05	82,380	82,380		82,380	38,250		38,250	U
73	0604287F	Physical Security Equipment	05	8,458	35,458		35,458	19,739		19,739	U
74	0604329F	Small Diameter Bomb (SDB) - EMD	05	54,838	54,838		54,838	38,979		38,979	U
75	0604421F	Counterspace Systems	05	34,819	41,919		41,919				U
76	0604425F	Space Situation Awareness Systems	05	23,945	23,945		23,945				U
77	0604426F	Space Fence	05	168,364	168,364		168,364				U
78	0604429F	Airborne Electronic Attack	05	9,187	9,187		9,187	7,091		7,091	U
79	0604441F	Space Based Infrared System (SBIRS) High EMD	05	181,966	218,766		218,766				U
80	0604602F	Armament/Ordnance Development	05	20,312	20,312		20,312	46,540		46,540	U
81	0604604F	Submunitions	05	2,503	2,503		2,503	2,705		2,705	U
82	0604617F	Agile Combat Support	05	53,680	53,680		53,680	31,240		31,240	U
83	0604618F	Joint Direct Attack Munition	05	9,901	9,901		9,901				U
84	0604706F	Life Support Systems	05	7,520	7,520		7,520	9,060		9,060	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req S e c
85	0604735F	Combat Training Ranges	05	11,368	77,409	77,409					U
86	0604800F	F-35 - EMD	05	575,932	450,467	450,467					U
87	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05	224,920	296,572	296,572					U
88	0604932F	Long Range Standoff Weapon	05	16,143	95,604	95,604					U
89	0604933F	ICBM Fuze Modernization	05	138,027	189,751	189,751					U
90	0605030F	Joint Tactical Network Center (JTNC)	05		1,131	1,131					U
91	0605031F	Joint Tactical Network (JTN)	05								U
92	0605213F	F-22 Modernization Increment 3.2B	05	115,603	70,290	70,290					U
93	0605214F	Ground Attack Weapons Fuze Development	05	3,477	937	937					U
94	0605221F	KC-46	05	572,118	261,724	261,724					U
95	0605223F	Advanced Pilot Training	05	10,395	12,377	12,377					U
96	0605229F	Combat Rescue Helicopter	05	150,341	319,331	319,331					U
97	0605431F	Advanced EHF MILSATCOM (SPACE)	05	208,095	259,131	259,131					U
98	0605432F	Polar MILSATCOM (SPACE)	05	71,867	50,815	50,815					U
99	0605433F	Wideband Global SATCOM (SPACE)	05	49,954	41,632	41,632					U
100	0605458F	Air & Space Ops Center 10.2 RDT&E	05	55,333	28,911	28,911					U
101	0605931F	B-2 Defensive Management System	05	261,162	315,615	315,615					U
102	0101125F	Nuclear Weapons Modernization	05	204,358	137,909	137,909					U
103	0207171F	F-15 EPAWSS	05	174,439	256,669	256,669					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se c
85	0604735F	Combat Training Ranges	05	77,409	77,409		77,409	87,350		87,350	U
86	0604800F	F-35 - EMD	05	450,467	450,467		450,467	292,947		292,947	U
87	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05	296,572	296,572		296,572				U
88	0604932F	Long Range Standoff Weapon	05	95,604	95,604		95,604	451,290		451,290	U
89	0604933F	ICBM Fuze Modernization	05	189,751	189,751		189,751	178,991		178,991	U
90	0605030F	Joint Tactical Network Center (JTNC)	05	1,131	1,131		1,131	12,736		12,736	U
91	0605031F	Joint Tactical Network (JTN)	05					9,319		9,319	U
92	0605213F	F-22 Modernization Increment 3.2B	05	70,290	70,290		70,290	13,600		13,600	U
93	0605214F	Ground Attack Weapons Fuze Development	05	937	937		937				U
94	0605221F	KC-46	05	261,724	261,724		261,724	93,845		93,845	U
95	0605223F	Advanced Pilot Training	05	12,377	12,377		12,377	105,999		105,999	U
96	0605229F	Combat Rescue Helicopter	05	319,331	319,331		319,331	354,485		354,485	U
97	0605431F	Advanced EHF MILSATCOM (SPACE)	05	259,131	259,131		259,131				U
98	0605432F	Polar MILSATCOM (SPACE)	05	50,815	50,815		50,815				U
99	0605433F	Wideband Global SATCOM (SPACE)	05	41,632	41,632		41,632				U
100	0605458F	Air & Space Ops Center 10.2 RDT&E	05	28,911	28,911		28,911	119,745		119,745	U
101	0605931F	B-2 Defensive Management System	05	315,615	315,615		315,615	194,570		194,570	U
102	0101125F	Nuclear Weapons Modernization	05	137,909	137,909		137,909	91,237		91,237	U
103	0207171F	F-15 EPAWSS	05	256,669	256,669		256,669	209,847		209,847	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
104	0207328F	Stand In Attack Weapon	05								U
105	0207701F	Full Combat Mission Training	05	17,290	12,051	12,051					U
106	0303267F	Auctioned Spectrum Relocation Fund	05	40,571							U
107	0303367F	Spectrum Access Research and Development	05	383							U
108	0305176F	Combat Survivor Evader Locator	05	958	29,253	29,253					U
109	0307581F	JSTARS Recap	05	51,306	128,019	128,019					U
110	0401310F	C-32 Executive Transport Recapitalization	05								U
111	0401319F	Presidential Aircraft Recapitalization (PAR)	05	82,420	351,220	351,220					U
112	0701212F	Automated Test Systems	05	14,422	19,062	19,062					U
113	1203176F	Combat Survivor Evader Locator	05								U
114	1203940F	Space Situation Awareness Operations	05								U
115	1206421F	Counterspace Systems	05								U
116	1206425F	Space Situation Awareness Systems	05								U
117	1206426F	Space Fence	05								U
118	1206431F	Advanced EHF MILSATCOM (SPACE)	05								U
119	1206432F	Polar MILSATCOM (SPACE)	05								U
120	1206433F	Wideband Global SATCOM (SPACE)	05								U
121	1206441F	Space Based Infrared System (SBIRS) High EMD	05								U

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
104	0207328F	Stand In Attack Weapon	05					3,400		3,400	U
105	0207701F	Full Combat Mission Training	05	12,051	12,051		12,051	16,727		16,727	U
106	0303267F	Auctioned Spectrum Relocation Fund	05								U
107	0303367F	Spectrum Access Research and Development	05								U
108	0305176F	Combat Survivor Evader Locator	05	29,253	29,253		29,253				U
109	0307581F	JSTARS Recap	05	128,019	128,019		128,019	417,201		417,201	U
110	0401310F	C-32 Executive Transport Recapitalization	05					6,017		6,017	U
111	0401319F	Presidential Aircraft Recapitalization (PAR)	05	351,220	351,220		351,220	434,069		434,069	U
112	0701212F	Automated Test Systems	05	19,062	19,062		19,062	18,528		18,528	U
113	1203176F	Combat Survivor Evader Locator	05					24,967		24,967	U
114	1203940F	Space Situation Awareness Operations	05					10,029		10,029	U
115	1206421F	Counterspace Systems	05					66,370		66,370	U
116	1206425F	Space Situation Awareness Systems	05					48,448		48,448	U
117	1206426F	Space Fence	05					35,937		35,937	U
118	1206431F	Advanced EHF MILSATCOM (SPACE)	05					145,610		145,610	U
119	1206432F	Polar MILSATCOM (SPACE)	05					33,644		33,644	U
120	1206433F	Wideband Global SATCOM (SPACE)	05					14,263		14,263	U
121	1206441F	Space Based Infrared System (SBIRS) High EMD	05					311,844		311,844	U

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req e c
122	1206442F	Evolved SBIRS	05								U
123	1206853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05								U
		System Development & Demonstration		3,832,399	4,075,804	4,135,704	425	11,425		11,425	
124	0604256F	Threat Simulator Development	06	23,558	21,630	21,630					U
125	0604759F	Major T&E Investment	06	70,894	66,385	71,385					U
126	0605101F	RAND Project Air Force	06	33,943	34,641	34,641					U
127	0605502F	Small Business Innovation Research	06	337,762							U
128	0605712F	Initial Operational Test & Evaluation	06	11,172	11,529	11,529					U
129	0605807F	Test and Evaluation Support	06	683,307	661,417	680,217					U
130	0605826F	Acq Workforce- Global Power	06								U
131	0605827F	Acq Workforce- Global Vig & Combat Sys	06								U
132	0605828F	Acq Workforce- Global Reach	06								U
133	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06								U
134	0605830F	Acq Workforce- Global Battle Mgmt	06								U
135	0605831F	Acq Workforce- Capability Integration	06								U
136	0605832F	Acq Workforce- Advanced Prgm Technology	06								U
137	0605833F	Acq Workforce- Nuclear Systems	06								U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
122	1206442F	Evolved SBIRS	05					71,018		71,018	U
123	1206853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05					297,572		297,572	U
		System Development & Demonstration		4,076,229	4,147,129		4,147,129	4,476,762		4,476,762	
124	0604256F	Threat Simulator Development	06	21,630	21,630		21,630	35,405		35,405	U
125	0604759F	Major T&E Investment	06	66,385	71,385		71,385	82,874		82,874	U
126	0605101F	RAND Project Air Force	06	34,641	34,641		34,641	34,346		34,346	U
127	0605502F	Small Business Innovation Research	06								U
128	0605712F	Initial Operational Test & Evaluation	06	11,529	11,529		11,529	15,523		15,523	U
129	0605807F	Test and Evaluation Support	06	661,417	680,217		680,217	678,289		678,289	U
130	0605826F	Acq Workforce- Global Power	06					219,809		219,809	U
131	0605827F	Acq Workforce- Global Vig & Combat Sys	06					223,179		223,179	U
132	0605828F	Acq Workforce- Global Reach	06					138,556		138,556	U
133	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06					221,393		221,393	U
134	0605830F	Acq Workforce- Global Battle Mgmt	06					152,577		152,577	U
135	0605831F	Acq Workforce- Capability Integration	06					196,561		196,561	U
136	0605832F	Acq Workforce- Advanced Prgm Technology	06					28,322		28,322	U
137	0605833F	Acq Workforce- Nuclear Systems	06					126,611		126,611	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

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138	0605860F	Rocket Systems Launch Program (SPACE)	06	21,245	11,198	11,198					U
139	0605864F	Space Test Program (STP)	06	28,143	27,070	27,070					U
140	0605898F	Management HQ - R&D	06								U
141	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	40,518	134,111	134,111					U
142	0605978F	Facilities Sustainment - Test and Evaluation Support	06	27,895	28,091	28,091					U
143	0606017F	Requirements Analysis and Maturation	06	21,922	29,100	129,100					U
144	0606116F	Space Test and Training Range Development	06	18,465	18,528	18,528					U
145	0606392F	Space and Missile Center (SMC) Civilian Workforce	06	169,196	176,666	176,666					U
146	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	3,841	4,410	4,410					U
147	0702806F	Acquisition and Management Support	06	16,358	14,613	14,613					U
148	0804731F	General Skill Training	06	1,268	1,404	1,404					U
149	0909999F	Financing for Cancelled Account Adjustments	06	656							U
150	1001004F	International Activities	06	2,315	4,784	4,784					U
151	1206116F	Space Test and Training Range Development	06								U
152	1206392F	Space and Missile Center (SMC) Civilian Workforce	06								U
153	1206398F	Space & Missile Systems Center - MHA	06								U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
138	0605860F	Rocket Systems Launch Program (SPACE)	06	11,198	11,198		11,198				U
139	0605864F	Space Test Program (STP)	06	27,070	27,070		27,070				U
140	0605898F	Management HQ - R&D	06					9,154		9,154	U
141	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	134,111	134,111		134,111	135,507		135,507	U
142	0605978F	Facilities Sustainment - Test and Evaluation Support	06	28,091	28,091		28,091	28,720		28,720	U
143	0606017F	Requirements Analysis and Maturation	06	29,100	129,100		129,100	35,453		35,453	U
144	0606116F	Space Test and Training Range Development	06	18,528	18,528		18,528				U
145	0606392F	Space and Missile Center (SMC) Civilian Workforce	06	176,666	176,666		176,666				U
146	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	4,410	4,410		4,410	29,049		29,049	U
147	0702806F	Acquisition and Management Support	06	14,613	14,613		14,613	14,980		14,980	U
148	0804731F	General Skill Training	06	1,404	1,404		1,404	1,434		1,434	U
149	0909999F	Financing for Cancelled Account Adjustments	06								U
150	1001004F	International Activities	06	4,784	4,784		4,784	4,569		4,569	U
151	1206116F	Space Test and Training Range Development	06					25,773		25,773	U
152	1206392F	Space and Missile Center (SMC) Civilian Workforce	06					169,887		169,887	U
153	1206398F	Space & Missile Systems Center - MHA	06					9,531		9,531	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Se
154	1206860F	Rocket Systems Launch Program (SPACE)	06								U
155	1206864F	Space Test Program (STP)	06								U
		Management Support		1,512,458	1,245,577	1,369,377					
156	0603423F	Global Positioning System III - Operational Control Segment	07	344,226	393,268	513,268					U
157	0604222F	Nuclear Weapons Support	07								U
158	0604233F	Specialized Undergraduate Flight Training	07	7,742	15,427	15,427					U
159	0604445F	Wide Area Surveillance	07	17,639	46,695	46,695					U
161	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	30,334	10,368	10,368					U
162	0605024F	Anti-Tamper Technology Executive Agency	07	25,857	31,952	31,952					U
163	0605117F	Foreign Materiel Acquisition and Exploitation	07	41,689	42,960	42,960					U
164	0605278F	HC/MC-130 Recap RDT&E	07	8,646	13,987	13,987					U
165	0606018F	NC3 Integration	07								U
166	0101113F	B-52 Squadrons	07	70,172	78,267	88,267					U
167	0101122F	Air-Launched Cruise Missile (ALCM)	07	451	453	453					U
168	0101126F	B-1B Squadrons	07	2,174	5,830	5,830					U
169	0101127F	B-2 Squadrons	07	105,914	152,458	152,458					U
170	0101213F	Minuteman Squadrons	07	128,492	182,958	182,958					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
154	1206860F	Rocket Systems Launch Program (SPACE)	06					20,975		20,975	U
155	1206864F	Space Test Program (STP)	06					25,398		25,398	U
		Management Support		1,245,577	1,369,377		1,369,377	2,663,875		2,663,875	
156	0603423F	Global Positioning System III - Operational Control Segment	07	393,268	513,268		513,268				U
157	0604222F	Nuclear Weapons Support	07					27,579		27,579	U
158	0604233F	Specialized Undergraduate Flight Training	07	15,427	15,427		15,427	5,776		5,776	U
159	0604445F	Wide Area Surveillance	07	46,695	46,695		46,695	16,247		16,247	U
161	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	10,368	10,368		10,368	21,915		21,915	U
162	0605024F	Anti-Tamper Technology Executive Agency	07	31,952	31,952		31,952	33,150		33,150	U
163	0605117F	Foreign Materiel Acquisition and Exploitation	07	42,960	42,960		42,960	66,653		66,653	U
164	0605278F	HC/MC-130 Recap RDT&E	07	13,987	13,987		13,987	38,579		38,579	U
165	0606018F	NC3 Integration	07					12,636		12,636	U
166	0101113F	B-52 Squadrons	07	78,267	88,267		88,267	111,910		111,910	U
167	0101122F	Air-Launched Cruise Missile (ALCM)	07	453	453		453	463		463	U
168	0101126F	B-1B Squadrons	07	5,830	5,830		5,830	62,471		62,471	U
169	0101127F	B-2 Squadrons	07	152,458	152,458		152,458	193,108		193,108	U
170	0101213F	Minuteman Squadrons	07	182,958	182,958		182,958	210,845		210,845	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req e c
171	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07	26,954	39,148	39,148					U
172	0101314F	Night Fist - USSTRATCOM	07	87							U
173	0101316F	Worldwide Joint Strategic Communications	07	3,815	6,042	6,042					U
174	0101324F	Integrated Strategic Planning & Analysis Network	07								U
176	0102110F	UH-1N Replacement Program	07		14,116	14,116					U
177	0102326F	Region/Sector Operation Control Center Modernization Program	07		10,868	10,868					U
178	0105921F	Service Support to STRATCOM - Space Activities	07	9,388	8,674	8,674					U
179	0205219F	MQ-9 UAV	07	124,695	151,373	151,373					U
180	0205671F	Joint Counter RCIED Electronic Warfare	07	300							U
181	0207040F	Multi-Platform Electronic Warfare Equipment	07	3,980							U
182	0207131F	A-10 Squadrons	07	16,200	14,853	21,353					U
183	0207133F	F-16 Squadrons	07	153,611	132,795	147,795					U
184	0207134F	F-15E Squadrons	07	210,029	356,717	356,717					U
185	0207136F	Manned Destructive Suppression	07	14,400	14,773	14,773					U
186	0207138F	F-22A Squadrons	07	224,550	387,564	387,564					U
187	0207142F	F-35 Squadrons	07	51,990	153,045	153,045					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

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Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
171	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07	39,148	39,148		39,148	25,736		25,736	U
172	0101314F	Night Fist - USSTRATCOM	07								U
173	0101316F	Worldwide Joint Strategic Communications	07	6,042	6,042		6,042	6,272		6,272	U
174	0101324F	Integrated Strategic Planning & Analysis Network	07					11,032		11,032	U
176	0102110F	UH-1N Replacement Program	07	14,116	14,116		14,116	108,617		108,617	U
177	0102326F	Region/Sector Operation Control Center Modernization Program	07	10,868	10,868		10,868	3,347		3,347	U
178	0105921F	Service Support to STRATCOM - Space Activities	07	8,674	8,674		8,674				U
179	0205219F	MQ-9 UAV	07	151,373	151,373		151,373	201,394		201,394	U
180	0205671F	Joint Counter RCIED Electronic Warfare	07								U
181	0207040F	Multi-Platform Electronic Warfare Equipment	07								U
182	0207131F	A-10 Squadrons	07	14,853	21,353		21,353	17,459		17,459	U
183	0207133F	F-16 Squadrons	07	132,795	147,795		147,795	246,578		246,578	U
184	0207134F	F-15E Squadrons	07	356,717	356,717		356,717	320,271		320,271	U
185	0207136F	Manned Destructive Suppression	07	14,773	14,773		14,773	15,106		15,106	U
186	0207138F	F-22A Squadrons	07	387,564	387,564		387,564	610,942		610,942	U
187	0207142F	F-35 Squadrons	07	153,045	153,045		153,045	334,530		334,530	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
188	0207161F	Tactical AIM Missiles	07	33,615	52,898	52,898					U
189	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	44,335	62,470	62,470					U
190	0207224F	Combat Rescue and Recovery	07	398							U
191	0207227F	Combat Rescue - Pararescue	07	636	362	362					U
192	0207247F	AF TENCAP	07	37,489	28,413	28,413					U
193	0207249F	Precision Attack Systems Procurement	07	1,064	649	649					U
194	0207253F	Compass Call	07	32,024	13,723	23,923					U
195	0207268F	Aircraft Engine Component Improvement Program	07	104,092	109,859	109,859					U
196	0207277F	ISR Innovations	07								U
197	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	9,221	30,002	30,002					U
198	0207410F	Air & Space Operations Center (AOC)	07	20,588	37,621	37,621					U
199	0207412F	Control and Reporting Center (CRC)	07	557	13,292	13,292					U
200	0207417F	Airborne Warning and Control System (AWACS)	07	124,457	86,644	86,644					U
201	0207418F	Tactical Airborne Control Systems	07	5,786	2,442	2,442					U
203	0207431F	Combat Air Intelligence System Activities	07	6,793	10,911	10,911					U
204	0207444F	Tactical Air Control Party-Mod	07	10,747	11,843	11,843					U
205	0207448F	C2ISR Tactical Data Link	07	1,629	1,515	1,515					U
206	0207452F	DCAPES	07	12,909	14,979	14,979					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

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188	0207161F	Tactical AIM Missiles	07	52,898	52,898		52,898	34,952		34,952	U
189	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	62,470	62,470		62,470	61,322		61,322	U
190	0207224F	Combat Rescue and Recovery	07								U
191	0207227F	Combat Rescue - Pararescue	07	362	362		362	693		693	U
192	0207247F	AF TENCAP	07	28,413	28,413		28,413				U
193	0207249F	Precision Attack Systems Procurement	07	649	649		649	1,714		1,714	U
194	0207253F	Compass Call	07	13,723	23,923		23,923	14,040		14,040	U
195	0207268F	Aircraft Engine Component Improvement Program	07	109,859	109,859		109,859	109,243		109,243	U
196	0207277F	ISR Innovations	07						5,750	5,750	U
197	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	30,002	30,002		30,002	29,932		29,932	U
198	0207410F	Air & Space Operations Center (AOC)	07	37,621	37,621		37,621	26,956		26,956	U
199	0207412F	Control and Reporting Center (CRC)	07	13,292	13,292		13,292	2,450		2,450	U
200	0207417F	Airborne Warning and Control System (AWACS)	07	86,644	86,644		86,644	151,726		151,726	U
201	0207418F	Tactical Airborne Control Systems	07	2,442	2,442		2,442	3,656		3,656	U
203	0207431F	Combat Air Intelligence System Activities	07	10,911	10,911		10,911	13,420		13,420	U
204	0207444F	Tactical Air Control Party-Mod	07	11,843	11,843		11,843	10,623		10,623	U
205	0207448F	C2ISR Tactical Data Link	07	1,515	1,515		1,515	1,754		1,754	U
206	0207452F	DCAPES	07	14,979	14,979		14,979	17,382		17,382	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req S e c
207	0207573F	National Technical Nuclear Forensics	07								U
208	0207590F	Seek Eagle	07	21,131	25,308	25,308					U
209	0207601F	USAF Modeling and Simulation	07	20,358	16,666	16,666					U
210	0207605F	Wargaming and Simulation Centers	07	5,819	4,245	4,245					U
211	0207697F	Distributed Training and Exercises	07	4,202	3,886	3,886					U
212	0208006F	Mission Planning Systems	07	54,176	71,785	71,785					U
213	0208007F	Tactical Deception	07								U
214	0208087F	AF Offensive Cyberspace Operations	07	14,939	25,025	25,025					U
215	0208088F	AF Defensive Cyberspace Operations	07	7,414	29,439	29,439					U
218	0301017F	Global Sensor Integrated on Network (GSIN)	07	5,803	3,470	3,470					U
219	0301112F	Nuclear Planning and Execution System (NPES)	07		4,060	4,060					U
226	0301400F	Space Superiority Intelligence	07	13,965	13,880	13,880					U
227	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07								U
228	0302015F	E-4B National Airborne Operations Center (NAOC)	07	76,760	30,948	30,948					U
229	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07	12,313	42,378	52,578					U
230	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	92,036	47,471	47,471					U
231	0303140F	Information Systems Security Program	07	44,578	46,388	46,388					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	S e c
207	0207573F	National Technical Nuclear Forensics	07					2,307		2,307	U
208	0207590F	Seek Eagle	07	25,308	25,308		25,308	25,397		25,397	U
209	0207601F	USAF Modeling and Simulation	07	16,666	16,666		16,666	10,175		10,175	U
210	0207605F	Wargaming and Simulation Centers	07	4,245	4,245		4,245	12,839		12,839	U
211	0207697F	Distributed Training and Exercises	07	3,886	3,886		3,886	4,190		4,190	U
212	0208006F	Mission Planning Systems	07	71,785	71,785		71,785	85,531		85,531	U
213	0208007F	Tactical Deception	07					3,761		3,761	U
214	0208087F	AF Offensive Cyberspace Operations	07	25,025	25,025		25,025	35,693	4,000	39,693	U
215	0208088F	AF Defensive Cyberspace Operations	07	29,439	29,439		29,439	20,964		20,964	U
218	0301017F	Global Sensor Integrated on Network (GSIN)	07	3,470	3,470		3,470	3,549		3,549	U
219	0301112F	Nuclear Planning and Execution System (NPES)	07	4,060	4,060		4,060	4,371		4,371	U
226	0301400F	Space Superiority Intelligence	07	13,880	13,880		13,880				U
227	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07					3,721		3,721	U
228	0302015F	E-4B National Airborne Operations Center (NAOC)	07	30,948	30,948		30,948	35,467		35,467	U
229	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07	42,378	52,578		52,578				U
230	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	47,471	47,471		47,471	48,841		48,841	U
231	0303140F	Information Systems Security Program	07	46,388	46,388		46,388	42,973		42,973	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Se
232	0303141F	Global Combat Support System	07		52	52					U
233	0303142F	Global Force Management - Data Initiative	07	2,470	2,099	2,099					U
234	0303601F	MILSATCOM Terminals	07	9,000							U
236	0304260F	Airborne SIGINT Enterprise	07	111,142	90,762	90,762					U
237	0304310F	Commercial Economic Analysis	07								U
240	0305020F	CCMD Intelligence Information Technology	07								U
241	0305099F	Global Air Traffic Management (GATM)	07	4,089	4,354	4,354					U
242	0305110F	Satellite Control Network (SPACE)	07	7,327	15,624	15,624					U
243	0305111F	Weather Service	07	28,812	19,974	19,974					U
244	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07	18,830	9,770	9,770					U
245	0305116F	Aerial Targets	07	2,578	3,051	3,051					U
248	0305128F	Security and Investigative Activities	07	455	405	405					U
249	0305145F	Arms Control Implementation	07	9,116	4,844	4,844					U
250	0305146F	Defense Joint Counterintelligence Activities	07	361	339	339					U
253	0305173F	Space and Missile Test and Evaluation Center	07	3,490	3,989	3,989					U
254	0305174F	Space Innovation, Integration and Rapid Technology Development	07	1,543	3,070	3,070	4,715	4,715		4,715	U
255	0305179F	Integrated Broadcast Service (IBS)	07	9,760	8,833	8,833					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
232	0303141F	Global Combat Support System	07	52	52		52	105		105	U
233	0303142F	Global Force Management - Data Initiative	07	2,099	2,099		2,099	2,147		2,147	U
234	0303601F	MILSATCOM Terminals	07								U
236	0304260F	Airborne SIGINT Enterprise	07	90,762	90,762		90,762	121,948		121,948	U
237	0304310F	Commercial Economic Analysis	07					3,544		3,544	U
240	0305020F	CCMD Intelligence Information Technology	07					1,542		1,542	U
241	0305099F	Global Air Traffic Management (GATM)	07	4,354	4,354		4,354	4,453		4,453	U
242	0305110F	Satellite Control Network (SPACE)	07	15,624	15,624		15,624				U
243	0305111F	Weather Service	07	19,974	19,974		19,974	26,654		26,654	U
244	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07	9,770	9,770		9,770	6,306		6,306	U
245	0305116F	Aerial Targets	07	3,051	3,051		3,051	21,295		21,295	U
248	0305128F	Security and Investigative Activities	07	405	405		405	415		415	U
249	0305145F	Arms Control Implementation	07	4,844	4,844		4,844				U
250	0305146F	Defense Joint Counterintelligence Activities	07	339	339		339	3,867		3,867	U
253	0305173F	Space and Missile Test and Evaluation Center	07	3,989	3,989		3,989				U
254	0305174F	Space Innovation, Integration and Rapid Technology Development	07	7,785	7,785		7,785				U
255	0305179F	Integrated Broadcast Service (IBS)	07	8,833	8,833		8,833				U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req e c
256	0305182F	Spacelift Range System (SPACE)	07	5,708	11,867	11,867					U
257	0305202F	Dragon U-2	07	34,471	37,217	37,217					U
258	0305205F	Endurance Unmanned Aerial Vehicles	07	5,000							U
259	0305206F	Airborne Reconnaissance Systems	07	61,742	3,841	3,841					U
260	0305207F	Manned Reconnaissance Systems	07	13,245	20,975	20,975					U
261	0305208F	Distributed Common Ground/Surface Systems	07	22,686	18,902	30,448					U
262	0305220F	RQ-4 UAV	07	180,547	256,307	256,307					U
263	0305221F	Network-Centric Collaborative Targeting	07	19,587	22,610	22,610					U
264	0305236F	Common Data Link Executive Agent (CDL EA)	07	43,709							U
265	0305238F	NATO AGS	07	131,900	38,904	38,904					U
266	0305240F	Support to DCGS Enterprise	07	28,336	23,084	23,084					U
267	0305258F	Advanced Evaluation Program	07		116,143	116,143					U
268	0305265F	GPS III Space Segment	07	147,398	141,888	179,188					U
269	0305600F	International Intelligence Technology and Architectures	07	2,298	2,360	2,360					U
270	0305614F	JSPOC Mission System	07	80,669	72,889	87,889					U
271	0305881F	Rapid Cyber Acquisition	07	3,036	4,280	4,280					U
272	0305906F	NCMC - TW/AA System	07		4,951	4,951					U
273	0305913F	NUDET Detection System (SPACE)	07	14,403	21,093	21,093					U

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
256	0305182F	Spacelift Range System (SPACE)	07	11,867	11,867		11,867				U
257	0305202F	Dragon U-2	07	37,217	37,217		37,217	34,486		34,486	U
258	0305205F	Endurance Unmanned Aerial Vehicles	07								U
259	0305206F	Airborne Reconnaissance Systems	07	3,841	3,841		3,841	4,450		4,450	U
260	0305207F	Manned Reconnaissance Systems	07	20,975	20,975		20,975	14,269		14,269	U
261	0305208F	Distributed Common Ground/Surface Systems	07	18,902	30,448		30,448	27,501		27,501	U
262	0305220F	RQ-4 UAV	07	256,307	256,307		256,307	214,849		214,849	U
263	0305221F	Network-Centric Collaborative Targeting	07	22,610	22,610		22,610	18,842		18,842	U
264	0305236F	Common Data Link Executive Agent (CDL EA)	07								U
265	0305238F	NATO AGS	07	38,904	38,904		38,904	44,729		44,729	U
266	0305240F	Support to DCGS Enterprise	07	23,084	23,084		23,084	26,349		26,349	U
267	0305258F	Advanced Evaluation Program	07	116,143	116,143		116,143				U
268	0305265F	GPS III Space Segment	07	141,888	179,188		179,188				U
269	0305600F	International Intelligence Technology and Architectures	07	2,360	2,360		2,360	3,491		3,491	U
270	0305614F	JSPOC Mission System	07	72,889	87,889		87,889				U
271	0305881F	Rapid Cyber Acquisition	07	4,280	4,280		4,280	4,899		4,899	U
272	0305906F	NCCM - TW/AA System	07	4,951	4,951		4,951				U
273	0305913F	NUDET Detection System (SPACE)	07	21,093	21,093		21,093				U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req e c
274	0305940F	Space Situation Awareness Operations	07	23,416	35,002	93,802					U
275	0305984F	Personnel Recovery Command & Ctrl (PRC2)	07								U
276	0307577F	Intelligence Mission Data (IMD)	07								U
277	0308699F	Shared Early Warning (SEW)	07	845	6,366	6,366					U
278	0401115F	C-130 Airlift Squadron	07	33,962	15,599	15,599					U
279	0401119F	C-5 Airlift Squadrons (IF)	07	22,766	66,146	66,146					U
280	0401130F	C-17 Aircraft (IF)	07	36,082	12,430	12,430					U
281	0401132F	C-130J Program	07	31,410	16,776	16,776					U
282	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	5,802	5,166	5,166					U
283	0401218F	KC-135s	07								U
284	0401219F	KC-10s	07	1,597							U
285	0401314F	Operational Support Airlift	07	46,453	13,817	13,817					U
286	0401318F	CV-22	07	26,821	16,702	28,702					U
287	0401840F	AMC Command and Control System	07								U
288	0408011F	Special Tactics / Combat Control	07	7,665	7,164	7,164					U
289	0702207F	Depot Maintenance (Non-IF)	07	1,514	1,518	1,518					U
290	0708055F	Maintenance, Repair & Overhaul System	07								U
291	0708610F	Logistics Information Technology (LOGIT)	07	52,482	61,676	61,676					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

UNCLASSIFIED

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
274	0305940F	Space Situation Awareness Operations	07	35,002	93,802		93,802				U
275	0305984F	Personnel Recovery Command & Ctrl (PRC2)	07					2,445		2,445	U
276	0307577F	Intelligence Mission Data (IMD)	07					8,684		8,684	U
277	0308699F	Shared Early Warning (SEW)	07	6,366	6,366		6,366				U
278	0401115F	C-130 Airlift Squadron	07	15,599	15,599		15,599	10,219		10,219	U
279	0401119F	C-5 Airlift Squadrons (IF)	07	66,146	66,146		66,146	22,758		22,758	U
280	0401130F	C-17 Aircraft (IF)	07	12,430	12,430		12,430	34,287		34,287	U
281	0401132F	C-130J Program	07	16,776	16,776		16,776	26,821		26,821	U
282	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	5,166	5,166		5,166	5,283		5,283	U
283	0401218F	KC-135s	07					9,942		9,942	U
284	0401219F	KC-10s	07					7,933		7,933	U
285	0401314F	Operational Support Airlift	07	13,817	13,817		13,817	6,681		6,681	U
286	0401318F	CV-22	07	16,702	28,702		28,702	22,519		22,519	U
287	0401840F	AMC Command and Control System	07					3,510		3,510	U
288	0408011F	Special Tactics / Combat Control	07	7,164	7,164		7,164	8,090		8,090	U
289	0702207F	Depot Maintenance (Non-IF)	07	1,518	1,518		1,518	1,528		1,528	U
290	0708055F	Maintenance, Repair & Overhaul System	07					31,677		31,677	U
291	0708610F	Logistics Information Technology (LOGIT)	07	61,676	61,676		61,676	33,344		33,344	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
292	0708611F	Support Systems Development	07	13,987	9,128	9,128					U
293	0804743F	Other Flight Training	07	1,770	1,653	1,653					U
294	0808716F	Other Personnel Activities	07	117	57	57					U
295	0901202F	Joint Personnel Recovery Agency	07	5,741	3,663	3,663					U
296	0901218F	Civilian Compensation Program	07	3,475	3,735	3,735					U
297	0901220F	Personnel Administration	07	4,416	5,157	5,157					U
298	0901226F	Air Force Studies and Analysis Agency	07	1,064	1,523	1,523					U
299	0901538F	Financial Management Information Systems Development	07	95,053	10,581	10,581					U
300	1201921F	Service Support to STRATCOM - Space Activities	07								U
301	1202247F	AF TENCAP	07								U
302	1203001F	Family of Advanced BLoS Terminals (FAB-T)	07								U
303	1203110F	Satellite Control Network (SPACE)	07								U
305	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	07								U
306	1203173F	Space and Missile Test and Evaluation Center	07								U
307	1203174F	Space Innovation, Integration and Rapid Technology Development	07								U
308	1203179F	Integrated Broadcast Service (IBS)	07								U
309	1203182F	Spacelift Range System (SPACE)	07								U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
292	0708611F	Support Systems Development	07	9,128	9,128		9,128	9,362		9,362	U
293	0804743F	Other Flight Training	07	1,653	1,653		1,653	2,074		2,074	U
294	0808716F	Other Personnel Activities	07	57	57		57	107		107	U
295	0901202F	Joint Personnel Recovery Agency	07	3,663	3,663		3,663	2,006		2,006	U
296	0901218F	Civilian Compensation Program	07	3,735	3,735		3,735	3,780		3,780	U
297	0901220F	Personnel Administration	07	5,157	5,157		5,157	7,472		7,472	U
298	0901226F	Air Force Studies and Analysis Agency	07	1,523	1,523		1,523	1,563		1,563	U
299	0901538F	Financial Management Information Systems Development	07	10,581	10,581		10,581	91,211		91,211	U
300	1201921F	Service Support to STRATCOM - Space Activities	07					14,255		14,255	U
301	1202247F	AF TENCAP	07					31,914		31,914	U
302	1203001F	Family of Advanced BLoS Terminals (FAB-T)	07					32,426		32,426	U
303	1203110F	Satellite Control Network (SPACE)	07					18,808		18,808	U
305	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	07					10,029		10,029	U
306	1203173F	Space and Missile Test and Evaluation Center	07					25,051		25,051	U
307	1203174F	Space Innovation, Integration and Rapid Technology Development	07					11,390		11,390	U
308	1203179F	Integrated Broadcast Service (IBS)	07					8,747		8,747	U
309	1203182F	Spacelift Range System (SPACE)	07					10,549		10,549	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 4, 2017 at 10:09:41

UNCLASSIFIED

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
310	1203265F	GPS III Space Segment	07								U
311	1203400F	Space Superiority Intelligence	07								U
312	1203614F	JSpOC Mission System	07								U
313	1203620F	National Space Defense Center	07								U
314	1203699F	Shared Early Warning (SEW)	07								U
315	1203906F	NCMC - TW/AA System	07								U
316	1203913F	NUDET Detection System (SPACE)	07								U
317	1203940F	Space Situation Awareness Operations	07								U
318	1206423F	Global Positioning System III - Operational Control Segment	07								U
9999	9999999999	Classified Programs		12,052,624	13,091,557	13,243,393	27,765	84,865		84,865	U
		Operational Systems Development		15,915,939	17,457,056	17,915,438	32,480	89,580		89,580	
319	0901560F	Continuing Resolution Programs	20		-2,965,689	-2,965,689	-15,805	-15,805		-15,805	U
		Undistributed			-2,965,689	-2,965,689	-15,805	-15,805		-15,805	
Total Research, Development, Test & Eval, AF				25,243,981	25,146,562	25,988,644	17,100	89,900		89,900	

Department of the Air Force
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2017

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

Line No	Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
310	1203265F	GPS III Space Segment	07					243,435		243,435	U
311	1203400F	Space Superiority Intelligence	07					12,691		12,691	U
312	1203614F	JSpOC Mission System	07					99,455		99,455	U
313	1203620F	National Space Defense Center	07					18,052		18,052	U
314	1203699F	Shared Early Warning (SEW)	07					1,373		1,373	U
315	1203906F	NCMC - TW/AA System	07					5,000		5,000	U
316	1203913F	NUDET Detection System (SPACE)	07					31,508		31,508	U
317	1203940F	Space Situation Awareness Operations	07					99,984		99,984	U
318	1206423F	Global Positioning System III - Operational Control Segment	07					510,938		510,938	U
9999	9999999999	Classified Programs		13,119,322	13,328,258		13,328,258	14,938,002	112,408	15,050,410	U
		Operational Systems Development		17,489,536	18,005,018		18,005,018	20,585,302	122,158	20,707,460	
319	0901560F	Continuing Resolution Programs	20	-2,981,494	-2,981,494		-2,981,494				U
		Undistributed		-2,981,494	-2,981,494		-2,981,494				
Total Research, Development, Test & Eval, AF				25,163,662	26,078,544		26,078,544	34,914,359	135,358	35,049,717	

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
1	01	0601102F	Defense Research Sciences.....	Volume 1 - 1
2	01	0601103F	University Research Initiatives.....	Volume 1 - 19
3	01	0601108F	High Energy Laser Research Initiatives.....	Volume 1 - 23

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
4	02	0602102F	Materials.....	Volume 1 - 27
5	02	0602201F	Aerospace Vehicle Technologies.....	Volume 1 - 43
6	02	0602202F	Human Effectiveness Applied Research.....	Volume 1 - 59
7	02	0602203F	Aerospace Propulsion.....	Volume 1 - 77
8	02	0602204F	Aerospace Sensors.....	Volume 1 - 101
9	02	0602298F	Science and Technology Management - Major Headquarters Activities.....	Volume 1 - 121
10	02	0602601F	Space Technology.....	Volume 1 - 125

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
11	02	0602602F	Conventional Munitions.....	Volume 1 - 143
12	02	0602605F	Directed Energy Technology.....	Volume 1 - 155
13	02	0602788F	Dominant Information Sciences and Methods.....	Volume 1 - 163
14	02	0602890F	High Energy Laser Research.....	Volume 1 - 189

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
15	03	0603112F	Advanced Materials for Weapon Systems.....	Volume 1 - 195
16	03	0603199F	Sustainment Science and Technology (S&T).....	Volume 1 - 207
17	03	0603203F	Advanced Aerospace Sensors.....	Volume 1 - 213
18	03	0603211F	Aerospace Technology Dev/Demo.....	Volume 1 - 225
19	03	0603216F	Aerospace Propulsion and Power Technology.....	Volume 1 - 233
20	03	0603270F	Electronic Combat Technology.....	Volume 1 - 253
21	03	0603401F	Advanced Spacecraft Technology.....	Volume 1 - 265
22	03	0603444F	Maui Space Surveillance System (MSSS).....	Volume 1 - 283
23	03	0603456F	Human Effectiveness Advanced Technology Development.....	Volume 1 - 287

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
24	03	0603601F	Conventional Weapons Technology.....	Volume 1 - 299
25	03	0603605F	Advanced Weapons Technology.....	Volume 1 - 307
26	03	0603680F	Manufacturing Technology Program.....	Volume 1 - 313
27	03	0603788F	Battlespace Knowledge Development and Demonstration.....	Volume 1 - 317

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
28	04	0603260F	Intelligence Advanced Development.....	Volume 2 - 1
29	04	0603438F	Space Control Technology.....	Volume 2 - 11
30	04	0603742F	Combat Identification Technology.....	Volume 2 - 13
31	04	0603790F	NATO Research and Development.....	Volume 2 - 33
32	04	0603830F	Space Security and Defense Program.....	Volume 2 - 37
33	04	0603851F	Intercontinental Ballistic Missile - Dem/Val.....	Volume 2 - 39
34	04	0603859F	Pollution Prevention - Dem/Val.....	Volume 2 - 53
35	04	0604015F	Long Range Strike - Bomber.....	Volume 2 - 55
36	04	0604201F	Integrated Avionics Planning and Development.....	Volume 2 - 61

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
37	04	0604257F	Advanced Technology and Sensors.....	Volume 2 - 71
38	04	0604288F	National Airborne Ops Center (NAOC) Recap.....	Volume 2 - 91
39	04	0604317F	Technology Transfer.....	Volume 2 - 95
40	04	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program.....	Volume 2 - 99
41	04	0604414F	Cyber Resiliency of Weapon Systems-ACS.....	Volume 2 - 109
42	04	0604422F	Weather System Follow-on.....	Volume 2 - 125
43	04	0604425F	Space Situation Awareness Systems.....	Volume 2 - 127
44	04	0604776F	Deployment & Distribution Enterprise R&D.....	Volume 2 - 129
45	04	0604857F	Operationally Responsive Space.....	Volume 2 - 149
46	04	0604858F	Tech Transition Program.....	Volume 2 - 151
47	04	0605230F	Ground Based Strategic Deterrent.....	Volume 2 - 167
48	04	0201184F	Counter Narco-Terrorism Program Office.....	Volume 2 - 177
49	04	0207110F	Next Generation Air Dominance.....	Volume 2 - 179
50	04	0207455F	Three Dimensional Long-Range Radar (3DELRR).....	Volume 2 - 189
51	04	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE).....	Volume 2 - 199
52	04	0305236F	Common Data Link Executive Agent (CDL EA).....	Volume 2 - 201
53	04	0306250F	Cyber Operations Technology Development.....	Volume 2 - 211
54	04	0306415F	Enabled Cyber Activities.....	Volume 2 - 225

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
55	04	0408011F	Special Tactics / Combat Control.....	Volume 2 - 231
56	04	0901410F	Contracting Information Technology System.....	Volume 2 - 235
57	04	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE).....	Volume 2 - 243
58	04	1203710F	EO/IR Weather Systems.....	Volume 2 - 257
59	04	1206422F	Weather System Follow-on.....	Volume 2 - 263
60	04	1206425F	Space Situation Awareness Systems.....	Volume 2 - 273
61	04	1206434F	Midterm Polar MILSATCOM System.....	Volume 2 - 281
62	04	1206438F	Space Control Technology.....	Volume 2 - 289
63	04	1206730F	Space Security and Defense Program.....	Volume 2 - 297
64	04	1206760F	Protected Tactical Enterprise Service (PTES).....	Volume 2 - 307
65	04	1206761F	Protected Tactical Service (PTS).....	Volume 2 - 315
66	04	1206855F	Protected SATCOM Services (PSCS) - Aggregated.....	Volume 2 - 323
67	04	1206857F	Operationally Responsive Space.....	Volume 2 - 331

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
68	05	0604200F	Future Advanced Weapon Analysis & Programs.....	Volume 2 - 341
69	05	0604201F	Integrated Avionics Planning and Development.....	Volume 2 - 345
70	05	0604222F	Nuclear Weapons Support.....	Volume 2 - 353
71	05	0604270F	Electronic Warfare Development.....	Volume 2 - 355
72	05	0604281F	Tactical Data Networks Enterprise.....	Volume 2 - 359
73	05	0604287F	Physical Security Equipment.....	Volume 2 - 379
74	05	0604329F	Small Diameter Bomb (SDB) - EMD.....	Volume 2 - 391
75	05	0604421F	Counterspace Systems.....	Volume 2 - 403
76	05	0604425F	Space Situation Awareness Systems.....	Volume 2 - 409
77	05	0604426F	Space Fence.....	Volume 2 - 413
78	05	0604429F	Airborne Electronic Attack.....	Volume 2 - 415
79	05	0604441F	Space Based Infrared System (SBIRS) High EMD.....	Volume 2 - 419
80	05	0604602F	Armament/Ordnance Development.....	Volume 2 - 423
81	05	0604604F	Submunitions.....	Volume 2 - 443
82	05	0604617F	Agile Combat Support.....	Volume 2 - 449
83	05	0604618F	Joint Direct Attack Munition.....	Volume 2 - 463

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
84	05	0604706F	Life Support Systems.....	Volume 2 - 465
85	05	0604735F	Combat Training Ranges.....	Volume 2 - 469
86	05	0604800F	F-35 - EMD.....	Volume 2 - 483
87	05	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD.....	Volume 2 - 513
88	05	0604932F	Long Range Standoff Weapon.....	Volume 2 - 515
89	05	0604933F	ICBM Fuze Modernization.....	Volume 2 - 523
90	05	0605030F	Joint Tactical Network Center (JTNC).....	Volume 2 - 533
91	05	0605031F	Joint Tactical Network (JTN).....	Volume 2 - 539
92	05	0605213F	F-22 Modernization Increment 3.2B.....	Volume 2 - 543
93	05	0605214F	Ground Attack Weapons Fuze Development.....	Volume 2 - 553
94	05	0605221F	KC-46.....	Volume 2 - 557
95	05	0605223F	Advanced Pilot Training.....	Volume 2 - 571
96	05	0605229F	Combat Rescue Helicopter.....	Volume 2 - 579
97	05	0605431F	Advanced EHF MILSATCOM (SPACE).....	Volume 2 - 587
98	05	0605432F	Polar MILSATCOM (SPACE).....	Volume 2 - 591
99	05	0605433F	Wideband Global SATCOM (SPACE).....	Volume 2 - 593
100	05	0605458F	Air & Space Ops Center 10.2 RDT&E.....	Volume 2 - 597
101	05	0605931F	B-2 Defensive Management System.....	Volume 2 - 607

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
102	05	0101125F	Nuclear Weapons Modernization.....	Volume 2 - 615
103	05	0207171F	F-15 EPAWSS.....	Volume 2 - 625
104	05	0207328F	Stand In Attack Weapon.....	Volume 2 - 633
105	05	0207701F	Full Combat Mission Training.....	Volume 2 - 635
106	05	0303267F	Auctioned Spectrum Relocation Fund.....	Volume 2 - 645
107	05	0303367F	Spectrum Access Research and Development.....	Volume 2 - 647
108	05	0305176F	Combat Survivor Evader Locator.....	Volume 2 - 649
109	05	0307581F	JSTARS Recap.....	Volume 2 - 651
110	05	0401310F	C-32 Executive Transport Recapitalization.....	Volume 2 - 661
111	05	0401319F	Presidential Aircraft Recapitalization (PAR).....	Volume 2 - 665
112	05	0701212F	Automated Test Systems.....	Volume 2 - 673
113	05	1203176F	Combat Survivor Evader Locator.....	Volume 2 - 685
114	05	1203940F	Space Situation Awareness Operations.....	Volume 2 - 691
115	05	1206421F	Counterspace Systems.....	Volume 2 - 697
116	05	1206425F	Space Situation Awareness Systems.....	Volume 2 - 709
117	05	1206426F	Space Fence.....	Volume 2 - 723
118	05	1206431F	Advanced EHF MILSATCOM (SPACE).....	Volume 2 - 731
119	05	1206432F	Polar MILSATCOM (SPACE).....	Volume 2 - 751

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
120	05	1206433F	WIDEBAND GLOBAL SATCOM (SPACE).....	Volume 2 - 759
121	05	1206441F	Space Based Infrared System (SBIRS) High EMD.....	Volume 2 - 771
122	05	1206442F	Evolved SBIRS.....	Volume 2 - 799
123	05	1206853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD.....	Volume 2 - 805

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
124	06	0604256F	Threat Simulator Development.....	Volume 2 - 815
125	06	0604759F	Major T&E Investment.....	Volume 2 - 825
126	06	0605101F	RAND Project Air Force.....	Volume 2 - 835
127	06	0605502F	Small Business Innovation Research.....	Volume 2 - 839
128	06	0605712F	Initial Operational Test & Evaluation.....	Volume 2 - 841
129	06	0605807F	Test and Evaluation Support.....	Volume 2 - 851
130	06	0605826F	Acq Workforce- Global Power.....	Volume 2 - 857
131	06	0605827F	Acq Workforce- Global Vig & Combat Sys.....	Volume 2 - 859
132	06	0605828F	Acq Workforce- Global Reach.....	Volume 2 - 861

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
133	06	0605829F	Acq Workforce- Cyber, Network, & Bus Sys.....	Volume 2 - 863
134	06	0605830F	Acq Workforce- Global Battle Mgmt.....	Volume 2 - 865
135	06	0605831F	Acq Workforce- Capability Integration.....	Volume 2 - 867
136	06	0605832F	Acq Workforce- Advanced Prgm Technology.....	Volume 2 - 869
137	06	0605833F	Acq Workforce- Nuclear Systems.....	Volume 2 - 871
138	06	0605860F	Rocket Systems Launch Program (SPACE).....	Volume 2 - 873
139	06	0605864F	Space Test Program (STP).....	Volume 2 - 875
140	06	0605898F	Management HQ - R&D.....	Volume 2 - 877
141	06	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support.....	Volume 2 - 883
142	06	0605978F	Facilities Sustainment - Test and Evaluation Support.....	Volume 2 - 887
143	06	0606017F	Requirements Analysis and Maturation.....	Volume 2 - 891
144	06	0606116F	Space Test and Training Range Development.....	Volume 2 - 899
145	06	0606392F	Space and Missile Center (SMC) Civilian Workforce.....	Volume 2 - 901
146	06	0308602F	ENTEPRISE INFORMATION SERVICES (EIS).....	Volume 2 - 903
147	06	0702806F	Acquisition and Management Support.....	Volume 2 - 909
148	06	0804731F	General Skill Training.....	Volume 2 - 917
150	06	1001004F	International Activities.....	Volume 2 - 919
151	06	1206116F	Space Test and Training Range Development.....	Volume 2 - 925

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
152	06	1206392F	Space and Missile Center (SMC) Civilian Workforce.....	Volume 2 - 929
153	06	1206398F	Space & Missile Systems Center - MHA.....	Volume 2 - 933
154	06	1206860F	Rocket Systems Launch Program (SPACE).....	Volume 2 - 935
155	06	1206864F	Space Test Program (STP).....	Volume 2 - 939

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
156	07	0603423F	Global Positioning System III - Operational Control Segment.....	Volume 3a - 1
157	07	0604222F	Nuclear Weapons Support.....	Volume 3a - 5
158	07	0604233F	Specialized Undergraduate Flight Training.....	Volume 3a - 11
159	07	0604445F	Wide Area Surveillance.....	Volume 3a - 23
161	07	0605018F	AF Integrated Personnel and Pay System (AF-IPPS).....	Volume 3a - 39
162	07	0605024F	Anti-Tamper Technology Executive Agency.....	Volume 3a - 47
163	07	0605117F	Foreign Materiel Acquisition and Exploitation.....	Volume 3a - 57
164	07	0605278F	HC/MC-130 Recap RDT&E.....	Volume 3a - 65
165	07	0606018F	NC3 Integration.....	Volume 3a - 73

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
166	07	0101113F	B-52 SQUADRONS.....	Volume 3a - 81
167	07	0101122F	Air-Launched Cruise Missile (ALCM).....	Volume 3a - 137
168	07	0101126F	B-1B Squadrons.....	Volume 3a - 141
169	07	0101127F	B-2 SQUADRONS.....	Volume 3a - 155
170	07	0101213F	Minuteman Squadrons.....	Volume 3a - 181
171	07	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM.....	Volume 3a - 225
172	07	0101314F	Night Fist - USSTRATCOM.....	Volume 3a - 241
173	07	0101316F	Worldwide Joint Strategic Communications.....	Volume 3a - 243
174	07	0101324F	Integrated Strategic Planning & Analysis Network.....	Volume 3a - 247
176	07	0102110F	UH-1N Replacement Program.....	Volume 3a - 255
177	07	0102326F	Region/Sector Operation Control Center Modernization Program.....	Volume 3a - 263
178	07	0105921F	Service Support to STRATCOM - Space Activities.....	Volume 3a - 267
179	07	0205219F	MQ-9 UAV.....	Volume 3a - 271
180	07	0205671F	Joint Counter RCIED Electronic Warfare.....	Volume 3a - 305
181	07	0207040F	Multi-Platform Electronic Warfare Equipment.....	Volume 3a - 307
182	07	0207131F	A-10 Squadrons.....	Volume 3a - 309
183	07	0207133F	F-16 Squadrons.....	Volume 3a - 317
184	07	0207134F	F-15E Squadrons.....	Volume 3a - 331

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
185	07	0207136F	Manned Destructive Suppression.....	Volume 3a - 351
186	07	0207138F	F-22A Squadrons.....	Volume 3a - 359
187	07	0207142F	F-35 Squadrons.....	Volume 3a - 381
188	07	0207161F	Tactical AIM Missiles.....	Volume 3a - 407
189	07	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM).....	Volume 3a - 419
190	07	0207224F	Combat Rescue and Recovery.....	Volume 3a - 429
191	07	0207227F	Combat Rescue - Pararescue.....	Volume 3a - 431
192	07	0207247F	AF TENCAP.....	Volume 3a - 435
193	07	0207249F	Precision Attack Systems Procurement.....	Volume 3a - 437
194	07	0207253F	Compass Call.....	Volume 3a - 441
195	07	0207268F	Aircraft Engine Component Improvement Program.....	Volume 3a - 449
196	07	0207277F	ISR Innovations.....	Volume 3a - 469
197	07	0207325F	Joint Air-to-Surface Standoff Missile (JASSM).....	Volume 3a - 473
198	07	0207410F	Air & Space Operations Center (AOC).....	Volume 3a - 483
199	07	0207412F	Control and Reporting Center (CRC).....	Volume 3a - 503
200	07	0207417F	Airborne Warning and Control System (AWACS).....	Volume 3a - 507
201	07	0207418F	Tactical Airborne Control Systems.....	Volume 3a - 521
203	07	0207431F	Combat Air Intelligence System Activities.....	Volume 3a - 525

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
204	07	0207444F	Tactical Air Control Party-Mod.....	Volume 3a - 535
205	07	0207448F	C2ISR Tactical Data Link.....	Volume 3a - 543
206	07	0207452F	DCAPES.....	Volume 3a - 549
207	07	0207573F	National Technical Nuclear Forensics.....	Volume 3a - 567
208	07	0207590F	Seek Eagle.....	Volume 3a - 569
209	07	0207601F	USAF Modeling and Simulation.....	Volume 3a - 579
210	07	0207605F	Wargaming and Simulation Centers.....	Volume 3a - 591
211	07	0207697F	Distributed Training and Exercises.....	Volume 3a - 605
212	07	0208006F	Mission Planning Systems.....	Volume 3a - 609
213	07	0208007F	Tactical Deception.....	Volume 3a - 643
214	07	0208087F	AF Offensive Cyberspace Operations.....	Volume 3a - 645
215	07	0208088F	AF Defensive Cyberspace Operations.....	Volume 3a - 655
218	07	0301017F	Global Sensor Integrated on Network (GSIN).....	Volume 3b - 1
219	07	0301112F	Nuclear Planning and Execution System (NPES).....	Volume 3b - 5
226	07	0301400F	Space Superiority Intelligence.....	Volume 3b - 13
227	07	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness.....	Volume 3b - 15
228	07	0302015F	E-4B National Airborne Operations Center (NAOC).....	Volume 3b - 17
229	07	0303001F	Family of Advanced BLoS Terminals (FAB-T).....	Volume 3b - 27

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
230	07	0303131F	Minimum Essential Emergency Communications Network (MEECN).....	Volume 3b - 29
231	07	0303140F	Information Systems Security Program.....	Volume 3b - 53
232	07	0303141F	Global Combat Support System.....	Volume 3b - 73
233	07	0303142F	Global Force Management - Data Initiative.....	Volume 3b - 75
234	07	0303601F	MILSATCOM Terminals.....	Volume 3b - 79
236	07	0304260F	Airborne SIGINT Enterprise.....	Volume 3b - 89
237	07	0304310F	Commercial Economic Analysis.....	Volume 3b - 115
240	07	0305020F	CCMD Intelligence Information Technology.....	Volume 3b - 119
241	07	0305099F	Global Air Traffic Management (GATM).....	Volume 3b - 123
242	07	0305110F	Satellite Control Network (SPACE).....	Volume 3b - 127
243	07	0305111F	Weather Service.....	Volume 3b - 129
244	07	0305114F	Air Traffic Control, Approach, and Landing System (ATCAL).....	Volume 3b - 141
245	07	0305116F	Aerial Targets.....	Volume 3b - 149
248	07	0305128F	Security and Investigative Activities.....	Volume 3b - 159
249	07	0305145F	Arms Control Implementation.....	Volume 3b - 163
250	07	0305146F	Defense Joint Counterintelligence Activities.....	Volume 3b - 167
253	07	0305173F	Space and Missile Test and Evaluation Center.....	Volume 3b - 171
254	07	0305174F	Space Innovation, Integration and Rapid Technology Development.....	Volume 3b - 173

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
255	07	0305179F	Integrated Broadcast Service (IBS).....	Volume 3b - 175
256	07	0305182F	Spacelift Range System (SPACE).....	Volume 3b - 177
257	07	0305202F	Dragon U-2.....	Volume 3b - 179
258	07	0305205F	Endurance Unmanned Aerial Vehicles.....	Volume 3b - 187
259	07	0305206F	Airborne Reconnaissance Systems.....	Volume 3b - 191
260	07	0305207F	Manned Reconnaissance Systems.....	Volume 3b - 211
261	07	0305208F	Distributed Common Ground/Surface Systems.....	Volume 3b - 219
262	07	0305220F	RQ-4 UAV.....	Volume 3b - 229
263	07	0305221F	Network-Centric Collaborative Targeting.....	Volume 3b - 269
264	07	0305236F	Common Data Link Executive Agent (CDL EA).....	Volume 3b - 283
265	07	0305238F	NATO AGS.....	Volume 3b - 287
266	07	0305240F	Support to DCGS Enterprise.....	Volume 3b - 295
267	07	0305258F	Advanced Evaluation Program.....	Volume 3b - 311
268	07	0305265F	GPS III Space Segment.....	Volume 3b - 313
269	07	0305600F	International Intelligence Technology and Architectures.....	Volume 3b - 317
270	07	0305614F	JSPOC Mission System.....	Volume 3b - 321
271	07	0305881F	Rapid Cyber Acquisition.....	Volume 3b - 325
272	07	0305906F	NCMC - TW/AA System.....	Volume 3b - 329

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
273	07	0305913F	NUDET Detection System (SPACE).....	Volume 3b - 331
274	07	0305940F	Space Situation Awareness Operations.....	Volume 3b - 333
275	07	0305984F	Personnel Recovery Command & Ctrl (PRC2).....	Volume 3b - 337
276	07	0307577F	Intelligence Mission Data (IMD).....	Volume 3b - 341
277	07	0308699F	Shared Early Warning (SEW).....	Volume 3b - 347
278	07	0401115F	C-130 Airlift Squadron.....	Volume 3b - 349
279	07	0401119F	C-5 Airlift Squadrons (IF).....	Volume 3b - 355
280	07	0401130F	C-17 Aircraft (IF).....	Volume 3b - 367
281	07	0401132F	C-130J Program.....	Volume 3b - 377
282	07	0401134F	Large Aircraft IR Countermeasures (LAIRCM).....	Volume 3b - 387
283	07	0401218F	KC-135s.....	Volume 3b - 393
284	07	0401219F	KC-10s.....	Volume 3b - 395
285	07	0401314F	Operational Support Airlift.....	Volume 3b - 399
286	07	0401318F	CV-22.....	Volume 3b - 405
287	07	0401840F	AMC Command and Control System.....	Volume 3b - 415
288	07	0408011F	Special Tactics / Combat Control.....	Volume 3b - 419
289	07	0702207F	Depot Maintenance (Non-IF).....	Volume 3b - 425
290	07	0708055F	Maintenance, Repair & Overhaul System.....	Volume 3b - 429

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
291	07	0708610F	Logistics Information Technology (LOGIT).....	Volume 3b - 437
292	07	0708611F	Support Systems Development.....	Volume 3b - 471
293	07	0804743F	Other Flight Training.....	Volume 3b - 479
294	07	0808716F	Other Personnel Activities.....	Volume 3b - 483
295	07	0901202F	Joint Personnel Recovery Agency.....	Volume 3b - 485
296	07	0901218F	Civilian Compensation Program.....	Volume 3b - 489
297	07	0901220F	Personnel Administration.....	Volume 3b - 491
298	07	0901226F	Air Force Studies and Analysis Agency.....	Volume 3b - 501
299	07	0901538F	Financial Management Information Systems Development.....	Volume 3b - 503
300	07	1201921F	Service Support to STRATCOM - Space Activities.....	Volume 3b - 529
301	07	1202247F	AF TENCAP.....	Volume 3b - 541
302	07	1203001F	Family of Advanced BLoS Terminals (FAB-T).....	Volume 3b - 549
303	07	1203110F	Satellite Control Network (SPACE).....	Volume 3b - 559
305	07	1203165F	NAVSTAR Global Positioning System (Space and Control Segments).....	Volume 3b - 569
306	07	1203173F	Space and Missile Test and Evaluation Center.....	Volume 3b - 575
307	07	1203174F	Space Innovation, Integration and Rapid Technology Development.....	Volume 3b - 585
308	07	1203179F	Integrated Broadcast Service (IBS).....	Volume 3b - 593
309	07	1203182F	Spacelift Range System (SPACE).....	Volume 3b - 601

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
310	07	1203265F	GPS III Space Segment.....	Volume 3b - 609
311	07	1203400F	Space Superiority Intelligence.....	Volume 3b - 633
312	07	1203614F	JSpOC Mission System.....	Volume 3b - 641
313	07	1203620F	National Space Defense Center.....	Volume 3b - 661
314	07	1203699F	Shared Early Warning (SEW).....	Volume 3b - 667
315	07	1203906F	NCMC - TW/AA System.....	Volume 3b - 673
316	07	1203913F	NUDET Detection System (SPACE).....	Volume 3b - 675
317	07	1203940F	Space Situation Awareness Operations.....	Volume 3b - 683
318	07	1206423F	Global Positioning System III - Operational Control Segment.....	Volume 3b - 699

UNCLASSIFIED

UNCLASSIFIED

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UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

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

Program Element Title	Program Element Number	Line #	BA	Page
A-10 Squadrons	0207131F	182	07.....	Volume 3a - 309
AF Defensive Cyberspace Operations	0208088F	215	07.....	Volume 3a - 655
AF Integrated Personnel and Pay System (AF-IPPS)	0605018F	161	07.....	Volume 3a - 39
AF Offensive Cyberspace Operations	0208087F	214	07.....	Volume 3a - 645
AF TENCAP	0207247F	192	07.....	Volume 3a - 435
AF TENCAP	1202247F	301	07.....	Volume 3b - 541
AMC Command and Control System	0401840F	287	07.....	Volume 3b - 415
Acq Workforce- Advanced Prgm Technology	0605832F	136	06.....	Volume 2 - 869
Acq Workforce- Capability Integration	0605831F	135	06.....	Volume 2 - 867
Acq Workforce- Cyber, Network, & Bus Sys	0605829F	133	06.....	Volume 2 - 863
Acq Workforce- Global Battle Mgmt	0605830F	134	06.....	Volume 2 - 865
Acq Workforce- Global Power	0605826F	130	06.....	Volume 2 - 857
Acq Workforce- Global Reach	0605828F	132	06.....	Volume 2 - 861
Acq Workforce- Global Vig & Combat Sys	0605827F	131	06.....	Volume 2 - 859
Acq Workforce- Nuclear Systems	0605833F	137	06.....	Volume 2 - 871
Acquisition and Management Support	0702806F	147	06.....	Volume 2 - 909
Advanced Aerospace Sensors	0603203F	17	03.....	Volume 1 - 213

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Advanced EHF MILSATCOM (SPACE)	0605431F	97	05.....	Volume 2 - 587
Advanced EHF MILSATCOM (SPACE)	1206431F	118	05.....	Volume 2 - 731
Advanced Evaluation Program	0305258F	267	07.....	Volume 3b - 311
Advanced Materials for Weapon Systems	0603112F	15	03.....	Volume 1 - 195
Advanced Medium Range Air-to-Air Missile (AMRAAM)	0207163F	189	07.....	Volume 3a - 419
Advanced Pilot Training	0605223F	95	05.....	Volume 2 - 571
Advanced Spacecraft Technology	0603401F	21	03.....	Volume 1 - 265
Advanced Technology and Sensors	0604257F	37	04.....	Volume 2 - 71
Advanced Weapons Technology	0603605F	25	03.....	Volume 1 - 307
Aerial Targets	0305116F	245	07.....	Volume 3b - 149
Aerospace Propulsion	0602203F	7	02.....	Volume 1 - 77
Aerospace Propulsion and Power Technology	0603216F	19	03.....	Volume 1 - 233
Aerospace Sensors	0602204F	8	02.....	Volume 1 - 101
Aerospace Technology Dev/Demo	0603211F	18	03.....	Volume 1 - 225
Aerospace Vehicle Technologies	0602201F	5	02.....	Volume 1 - 43
Agile Combat Support	0604617F	82	05.....	Volume 2 - 449
Air & Space Operations Center (AOC)	0207410F	198	07.....	Volume 3a - 483
Air & Space Ops Center 10.2 RDT&E	0605458F	100	05.....	Volume 2 - 597
Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	0301401F	227	07.....	Volume 3b - 15

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Air Force Studies and Analysis Agency	0901226F	298	07.....	Volume 3b - 501
Air Traffic Control, Approach, and Landing System (ATCAL)	0305114F	244	07.....	Volume 3b - 141
Air-Launched Cruise Missile (ALCM)	0101122F	167	07.....	Volume 3a - 137
Airborne Electronic Attack	0604429F	78	05.....	Volume 2 - 415
Airborne Reconnaissance Systems	0305206F	259	07.....	Volume 3b - 191
Airborne SIGINT Enterprise	0304260F	236	07.....	Volume 3b - 89
Airborne Warning and Control System (AWACS)	0207417F	200	07.....	Volume 3a - 507
Aircraft Engine Component Improvement Program	0207268F	195	07.....	Volume 3a - 449
Anti-Tamper Technology Executive Agency	0605024F	162	07.....	Volume 3a - 47
Armament/Ordnance Development	0604602F	80	05.....	Volume 2 - 423
Arms Control Implementation	0305145F	249	07.....	Volume 3b - 163
Auctioned Spectrum Relocation Fund	0303267F	106	05.....	Volume 2 - 645
Automated Test Systems	0701212F	112	05.....	Volume 2 - 673
B-1B Squadrons	0101126F	168	07.....	Volume 3a - 141
B-2 Defensive Management System	0605931F	101	05.....	Volume 2 - 607
B-2 SQUADRONS	0101127F	169	07.....	Volume 3a - 155
B-52 SQUADRONS	0101113F	166	07.....	Volume 3a - 81
Battlespace Knowledge Development and Demonstration	0603788F	27	03.....	Volume 1 - 317
C-130 Airlift Squadron	0401115F	278	07.....	Volume 3b - 349

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
C-130J Program	0401132F	281	07.....	Volume 3b - 377
C-17 Aircraft (IF)	0401130F	280	07.....	Volume 3b - 367
C-32 Executive Transport Recapitalization	0401310F	110	05.....	Volume 2 - 661
C-5 Airlift Squadrons (IF)	0401119F	279	07.....	Volume 3b - 355
C2ISR Tactical Data Link	0207448F	205	07.....	Volume 3a - 543
CCMD Intelligence Information Technology	0305020F	240	07.....	Volume 3b - 119
CV-22	0401318F	286	07.....	Volume 3b - 405
Civilian Compensation Program	0901218F	296	07.....	Volume 3b - 489
Combat Air Intelligence System Activities	0207431F	203	07.....	Volume 3a - 525
Combat Identification Technology	0603742F	30	04.....	Volume 2 - 13
Combat Rescue - Pararescue	0207227F	191	07.....	Volume 3a - 431
Combat Rescue Helicopter	0605229F	96	05.....	Volume 2 - 579
Combat Rescue and Recovery	0207224F	190	07.....	Volume 3a - 429
Combat Survivor Evader Locator	0305176F	108	05.....	Volume 2 - 649
Combat Survivor Evader Locator	1203176F	113	05.....	Volume 2 - 685
Combat Training Ranges	0604735F	85	05.....	Volume 2 - 469
Commercial Economic Analysis	0304310F	237	07.....	Volume 3b - 115
Common Data Link Executive Agent (CDL EA)	0305236F	52	04.....	Volume 2 - 201
Common Data Link Executive Agent (CDL EA)	0305236F	264	07.....	Volume 3b - 283

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Compass Call	0207253F	194	07.....	Volume 3a - 441
Contracting Information Technology System	0901410F	56	04.....	Volume 2 - 235
Control and Reporting Center (CRC)	0207412F	199	07.....	Volume 3a - 503
Conventional Munitions	0602602F	11	02.....	Volume 1 - 143
Conventional Weapons Technology	0603601F	24	03.....	Volume 1 - 299
Counter Narco-Terrorism Program Office	0201184F	48	04.....	Volume 2 - 177
Counterspace Systems	0604421F	75	05.....	Volume 2 - 403
Counterspace Systems	1206421F	115	05.....	Volume 2 - 697
Cyber Operations Technology Development	0306250F	53	04.....	Volume 2 - 211
Cyber Resiliency of Weapon Systems-ACS	0604414F	41	04.....	Volume 2 - 109
DCAPES	0207452F	206	07.....	Volume 3a - 549
Defense Joint Counterintelligence Activities	0305146F	250	07.....	Volume 3b - 167
Defense Research Sciences	0601102F	1	01.....	Volume 1 - 1
Deployment & Distribution Enterprise R&D	0604776F	44	04.....	Volume 2 - 129
Depot Maintenance (Non-IF)	0702207F	289	07.....	Volume 3b - 425
Directed Energy Technology	0602605F	12	02.....	Volume 1 - 155
Distributed Common Ground/Surface Systems	0305208F	261	07.....	Volume 3b - 219
Distributed Training and Exercises	0207697F	211	07.....	Volume 3a - 605
Dominant Information Sciences and Methods	0602788F	13	02.....	Volume 1 - 163

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Dragon U-2	0305202F	257	07.....	Volume 3b - 179
E-4B National Airborne Operations Center (NAOC)	0302015F	228	07.....	Volume 3b - 17
ENTEPRISE INFORMATION SERVICES (EIS)	0308602F	146	06.....	Volume 2 - 903
EO/IR Weather Systems	1203710F	58	04.....	Volume 2 - 257
Electronic Combat Technology	0603270F	20	03.....	Volume 1 - 253
Electronic Warfare Development	0604270F	71	05.....	Volume 2 - 355
Enabled Cyber Activities	0306415F	54	04.....	Volume 2 - 225
Endurance Unmanned Aerial Vehicles	0305205F	258	07.....	Volume 3b - 187
Evolved Expendable Launch Vehicle Program (SPACE) - EMD	0604853F	87	05.....	Volume 2 - 513
Evolved Expendable Launch Vehicle Program (SPACE) - EMD	1206853F	123	05.....	Volume 2 - 805
Evolved SBIRS	1206442F	122	05.....	Volume 2 - 799
F-15 EPAWSS	0207171F	103	05.....	Volume 2 - 625
F-15E Squadrons	0207134F	184	07.....	Volume 3a - 331
F-16 Squadrons	0207133F	183	07.....	Volume 3a - 317
F-22 Modernization Increment 3.2B	0605213F	92	05.....	Volume 2 - 543
F-22A Squadrons	0207138F	186	07.....	Volume 3a - 359
F-35 - EMD	0604800F	86	05.....	Volume 2 - 483
F-35 Squadrons	0207142F	187	07.....	Volume 3a - 381
Facilities Restoration and Modernization - Test and Evaluation Support	0605976F	141	06.....	Volume 2 - 883

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Facilities Sustainment - Test and Evaluation Support	0605978F	142	06.....	Volume 2 - 887
Family of Advanced BLoS Terminals (FAB-T)	0303001F	229	07.....	Volume 3b - 27
Family of Advanced BLoS Terminals (FAB-T)	1203001F	302	07.....	Volume 3b - 549
Financial Management Information Systems Development	0901538F	299	07.....	Volume 3b - 503
Foreign Materiel Acquisition and Exploitation	0605117F	163	07.....	Volume 3a - 57
Full Combat Mission Training	0207701F	105	05.....	Volume 2 - 635
Future Advanced Weapon Analysis & Programs	0604200F	68	05.....	Volume 2 - 341
GPS III Space Segment	0305265F	268	07.....	Volume 3b - 313
GPS III Space Segment	1203265F	310	07.....	Volume 3b - 609
General Skill Training	0804731F	148	06.....	Volume 2 - 917
Global Air Traffic Management (GATM)	0305099F	241	07.....	Volume 3b - 123
Global Combat Support System	0303141F	232	07.....	Volume 3b - 73
Global Force Management - Data Initiative	0303142F	233	07.....	Volume 3b - 75
Global Positioning System III - Operational Control Segment	0603423F	156	07.....	Volume 3a - 1
Global Positioning System III - Operational Control Segment	1206423F	318	07.....	Volume 3b - 699
Global Sensor Integrated on Network (GSIN)	0301017F	218	07.....	Volume 3b - 1
Ground Attack Weapons Fuze Development	0605214F	93	05.....	Volume 2 - 553
Ground Based Strategic Deterrent	0605230F	47	04.....	Volume 2 - 167
HC/MC-130 Recap RDT&E	0605278F	164	07.....	Volume 3a - 65

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Hard and Deeply Buried Target Defeat System (HDBTDS) Program	0604327F	40	04.....	Volume 2 - 99
High Energy Laser Research	0602890F	14	02.....	Volume 1 - 189
High Energy Laser Research Initiatives	0601108F	3	01.....	Volume 1 - 23
Human Effectiveness Advanced Technology Development	0603456F	23	03.....	Volume 1 - 287
Human Effectiveness Applied Research	0602202F	6	02.....	Volume 1 - 59
ICBM Fuze Modernization	0604933F	89	05.....	Volume 2 - 523
ISR Innovations	0207277F	196	07.....	Volume 3a - 469
Information Systems Security Program	0303140F	231	07.....	Volume 3b - 53
Initial Operational Test & Evaluation	0605712F	128	06.....	Volume 2 - 841
Integrated Avionics Planning and Development	0604201F	36	04.....	Volume 2 - 61
Integrated Avionics Planning and Development	0604201F	69	05.....	Volume 2 - 345
Integrated Broadcast Service (IBS)	0305179F	255	07.....	Volume 3b - 175
Integrated Broadcast Service (IBS)	1203179F	308	07.....	Volume 3b - 593
Integrated Strategic Planning & Analysis Network	0101324F	174	07.....	Volume 3a - 247
Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	0101313F	171	07.....	Volume 3a - 225
Intelligence Advanced Development	0603260F	28	04.....	Volume 2 - 1
Intelligence Mission Data (IMD)	0307577F	276	07.....	Volume 3b - 341
Intercontinental Ballistic Missile - Dem/Val	0603851F	33	04.....	Volume 2 - 39
International Activities	1001004F	150	06.....	Volume 2 - 919

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
International Intelligence Technology and Architectures	0305600F	269	07.....	Volume 3b - 317
JSPOC Mission System	0305614F	270	07.....	Volume 3b - 321
JSTARS Recap	0307581F	109	05.....	Volume 2 - 651
JSpOC Mission System	1203614F	312	07.....	Volume 3b - 641
Joint Air-to-Surface Standoff Missile (JASSM)	0207325F	197	07.....	Volume 3a - 473
Joint Counter RCIED Electronic Warfare	0205671F	180	07.....	Volume 3a - 305
Joint Direct Attack Munition	0604618F	83	05.....	Volume 2 - 463
Joint Personnel Recovery Agency	0901202F	295	07.....	Volume 3b - 485
Joint Tactical Network (JTN)	0605031F	91	05.....	Volume 2 - 539
Joint Tactical Network Center (JTNC)	0605030F	90	05.....	Volume 2 - 533
KC-10s	0401219F	284	07.....	Volume 3b - 395
KC-135s	0401218F	283	07.....	Volume 3b - 393
KC-46	0605221F	94	05.....	Volume 2 - 557
Large Aircraft IR Countermeasures (LAIRCM)	0401134F	282	07.....	Volume 3b - 387
Life Support Systems	0604706F	84	05.....	Volume 2 - 465
Logistics Information Technology (LOGIT)	0708610F	291	07.....	Volume 3b - 437
Long Range Standoff Weapon	0604932F	88	05.....	Volume 2 - 515
Long Range Strike - Bomber	0604015F	35	04.....	Volume 2 - 55
MILSATCOM Terminals	0303601F	234	07.....	Volume 3b - 79

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
MQ-9 UAV	0205219F	179	07.....	Volume 3a - 271
Maintenance, Repair & Overhaul System	0708055F	290	07.....	Volume 3b - 429
Major T&E Investment	0604759F	125	06.....	Volume 2 - 825
Management HQ - R&D	0605898F	140	06.....	Volume 2 - 877
Manned Destructive Suppression	0207136F	185	07.....	Volume 3a - 351
Manned Reconnaissance Systems	0305207F	260	07.....	Volume 3b - 211
Manufacturing Technology Program	0603680F	26	03.....	Volume 1 - 313
Materials	0602102F	4	02.....	Volume 1 - 27
Maui Space Surveillance System (MSSS)	0603444F	22	03.....	Volume 1 - 283
Midterm Polar MILSATCOM System	1206434F	61	04.....	Volume 2 - 281
Minimum Essential Emergency Communications Network (MEECN)	0303131F	230	07.....	Volume 3b - 29
Minuteman Squadrons	0101213F	170	07.....	Volume 3a - 181
Mission Planning Systems	0208006F	212	07.....	Volume 3a - 609
Multi-Platform Electronic Warfare Equipment	0207040F	181	07.....	Volume 3a - 307
NATO AGS	0305238F	265	07.....	Volume 3b - 287
NATO Research and Development	0603790F	31	04.....	Volume 2 - 33
NAVSTAR Global Positioning System (Space and Control Segments)	1203165F	305	07.....	Volume 3b - 569
NAVSTAR Global Positioning System (User Equipment) (SPACE)	0305164F	51	04.....	Volume 2 - 199
NAVSTAR Global Positioning System (User Equipment) (SPACE)	1203164F	57	04.....	Volume 2 - 243

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
NC3 Integration	0606018F	165	07.....	Volume 3a - 73
NCMC - TW/AA System	0305906F	272	07.....	Volume 3b - 329
NCMC - TW/AA System	1203906F	315	07.....	Volume 3b - 673
NUDET Detection System (SPACE)	0305913F	273	07.....	Volume 3b - 331
NUDET Detection System (SPACE)	1203913F	316	07.....	Volume 3b - 675
National Airborne Ops Center (NAOC) Recap	0604288F	38	04.....	Volume 2 - 91
National Space Defense Center	1203620F	313	07.....	Volume 3b - 661
National Technical Nuclear Forensics	0207573F	207	07.....	Volume 3a - 567
Network-Centric Collaborative Targeting	0305221F	263	07.....	Volume 3b - 269
Next Generation Air Dominance	0207110F	49	04.....	Volume 2 - 179
Night Fist - USSTRATCOM	0101314F	172	07.....	Volume 3a - 241
Nuclear Planning and Execution System (NPES)	0301112F	219	07.....	Volume 3b - 5
Nuclear Weapons Modernization	0101125F	102	05.....	Volume 2 - 615
Nuclear Weapons Support	0604222F	70	05.....	Volume 2 - 353
Nuclear Weapons Support	0604222F	157	07.....	Volume 3a - 5
Operational Support Airlift	0401314F	285	07.....	Volume 3b - 399
Operationally Responsive Space	0604857F	45	04.....	Volume 2 - 149
Operationally Responsive Space	1206857F	67	04.....	Volume 2 - 331
Other Flight Training	0804743F	293	07.....	Volume 3b - 479

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Other Personnel Activities	0808716F	294	07.....	Volume 3b - 483
Personnel Administration	0901220F	297	07.....	Volume 3b - 491
Personnel Recovery Command & Ctrl (PRC2)	0305984F	275	07.....	Volume 3b - 337
Physical Security Equipment	0604287F	73	05.....	Volume 2 - 379
Polar MILSATCOM (SPACE)	0605432F	98	05.....	Volume 2 - 591
Polar MILSATCOM (SPACE)	1206432F	119	05.....	Volume 2 - 751
Pollution Prevention - Dem/Val	0603859F	34	04.....	Volume 2 - 53
Precision Attack Systems Procurement	0207249F	193	07.....	Volume 3a - 437
Presidential Aircraft Recapitalization (PAR)	0401319F	111	05.....	Volume 2 - 665
Protected SATCOM Services (PSCS) - Aggregated	1206855F	66	04.....	Volume 2 - 323
Protected Tactical Enterprise Service (PTES)	1206760F	64	04.....	Volume 2 - 307
Protected Tactical Service (PTS)	1206761F	65	04.....	Volume 2 - 315
RAND Project Air Force	0605101F	126	06.....	Volume 2 - 835
RQ-4 UAV	0305220F	262	07.....	Volume 3b - 229
Rapid Cyber Acquisition	0305881F	271	07.....	Volume 3b - 325
Region/Sector Operation Control Center Modernization Program	0102326F	177	07.....	Volume 3a - 263
Requirements Analysis and Maturation	0606017F	143	06.....	Volume 2 - 891
Rocket Systems Launch Program (SPACE)	0605860F	138	06.....	Volume 2 - 873
Rocket Systems Launch Program (SPACE)	1206860F	154	06.....	Volume 2 - 935

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Satellite Control Network (SPACE)	0305110F	242	07.....	Volume 3b - 127
Satellite Control Network (SPACE)	1203110F	303	07.....	Volume 3b - 559
Science and Technology Management - Major Headquarters Activities	0602298F	9	02.....	Volume 1 - 121
Security and Investigative Activities	0305128F	248	07.....	Volume 3b - 159
Seek Eagle	0207590F	208	07.....	Volume 3a - 569
Service Support to STRATCOM - Space Activities	0105921F	178	07.....	Volume 3a - 267
Service Support to STRATCOM - Space Activities	1201921F	300	07.....	Volume 3b - 529
Shared Early Warning (SEW)	0308699F	277	07.....	Volume 3b - 347
Shared Early Warning (SEW)	1203699F	314	07.....	Volume 3b - 667
Small Business Innovation Research	0605502F	127	06.....	Volume 2 - 839
Small Diameter Bomb (SDB) - EMD	0604329F	74	05.....	Volume 2 - 391
Space & Missile Systems Center - MHA	1206398F	153	06.....	Volume 2 - 933
Space Based Infrared System (SBIRS) High EMD	0604441F	79	05.....	Volume 2 - 419
Space Based Infrared System (SBIRS) High EMD	1206441F	121	05.....	Volume 2 - 771
Space Control Technology	0603438F	29	04.....	Volume 2 - 11
Space Control Technology	1206438F	62	04.....	Volume 2 - 289
Space Fence	0604426F	77	05.....	Volume 2 - 413
Space Fence	1206426F	117	05.....	Volume 2 - 723
Space Innovation, Integration and Rapid Technology Development	0305174F	254	07.....	Volume 3b - 173

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Space Innovation, Integration and Rapid Technology Development	1203174F	307	07.....	Volume 3b - 585
Space Security and Defense Program	0603830F	32	04.....	Volume 2 - 37
Space Security and Defense Program	1206730F	63	04.....	Volume 2 - 297
Space Situation Awareness Operations	1203940F	114	05.....	Volume 2 - 691
Space Situation Awareness Operations	0305940F	274	07.....	Volume 3b - 333
Space Situation Awareness Operations	1203940F	317	07.....	Volume 3b - 683
Space Situation Awareness Systems	0604425F	43	04.....	Volume 2 - 127
Space Situation Awareness Systems	1206425F	60	04.....	Volume 2 - 273
Space Situation Awareness Systems	0604425F	76	05.....	Volume 2 - 409
Space Situation Awareness Systems	1206425F	116	05.....	Volume 2 - 709
Space Superiority Intelligence	0301400F	226	07.....	Volume 3b - 13
Space Superiority Intelligence	1203400F	311	07.....	Volume 3b - 633
Space Technology	0602601F	10	02.....	Volume 1 - 125
Space Test Program (STP)	0605864F	139	06.....	Volume 2 - 875
Space Test Program (STP)	1206864F	155	06.....	Volume 2 - 939
Space Test and Training Range Development	0606116F	144	06.....	Volume 2 - 899
Space Test and Training Range Development	1206116F	151	06.....	Volume 2 - 925
Space and Missile Center (SMC) Civilian Workforce	0606392F	145	06.....	Volume 2 - 901
Space and Missile Center (SMC) Civilian Workforce	1206392F	152	06.....	Volume 2 - 929

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Space and Missile Test and Evaluation Center	0305173F	253	07.....	Volume 3b - 171
Space and Missile Test and Evaluation Center	1203173F	306	07.....	Volume 3b - 575
Spacelift Range System (SPACE)	0305182F	256	07.....	Volume 3b - 177
Spacelift Range System (SPACE)	1203182F	309	07.....	Volume 3b - 601
Special Tactics / Combat Control	0408011F	55	04.....	Volume 2 - 231
Special Tactics / Combat Control	0408011F	288	07.....	Volume 3b - 419
Specialized Undergraduate Flight Training	0604233F	158	07.....	Volume 3a - 11
Spectrum Access Research and Development	0303367F	107	05.....	Volume 2 - 647
Stand In Attack Weapon	0207328F	104	05.....	Volume 2 - 633
Submunitions	0604604F	81	05.....	Volume 2 - 443
Support Systems Development	0708611F	292	07.....	Volume 3b - 471
Support to DCGS Enterprise	0305240F	266	07.....	Volume 3b - 295
Sustainment Science and Technology (S&T)	0603199F	16	03.....	Volume 1 - 207
Tactical AIM Missiles	0207161F	188	07.....	Volume 3a - 407
Tactical Air Control Party-Mod	0207444F	204	07.....	Volume 3a - 535
Tactical Airborne Control Systems	0207418F	201	07.....	Volume 3a - 521
Tactical Data Networks Enterprise	0604281F	72	05.....	Volume 2 - 359
Tactical Deception	0208007F	213	07.....	Volume 3a - 643
Tech Transition Program	0604858F	46	04.....	Volume 2 - 151

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Technology Transfer	0604317F	39	04.....	Volume 2 - 95
Test and Evaluation Support	0605807F	129	06.....	Volume 2 - 851
Threat Simulator Development	0604256F	124	06.....	Volume 2 - 815
Three Dimensional Long-Range Radar (3DELRR)	0207455F	50	04.....	Volume 2 - 189
UH-1N Replacement Program	0102110F	176	07.....	Volume 3a - 255
USAF Modeling and Simulation	0207601F	209	07.....	Volume 3a - 579
University Research Initiatives	0601103F	2	01.....	Volume 1 - 19
WIDEBAND GLOBAL SATCOM (SPACE)	1206433F	120	05.....	Volume 2 - 759
Wargaming and Simulation Centers	0207605F	210	07.....	Volume 3a - 591
Weather Service	0305111F	243	07.....	Volume 3b - 129
Weather System Follow-on	0604422F	42	04.....	Volume 2 - 125
Weather System Follow-on	1206422F	59	04.....	Volume 2 - 263
Wide Area Surveillance	0604445F	159	07.....	Volume 3a - 23
Wideband Global SATCOM (SPACE)	0605433F	99	05.....	Volume 2 - 593
Worldwide Joint Strategic Communications	0101316F	173	07.....	Volume 3a - 243

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**Fiscal Year (FY) 2018 Budget Estimates
RDT&E Descriptive Summaries
Budget Activities
May 2017**

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 2018 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 2018 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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 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 01: Basic Research

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
1	01	0601102F	Defense Research Sciences	-	365.276	340.812	342.919	0.000	342.919
2	01	0601103F	University Research Initiatives	-	132.526	145.044	147.923	0.000	147.923
3	01	0601108F	High Energy Laser Research Initiatives	-	12.871	14.168	14.417	0.000	14.417
Total: Basic Research				-	510.673	500.024	505.259	0.000	505.259

BA# 02: Applied Research

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
4	02	0602102F	Materials	-	132.768	126.152	124.264	0.000	124.264
5	02	0602201F	Aerospace Vehicle Technologies	-	118.263	122.831	124.678	0.000	124.678
6	02	0602202F	Human Effectiveness Applied Research	0.000	108.784	111.647	108.784	0.000	108.784
7	02	0602203F	Aerospace Propulsion	-	184.498	185.671	192.695	0.000	192.695
8	02	0602204F	Aerospace Sensors	-	151.264	155.174	152.782	0.000	152.782
9	02	0602298F	Science and Technology Management - Major Headquarters Activities	-	0.000	0.000	8.353	0.000	8.353
10	02	0602601F	Space Technology	-	107.442	117.915	116.503	0.000	116.503

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 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 02: Applied Research

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
11	02	0602602F	Conventional Munitions	-	105.296	109.649	112.195	0.000	112.195
12	02	0602605F	Directed Energy Technology	-	122.835	127.163	132.993	0.000	132.993
13	02	0602788F	Dominant Information Sciences and Methods	-	171.196	161.650	167.818	0.000	167.818
14	02	0602890F	High Energy Laser Research	-	39.155	42.300	43.049	0.000	43.049
Total: Applied Research				0.000	1,241.501	1,260.152	1,284.114	0.000	1,284.114

BA# 03: Advanced Technology Development (ATD)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
15	03	0603112F	Advanced Materials for Weapon Systems	-	38.238	35.137	37.856	0.000	37.856
16	03	0603199F	Sustainment Science and Technology (S&T)	-	17.323	20.636	22.811	0.000	22.811
17	03	0603203F	Advanced Aerospace Sensors	-	39.794	40.945	40.978	0.000	40.978
18	03	0603211F	Aerospace Technology Dev/Demo	-	95.266	130.950	115.966	0.000	115.966
19	03	0603216F	Aerospace Propulsion and Power Technology	-	168.542	94.594	104.499	0.000	104.499
20	03	0603270F	Electronic Combat Technology	-	45.359	58.250	60.551	0.000	60.551
21	03	0603401F	Advanced Spacecraft Technology	-	62.278	61.593	58.910	0.000	58.910

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 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 03: Advanced Technology Development (ATD)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
22	03	0603444F	Maui Space Surveillance System (MSSS)	-	12.303	11.681	10.433	0.000	10.433
23	03	0603456F	Human Effectiveness Advanced Technology Development	-	24.094	26.492	33.635	0.000	33.635
24	03	0603601F	Conventional Weapons Technology	-	42.204	102.009	167.415	0.000	167.415
25	03	0603605F	Advanced Weapons Technology	-	37.301	39.064	45.502	0.000	45.502
26	03	0603680F	Manufacturing Technology Program	-	51.467	46.344	46.450	0.000	46.450
27	03	0603788F	Battlespace Knowledge Development and Demonstration	-	41.568	58.110	49.011	0.000	49.011
Total: Advanced Technology Development (ATD)				-	675.737	725.805	794.017	0.000	794.017

BA# 04: Advanced Component Development & Prototypes (ACD&P)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
28	04	0603260F	Intelligence Advanced Development	-	5.032	5.598	5.652	0.000	5.652
29	04	0603438F	Space Control Technology	-	3.955	7.534	0.000	7.800	7.800
30	04	0603742F	Combat Identification Technology	-	21.025	24.418	24.397	0.000	24.397
31	04	0603790F	NATO Research and Development	-	4.566	4.333	3.851	0.000	3.851

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Air Force • Budget Estimates FY 2018 • RDT&E Program

Master Exhibit R-1

(Listing by Budget Activity, then Program Element Number)

BA# 04: Advanced Component Development & Prototypes (ACD&P)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
32	04	0603830F	Space Security and Defense Program	-	30.771	32.399	0.000	0.000	0.000
33	04	0603851F	Intercontinental Ballistic Missile - Dem/Val	-	34.765	108.663	10.736	0.000	10.736
34	04	0603859F	Pollution Prevention - Dem/Val	-	0.000	0.000	0.002	0.000	0.002
35	04	0604015F	Long Range Strike - Bomber	-	710.390	1,358.309	2,003.580	0.000	2,003.580
36	04	0604201F	Integrated Avionics Planning and Development	-	0.000	0.000	65.458	0.000	65.458
37	04	0604257F	Advanced Technology and Sensors	-	0.000	34.818	68.719	0.000	68.719
38	04	0604288F	National Airborne Ops Center (NAOC) Recap	-	0.000	0.000	7.850	0.000	7.850
39	04	0604317F	Technology Transfer	-	7.494	3.368	3.295	0.000	3.295
40	04	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	440.671	62.034	74.308	17.365	0.000	17.365
41	04	0604414F	Cyber Resiliency of Weapon Systems-ACS	-	0.000	40.000	32.253	0.000	32.253
42	04	0604422F	Weather System Follow-on	-	46.307	118.953	0.000	0.000	0.000
43	04	0604425F	Space Situation Awareness Systems	-	0.000	10.901	0.000	0.000	0.000
44	04	0604776F	Deployment & Distribution Enterprise R&D	-	0.000	25.890	26.222	0.000	26.222
45	04	0604857F	Operationally Responsive Space	-	22.123	17.921	0.000	0.000	0.000
46	04	0604858F	Tech Transition Program	-	264.673	349.304	840.650	0.000	840.650
47	04	0605230F	Ground Based Strategic Deterrent	0.000	64.966	113.919	215.721	0.000	215.721
48	04	0201184F	Counter Narco-Terrorism Program Office	-	1.850	0.000	0.000	0.000	0.000

UNCLASSIFIED

Master Exhibit R-1

Page 4 of 21

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 04: Advanced Component Development & Prototypes (ACD&P)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
49	04	0207110F	Next Generation Air Dominance	-	32.495	167.595	294.746	0.000	294.746
50	04	0207455F	Three Dimensional Long-Range Radar (3DELRR)	91.723	7.865	49.491	10.645	0.000	10.645
51	04	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	-	143.118	278.147	0.000	0.000	0.000
52	04	0305236F	Common Data Link Executive Agent (CDL EA)	-	0.000	42.338	41.509	0.000	41.509
53	04	0306250F	Cyber Operations Technology Development	-	91.845	162.702	226.287	5.400	231.687
54	04	0306415F	Enabled Cyber Activities	-	0.000	15.842	16.687	0.000	16.687
55	04	0408011F	Special Tactics / Combat Control	-	0.000	0.000	4.500	0.000	4.500
56	04	0901410F	Contracting Information Technology System	-	0.000	5.782	15.867	0.000	15.867
57	04	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	354.744	143.118	278.147	253.939	0.000	253.939
58	04	1203710F	EO/IR Weather Systems	-	0.000	0.000	10.000	0.000	10.000
59	04	1206422F	Weather System Follow-on	146.931	46.307	118.953	112.088	0.000	112.088
60	04	1206425F	Space Situation Awareness Systems	-	0.000	10.901	34.764	0.000	34.764
61	04	1206434F	Midterm Polar MILSATCOM System	-	0.000	0.000	63.092	0.000	63.092
62	04	1206438F	Space Control Technology	-	3.955	7.534	7.842	7.800	15.642
63	04	1206730F	Space Security and Defense Program	-	30.771	32.399	41.385	0.000	41.385
64	04	1206760F	Protected Tactical Enterprise Service (PTES)	-	0.000	0.000	18.150	0.000	18.150

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 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 04: Advanced Component Development & Prototypes (ACD&P)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
65	04	1206761F	Protected Tactical Service (PTS)	-	0.000	0.000	24.201	0.000	24.201
66	04	1206855F	Protected SATCOM Services (PSCS) - Aggregated	-	0.000	0.000	16.000	0.000	16.000
67	04	1206857F	Operationally Responsive Space	-	22.123	17.921	87.577	0.000	87.577
Total: Advanced Component Development & Prototypes (ACD&P)				1,034.069	1,801.548	3,518.388	4,605.030	21.000	4,626.030

BA# 05: System Development & Demonstration (SDD)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
68	05	0604200F	Future Advanced Weapon Analysis & Programs	-	0.000	0.000	5.100	0.000	5.100
69	05	0604201F	Integrated Avionics Planning and Development	-	0.000	0.000	101.203	0.000	101.203
70	05	0604222F	Nuclear Weapons Support	-	0.000	0.000	3.009	0.000	3.009
71	05	0604270F	Electronic Warfare Development	-	0.813	12.476	2.241	0.000	2.241
72	05	0604281F	Tactical Data Networks Enterprise	-	49.495	82.380	38.250	0.000	38.250
73	05	0604287F	Physical Security Equipment	-	5.973	35.458	19.739	0.000	19.739
74	05	0604329F	Small Diameter Bomb (SDB) - EMD	1,032.472	27.950	54.838	38.979	0.000	38.979

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 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 05: System Development & Demonstration (SDD)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
75	05	0604421F	Counterspace Systems	-	24.134	41.919	0.000	0.000	0.000
76	05	0604425F	Space Situation Awareness Systems	-	30.116	23.945	0.000	0.000	0.000
77	05	0604426F	Space Fence	-	240.692	168.364	0.000	0.000	0.000
78	05	0604429F	Airborne Electronic Attack	-	8.067	9.187	7.091	0.000	7.091
79	05	0604441F	Space Based Infrared System (SBIRS) High EMD	-	291.510	218.766	0.000	0.000	0.000
80	05	0604602F	Armament/Ordnance Development	-	36.266	20.312	46.540	0.000	46.540
81	05	0604604F	Submunitions	-	2.419	2.503	2.705	0.000	2.705
82	05	0604617F	Agile Combat Support	-	56.178	53.680	31.240	0.000	31.240
83	05	0604618F	Joint Direct Attack Munition	0.000	0.000	9.901	0.000	0.000	0.000
84	05	0604706F	Life Support Systems	-	7.904	7.520	9.060	0.000	9.060
85	05	0604735F	Combat Training Ranges	-	11.368	77.409	87.350	0.000	87.350
86	05	0604800F	F-35 - EMD	21,111.851	575.932	450.467	292.947	0.000	292.947
87	05	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	-	224.920	296.572	0.000	0.000	0.000
88	05	0604932F	Long Range Standoff Weapon	10.274	16.143	95.604	451.290	0.000	451.290
89	05	0604933F	ICBM Fuze Modernization	205.638	138.027	189.751	178.991	0.000	178.991
90	05	0605030F	Joint Tactical Network Center (JTNC)	-	0.000	1.131	12.736	0.000	12.736
91	05	0605031F	Joint Tactical Network (JTN)	-	0.000	0.000	9.319	0.000	9.319

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Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 05: System Development & Demonstration (SDD)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
92	05	0605213F	F-22 Modernization Increment 3.2B	362.577	115.603	70.290	13.600	0.000	13.600
93	05	0605214F	Ground Attack Weapons Fuze Development	-	3.477	0.937	0.000	0.000	0.000
94	05	0605221F	KC-46	5,319.514	572.118	261.724	93.845	0.000	93.845
95	05	0605223F	Advanced Pilot Training	7.747	10.395	12.377	105.999	0.000	105.999
96	05	0605229F	Combat Rescue Helicopter	472.534	150.341	319.331	354.485	0.000	354.485
97	05	0605431F	Advanced EHF MILSATCOM (SPACE)	-	208.095	259.131	0.000	0.000	0.000
98	05	0605432F	Polar MILSATCOM (SPACE)	-	71.867	50.815	0.000	0.000	0.000
99	05	0605433F	Wideband Global SATCOM (SPACE)	-	49.954	41.632	0.000	0.000	0.000
100	05	0605458F	Air & Space Ops Center 10.2 RDT&E	86.444	55.333	28.911	119.745	0.000	119.745
101	05	0605931F	B-2 Defensive Management System	726.260	261.162	315.615	194.570	0.000	194.570
102	05	0101125F	Nuclear Weapons Modernization	285.271	204.358	137.909	91.237	0.000	91.237
103	05	0207171F	F-15 EPAWSS	0.000	174.439	256.669	209.847	0.000	209.847
104	05	0207328F	Stand In Attack Weapon	-	0.000	0.000	3.400	0.000	3.400
105	05	0207701F	Full Combat Mission Training	-	17.290	12.051	16.727	0.000	16.727
106	05	0303267F	Auctioned Spectrum Relocation Fund	-	40.571	0.000	0.000	0.000	0.000
107	05	0303367F	Spectrum Access Research and Development	-	0.383	0.000	0.000	0.000	0.000
108	05	0305176F	Combat Survivor Evader Locator	-	0.958	29.253	0.000	0.000	0.000
109	05	0307581F	JSTARS Recap	85.879	51.306	128.019	417.201	0.000	417.201

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 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 05: System Development & Demonstration (SDD)

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
110	05	0401310F	C-32 Executive Transport Recapitalization	-	0.000	0.000	6.017	0.000	6.017
111	05	0401319F	Presidential Aircraft Recapitalization (PAR)	11.006	82.420	351.220	434.069	0.000	434.069
112	05	0701212F	Automated Test Systems	-	14.422	19.062	18.528	0.000	18.528
113	05	1203176F	Combat Survivor Evader Locator	-	0.958	29.253	24.967	0.000	24.967
114	05	1203940F	Space Situation Awareness Operations	-	0.000	0.000	10.029	0.000	10.029
115	05	1206421F	Counterspace Systems	-	24.134	34.819	66.370	0.000	66.370
116	05	1206425F	Space Situation Awareness Systems	0.000	30.116	23.945	48.448	0.000	48.448
117	05	1206426F	Space Fence	0.000	240.692	168.364	35.937	0.000	35.937
118	05	1206431F	Advanced EHF MILSATCOM (SPACE)	372.471	208.095	259.131	145.610	0.000	145.610
119	05	1206432F	Polar MILSATCOM (SPACE)	201.189	71.867	50.815	33.644	0.000	33.644
120	05	1206433F	WIDEBAND GLOBAL SATCOM (SPACE)	-	49.954	41.632	14.263	0.000	14.263
121	05	1206441F	Space Based Infrared System (SBIRS) High EMD	9,827.288	291.510	218.766	311.844	0.000	311.844
122	05	1206442F	Evolved SBIRS	-	0.000	0.000	71.018	0.000	71.018
123	05	1206853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	259.600	224.920	296.572	297.572	0.000	297.572
Total: System Development & Demonstration (SDD)				40,378.015	4,974.645	5,270.426	4,476.762	0.000	4,476.762

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 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 06: RDT&E Management Support

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
124	06	0604256F	Threat Simulator Development	-	23.558	21.630	35.405	0.000	35.405
125	06	0604759F	Major T&E Investment	-	70.894	71.385	82.874	0.000	82.874
126	06	0605101F	RAND Project Air Force	-	33.943	34.641	34.346	0.000	34.346
127	06	0605502F	Small Business Innovation Research	-	337.762	0.000	0.000	0.000	0.000
128	06	0605712F	Initial Operational Test & Evaluation	-	11.172	11.529	15.523	0.000	15.523
129	06	0605807F	Test and Evaluation Support	-	683.307	680.217	678.289	0.000	678.289
130	06	0605826F	Acq Workforce- Global Power	-	0.000	0.000	219.809	0.000	219.809
131	06	0605827F	Acq Workforce- Global Vig & Combat Sys	-	0.000	0.000	223.179	0.000	223.179
132	06	0605828F	Acq Workforce- Global Reach	-	0.000	0.000	138.556	0.000	138.556
133	06	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	-	0.000	0.000	221.393	0.000	221.393
134	06	0605830F	Acq Workforce- Global Battle Mgmt	-	0.000	0.000	152.577	0.000	152.577
135	06	0605831F	Acq Workforce- Capability Integration	-	0.000	0.000	196.561	0.000	196.561
136	06	0605832F	Acq Workforce- Advanced Prgm Technology	-	0.000	0.000	28.322	0.000	28.322
137	06	0605833F	Acq Workforce- Nuclear Systems	-	0.000	0.000	126.611	0.000	126.611
138	06	0605860F	Rocket Systems Launch Program (SPACE)	-	21.245	11.198	0.000	0.000	0.000
139	06	0605864F	Space Test Program (STP)	-	28.143	27.070	0.000	0.000	0.000

UNCLASSIFIED

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Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 06: RDT&E Management Support

Line#	BA#	PE#	PE Title	Cost (\$ in Millions)					
				Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
140	06	0605898F	Management HQ - R&D	-	0.000	0.000	9.154	0.000	9.154
141	06	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	-	40.518	134.111	135.507	0.000	135.507
142	06	0605978F	Facilities Sustainment - Test and Evaluation Support	-	27.895	28.091	28.720	0.000	28.720
143	06	0606017F	Requirements Analysis and Maturation	-	21.922	129.100	35.453	0.000	35.453
144	06	0606116F	Space Test and Training Range Development	-	18.465	18.528	0.000	0.000	0.000
145	06	0606392F	Space and Missile Center (SMC) Civilian Workforce	-	169.196	176.666	0.000	0.000	0.000
146	06	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	-	3.841	4.410	29.049	0.000	29.049
147	06	0702806F	Acquisition and Management Support	-	16.358	14.613	14.980	0.000	14.980
148	06	0804731F	General Skill Training	-	1.268	1.404	1.434	0.000	1.434
150	06	1001004F	International Activities	-	2.315	4.784	4.569	0.000	4.569
151	06	1206116F	Space Test and Training Range Development	-	18.465	22.228	25.773	0.000	25.773
152	06	1206392F	Space and Missile Center (SMC) Civilian Workforce	-	169.196	176.666	169.887	0.000	169.887
153	06	1206398F	Space & Missile Systems Center - MHA	-	0.000	0.000	9.531	0.000	9.531
154	06	1206860F	Rocket Systems Launch Program (SPACE)	-	21.245	11.198	20.975	0.000	20.975
155	06	1206864F	Space Test Program (STP)	-	28.143	27.070	25.398	0.000	25.398

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Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 06: RDT&E Management Support

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Total: RDT&E Management Support				-	1,748.851	1,606.539	2,663.875	0.000	2,663.875

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
156	07	0603423F	Global Positioning System III - Operational Control Segment	-	344.226	513.268	0.000	0.000	0.000
157	07	0604222F	Nuclear Weapons Support	-	0.000	0.000	27.579	0.000	27.579
158	07	0604233F	Specialized Undergraduate Flight Training	-	7.742	15.427	5.776	0.000	5.776
159	07	0604445F	Wide Area Surveillance	6.836	17.639	46.695	16.247	0.000	16.247
161	07	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	199.827	30.334	10.368	21.915	0.000	21.915
162	07	0605024F	Anti-Tamper Technology Executive Agency	-	25.857	31.952	33.150	0.000	33.150
163	07	0605117F	Foreign Materiel Acquisition and Exploitation	-	41.689	42.960	66.653	0.000	66.653
164	07	0605278F	HC/MC-130 Recap RDT&E	0.000	8.646	13.987	38.579	0.000	38.579
165	07	0606018F	NC3 Integration	-	0.000	0.000	12.636	0.000	12.636
166	07	0101113F	B-52 SQUADRONS	-	70.172	88.267	111.910	0.000	111.910

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Master Exhibit R-1

(Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
167	07	0101122F	Air-Launched Cruise Missile (ALCM)	-	0.451	0.453	0.463	0.000	0.463
168	07	0101126F	B-1B Squadrons	-	2.174	5.830	62.471	0.000	62.471
169	07	0101127F	B-2 SQUADRONS	0.000	105.914	152.458	193.108	0.000	193.108
170	07	0101213F	Minuteman Squadrons	0.000	128.492	182.958	210.845	0.000	210.845
171	07	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	207.933	26.954	39.148	25.736	0.000	25.736
172	07	0101314F	Night Fist - USSTRATCOM	-	0.087	0.000	0.000	0.000	0.000
173	07	0101316F	Worldwide Joint Strategic Communications	-	3.815	6.042	6.272	0.000	6.272
174	07	0101324F	Integrated Strategic Planning & Analysis Network	-	0.000	0.000	11.032	0.000	11.032
176	07	0102110F	UH-1N Replacement Program	-	0.000	14.116	108.617	0.000	108.617
177	07	0102326F	Region/Sector Operation Control Center Modernization Program	-	0.000	10.868	3.347	0.000	3.347
178	07	0105921F	Service Support to STRATCOM - Space Activities	-	9.388	8.674	0.000	0.000	0.000
179	07	0205219F	MQ-9 UAV	958.691	124.695	151.373	201.394	0.000	201.394
180	07	0205671F	Joint Counter RCIED Electronic Warfare	-	0.300	0.000	0.000	0.000	0.000
181	07	0207040F	Multi-Platform Electronic Warfare Equipment	-	3.980	0.000	0.000	0.000	0.000
182	07	0207131F	A-10 Squadrons	-	16.200	21.353	17.459	0.000	17.459

UNCLASSIFIED

Master Exhibit R-1

Page 13 of 21

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
183	07	0207133F	F-16 Squadrons	-	153.611	147.795	246.578	0.000	246.578
184	07	0207134F	F-15E Squadrons	0.000	210.029	356.717	320.271	0.000	320.271
185	07	0207136F	Manned Destructive Suppression	-	14.400	14.773	15.106	0.000	15.106
186	07	0207138F	F-22A Squadrons	3,674.494	224.550	387.564	610.942	0.000	610.942
187	07	0207142F	F-35 Squadrons	61.782	51.990	153.045	334.530	0.000	334.530
188	07	0207161F	Tactical AIM Missiles	96.110	33.615	52.898	34.952	0.000	34.952
189	07	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	459.428	44.335	62.470	61.322	0.000	61.322
190	07	0207224F	Combat Rescue and Recovery	-	0.398	0.000	0.000	0.000	0.000
191	07	0207227F	Combat Rescue - Pararescue	-	0.636	0.362	0.693	0.000	0.693
192	07	0207247F	AF TENCAP	-	37.489	28.413	0.000	0.000	0.000
193	07	0207249F	Precision Attack Systems Procurement	-	1.064	0.649	1.714	0.000	1.714
194	07	0207253F	Compass Call	-	32.024	23.923	14.040	0.000	14.040
195	07	0207268F	Aircraft Engine Component Improvement Program	-	104.092	109.859	109.243	0.000	109.243
196	07	0207277F	ISR Innovations	-	0.000	0.000	0.000	5.750	5.750
197	07	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	209.212	9.221	30.002	29.932	0.000	29.932
198	07	0207410F	Air & Space Operations Center (AOC)	0.000	20.588	37.621	26.956	0.000	26.956
199	07	0207412F	Control and Reporting Center (CRC)	-	0.557	13.292	2.450	0.000	2.450

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
200	07	0207417F	Airborne Warning and Control System (AWACS)	-	124.457	86.644	151.726	0.000	151.726
201	07	0207418F	Tactical Airborne Control Systems	-	5.786	2.442	3.656	0.000	3.656
203	07	0207431F	Combat Air Intelligence System Activities	-	6.793	10.911	13.420	0.000	13.420
204	07	0207444F	Tactical Air Control Party-Mod	-	10.747	11.843	10.623	0.000	10.623
205	07	0207448F	C2ISR Tactical Data Link	-	1.629	1.515	1.754	0.000	1.754
206	07	0207452F	DCAPES	186.286	12.909	14.979	17.382	0.000	17.382
207	07	0207573F	National Technical Nuclear Forensics	-	0.000	0.000	2.307	0.000	2.307
208	07	0207590F	Seek Eagle	-	21.131	25.308	25.397	0.000	25.397
209	07	0207601F	USAF Modeling and Simulation	-	20.358	16.666	10.175	0.000	10.175
210	07	0207605F	Wargaming and Simulation Centers	-	5.819	4.245	12.839	0.000	12.839
211	07	0207697F	Distributed Training and Exercises	-	4.202	3.886	4.190	0.000	4.190
212	07	0208006F	Mission Planning Systems	338.582	54.176	71.785	85.531	0.000	85.531
213	07	0208007F	Tactical Deception	-	0.000	0.000	3.761	0.000	3.761
214	07	0208087F	AF Offensive Cyberspace Operations	-	14.939	25.025	35.693	4.000	39.693
215	07	0208088F	AF Defensive Cyberspace Operations	-	7.414	29.439	20.964	0.000	20.964
218	07	0301017F	Global Sensor Integrated on Network (GSIN)	-	5.803	3.470	3.549	0.000	3.549
219	07	0301112F	Nuclear Planning and Execution System (NPES)	0.000	0.000	4.060	4.371	0.000	4.371

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Line#	BA#	PE#	PE Title	Cost (\$ in Millions)					
				Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
226	07	0301400F	Space Superiority Intelligence	-	13.965	13.880	0.000	0.000	0.000
227	07	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	-	0.000	0.000	3.721	0.000	3.721
228	07	0302015F	E-4B National Airborne Operations Center (NAOC)	-	76.760	30.948	35.467	0.000	35.467
229	07	0303001F	Family of Advanced BLoS Terminals (FAB-T)	-	12.313	52.578	0.000	0.000	0.000
230	07	0303131F	Minimum Essential Emergency Communications Network (MEECN)	-	92.036	47.471	48.841	0.000	48.841
231	07	0303140F	Information Systems Security Program	-	44.578	46.388	42.973	0.000	42.973
232	07	0303141F	Global Combat Support System	-	0.000	0.052	0.105	0.000	0.105
233	07	0303142F	Global Force Management - Data Initiative	-	2.470	2.099	2.147	0.000	2.147
234	07	0303601F	MILSATCOM Terminals	2,216.097	9.000	0.000	0.000	0.000	0.000
236	07	0304260F	Airborne SIGINT Enterprise	-	111.142	90.762	121.948	0.000	121.948
237	07	0304310F	Commercial Economic Analysis	-	0.000	0.000	3.544	0.000	3.544
240	07	0305020F	CCMD Intelligence Information Technology	-	0.000	0.000	1.542	0.000	1.542
241	07	0305099F	Global Air Traffic Management (GATM)	-	4.089	4.354	4.453	0.000	4.453
242	07	0305110F	Satellite Control Network (SPACE)	-	7.327	15.624	0.000	0.000	0.000
243	07	0305111F	Weather Service	-	28.812	19.974	26.654	0.000	26.654

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Master Exhibit R-1

(Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
244	07	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	-	18.830	9.770	6.306	0.000	6.306
245	07	0305116F	Aerial Targets	-	2.578	3.051	21.295	0.000	21.295
248	07	0305128F	Security and Investigative Activities	-	0.455	0.405	0.415	0.000	0.415
249	07	0305145F	Arms Control Implementation	-	9.116	4.844	0.000	0.000	0.000
250	07	0305146F	Defense Joint Counterintelligence Activities	-	0.361	0.339	3.867	0.000	3.867
253	07	0305173F	Space and Missile Test and Evaluation Center	-	3.490	3.989	0.000	0.000	0.000
254	07	0305174F	Space Innovation, Integration and Rapid Technology Development	-	1.543	3.070	0.000	0.000	0.000
255	07	0305179F	Integrated Broadcast Service (IBS)	-	9.760	8.833	0.000	0.000	0.000
256	07	0305182F	Spacelift Range System (SPACE)	-	5.708	11.867	0.000	0.000	0.000
257	07	0305202F	Dragon U-2	-	34.471	37.217	34.486	0.000	34.486
258	07	0305205F	Endurance Unmanned Aerial Vehicles	-	5.000	0.000	0.000	0.000	0.000
259	07	0305206F	Airborne Reconnaissance Systems	-	61.742	3.841	4.450	0.000	4.450
260	07	0305207F	Manned Reconnaissance Systems	-	13.245	20.975	14.269	0.000	14.269
261	07	0305208F	Distributed Common Ground/Surface Systems	-	22.686	30.448	27.501	0.000	27.501
262	07	0305220F	RQ-4 UAV	686.056	180.547	256.307	214.849	0.000	214.849
263	07	0305221F	Network-Centric Collaborative Targeting	-	19.587	22.610	18.842	0.000	18.842
264	07	0305236F	Common Data Link Executive Agent (CDL EA)	-	43.709	0.000	0.000	0.000	0.000

UNCLASSIFIED

Master Exhibit R-1

Page 17 of 21

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
265	07	0305238F	NATO AGS	-	131.900	38.904	44.729	0.000	44.729
266	07	0305240F	Support to DCGS Enterprise	-	28.336	23.084	26.349	0.000	26.349
267	07	0305258F	Advanced Evaluation Program	-	0.000	116.143	0.000	0.000	0.000
268	07	0305265F	GPS III Space Segment	-	147.398	179.188	0.000	0.000	0.000
269	07	0305600F	International Intelligence Technology and Architectures	-	2.298	2.360	3.491	0.000	3.491
270	07	0305614F	JSPOC Mission System	-	80.669	87.889	0.000	0.000	0.000
271	07	0305881F	Rapid Cyber Acquisition	-	3.036	4.280	4.899	0.000	4.899
272	07	0305906F	NCMC - TW/AA System	-	0.000	4.951	0.000	0.000	0.000
273	07	0305913F	NUDET Detection System (SPACE)	-	14.403	21.093	0.000	0.000	0.000
274	07	0305940F	Space Situation Awareness Operations	-	23.416	93.802	0.000	0.000	0.000
275	07	0305984F	Personnel Recovery Command & Ctrl (PRC2)	-	0.000	0.000	2.445	0.000	2.445
276	07	0307577F	Intelligence Mission Data (IMD)	-	0.000	0.000	8.684	0.000	8.684
277	07	0308699F	Shared Early Warning (SEW)	-	0.845	6.366	0.000	0.000	0.000
278	07	0401115F	C-130 Airlift Squadron	0.000	33.962	15.599	10.219	0.000	10.219
279	07	0401119F	C-5 Airlift Squadrons (IF)	-	22.766	66.146	22.758	0.000	22.758
280	07	0401130F	C-17 Aircraft (IF)	-	36.082	12.430	34.287	0.000	34.287
281	07	0401132F	C-130J Program	242.300	31.410	16.776	26.821	0.000	26.821

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program

Master Exhibit R-1

(Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
282	07	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	-	5.802	5.166	5.283	0.000	5.283
283	07	0401218F	KC-135s	-	0.000	0.000	9.942	0.000	9.942
284	07	0401219F	KC-10s	-	1.597	0.000	7.933	0.000	7.933
285	07	0401314F	Operational Support Airlift	0.000	46.453	13.817	6.681	0.000	6.681
286	07	0401318F	CV-22	37.698	26.821	28.702	22.519	0.000	22.519
287	07	0401840F	AMC Command and Control System	-	0.000	0.000	3.510	0.000	3.510
288	07	0408011F	Special Tactics / Combat Control	-	7.665	7.164	8.090	0.000	8.090
289	07	0702207F	Depot Maintenance (Non-IF)	-	1.514	1.518	1.528	0.000	1.528
290	07	0708055F	Maintenance, Repair & Overhaul System	0.000	0.000	0.000	31.677	0.000	31.677
291	07	0708610F	Logistics Information Technology (LOGIT)	0.000	52.482	61.676	33.344	0.000	33.344
292	07	0708611F	Support Systems Development	-	13.987	9.128	9.362	0.000	9.362
293	07	0804743F	Other Flight Training	-	1.770	1.653	2.074	0.000	2.074
294	07	0808716F	Other Personnel Activities	-	0.117	0.057	0.107	0.000	0.107
295	07	0901202F	Joint Personnel Recovery Agency	-	5.741	3.663	2.006	0.000	2.006
296	07	0901218F	Civilian Compensation Program	-	3.475	3.735	3.780	0.000	3.780
297	07	0901220F	Personnel Administration	-	4.416	5.157	7.472	0.000	7.472
298	07	0901226F	Air Force Studies and Analysis Agency	-	1.064	1.523	1.563	0.000	1.563

UNCLASSIFIED

Master Exhibit R-1

Page 19 of 21

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
299	07	0901538F	Financial Management Information Systems Development	496.071	95.053	10.581	91.211	0.000	91.211
300	07	1201921F	Service Support to STRATCOM - Space Activities	-	9.388	8.674	14.255	0.000	14.255
301	07	1202247F	AF TENCAP	-	37.489	28.413	31.914	0.000	31.914
302	07	1203001F	Family of Advanced BLoS Terminals (FAB-T)	-	12.313	52.578	32.426	0.000	32.426
303	07	1203110F	Satellite Control Network (SPACE)	-	7.327	15.624	18.808	0.000	18.808
305	07	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	-	0.000	0.000	10.029	0.000	10.029
306	07	1203173F	Space and Missile Test and Evaluation Center	-	3.490	3.989	25.051	0.000	25.051
307	07	1203174F	Space Innovation, Integration and Rapid Technology Development	-	1.543	3.070	11.390	0.000	11.390
308	07	1203179F	Integrated Broadcast Service (IBS)	-	9.760	8.833	8.747	0.000	8.747
309	07	1203182F	Spacelift Range System (SPACE)	-	5.708	11.867	10.549	0.000	10.549
310	07	1203265F	GPS III Space Segment	2,799.129	147.398	179.188	243.435	0.000	243.435
311	07	1203400F	Space Superiority Intelligence	-	13.965	13.880	12.691	0.000	12.691
312	07	1203614F	JSpOC Mission System	0.000	80.669	87.889	99.455	0.000	99.455
313	07	1203620F	National Space Defense Center	-	0.000	0.000	18.052	0.000	18.052
314	07	1203699F	Shared Early Warning (SEW)	-	0.845	6.366	1.373	0.000	1.373

UNCLASSIFIED

UNCLASSIFIED

Air Force • Budget Estimates FY 2018 • RDT&E Program
 Master Exhibit R-1
 (Listing by Budget Activity, then Program Element Number)

BA# 07: Operational Systems Development

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
315	07	1203906F	NCMC - TW/AA System	-	0.000	4.951	5.000	0.000	5.000
316	07	1203913F	NUDET Detection System (SPACE)	-	14.403	21.093	31.508	0.000	31.508
317	07	1203940F	Space Situation Awareness Operations	-	23.416	93.802	99.984	0.000	99.984
318	07	1206423F	Global Positioning System III - Operational Control Segment	2,804.399	344.226	513.268	510.938	0.000	510.938
Total: Operational Systems Development				15,680.931	4,575.255	5,725.530	5,647.300	9.750	5,657.050

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In the Fiscal Year (FY) 2018 Budget Estimates

RDT&E Exhibits in Budget Activity 7

are split into two books:

Vol-III Part 1

Vol-III Part 2

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

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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0603423F I Global Positioning System III - Operational Control Segment
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	344.226	513.268	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A021: OCX	-	283.170	451.362	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A025: GPS Enterprise Integrator	-	61.056	61.906	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 Positional System III - Operational Control Segment, due to the creation of a new Major Force Program for Space. FY2016 and FY2017 funding is now documented in the exhibits for PE 1206423F.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	344.226	513.268	0.000	0.000	0.000
Total Adjustments	344.226	513.268	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	344.226	513.268	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

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
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
67A021: OCX	-	283.170	451.362	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: FY 2018 Air Force										Date: May 2017		
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>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
67A025: <i>GPS Enterprise Integrator</i>	-	61.056	61.906	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: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	27.579	0.000	27.579	0.000	0.000	0.000	0.000	Continuing	Continuing
674237: <i>EMP Certification</i>	-	0.000	0.000	27.579	0.000	27.579	0.000	0.000	0.000	0.000	Continuing	Continuing

Note
 This program, BA 07 PE 0604222F, project 674237, Electronic Magnetic Pulse (EMP), is a new start.

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.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	27.579	0.000	27.579
Total Adjustments	0.000	0.000	27.579	0.000	27.579
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	27.579	0.000	27.579

Change Summary Explanation

FY18 increase by \$27.579M for Electronic Magnetic Pulse (EMP)

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674237: EMP Certification	-	0.000	0.000	27.579	0.000	27.579	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0604222F, project 674237, Electronic Magnetic Pulse (EMP), is a new start.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Electronic Magnetic Pulse (EMP)	0.000	0.000	27.579	0.000	27.579
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 2016 Accomplishments: N/A					
FY 2017 Plans: N/A					
FY 2018 Base 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					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
are not possible through testing alone. This program will recommend upgrades to existing systems as well as informing requirements for future systems. FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	27.579	0.000	27.579

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

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: FY 2018 Air Force **Date:** May 2017

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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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-	-	-	-	-	-	-	-	-	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-	-	-	-	-	-	-	-	-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.000		0.000		25.579	Mar 2018	0.000		25.579	Continuing	Continuing	-
Subtotal			-	0.000		0.000		25.579		0.000		25.579	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.000		0.000		2.000	Mar 2018	0.000		2.000	Continuing	Continuing	-
Subtotal			-	0.000		0.000		2.000		0.000		2.000	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000	0.000	27.579	0.000	27.579	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Award and MIPR acceptance									■																			
Survivability and vulnerability studies									■	■	■	■																
Testing and Analysis											■	■	■	■	■	■												
Final Reports																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
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: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0604233F I Specialized Undergraduate Flight Training
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	7.742	15.427	5.776	0.000	5.776	10.992	3.269	2.189	2.434	Continuing	Continuing
674101: Undergraduate Remotely Piloted Aircraft Training	-	0.700	0.734	0.758	0.000	0.758	0.777	0.802	0.816	0.833	Continuing	Continuing
676034: Joint Primary Aircraft Training System (JPATS)	-	0.391	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.391
676035: T-6 Operational System Development	-	0.193	1.811	3.008	0.000	3.008	1.789	1.290	0.176	0.379	Continuing	Continuing
676037: T-38 Operational System Development	-	6.458	12.882	2.010	0.000	2.010	8.426	1.177	1.197	1.222	0.000	33.372

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 Joint Primary Aircraft Training System including studies & development efforts to support future ACAT III Engineering Change Proposals to the T-6 Aircraft, instructional courseware, and logistics support to include Diminishing Manufacturing Sources and Material Shortages and development activities related to Diminishing Manufacturing Sources and Material Shortages. Included is development for the Federal Aviation Administration mandated ACAT III program for Automatic Dependent Surveillance-Broadcast Out and associated upgrades.

T-38 program will continue development in FY2017 and FY2018 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. System testing is projected to begin in FY2017 and production and deployment of the replacement the systems will begin in late FY2018 and continue through FY2021.

The FY 2018 funding request was reduced by \$5.354 million to account for the availability of prior year execution balances.

In FY 2016 T-6 Avionics Upgrades for FAA (Federal Aviation Administration) Compliance was a new start.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	8.565	15.427	11.130	0.000	11.130
Current President's Budget	7.742	15.427	5.776	0.000	5.776
Total Adjustments	-0.823	0.000	-5.354	0.000	-5.354
• 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	-0.803	0.000			
• SBIR/STTR Transfer	-0.020	0.000			
• Other Adjustments	0.000	0.000	-5.354	0.000	-5.354

Change Summary Explanation

The FY 2018 funding request was reduced by \$5.354 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674101: <i>Undergraduate Remotely Piloted Aircraft Training</i>	-	0.700	0.734	0.758	0.000	0.758	0.777	0.802	0.816	0.833	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 (DTS) to prepare undergraduate students for entry in RPA Formal Training Units (FTU). PRIME has completed 6 Phases of development and is now at baseline functionality. PRIME is a desktop 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 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.

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

	FY 2016	FY 2017	FY 2018
Title: Predator Reaper Integrated Mission Environment (PRIME) support	0.700	0.734	0.758
Description: Add Phase 7 operational capabilities.			
FY 2016 Accomplishments: Extended and enhanced interoperability between PRIME and Modern Air Combat Environment (MACE) software incorporated in Phase 6 for instructor operations and entity generation.			
FY 2017 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 record and playback functionality. Add multiple emergency missions.			
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			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
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.			
Accomplishments/Planned Programs Subtotals	0.700	0.734	0.758

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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>				Project (Number/Name) 676034 / <i>Joint Primary Aircraft Training System (JPATS)</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676034: <i>Joint Primary Aircraft Training System (JPATS)</i>	-	0.391	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.391
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Primary Aircraft Training System (JPATS) is a joint USAF/USN venture to replace the Services' fleets of primary trainer aircraft (T-37 and T-34, respectively) and associated Ground Based Training Systems (GBTS). Additionally the US Army purchased four T-6 Army Variant aircraft to replace the T-34 aircraft for the Army Test and Evaluation Command. The USAF/USN T-6 aircraft and GBTS are used to train entry-level student aviators in the fundamentals of flying so they can transition into advanced training tracks leading to qualification as military pilots, combat systems officers, and naval flight officers. The program includes the purchase of aircraft, simulators, and other associated ground-based training devices, Training Integration Management System (TIMS), instructional courseware, and logistics support to include Diminishing Manufacturing Sources and Material Shortages (DMSMS) and development activities related to DMSMS.

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

	FY 2016	FY 2017	FY 2018
<p>Title: Joint Primary Aircraft Training System (JPATS) Studies</p> <p>Description: JPATS studies and development activities including but not limited to: T-6 Power Management Unit (PMU) software upgrade, parachute surveillance study, ejection seat, and safe/arm handle development.</p> <p>FY 2016 Accomplishments: Continued JPATS studies and development activities including but not limited to additional phases of the 6 Engine Upgrade Studies, Phase 2 of the Parachute Surveillance study, ejection seat alternative to existing T-6A/B/D, and safe/arm handle development</p>	0.088	-	-
<p>Title: Alternate Ejection Seat Study</p> <p>Description: JPATS requested a study to assess the existing issues with the current seat, other potential options for the T-6 ejection seat, and what modifications would be required to integrate an alternate ejection seat option into the existing one. The purpose of this study was to determine the cost to buy and install an upgraded T-6 seat and an estimate of the life cycle costs based on the remaining service life of the aircraft.</p> <p>FY 2016 Accomplishments: JPATS requested a study to assess the existing issues with the current seat, other potential options for the T-6 ejection seat, and what modifications would be required to integrate an alternate ejection seat option into the existing one. The purpose of this study</p>	0.074	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / <i>Specialized Undergraduate Flight Training</i>	Project (Number/Name) 676034 / <i>Joint Primary Aircraft Training System (JPATS)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
was to determine the cost to buy and install an upgraded T-6 seat and an estimate of the life cycle costs based on the remaining service life of the aircraft. Subsequently, this study was cancelled. This FY16 amount reflects B&P costs.			
Title: High Cycle Engine Fatigue Research	0.229	-	-
Description: Analysis of Hight Cycle Fatigue (HCF) and Structural Health Monitoring (SHM) of the T106-PW-100 engine.			
FY 2016 Accomplishments: Continued research and analysis of High Cycle Fatigue (HCF) and Structural Health Monitoring (SHM) of the T106-PW-100 engine.			
Accomplishments/Planned Programs Subtotals	0.391	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA06: Line Item #	0.875	0.000	3.079	0.000	3.079	1.190	1.214	1.548	1.860	0.00	9.766
000999: <i>Initial Spares/Repair Parts</i>											
• APAF: BA05: Line Item # JPAT00: T-6	14.968	12.765	35.648	0.000	35.648	26.035	11.702	26.975	14.252	0.00	142.345

Remarks

D. Acquisition Strategy

JPATS was competitively awarded with the intent of maximizing the use of commercially available equipment and best commercial practices. Initially, the JPATS Program competitively awarded two contracts: a Firm Fixed Price (FFP) Contractor Logistics Support (CLS) Operations and Maintenance funded contract and a Fixed Price Incentive Firm Target (FPIF) manufacturing development (MD)/production contract with seven options. The follow-on contract production for both the air vehicle and GBTS was awarded as a FAR Part 15 action. The FFP CLS Operations and Maintenance funded contract is a FAR Part 15 action.

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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676035: <i>T-6 Operational System Development</i>	-	0.193	1.811	3.008	0.000	3.008	1.789	1.290	0.176	0.379	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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.

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

	FY 2016	FY 2017	FY 2018
Title: T-6 (JPATS) Studies	0.005	0.442	0.209
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.			
FY 2016 Accomplishments: Continued JPATS studies and development activities including but not limited to additional phases of the 6 Engine Upgrade Studies, Phase 2 of the Parachute Surveillance study, Safe/Arm Handle development, Crash Survivable Cockpit Voice Recorder (CSCVR), and ejection seat alternative to existing T-6A/B/D.			
FY 2017 Plans: Continue T-6 Aircraft studies and development activities including but not limited to: the T-6 Power Management Unit (PMU) Software Upgrade study, parachute surveillance study, safe/arm handle development, Crash Survivable Cockpit Voice Recorder (CSCVR), ejection seat alternatives, and engine upgrade studies.			
FY 2018 Plans: Continue T-6 Aircraft studies and development activities including but not limited to: the T-6 Power Management Unit (PMU) Software Upgrade study, parachute surveillance study, safe/arm handle development, Crash Survivable Cockpit Voice Recorder (CSCVR), and engine upgrade studies.			
Title: T-6 Avionics Upgrades for FAA (Federal Aviation Administration) Compliance	0.188	1.369	2.799

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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)	FY 2016	FY 2017	FY 2018
<p>Description: The T-6 Automatic Dependent Surveillance Broadcast (ADS-B) Out program includes 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.</p> <p>FY 2016 Accomplishments: Began the 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 2017 Plans: Continue the 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 2018 Plans: Continue the 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>			
Accomplishments/Planned Programs Subtotals	0.193	1.811	3.008

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF: BA06: Line Item # 000999: <i>Initial Spares/Repair Parts</i>	0.875	0.000	3.079	0.000	3.079	1.190	1.214	1.548	1.860	0.00	9.766
• APAF: BA05: Line Item # JPAT00: <i>T-6</i>	14.968	12.765	35.648	0.000	35.648	26.035	11.702	26.975	14.252	0.00	142.345

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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676037: <i>T-38 Operational System Development</i>	-	6.458	12.882	2.010	0.000	2.010	8.426	1.177	1.197	1.222	0.000	33.372
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 5 T-38Cs pending removal. T-38s first entered service in 1961 and average over 49 years old.

T-38C Avionics System obsolescence remediation efforts to qualify updated systems will continue from FY2016 through 2018 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 2016	FY 2017	FY 2018
Title: T-38 Avionics Post Production Support (APPS)	6.458	10.609	-
Description: T-38C Avionics System obsolescence remediation effort is intended to develop and qualify replacement components/LRUs 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 will begin development of a solution for the Federal Aviation Administration Automated Dependent Surveillance-Broadcast (Out) mandate.			
FY 2016 Accomplishments: Continue (from BA5) T-38C Avionics System obsolescence remediation efforts. Development and system integration efforts will continue for the Mission Display Processor, Heads-Up Display, Very High Frequency Communication and Navigation radios. Additionally, the T-38C program will continue development and integration of a solution for the Federal Aviation Administration Automatic Dependent Surveillance-Broadcast (Out) mandate.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
Continue T-38C Avionics System development and system integration efforts. Begin flight test planning and preliminary test for the Mission Display Processor, Heads-Up Display, Very High Frequency Communication and Navigation radios and the Automatic Dependent Surveillance-Broadcast (Out) solution.			
Title: T-38 Studies and Development Efforts 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. FY 2017 Plans: Component Diminishing Manufacturing Sources and Material Shortages studies.	-	0.100	-
Title: T-38A/B ADS-B 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. FY 2017 Plans: Begin ADS-B system development. FY 2018 Plans: Complete system development and integration. Accomplish ground and flight testing. Finalize TCTO development.	-	2.173	2.010
Accomplishments/Planned Programs Subtotals	6.458	12.882	2.010

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item #T03800: T-38	30.604	45.090	54.692	0.000	54.692	97.503	25.795	26.269	0.000	0.00	0.000

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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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 will begin 1 April 2017.

The T-38A/B Automatic Dependent Surveillance-Broadcast program is in the source selection phase. Projected contract award is June 2017. The current contract strategy 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. As part of the sole source effort, the aircraft integration work will be accomplished.

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	6.836	17.639	46.695	16.247	0.000	16.247	0.000	0.000	0.002	0.000	0.000	87.419
675895: <i>Wide Area Surveillance</i>	6.836	17.639	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	24.477
675899: <i>Wide Area Surveillance</i>	0.000	0.000	46.695	16.247	0.000	16.247	0.000	0.000	0.000	0.000	0.000	62.942

Program MDAP/MAIS Code: 519

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.

In FY2017, Special Program efforts were transferred to PE 0604445F, Wide Area Surveillance, Project 675899, Wide Area Surveillance in order to centrally fund and manage efforts.

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

Some aspects of the WAS program are classified and will be provided on a need-to-know basis. Contact Major Willie Mims (SAF/AQID), 202-404-3331, for additional information.

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: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	22.577	46.695	83.044	0.000	83.044
Current President's Budget	17.639	46.695	16.247	0.000	16.247
Total Adjustments	-4.938	0.000	-66.797	0.000	-66.797
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-4.251	0.000			
• SBIR/STTR Transfer	-0.687	0.000			
• Other Adjustments	0.000	0.000	-66.797	0.000	-66.797

Change Summary Explanation

- FY16 \$4.251M reprogramming for higher AF priorities.
- FY18 \$5.344M RDT&E reduction to match Service Cost Position (SCP).
- FY18 \$61.5M funding transferred to OPAF in order to support WAS fielding.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>				Project (Number/Name) 675895 / <i>Wide Area Surveillance</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675895: <i>Wide Area Surveillance</i>	6.836	17.639	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	24.477
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.

Some aspects of the WAS program are classified and will be provided on a need-to-know basis. Contact Major Willie Mims (SAF/AQID), 202-404-3331, for additional information.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Development, Test & Fielding	17.639	0.000	0.000	0.000	0.000
Description: Development, Test & Fielding					
FY 2016 Accomplishments: Activities included, but were not limited to: - Development, integration and testing of sensors - Continued studies, analysis, and risk mitigation activities to support testing, modeling and simulation, system engineering analysis and site specific requirements, such as security, site maintenance, equipment maintenance, material shipping, site analysis/studies & environmental analysis/studies - Develop and test software builds to feed into the system of record, Battle Control Systems Fixed.					
FY 2017 Plans: N/A					
FY 2018 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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) 675895 / <i>Wide Area Surveillance</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
<i>FY 2018 OCO Plans:</i> N/A					
Accomplishments/Planned Programs Subtotals	17.639	0.000	0.000	0.000	0.000

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

N/A

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 Capitol Region. Science & Technology contracts were let prior to the Engineering and Manufacturing Development phase for both sub-systems. The ongoing contract for the Stateside Affordable Radar System (STARS) was awarded to a single developer to design, build, integrate, and test the STARS system.

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: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>	Project (Number/Name) 675895 / <i>Wide Area Surveillance</i>
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Wide Area Surveillance (WAS)	Various	Various : Various	0.936	11.360	Jul 2016	0.000		0.000		0.000		0.000	0.000	12.296	-
Subtotal			0.936	11.360		0.000		0.000		0.000		0.000	0.000	12.296	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Direct Mission	Various	Various : Various	0.480	2.679	Dec 2015	0.000		0.000		0.000		0.000	0.000	3.159	-
Subtotal			0.480	2.679		0.000		0.000		0.000		0.000	0.000	3.159	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	46 TS : Eglin AFB, FL	0.000	0.500	Jan 2016	0.000		0.000		0.000		0.000	0.000	0.500	-
Subtotal			0.000	0.500		0.000		0.000		0.000		0.000	0.000	0.500	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	AFLCMC/HBDB : Hanscom AFB, MA	5.420	3.100	Oct 2015	0.000		0.000		0.000		0.000	0.000	8.520	-
Subtotal			5.420	3.100		0.000		0.000		0.000		0.000	0.000	8.520	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			6.836	17.639	0.000	0.000	0.000	0.000	0.000	24.475	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force	Date: May 2017
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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) 675895 / <i>Wide Area Surveillance</i>
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	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks									

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>	Project (Number/Name) 675895 / <i>Wide Area Surveillance</i>
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

Program Transferred to Air Force (Oct 2015)	
Development, Integration and Testing	

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604445F / <i>Wide Area Surveillance</i>	Project (Number/Name) 675895 / <i>Wide Area Surveillance</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Program Transferred to Air Force (Oct 2015)	1	2016	1	2016
Development, Integration and Testing	1	2016	4	2016

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675899: <i>Wide Area Surveillance</i>	0.000	0.000	46.695	16.247	0.000	16.247	0.000	0.000	0.000	0.000	0.000	62.942
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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Development, Test & Fielding	0.000	46.695	16.247	-	16.247
Description: Development, Test & Fielding					
FY 2016 Accomplishments: N/A					
FY 2017 Plans: Items include but are not limited to: - Continue to develop, integrate and test sensors for STARS and Scorpion systems. - Continue to integrate and test track feeds into systems of record, Battle Control System-Fixed - Continue studies, analysis, and risk mitigation activities to support testing, modeling & simulation, system engineering - Continue to establish site specific requirements to include but not limited to security, maintenance, material shipping, site/environmental analysis and studies for the Regional Support Facility for both STARS and Scorpion - Continue to develop, test software and integrate builds to feed into the system of record, Battle Control Systems-Fixed.					
FY 2018 Base Plans: Will include but are not limited to:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Will complete development, integration and testing of final Stateside Affordable Radar System (STARS) in preparation for Milestone C approval.					
- Will complete development, integration and testing of a Regional Support Facility supporting both STARS and Scorpion systems.					
- Will provide pre-operational support to fielded STARS and Scorpion systems.					
- Will continue to integrate and test track feeds into systems of record, Battle Control System-Fixed.					
- Will 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. Will 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.					
- Will develop/test software and integrate builds to feed into the system of record, Battle Control Systems-Fixed.					
Accomplishments/Planned Programs Subtotals	0.000	46.695	16.247	-	16.247

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item # 834240: <i>Wide Area Surveillance</i>	0.000	6.943	62.087	0.000	62.087	77.760	27.425	27.917	28.420	0.000	230.552

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 let 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 will be awarded (May 17) to include pre-operational site support. The ongoing CPFF contract for Scorpion was awarded to a single developer to complete the design, build, integration, and testing of the Scorpion system, and conduct pre-operational site support. The pre-operational site support for both the STARS and Scorpion contracts will transition to Interim Contract Support (ICS) in FY2018.

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).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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: FY 2018 Air Force **Date:** May 2017

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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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Wide Area Surveillance (WAS)	Various	Various : Various	0.000	0.000		35.280	Feb 2017	12.340	Feb 2018	0.000		12.340	180.260	227.880	46.000
Subtotal			0.000	0.000		35.280		12.340		0.000		12.340	180.260	227.880	46.000

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Direct Mission	Various	Various : Various	0.000	0.000		4.614	Nov 2016	1.021	Oct 2017	0.000		1.021	10.000	15.635	-
Subtotal			0.000	0.000		4.614		1.021		0.000		1.021	10.000	15.635	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	46 TS : Eglin AFB, FL	0.000	0.000	Dec 2017	1.825	Dec 2016	0.800		0.000		0.800	4.680	7.305	-
Subtotal			0.000	0.000		1.825		0.800		0.000		0.800	4.680	7.305	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	AFLCMC/HBDB : Hanscom AFB, MA	0.000	0.000		4.976	Jan 2017	2.086	Oct 2017	0.000		2.086	19.904	26.966	-
Subtotal			0.000	0.000		4.976		2.086		0.000		2.086	19.904	26.966	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000	46.695	16.247	0.000	16.247	214.844	277.786	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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<u>Remarks</u>									
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

Development, Integration and Testing	
Initial Operational Capability (IOC) (Dec 2018)	

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
Development, Integration and Testing	1	2017	4	2018
Initial Operational Capability (IOC) (Dec 2018)	1	2019	1	2019

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	199.827	30.334	10.368	21.915	0.000	21.915	52.428	52.479	30.666	31.687	0.000	429.704
676003: <i>HRM Structural Development</i>	199.827	30.334	10.368	21.915	0.000	21.915	52.428	52.479	30.666	31.687	0.000	429.704
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. AFIPPS will enable accurate and timely delivery of pay, entitlements, allowances and benefits and make appropriate information available for all levels of management. 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.

AFIPPS's customers include approximately 510,000 AF service members across all components (RegAF, ANG, and AFRes) as well as 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 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: FY 2018 Air Force	Date: May 2017
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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0605018F I AF Integrated Personnel and Pay System (AF-IPPS)
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	31.344	10.368	51.843	0.000	51.843
Current President's Budget	30.334	10.368	21.915	0.000	21.915
Total Adjustments	-1.010	0.000	-29.928	0.000	-29.928
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.010	0.000			
• Other Adjustments	0.000	0.000	-29.928	0.000	-29.928

Change Summary Explanation

Reduction in FY2018 (\$29.928M) due to higher Air Force priorities

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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Title: Air Force Integrated Personnel and Pay System (AFIPPS) - Product Development	30.169	10.308	21.706
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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 2016 Accomplishments:

- Transitioned program office to Joint Base San Antonio(JBSA) Randolph, TX
- Modified integrated personnel and pay system (IPPS) long-range strategy
- Prepared acquisition and contract documentation to support AFIPPS strategy
- Refined acquisition planning, reporting, and the execution of AFIPPS activities
- Continued AF information technology efforts (e.g.,implementation & baselines, application services, etc.) to ensure AFIPPS is fully integrated into the AF & DoD enterprise networks, databases, and information systems
- Purchased Commercial Off-the-Shelf (COTS) Software to support development activities
- Conducted risk reduction activities to assess/reduce risk and support decision-making
- Designed the required AFIPPS computing environments, e.g. development and test environment
- Designed enterprise architecture for pay
- Completed initial Data Management Environment(DME) activities and decommissioned PeopleSoft environment
- Awarded E-Business Suite(EBS)training contract

	30.169	10.308	21.706
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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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)		FY 2016	FY 2017	FY 2018
<p>- Added Professional Acquisition Support Services (PASS)/Engineering and Technology Acquisition Support Services(ETASS) contracted personnel and Federally Funded Research and Development Center (FFRDC)resources to support implementation of the program</p> <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Finalize and approve new acquisition strategy for AFIPPS - Release Request For Proposal (RFP) supporting the new AFIPPS Course of Action (COA) strategy - Prepare additional acquisition and contract documentation to support AFIPPS strategy - Continue acquisition planning, reporting, and the execution of AFIPPS activities - Continue AF information technology efforts (e.g., Common Computing Environment, Financial Improvement Audit Readiness(FIAR)/Federal Information System Control Audit Manual(FISCAM) audit support, etc.) to ensure AFIPPS is fully integrated into the AF & DoD enterprise networks, databases, and information systems - Complete study to evaluate system interfaces (e.g. MILPERS, AROWS, AROWS-R, My Pay, PEPA, TTS2, UTAPSWeb) associated with integrating pay capability resulting from AFIPPS implementation - Build and maintain the required AFIPPS computing environments, e.g. development, test environment - Purchase COTS Software to support data management and development activities - Continue risk reduction activities to support decision-making - Continue to design and implement enterprise architecture for pay - Execute EBS training contract - Continue using PASS/ETASS contracted personnel and FFRDC resources to support implementation of the program <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will award contract to develop and integrate personnel and pay capabilities - Will prepare contract documentation to support AFIPPS strategy and Milestone B approval - Will continue acquisition planning, reporting, and the execution of AFIPPS activities 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 modify system interfaces (e.g. MILPERS, AROWS, AROWS-R, My Pay, PEPA, TTS2, UTAPSWeb) to support integrating pay capability resulting from AFIPPS implementation - Will build and maintain the required AFIPPS computing environments, e.g. development, test environment - Will purchase COTS S/W to support data management and development activities - Will continue risk reduction activities to support decision-making - Will continue to design and implement enterprise architecture for pay - Will complete EBS training contract - Will perform change management and other integration activities 				

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0605018F I AF Integrated Personnel and Pay System (AF-IPPS)
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Will continue using PASS/ETASS contracted personnel and FFRDC resources to support implementation of the program			
Title: AFIPPS - Test and Evaluation	0.165	0.060	0.209
Description: Government integrated test and evaluation activities.			
FY 2016 Accomplishments: - Updated Test and Evaluation Master Plan (TEMP) and preparing test plans for future releases			
FY 2017 Plans: - Refine Test and Evaluation program for pay			
FY 2018 Plans: - Will refine Test and Evaluation program for pay			
Accomplishments/Planned Programs Subtotals	30.334	10.368	21.915

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

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.

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: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
3600 / 7				PE 0605018F / AF Integrated Personnel and Pay System (AF-IPPS)						676003 / HRM Structural Development					
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Application Hosting Environment	MIPR	DISA, Various SW Vendors : Bedford, MA	55.745	0.000		0.400	May 2017	0.400	May 2018	0.000		0.400	2.452	58.997	3.252
Common Computing Environment (CCE)	Various	Various : Various	0.000	0.881	Jan 2017	0.326	Jul 2017	0.855	Apr 2018	0.000		0.855	11.736	13.798	13.798
Prime Development & Integration Contract	C/TBD	TBD : TBD	33.717	0.000		0.000		8.210	Mar 2018	0.000		8.210	35.390	77.317	43.600
Direct Mission Support (DMS) Other	Various	Various IT Vendors : Various	53.862	26.000		0.000		0.000		0.000		0.000	0.000	79.862	53.114
COTs Licenses	Various	Various : Various	11.573	0.000		2.124	May 2017	3.535	May 2018	0.000		3.535	26.642	43.874	16.986
System Interface Integration & Modification	C/TBD	TBD : TBD	0.000	0.000		0.000		0.775	Jun 2018	0.000		0.775	14.043	14.818	14.818
Subtotal			154.897	26.881		2.850		13.775		0.000		13.775	90.263	288.666	145.568
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Independent Verification & Validation (IV&V)	Various	Various : Various	2.354	0.000		0.000		0.000		0.000		0.000	0.000	2.354	2.507
Gov't Integrated Test & Evaluation Activities	MIPR	Various : Various	1.454	0.165	May 2016	0.060	Sep 2017	0.209	Mar 2018	0.000		0.209	1.546	3.434	1.836
Subtotal			3.808	0.165		0.060		0.209		0.000		0.209	1.546	5.788	4.343

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	9.225	0.604	Mar 2017	0.817	Jul 2017	1.400	Mar 2018	0.000		1.400	4.079	16.125	5.955
Engineering Support (FFRDC)	SS/CPFF	CMU-SEI : Pittsburgh, PA	5.245	0.000		1.800	May 2017	2.172	Jul 2018	0.000		2.172	5.061	14.278	25.122
Other Program Support Cost	Various	Various : Various	11.117	0.940	Mar 2016	3.053	May 2017	2.640	Jan 2018	0.000		2.640	8.727	26.477	13.988
Professional Acquisition Support Services I (PASS I)	C/CPFF	Oasis Systems, Inc. : Lexington, MA	9.819	0.000		0.000		0.000		0.000		0.000	0.000	9.819	-
Professional Acquisition Support Services II (PASS II)	C/CPAF	Quantech Services, Inc. : Lexington, MA	2.690	1.569	Nov 2016	1.638	Nov 2017	0.000		0.000		0.000	4.704	10.601	7.911
Specialized Cost Services (SCS): EPASS	C/CPAF	BusinessTechnologies & Solutions : Beavercreek, OH	3.026	0.175	Oct 2016	0.150	Apr 2017	0.522	Nov 2017	0.000		0.522	1.118	4.991	1.965
Oracle EBS Subject Matter Experts	Various	Various : Various	0.000	0.000		0.000		1.197	Jun 2018	0.000		1.197	4.758	5.955	5.955
Subtotal			41.122	3.288		7.458		7.931		0.000		7.931	28.447	88.246	-
Project Cost Totals			199.827	30.334		10.368		21.915		0.000		21.915	120.256	382.700	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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

Development, Test, and Production Environments	
Enterprise Architecture Design/Implement	
Acquisition planning, RFP, Contract Award	
Prime Development, Integration, and Deployment	
AF Information Technology Efforts	
Government Integrated Test and Evaluation Activities	

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Development, Test, and Production Environments	1	2016	4	2020
Enterprise Architecture Design/Implement	2	2016	4	2022
Acquisition planning, RFP, Contract Award	2	2016	2	2018
Prime Development, Integration, and Deployment	2	2018	1	2021
AF Information Technology Efforts	1	2016	4	2022
Government Integrated Test and Evaluation Activities	1	2016	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	25.857	31.952	33.150	0.000	33.150	33.017	34.450	35.851	36.584	Continuing	Continuing
675066: <i>Anti-Tamper Technology Executive Agent</i>	-	25.857	31.952	33.150	0.000	33.150	33.017	34.450	35.851	36.584	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. 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.

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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 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.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	26.718	31.952	33.056	0.000	33.056
Current President's Budget	25.857	31.952	33.150	0.000	33.150
Total Adjustments	-0.861	0.000	0.094	0.000	0.094
• Congressional General Reductions	-0.861	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	0.094	0.000	0.094

Change Summary Explanation

FY16: Reduction of 3.177M due under execution with a payback in FY17 and FY18

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Title: DoD Anti-Tamper Technology Executive Agent (DoDATEA)	20.189	23.815	23.676
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 2016 Accomplishments:			
- 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.			
- Continue to train acquisition workforce on AT policy and technology, and implement AT policy within the AT Community.			
FY 2017 Plans:			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<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 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>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 2016 Accomplishments: Support program office efforts, including civilian pay, A&AS, outreach and education, travel, and supplies.</p> <p>FY 2017 Plans: Support program office efforts, including civilian pay, A&AS, outreach and education, travel, and supplies.</p> <p>FY 2018 Plans: Support program office efforts, including civilian pay, A&AS, outreach and education, travel, and supplies.</p>		5.051	5.487	5.284
<p>Title: Air Force Anti-Tamper Office Program Management Support</p> <p>Description: Includes civilian pay, A&AS, travel, and supplies for Air Force Component AT OPR.</p> <p>FY 2016 Accomplishments: Includes civilian pay, A&AS, travel, and supplies.</p> <p>FY 2017 Plans: Includes civilian pay, A&AS, travel, and supplies.</p> <p>FY 2018 Plans: Includes civilian pay, A&AS, travel, and supplies.</p>		0.617	0.650	0.590
<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 weapons systems.</p>		0.000	2.000	3.600

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018
<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>The Air Force Anti-Tamper office 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.</p> <p><i>FY 2016 Accomplishments:</i> No funding received for FY16 for technology development.</p> <p><i>FY 2017 Plans:</i> 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><i>FY 2018 Plans:</i> 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>			
Accomplishments/Planned Programs Subtotals	25.857	31.952	33.150

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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force Date: May 2017

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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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.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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. : TBD	-	0.000		2.000		3.694		0.000		3.694	Continuing	Continuing	-
Subtotal			-	0.000		2.000		3.694		0.000		3.694	-	-	-

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

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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. : TBD	-	20.189		23.815		23.676		0.000		23.676	Continuing	Continuing	-
Subtotal			-	20.189		23.815		23.676		0.000		23.676	-	-	-

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

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Program Management Support	Various	Not specified. : TBD	-	0.617		0.650		0.590		0.000		0.590	Continuing	Continuing	-
DoDATEA Program Management Support	Various	Not specified. : TBD	-	5.051		5.487		5.190		0.000		5.190	Continuing	Continuing	-
Subtotal			-	5.668		6.137		5.780		0.000		5.780	-	-	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	25.857	31.952	33.150	0.000	33.150	-	-	-

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: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Program Office	[REDACTED]																											
AT RDT&E	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
ATEA Program Office	1	2016	4	2021
AT RDT&E	1	2016	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	41.689	42.960	66.653	0.000	66.653	68.882	70.610	71.898	73.098	Continuing	Continuing
675897: <i>Foreign Materiel Aquisition and Exploitation</i>	-	41.689	42.960	66.653	0.000	66.653	68.882	70.610	71.898	73.098	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Foreign Material Acquisition and Exploitation program funds the acquisition and assessment of foreign weapon systems, military equipment, and military dual-use technologies for the military services and defense agencies.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	41.689	42.960	45.392	0.000	45.392
Current President's Budget	41.689	42.960	66.653	0.000	66.653
Total Adjustments	0.000	0.000	21.261	0.000	21.261
• 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	21.261	0.000	21.261

Change Summary Explanation

FY18 change: Funding realigned from a classified program element to consolidate the Foreign Material Procurement program into a single line item. Classified details can be found in OSD Comptroller's classified Defense-Wide Justification Book Volume 6.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605117F / Foreign Materiel Acquisition and Exploitation	Project (Number/Name) 675897 / Foreign Materiel Acquisition and Exploitation
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675897: Foreign Materiel Acquisition and Exploitation	-	41.689	42.960	66.653	0.000	66.653	68.882	70.610	71.898	73.098	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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Foreign Materiel Acquisition and Exploitation	41.689	42.960	66.653	0.000	66.653
Description: Classified details can be found in OSD Comptroller's classified Defense Wide Justification Book Volume 6.					
FY 2016 Accomplishments: Classified					
FY 2017 Plans: Classified					
FY 2018 Base Plans: Classified					
FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	41.689	42.960	66.653	0.000	66.653

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Remarks

D. Acquisition Strategy

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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605117F / Foreign Materiel Acquisition and Exploitation	Project (Number/Name) 675897 / Foreign Materiel Acquisition and Exploitation
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Classified details can be found in OSD Comptroller's classified Defense-Wide Justification Book Volume 6.	Various	Various : TBD	-	41.689	Dec 2015	42.960	Dec 2016	66.653	Dec 2017	0.000		66.653	Continuing	Continuing	-
Subtotal			-	41.689		42.960		66.653		0.000		66.653	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	41.689	42.960	66.653	0.000	66.653	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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

FY17 requirements and funding requests submitted by Services/Agencies	██████████																											
Requirements and funding requests validated and prioritized	████																											
FY17 FMP Plan approved and published	████																											
FY17 Plan executed and updated as required	████████████████████																											
Additional acquisition opportunities reviewed quarterly; FY17 execution reprioritized	████████████████████																											
Additional exploitation opportunities reviewed quarterly; FY17 execution reprioritized	████████████████████																											
FY18 requirements and funding requests submitted by Services/Agencies	██████████																											
FY18 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	████																											
Additional acquisition opportunities reviewed quarterly; FY19 execution reprioritized	████████████████████																											

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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>
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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 exploitation opportunities reviewed quarterly; FY19 execution reprioritized																																
FY20 FMP process continues																																
FY21 FMP process continues																																
FY22 FMP process continues																																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
FY17 requirements and funding requests submitted by Services/Agencies	3	2016	4	2016
Requirements and funding requests validated and prioritized	4	2016	4	2016
FY17 FMP Plan approved and published	4	2016	4	2016
FY17 Plan executed and updated as required	1	2017	1	2018
Additional acquisition opportunities reviewed quarterly; FY17 execution reprioritized	1	2017	1	2018
Additional exploitation opportunities reviewed quarterly; FY17 execution reprioritized	1	2017	1	2018
FY18 requirements and funding requests submitted by Services/Agencies	3	2017	4	2017
FY18 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
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 FMP process continues	3	2019	1	2021
FY21 FMP process continues	3	2020	1	2022
FY22 FMP process continues	3	2021	4	2022

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0605117F / Foreign Materiel Acquisition and Exploitation	Project (Number/Name) 675897 / Foreign Material Aquisition and Exploitation

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: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	0.000	8.646	13.987	38.579	0.000	38.579	13.632	4.853	4.937	5.040	0.000	89.674
675006: <i>HC/MC-130 Recap</i>	0.000	8.646	13.987	38.579	0.000	38.579	13.632	4.853	4.937	5.040	0.000	89.674
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 257

Note

This program, BA 07 PE 0605278F, project 675006, HC/MC-130 Block 8.X, is a new start.

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.

This program will develop and integrate changes from discrepancies found during development and operational flight test, and common C-130J block upgrades during HC/MC production. The HC/MC Block 8.1 program follows the same "Block Upgrade" strategy being used in the C-130J program (PE 0401132F).

The internationally developed Block 8.1 program addresses mandated Communication, Navigation, and Surveillance/Air Traffic Management (CNS/ATM) requirements. It also incorporates capabilities such as Link 16, a new Flight Management System (FMS), Civil GPS Navigation, Identification Friend or FOE (IFF) transponder Mode-5, Civil Data-link, and Automatic Dependent Surveillance-Broadcast Out (ADS-B Out).

The HC/MC Block 8.1 RDT&E effort integrates Block 8.1 into a HC-130J and a MC-130J via a trial kit install effort followed by a Development and Operational Test effort.

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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0605278F I HC/MC-130 Recap RDT&E
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	10.807	13.987	27.513	0.000	27.513
Current President's Budget	8.646	13.987	38.579	0.000	38.579
Total Adjustments	-2.161	0.000	11.066	0.000	11.066
• 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	-2.161	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	11.066	0.000	11.066

Change Summary Explanation

FY16 -\$2.161M is the result of a Below Threshold Reprogramming where HC/MC-130J was used as a source for PEC: 25219F MQ-9 UAV to adequately fund Hybrid release 1.

FY18 +11.066 is to integrate a 4th station Communication, Navigation, Identification Management Unit into Block 8.1 as part of the MC-130J Trial Kit Install.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: HC/MC-130 Recap Test and Evaluation	0.785	0.200	0.101	-	0.101
Description: Test and evaluation planning, conduct, and support for developmental and operational testing.					
FY 2016 Accomplishments: Funding supported developmental and operational testing.					
FY 2017 Plans: Funding will support developmental and operational testing including Block 8.1 DT&E.					
FY 2018 Base Plans: Funding will support developmental and operational testing including Block 8.1 DT&E.					
Title: HC/MC-130 Recap Continuous Improvement Program (CIP)	0.000	0.200	0.200	-	0.200
Description: Recurring Software and hardware enhancements to address evolving requirements for Special Operations Forced and Personnel Recovery missions. These enhancements will be incorporated in both					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017				
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				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
production and fielded aircraft. These enhancements will include, but are not limited to, parallel operational flight program (OFP)updates.						
<p>FY 2016 Accomplishments: Initial CIP software build completed. Regression testing and DT completed.</p> <p>FY 2017 Plans: Contract to develop software only updates to the HC/MC-130J MTS-A and any OFP changes that arise.</p> <p>FY 2018 Base Plans: Lay in funding through the FYDP to allow for a continuous improvement cycle of both hardware and software of the sensor, some of which may impact the aircraft OFP with programs already in work.</p>						
<p>Title: HC/MC-130 Block 8.1</p> <p>Description: Combined software/hardware upgrade for Block 8.1. Block 8.1 includes: Link 16, a new Flight Managment 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 2016 Accomplishments: Technical Evaluation of proposal began.</p> <p>FY 2017 Plans: Due to program interdependencies, HC/MC Block 8.1 program begins in FY17 with the ordering of long lead parts. A Block 8.1 trial kit installation (TKI) will be developed on one HC-130J (Increment 2) and one MC-130J (Increment 3) aircraft.</p> <p>FY 2018 Base Plans: The HC-130J and MC-130J Block 8.1 TKI hardware installation and engineering development and integration effort begins on both the HC-130J Increment 2 and the MC-130J Increment 3 aircraft.</p>		7.861	13.587	22.278	-	22.278
<p>Title: HC/MC-130 Block 8.X</p> <p>Description: Update to the Block 7.0/8.1 effort for HC/MC to do the following. Remove Link-16 function from Block 7.0/8.1 (It will come via other programs). Re-define the baseline configuration of GFE aircraft to align with</p>		-	-	16.000	-	16.000

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date: May 2017**

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
expected configuration at time of TKI. This will allow the contractor design to account for several hardware and software changes being brought to the aircraft via other programs.					
<i>FY 2018 Base Plans:</i> Contract to remove Link-16 Function from Block 7.0/8.1. Release the RFP to change the aircraft baseline configuration to align with expected configuration at time of TKI.					
Accomplishments/Planned Programs Subtotals	8.646	13.987	38.579	-	38.579

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item #	31.070	51.317	67.674	153.080	220.754	38.264	6.127	4.249	4.333	385.000	764.653
HC/MC00: <i>HC/MC-130 Modifications</i>											
• APAF: BA02: Line Item # C130JH: <i>HC-130J</i>	458.030	437.576	198.502	0.000	198.502	0.000	0.000	0.000	0.000	0.000	2,622.590
• APAF: BA02: Line Item # C-130JM: <i>MC-130J</i>	803.770	998.358	409.373	0.000	409.373	366.949	569.344	476.856	228.105	1,195.758	7,404.580

Remarks

E. Acquisition Strategy
 Lockheed Martin is the prime 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.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.000		0.200	Jul 2017	0.200	Jul 2018	0.000		0.200	4.625	5.025	6.078
HC/MC-130 Recap Block 8.1	SS/CPIF	Lockheed Martin : Marietta, GA	0.000	7.861	Dec 2016	13.587	Dec 2016	22.278	Jan 2018	0.000		22.278	12.363	56.089	56.979
HC/ MC-130 Recap Block 8.X	SS/CPIF	Lockheed Martin : Marietta, GA	0.000	0.000		0.000		16.000	Jan 2018	0.000		16.000	0.000	16.000	-
Subtotal			0.000	7.861		13.787		38.478		0.000		38.478	16.988	77.114	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.785	May 2016	0.200	May 2017	0.101	May 2018	0.000		0.101	6.670	7.756	7.756
Subtotal			0.000	0.785		0.200		0.101		0.000		0.101	6.670	7.756	7.756

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date: May 2017**

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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	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	8.646	13.987	38.579	0.000	38.579	23.658	84.870	-

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

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date: May 2017**

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

Development Test and Evaluation																												
HC/MC-130 RECAP Block 8.1 Development																												
HC/MC-130 RECAP Block 8.X Development																												
Continuous Improvement Program (CIP)																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Development Test and Evaluation	1	2016	4	2022
HC/MC-130 RECAP Block 8.1 Development	1	2017	4	2020
HC/MC-130 RECAP Block 8.X Development	2	2018	2	2021
Continuous Improvement Program (CIP)	1	2016	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	12.636	0.000	12.636	19.308	26.112	26.603	27.168	Continuing	Continuing
674877: <i>NC3 Integration, Assessment, and Improvement</i>	-	0.000	0.000	12.636	0.000	12.636	19.308	26.112	26.603	27.168	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY2018, PE 0303131F, Minimum Essential Emergency Communications Network (MEECN), Project 672832 MEECN System Improvements (MSI) efforts were transferred to PE 0606018F, 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 Nuclear Command, Control, and Communications (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). Activities funded in this PE 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, 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, and overall AF NC3 WS integration, system test, verification, and certification.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	12.636	0.000	12.636
Total Adjustments	0.000	0.000	12.636	0.000	12.636
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	12.636	0.000	12.636

Change Summary Explanation

FY18 increase of \$12.6M for NC3 Integration

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Title: NC3 Integration, Assessment, and Improvement	0.000	0.000	12.636
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 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, 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.			
FY 2016 Accomplishments:			
Funded in PE 0303131F:			
- Established AFNWC NC3 Integration Directorate			
- Assessed AF NC3 WS integration status			
- Identified, planned and developed AF NC3 WS analysis, integration, and testing activities			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 / NC3 Integration
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Consolidated and expanded upon previously stove-piped management of the weapon system FY 2017 Plans: Funded in PE 0303131F: - Continue planning and initiate integration, analysis, and testing activities for NC3 WS - Continue assessment of NC3 WS - Develop AF NC3 WS test plans FY 2018 Plans: NC3 weapon system integration efforts including, but not limited to: - Implement test and certification program for NC3 WS and expand existing HF testbed utilizing a phased approach - Perform NC3 physics, communication and networking analysis - Develop and evolve technical framework of the NC3 WS to meet mission threats of 2030 and beyond - Conduct WS analysis, develop WS capability model, plan WS updates, and implement WS updates - Evaluate options for pacing system-of-system performance improvements within constraints of WS - Analyze, model, and prototype emerging NC3 technologies - Develop and implement NC3 WS program and materiel management control processes including risk management, configuration control, integrated scheduling, budgeting and cost controls, etc. - Conduct NC3 WS health assessments, reporting, and issue resolution			
Accomplishments/Planned Programs Subtotals	0.000	0.000	12.636

D. Other Program Funding Summary (\$ in Millions)												
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>	
• RDTE: BA07 Line Item # 672832: MSI	19.339	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

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, 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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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

R-1 Program Element (Number/Name)
PE 0606018F / *NC3 Integration*

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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/A&AS	TBD	TBD : TBD	-	0.000		0.000		10.000	Oct 2017	0.000		10.000	Continuing	Continuing	-
Subtotal			-	0.000		0.000		10.000		0.000		10.000	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.000		0.000		1.036	Oct 2017	0.000		1.036	Continuing	Continuing	-
Subtotal			-	0.000		0.000		1.036		0.000		1.036	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.000		0.000		1.600	Oct 2017	0.000		1.600	Continuing	Continuing	-
Subtotal			-	0.000		0.000		1.600		0.000		1.600	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000	0.000	12.636	0.000	12.636	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
NC3 WS Test and Certification Program	[REDACTED]																											
NC3 Assessment and Analysis	[REDACTED]																											
Enhance Target Architecture through Development of NC3 Technologies	[REDACTED]																											
Implement NC3 WS Program and Materiel Management Control Process	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
NC3 WS Test and Certification Program	1	2018	4	2022
NC3 Assessment and Analysis	1	2018	4	2022
Enhance Target Architecture through Development of NC3 Technologies	1	2018	4	2022
Implement NC3 WS Program and Materiel Management Control Process	1	2018	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	70.172	88.267	111.910	0.000	111.910	130.323	121.576	153.711	178.177	Continuing	Continuing
675039: B-52 System Improvements	-	3.290	0.051	0.050	0.000	0.050	0.000	0.000	0.000	0.000	Continuing	Continuing
675041: Bomber Tactical Data Link	-	0.000	7.525	8.167	0.000	8.167	5.581	0.000	0.000	0.000	Continuing	Continuing
675048: 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)	-	53.670	34.634	15.164	0.000	15.164	0.001	0.000	0.000	0.000	Continuing	Continuing
675050: CONECT	-	10.335	13.672	7.043	0.000	7.043	11.222	0.000	0.000	0.002	Continuing	Continuing
675055: GPS-IU	-	2.877	6.916	18.767	0.000	18.767	9.309	0.000	0.000	0.000	Continuing	Continuing
675056: B-52 Radar Modernization Program (RMP)	-	0.000	4.653	15.226	0.000	15.226	57.292	118.899	151.036	175.445	Continuing	Continuing
675057: B-52 Low Cost Improvement (LCI)	-	0.000	0.000	2.682	0.000	2.682	2.675	2.677	2.675	2.730	Continuing	Continuing
675058: B-52 Weapon Sys Trainer Air Ref Training Upgrade	-	0.000	4.875	13.240	0.000	13.240	7.917	0.000	0.000	0.000	Continuing	Continuing
675129: B-52 Re-Engining	-	0.000	10.000	10.000	0.000	10.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675160: B-52 Crypto Modernization	-	0.000	5.941	11.919	0.000	11.919	0.000	0.000	0.000	0.000	Continuing	Continuing
676039: B-52 Airspace Compliance	-	0.000	0.000	9.652	0.000	9.652	36.326	0.000	0.000	0.000	Continuing	Continuing

Note
 This program, BA 07 PE 0101113F, project 676039, B-52 Airspace Compliance, is a new start.

 In FY17 Bomber Tactical Data Link was a new start.
 In FY17 Radar Modernization Program was a new start.
 In FY17 B-52 Weapons Systems Trainer Air Refueling Training Upgrade was a new start.
 In FY17 B-52 Crypto Modernization was a new start.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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 / B-52 SQUADRONS	
A. Mission Description and Budget Item Justification		
B-52 SYSTEM IMPROVEMENTS (BPAC 675039) A comprehensive project to ensure B-52 viability to perform current and future wartime missions. B-52 System Improvements will facilitate future capabilities, scope of work may involve development of Analysis of Alternatives (AoA), Studies and Analysis, Capability Development Documents (CDD) or any other analysis or documentation necessary to establish a program of record. Additionally, this project may include airborne integration experiments or demonstrations of emerging technologies. Trainers and Upgrades for Systems Improvements. In order to maintain currency with the latest aircraft configuration, the Systems Improvements project will update existing trainers or use computer-based training to add any new systems improvements functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.		
BOMBER TACTICAL DATA LINK (B-52 LINK 16) (BPAC 675041) The B-52 Tactical Data Link (TDL) provides low latency, jam-resistant situation awareness and command and control 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 antenna, and the Group B terminal Line Replaceable Unit (LRU). The TDL terminal will be fully integrated with CONECT. This Line-Of-Sight (LOS) Link 16 capability allows the warfighter to maintain situational awareness, avoid threats and employ an array of weapons. Trainers and Upgrades for Bomber Tactical Data Link (TDL) In order to maintain currency with the latest aircraft configuration, the TDL project will update existing trainers or use computer-based training to add TDL functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.		
B-52 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU) (BPAC 675048) The 1760 IWBU integrates MIL-STD 1760 weapons capability into the bomb bay on 78 B-52H aircraft, which includes two Ground Instructional Training Aircraft (GITA), utilizing 44 Common Strategic Rotary Launcher (CSRLs) converted into Conventional Rotary Launchers (CRLs), where three of the CRLs will be modified under Engineering Manufacturing and Development (EMD) for test purposes. This requirement's Capability Development Document (CDD) was validated by the AFROCC in June 2013. The 1760 IWBU project provides internal and external carriage for eight MIL STD 1760 weapons and consists of two sub increments: 1.1 and 1.2. Trainers and Upgrades for 1760 IWBU In order to maintain currency with the latest aircraft configuration, the 1760 IWBU project will update existing trainers or use computer-based training to add 1760 IWBU functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.		
B-52 COMBAT NETWORK COMMUNICATIONS TECHNOLOGY (CONECT) (BPAC 675050) The B-52 CONECT acquisition project supports nuclear and conventional operations by upgrading the B-52 fleet with tactical datalink and voice communications capabilities along with improved threat and situational awareness to support participation in network centric operations. The CONECT upgrade includes new Multi-Functional Color Displays (MFCDs) and a digital interphone system, which will survive and function through the nuclear environment to enhance crew interaction and		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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 / B-52 SQUADRONS	
<p>situational awareness. To enable net centric operations, the CONECT upgrade integrates: 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 to exchange J-Series messaging within theater; Intelligence Broadcast Receiver (IBR); limited Internet Protocol (IP) based UHF BLOS link supporting voice, e-mail and file transfers; and Improved Data Modem (IDM)-based digital Variable Message Format (VMF) datalink to significantly enhance close air support (CAS) missions. This integrated 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 Requirement's Oversight Council (AFROC) on 16 September 2008.</p> <p>Trainers and Upgrades for CONECT In order to maintain currency with the latest aircraft configuration, the CONECT project will update existing trainers or use computer-based training to add CONECT functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.</p> <p>GPS-INTERFACE UNIT (GPS-IU) REPLACEMENT (BPAC 675055) Global Positioning System (GPS) Interface Unit (IU) Upgrade 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/1553, the power supply CCA, and the video graphics card.</p> <p>Trainers and Upgrades for GPS-Interface Unit In order to maintain currency with the latest aircraft configuration, the GPS-IU project will update existing trainers or use computer-based training to add GPS-IU functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.</p> <p>RADAR MODERNIZATION PROGRAM (BPAC 675056) 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 and obsolescent technologies; the average reliability rate places long-duration missions at risk. This replacement program will encompass the radar antenna array and up to 14 individual LRUs that comprise the entire radar system. Development and production of new systems to replace the legacy equipment; to be installed on all 76 B-52H aircraft. Radar Modernization Program (RMP) will take advantage of advances in technology and on-going development efforts to acquire, to the maximum extent possible, off-the-shelf components and integrate them into the B-52. The use of new technology will increase reliability of the radar system and allows the operational command to fully utilize the capabilities of the B-52H aircraft to employ an array of weapons and to perform mission-essential navigation and weather avoidance functions.</p> <p>Trainers and Upgrades for Radar Modernization Program In order to maintain currency with the latest aircraft configuration, the Radar Modernization project will update existing trainers or use computer-based training to add Radar Modernization functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.</p> <p>LOW COST IMPROVEMENTS (BPAC 675057)</p>		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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 / B-52 SQUADRONS	
<p>Project to facilitate future B-52 capabilities. Scope of work may involve, but is not limited to, Avionics, Navigation, Situational Awareness (SA), Weapons/Targeting Pod Integration, Communications, Flight Systems, Nuclear Systems, and Electronic Flight Bags. Additionally, develop and integrate emerging technologies for specialized B-52 missions to include Information 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.</p> <p>Trainers and Upgrades for Low Cost Improvements In order to maintain currency with the latest aircraft configuration, the Low Cost Improvements project will update existing trainers or use computer-based training to add Low Cost Improvements functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.</p> <p>WEAPON SYSTEMS TRAINER AIR REFUELING TRAINER UPGRADE (BPAC 675058) 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 for 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 will involve development of Analysis of Alternatives (AoA), Studies and Analysis, Capability Development Documents (CDD) or any other Analysis or documentation necessary to establish a program of record.</p> <p>B-52 RE-ENGINEING (BPAC 675129) Funds will address emergency war-fighting readiness requirements. Funds will facilitate future capabilities by conducting B-52 modernization and sustainment risk reduction studies such as, but not limited to, studies on new engines, electrical, pneumatic, cart-start, wing flutter analysis, TF-33 (present engine) refurbishment (SLEP). It also includes program management support for the development and integration of future capabilities. To facilitate future capabilities, the scope of work may involve development of Analysis of Alternatives (AoA), studies and Analysis, Capability Development Documents (CDD) or any other analysis or paper work necessary to establish a program or record.</p> <p>Trainers and Upgrades for Re-Engining In order to maintain currency with the latest aircraft configuration, the Re-Engining project will update existing trainers or use computer-based training to add Re-Engining to meet user-training requirements, and update/maintain the SIL for the WSTs.</p> <p>B-52 CRYPTO MODERNIZATION (BPAC 675160) Upgrades aircraft with Mobile User Objective System (MUOS) capable ARC-210 radio systems to prevent loss of BLOS voice and data communications capability. As MUOS channels are turned on, existing satellites will be removed from service. B-52 CONECT is at risk of losing its File Transfer Protocol (FTP), email, Beyond Line of Site (BLOS) voice, and BLOS data link communications without this modernization effort.</p> <p>Trainers and Upgrades for Crypto Modernization</p>		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force Date: May 2017

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

In order to maintain currency with the latest aircraft configuration, the Crypto Modernization project will update existing trainers or use computer-based training to add Crypto Modernization functionality to meet user-training requirements, and update/maintain the SIL for the WSTs.

B-52 AIRSPACE COMPLIANCE (BPAC 676039)
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. GPS guidance unit requires upgrade to new military M-Code standard.

Trainers and Upgrades for Airspace Compliance
In order to maintain currency with the latest aircraft configuration, the Airspace Compliance project will update existing trainers or use computer-based training to add Airspace Compliance 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 diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

Funds are included to accommodate the FAA mandate for ADS-B as outlined throughout previous AF and DoD budget exhibits.

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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability.

BA7- 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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	74.520	78.267	140.285	0.000	140.285
Current President's Budget	70.172	88.267	111.910	0.000	111.910
Total Adjustments	-4.348	10.000	-28.375	0.000	-28.375
• 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	-1.761	0.000			
• SBIR/STTR Transfer	-2.587	0.000			
• Other Adjustments	0.000	10.000	-28.375	0.000	-28.375

Change Summary Explanation

FY16: Reduction of \$2.587M to account for Small Business Innovative Research (SBIR)

FY16: Reduction of \$1.761M to account for Higher AF Priorities

FY17: Increase of \$10.000M consists of: Request for Additional Appropriations (RAA) in FY17 PB Amended, +\$10.000 RDT&E Project 675129 B-52 Re-Engining risk reduction studies and development of Analysis of Alternatives (AoA).

FY18: Reduction of \$38.375M Radar Modernization Program; Increase of \$10.000M RDT&E Project 675129 B-52 Re-Engining risk reduction studies.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS				Project (Number/Name) 675039 / B-52 System Improvements			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675039: B-52 System Improvements	-	3.290	0.051	0.050	0.000	0.050	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

B-52 System Improvements - A comprehensive project to ensure B-52 viability to perform current and future wartime missions. To facilitate future capabilities, scope of work may involve development of Analysis of Alternatives (AoA), Studies and Analysis, Capability Development Documents (CDD) or any other analysis or paper work necessary to establish a program of record. Additionally, this project may lead to airborne integration experiments or demonstrations of emerging technologies.

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.

B-52 System Improvements will encompass the following major aircraft areas but is not limited to the examples given within each area.

Avionics - Offensive and Defensive; Electronic Warfare systems require upgrades to continue to protect the aircraft in the battle space. Radar Modernization is required to ensure the aircraft can perform the mission in today's environment and resolve current mean time between repair issues with legacy radar. Global Positioning Satellite Interface Unit (GPS-IU) requires replacement due to throughput issues.

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) upgrade to meet FAA mandate for FY20. GPS guidance unit requires upgrade to new military M-Code standard.

Situational Awareness (SA) - upgrades to current SA systems is required to ensure the B-52 maintains battle space awareness of intelligence broadcasts, friendly force locations, enemy forces and any emerging threats within the Area of Responsibility (AOR). Adaptation of new data links as well as addition of existing links is crucial to the B-52 remaining relevant to the integrated airborne battle space.

Weapons/Targeting Pod Integration - Improves conventional warfare capability with additional MIL-STD-1760 smart weapons and improved weapons carriage and fully integrates advanced targeting pods with the offensive avionics system. Integrate emerging targeting pods to include optical and radar targeting capabilities.

Communications - current UHF communications systems require upgrades due to legacy radios and satellite systems rearing end of life. Multiple User Objective System (MUOS) satellite deployments will require the B-52 to upgrade legacy UHF radios to remain relevant. New technology Beyond line of Sight (BLOS) and Line of Sight (LOS) radios are emerging and required on the B-52 to ensure communications continue in the AOR. Extreme High Frequency (EHF) program required to meet Nuclear Command Authority two way communications.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS	Project (Number/Name) 675039 / B-52 System Improvements

Flight Systems - current Jet A fuel used freezes at higher temperatures than previous fuel and therefore requires the addition of an internal fuel tank monitoring system to ensure the fuel does not gel and freeze while flying at altitude. In addition, the B-52 requires a new Environmental Control System (ECS) upgrade to support any new major aircraft modifications. EHF studies have indicated this will be a needed modification for integration depending on the terminal selection.

Nuclear Systems - studies, analyzes, and tests aircraft systems' hardness to Chemical, Biological, Radiological, and Nuclear (CBRN) weapons effects, such as Low Level Continuous Wave (LLCW) and High altitude Electromagnetic Pulse (HEMP) Survivability tests. It upgrades mission critical systems to survive in CBRN environments.

Electronic Flight Bags - require a system for displaying aircrew checklists on a permanent display. This supports current AF requirements to reduce carry on paper checklists.

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.

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

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability.

BA7- 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: B-52 System Improvements	3.290	0.051	0.050	0.000	0.050
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.					
FY 2016 Accomplishments: Conducted B-52 low-level continuous wave (LLCW) test planning on the B-52H. Actual testing will include active, passive, and direct drive testing of the airframe and subsystems to determine weapon system survivability in the event of an EMP.					
FY 2017 Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS	Project (Number/Name) 675039 / B-52 System Improvements

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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. FY 2018 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. FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	3.290	0.051	0.050	0.000	0.050

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line item # B05200: <i>Arms Control Implementation</i>	0.000	0.196	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.196

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-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675041: Bomber Tactical Data Link	-	0.000	7.525	8.167	0.000	8.167	5.581	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY17 Bomber Tactical Data Link was a new start.

A. Mission Description and Budget Item Justification

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 situation awareness and command and control 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 antenna, and the Group B terminal Line Replaceable Unit (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 Diminishing Manufacturing and Material Shortage (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 IWB, 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 be used for Engineering Development Models (EDMs), 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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability.

BA7- 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

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Bomber Tactical Data Link	0.000	7.525	8.167	-	8.167

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<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 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Establish/stand up program office; conduct systems requirements development and refinement; enter Engineering Manufacturing and Development phase of program with contract award to OEM. Support MIDS/ JTRS environmental qualification for B-52 specification, purchase terminals to support EMD, conduct SRR, PDR, CDR activities, etc.</p> <p>FY 2018 Base Plans: Continue EMD phase, with subsequent Developmental and Operational testing.</p>					
Accomplishments/Planned Programs Subtotals	0.000	7.525	8.167	-	8.167

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item # B05200: B-52 Bomber Tactical Data Link (TDL)	0.000	0.000	0.000	0.000	0.000	8.860	19.748	26.772	18.128	0.000	73.472
• APAF: BA06: Line Item # 000999: Initial Spares/Repair Parts	0.000	0.000	0.000	0.000	0.000	1.119	2.400	2.520	0.000	0.00	6.039

Remarks

D. Acquisition Strategy

The Milestone Decision Authority (MDA) approved the B-52 Link-16 Acquisition Strategy Panel (ASP) on 28 October 2016 authorizing the program to enter into the Engineering and Manufacturing Development phase with the OEM. The program is required to return to the MDA for the production/deployment ASP following a successful preliminary design review.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675048: 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)	-	53.670	34.634	15.164	0.000	15.164	0.001	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MIL-STD-1760 Internal Weapons Bay Upgrade (IWBU) requires 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), where three of the CRLs will be modified under Engineering Manufacturing and Development (EMD) for test purposes. The 1760 IWBU project is segmented into increments. Increment 1.0 provides internal and external carriage and consists of two sub increments 1.1 and 1.2. This requirement's Capability Development Document (CDD) was validated by the Air Force Requirements Oversight Council (AFROC) in June 2013. The 1760 Capability Production Document was validated 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) May 2016.

Increment 1.2

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.

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 will validate this capability in advance of 1.2 Full System validation.

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 Ground Instructional Training Aircraft.

Software Development: Development 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 JMPS.

CRL Hardware Development: Develops Group A associated interface hardware and two Group B LRUs (power supply and power distribution box). One CRL will be modified for Interim and three CRLs will be modified for 1.2 Full using RDT&E funds.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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)

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.

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 and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA 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 B-52 weapon system capability.

BA7- 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 1760 IWBU Inc 1.2	53.670	34.634	15.164	-	15.164
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.					
FY 2016 Accomplishments: Continued Increment 1.2 development: Completed TMRR phase in support of Milestone B decision and awards Engineering and Manufacturing Development Option. Continued weapon software modification and provision remaining test assets. Continued SEEK EAGLE safe separation analysis. Conducted ground testing of JASSM SMO. Finalized test planning and technical orders in preparation for Interim JASSM/ER Capability validation. Initiate and conclude modification of one Interim prototype CRL.					
FY 2017 Plans: Continue Increment 1.2 development: Continue 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. Continue test planning and technical orders in preparation					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
for full 1.2 Capability validation. Initiate and conclude modification of one 1.2 Full prototype aircraft and CRL. Deliver interim JASSM-ER capability.					
<i>FY 2018 Base Plans:</i> Continue 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.					
Accomplishments/Planned Programs Subtotals	53.670	34.634	15.164	-	15.164

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item # B05200: 1760 Internal Weapons Bay Upgrade (IWBU)	13.171	3.691	26.934	0.000	26.934	24.375	0.000	0.000	0.000	0.00	69.424
• APAF: BA06: Line Item # 000999: Initial Spares/Repair Parts	1.051	0.944	0.814	0.000	0.814	0.171	0.020	0.000	0.000	0.00	2.999
• APAF: BA07: Line Item # B05200: Depot Activation	3.960	0.000	0.000	0.000	0.000	0.300	0.000	0.000	0.000	0.00	4.952

Remarks

D. Acquisition Strategy

The 1760 Internal Weapons Bay Upgrade project will acquire software development and hardware design via a sole-source contract to Boeing Defense, Space & Security (DSS), Oklahoma City, OK. Deliverables include an updated J-series weapon SMOs (software), three prototype modified CSRLs, six Low Rate Initial Production (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 Engineering Manufacturing and Development contract to Boeing Defense, Space & Security (DSS), Oklahoma City, OK. 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) will be validated thru DT/OT in FY17. The Increment 1.2 program plans to procure the CRL modification and aircraft kits for full rate production via sole source, and this was approved at a Delta Acquisition Strategy, October 2016. The installs of the kits are planned to be completed via CFTs and PDM (10 installations through PDM).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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)

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: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 7				PE 0101113F / B-52 SQUADRONS				675048 / 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
1.2 1760 IWBU Production Development	Various	Boeing : OKC, OK	-	40.293	Jan 2016	8.215	Feb 2017	6.265	Nov 2018	0.000		6.265	Continuing	Continuing	-
1.2 1760 IWBU MALD OFP	SS/FFP	Raytheon : Tuson, AZ	-	0.736	Sep 2016	2.841	Feb 2017	1.000	Nov 2018	0.000		1.000	Continuing	Continuing	-
1.2 1760 IWBU JASSM OFP	SS/FFP	Lockheed : Orlando, FL	-	7.147	Aug 2016	2.731	Feb 2017	1.000	Nov 2018	0.000		1.000	Continuing	Continuing	-
Subtotal			-	48.176		13.787		8.265		0.000		8.265	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
1.2 1760 559th SMXG	C/FFP	559 SMXG : Tinker AFB, OK	-	0.238	Jul 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			-	0.238		0.000		0.000		0.000		0.000	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
1.2 1760 IWBU Government Test	PO	419 FLTS : Edwards AFB, CA	-	4.305	May 2016	8.039	May 2017	3.405	Mar 2018	0.000		3.405	Continuing	Continuing	-
1.2 1760 IWBU Trainer Software	Allot	AFLCMC : Wright Patterson AFB, OH	-	0.000	Mar 2016	2.093	May 2017	0.000		0.000		0.000	Continuing	Continuing	-
1.2 1760 IWBU JASSM Test Assets	SS/FFP	Lockheed : Orlando, FL	-	0.354	Oct 2016	9.567	Jun 2017	2.700	Jan 2018	0.000		2.700	Continuing	Continuing	-
Subtotal			-	4.659		19.699		6.105		0.000		6.105	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 IWBU Inc. 1.1 RAA (Dec 15)	■																											
1760 IWBU Inc. 1.2 TMRR	■	■																										
1760 IWBU Inc. 1.2 Milestone B (Apr 16)			■																									
1760 IWBU Inc. 1.2 EMD		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1760 IWBU Inc. 1.2 Milestone C (Jul 18)											■																	
1760 IWBU Inc. 1.2 RAA (Jul 19)															■													

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
1760 IWBU Inc. 1.1 RAA (Dec 15)	1	2016	1	2016
1760 IWBU Inc. 1.2 TMRR	1	2016	2	2016
1760 IWBU Inc. 1.2 Milestone B (Apr 16)	3	2016	3	2016
1760 IWBU Inc. 1.2 EMD	2	2016	4	2018
1760 IWBU Inc. 1.2 Milestone C (Jul 18)	4	2018	4	2018
1760 IWBU Inc. 1.2 RAA (Jul 19)	4	2019	4	2019

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675050: CONECT	-	10.335	13.672	7.043	0.000	7.043	11.222	0.000	0.000	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 tactical datalink and voice communications capabilities, along with improved threat and situational awareness to support participation in network centric operations.

The CONECT upgrade includes new Multi-Functional Color Displays (MFCDs); a digital interphone system, on-board client/server architecture supporting distributed processing with independent control functions; 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 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 Internal Weapons Bay Upgrade, Mode S/Mode 5 Identification, Friend or Foe (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 system integration laboratory (SIL) for the Weapon System Trainers (WST). In order to assist PDM during after-install checkout and Barksdale and Minot units with maintenance checkout and operational training, a CONECT ground station is being developed.

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 and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA 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 B-52 weapon system capability.

BA7- 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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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Title: CONECT	10.335	13.672	7.043	-	7.043
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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 Upgrade, Mode S/Mode 5 IFF, etc.) may require study for potential impacts to CONECT. CONECT will update the existing trainers and/or use computer-based training to add CONECT functionality to meet user-training requirements, and update/maintain the System Integration Lab (SIL) and for the WST. A CONECT 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.

FY 2016 Accomplishments:

Completed ground and flight test of the AFTRS R3. Completed source selection for the CONECT WST. Incorporated changes required due to updates in GFE and crypto modernization requirements. Incorporated/integrated CONECT with recurring updates of the B-52 software baseline. The CONECT Desktop Training Tool (CDTT) completed development and began deployment to the user as an interim training capability until the WST is available. Plan and developed acquisition strategy, and the engineering design of the CONECT ground station, required in order to assist PDM during after-install checkout, and provide Barksdale/Minot units with maintenance checkout and operational training capability. Completed spares acquisition to support Full Rate Production.

FY 2017 Plans:

Continue engineering design of CONECT capability into the B-52 training systems. Begin engineering design of CONECT capability into the B-52 training systems and SIL development through simulation/computer based training or a mix. Incorporate changes required due to updates in GFE and crypto modernization requirements. Incorporate/integrate 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 Upgrade, Mode S/Mode 5 IFF, etc) may require study for potential impacts to CONECT. Continue procurement of spares to support risk kits and DMS items to support Barksdale/Minot Operational Deployments.

FY 2018 Base Plans:

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

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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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue Diminishing Manufacturing Source (DMS) redesign development and test effort. Continue the engineering design of the CONECT ground station, required in order to assist PDM during after-install checkout, and provide Barksdale/Minot units with maintenance checkout and operational training capability. CONECT will continue the development/update of the existing trainers, by simulation/computer-based training or a mix, to add CONECT functionality to meet user-training requirements, and update/maintain the SIL for the Weapon System Trainer (WST). Continue development of offensive station mission trainer.					
Accomplishments/Planned Programs Subtotals	10.335	13.672	7.043	-	7.043

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item # B05200: B-52 CONECT	124.144	99.068	74.355	0.000	74.355	75.323	22.242	22.449	25.002	0.00	630.374
• APAF: BA06: Line Item # B05200: Initial Spares/Repair Parts	5.265	4.561	4.609	0.000	4.609	0.000	0.000	0.000	0.000	0.00	16.836
• APAF: BA07: Line Item # B05200: Post Production Support	5.911	28.125	0.199	0.000	0.199	12.924	4.678	5.597	5.710	0.00	45.797

Remarks

D. Acquisition Strategy
The B-52 CONECT EMD prime contract is a sole source to Boeing Defense, Space & Security (DSS), Oklahoma City, OK. Boeing 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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675055: GPS-IU	-	2.877	6.916	18.767	0.000	18.767	9.309	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Global Positioning System (GPS) Interface Unit (IU) Upgrade will replace three Circuit Card Assemblies (CCA) 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. The current inventory of GPS IUs (76 installed on B-52H, plus current supply level of 16), plus 1 in the System Integration Laboratory (SIL), and 2 on Ground Instructional Training Aircraft (GITA)) will be upgraded by Prime Contractor Boeing. The upgraded LRUs will be replaced using blue-suit installation, using remove-and-replace processes on the flight line (the current maintenance process).

The GPS IU integrates GPS Position, Navigation and Timing (PNT) data into navigation, communications, and weapons systems onboard 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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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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BA7- 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Global Positioning System (GPS) Interface Unit (IU)	2.877	6.916	18.767	-	18.767
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.					
FY 2016 Accomplishments: Entered GPS IU Upgrade Technology Maturation and Risk Reduction (TMRR) phase. Awarded TMRR sole source contract to Boeing, OKC OK.					
FY 2017 Plans: Continue GPS IU Upgrade development. Continue TMRR phase and prepare for Milestone B decision.					
FY 2018 Base Plans: Continue GPS IU Upgrade development. Complete TMRR phase in support of Milestone B decision. Award EMD sole source contract to Boeing, OKC					
Accomplishments/Planned Programs Subtotals					
	2.877	6.916	18.767	-	18.767

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF BA05: Line Item # B05200: GPS-IU Replacement	0.000	0.000	0.000	0.000	0.000	0.000	25.642	24.106	15.972	0.00	18.028

Remarks

D. Acquisition Strategy

The GPS IU Upgrade project will begin development in the Technology Maturation and Risk Reduction (TMRR) phase via a sole source contract to Boeing Defense, Space & Security (DSS), Oklahoma City, OK.

Development will continue in the Engineering and Manufacturing Development (EMD) phase via a sole source contract to Boeing DSS, OKC. Deliverables include software, five prototype upgraded GPS IUs, logistics support, ground and flight test support, and engineering drawings.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS-IU TMRR	SS/ Various	Boeing : Oklahoma City, OK	-	2.877	Feb 2017	6.616	Mar 2017	7.000	Dec 2017	0.000		7.000	Continuing	Continuing	-
GPS-IU EMD Contract	SS/ Various	Boeing : Oklahoma City, OK	-	0.000		0.000		11.313	Jun 2018	0.000		11.313	Continuing	Continuing	-
Subtotal			-	2.877		6.616		18.313		0.000		18.313	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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, Contractor Support, Travel	Various	Various : TBD	-	0.000		0.300	Jan 2017	0.454	Jan 2018	0.000		0.454	Continuing	Continuing	-
Subtotal			-	0.000		0.300		0.454		0.000		0.454	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	2.877	6.916	18.767	0.000	18.767	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

MS A (Nov 16)	█																											
TMRR	████████████████████																											
MS B (Sep 17)	████																											
EMD	██																											
DT/OT	████████████████████																											
MS C	████																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MS A (Nov 16)	1	2017	1	2017
TMRR	2	2017	1	2018
MS B (Sep 17)	4	2017	4	2017
EMD	2	2018	1	2020
DT/OT	1	2019	4	2019
MS C	1	2020	1	2020

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675056: B-52 Radar Modernization Program (RMP)	-	0.000	4.653	15.226	0.000	15.226	57.292	118.899	151.036	175.445	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY17 Radar Modernization Program was a new start.

A. Mission Description and Budget Item Justification

The B-52 Radar Modernization Program (RMP) supports nuclear and conventional operations by upgrading or replacing, in whole or in part, the current APQ-166 radar Line Replaceable Units 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, off-the-shelf components 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, all the applicable training devices which process radar data or represent the radar subsystem must also be modified and upgraded in conjunction with the aircraft modifications. This upgrade will affect all three Weapon System Trainers (WST), the WST Training Systems Integration Laboratory (SIL), both B-52 Offensive Station Maintenance Trainers (OSMT), and the Bombing-Navigation System Maintenance Trainers (BNSMT). The program will retire the five existing BNMSTs and replace them with three new virtual training devices.

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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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)

BA7- 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

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Radar Modernization Program	0.000	4.653	15.226	-	15.226
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 2016 Accomplishments: N/A					
FY 2017 Plans: Establish/stand up program office; conduct systems requirements development and refinement; complete other materiel solution analysis (Human Systems Integration, studies of cooling, electromagnetic compatibility, power and nuclear hardening impacts and requirements, etc.); initiate acquisition strategy and program planning support for development, integration, and testing of radar and associated sub-system hardware and associated software					
FY 2018 Base Plans: Continue requirements development/refinement, acquisition planning, and preparations for radar vendor competition/award and Developmental Request for Proposal Release Date (DRFPRD).					
Accomplishments/Planned Programs Subtotals					
	0.000	4.653	15.226	-	15.226

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item # B05200: B-52 Radar Modernization Program (RMP)	0.000	0.000	0.000	0.000	0.000	0.000	5.855	13.105	13.368	0.00	32.301
• APAF: BA07: Line Item # B05200: Post Production Support	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.101	0.00	0.200

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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)

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• APAF: BA06: Line Item # B05200: <i>Initial Spares\Repair Parts</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.199	0.203	0.00	0.501

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. Program has been designated as ACAT I Pre-Major Defense Acquisition Program with authorization to enter into pre-Milestone B phase with the DRFPRD as the next decision point.

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: FY 2018 Air Force												Date: May 2017				
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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	
Risk Reduction	TBD	Not specified. : TBD	-	0.000		3.500	May 2017	12.226	Jan 2018	0.000		12.226	Continuing	Continuing	-	
Subtotal			-	0.000		3.500		12.226		0.000		12.226	-	-	-	
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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. : TBD	-	0.000		1.153	Aug 2017	3.000	Jan 2018	0.000		3.000	Continuing	Continuing	-	
Subtotal			-	0.000		1.153		3.000		0.000		3.000	-	-	-	
Project Cost Totals			-	0.000		4.653		15.226		0.000		15.226	-	-	-	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Acquisition Planning																												
Risk Reduction																												
Development Request for Proposal (DRFPRD)																												
MS B																												
EMD																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Acquisition Planning	3	2017	1	2018
Risk Reduction	1	2018	2	2020
Development Request for Proposal (DRFPRD)	1	2019	1	2019
MS B	2	2020	2	2020
EMD	2	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675057: B-52 Low Cost Improvement (LCI)	-	0.000	0.000	2.682	0.000	2.682	2.675	2.677	2.675	2.730	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 Information 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.

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 and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA 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 B-52 weapon system capability.

BA7- 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

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: B-52 Low Cost Improvements	0.000	0.000	2.682	-	2.682
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 2016 Accomplishments:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
FY 2017 Plans: N/A					
FY 2018 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 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.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.682	-	2.682

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA 05: Line item # B05200: <i>B-52 Low Cost Improvements</i>	0.000	2.331	2.378	0.000	2.378	2.381	2.431	2.482	2.532	Continuing	Continuing

Remarks

D. Acquisition Strategy
Analyses of Alternatives will be conducted by various AFLCMC organizations and AFGSC. Additionally, the OEM will perform work necessary to make the Mission Data Recorder via contract 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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675058: B-52 Weapon Sys Trainer Air Ref Training Upgrade	-	0.000	4.875	13.240	0.000	13.240	7.917	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY17 B-52 Weapons Systems Trainer Air Refueling Training Upgrade was a new start.

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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability.

BA7- 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: B-52 Weapons Systems Trainer Air Refueling Training Upgrade	0.000	4.875	13.240	-	13.240
Description: Upgrade allows pilots to conduct effective air refueling training in a simulator; mitigates tanker availability shortfalls for training.					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<i>FY 2016 Accomplishments:</i> N/A					
<i>FY 2017 Plans:</i> Initiate engineering studies, flight test planning, data collection, data analysis, and software development required to support B-52 Weapon System Trainer Air Refueling Training Upgrade.					
<i>FY 2018 Base Plans:</i> 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.					
Accomplishments/Planned Programs Subtotals	0.000	4.875	13.240	-	13.240

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA 05: Line item # B05200: Weapons System Trainer Air Refueling Training Upgrade	0.000	0.000	1.809	0.000	1.809	0.000	11.085	0.000	0.000	0.00	12.891

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: FY 2018 Air Force												Date: May 2017				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0101113F / B-52 SQUADRONS				675058 / B-52 Weapon Sys Trainer Air Ref Training Upgrade								
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 : TBD	-	0.000		4.875	Feb 2017	13.240	Feb 2018	0.000		13.240	Continuing	Continuing	-	
Subtotal			-	0.000		4.875		13.240		0.000		13.240	-	-	-	
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Project Cost Totals			-	0.000		4.875		13.240		0.000		13.240	-	-	-	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

WST AR Trainer Engineering Studies/Analysis	[REDACTED]																											
WST AR Trainer Data Collection/Compilation	[REDACTED]																											
WST AR Trainer Software/Hardware Development/Integration/Test	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
WST AR Trainer Engineering Studies/Analysis	2	2017	4	2017
WST AR Trainer Data Collection/Compilation	1	2018	3	2018
WST AR Trainer Software/Hardware Development/Integration/Test	4	2017	3	2020

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675129: B-52 Re-Engining	-	0.000	10.000	10.000	0.000	10.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funds will address emergency warfighting readiness requirements. Funds will facilitate future capabilities by conducting B-52 modernization and sustainment risk reduction studies such as, but not limited to, studies on new engines, electrical, pneumatic, cart-start, wing flutter analysis, TF-33 (present engine) refurbishment (SLEP). It also includes program management support for the development and integration of future capabilities. To facilitate future capabilities, the scope of work may involve development of Analysis of Alternatives (AoA), studies and Analysis, Capability Development Documents (CDD) or any other analysis or paper work necessary to establish a program or record.

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.

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 B-52 weapon system capability.

BA7- 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: B-52 Re-Engining	0.000	10.000	10.000	-	10.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Funds will facilitate future capabilities by conducting B-52 modernization and sustainment risk reduction studies such as studies on new engines, electrical, pneumatic, cart-start, wing flutter analysis and TF-33 Engines</p> <p>FY 2016 Accomplishments: n/a</p> <p>FY 2017 Plans: To facilitate future capabilities, scope of work will involve development of Analysis of Alternatives (AoA), Studies and Analysis, Capability Development Documents (CDD) and other analysis or paperwork necessary to establish a program of record.</p> <p>FY 2018 Base Plans: Continue development of Analysis of Alternatives (AoA), Studies and analyses, Capability Development Documents (CDD) or any other analysis or paper work necessary to establish a program of record.</p>					
Accomplishments/Planned Programs Subtotals	0.000	10.000	10.000	-	10.000

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

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

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
EMD Risk Reduction, Studies & Analyses	SS/CPFF	The Boeing Co : Oklahoma City, OK	-	0.000		9.000	Jun 2017	9.000	Feb 2018	0.000		9.000	Continuing	Continuing	-
Subtotal			-	0.000		9.000		9.000		0.000		9.000	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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, TDY	Various	EPASS Contract for A&AS : WPAFB, OH	-	0.000		1.000	Jun 2017	1.000	Jan 2018	0.000		1.000	Continuing	Continuing	-
Subtotal			-	0.000		1.000		1.000		0.000		1.000	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000	10.000	10.000	0.000	10.000	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

EMD Studies-Analyses/Risk Reduction	[REDACTED]
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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMD Studies-Analyses/Risk Reduction	3	2017	4	2018

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675160: B-52 Crypto Modernization	-	0.000	5.941	11.919	0.000	11.919	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY17 B-52 Crypto Modernization was a new start.

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. As MUOS legacy channels are turned on, existing satellites will be removed from service. B-52 CONECT is at risk of losing its File Transfer Protocol (FTP), email, Beyond Line of Site (BLOS) voice, and BLOS data link communications without this modernization effort.

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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 weapon system capability.

BA7- 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: B-52 Crypto Modernization	0.000	5.941	11.919	-	11.919
Description: Upgrades aircraft with MUOS capable ARC-210 radio systems to prevent loss of BLOS voice and data communications capability. As Mobile User Objective System (MUOS) legacy channels are turned on, existing satellites will be removed from service. B-52 CONECT is at risk of losing its File Transfer Protocol					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS	Project (Number/Name) 675160 / B-52 Crypto Modernization

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
(FTP), email, Beyond Line of Site (BLOS) voice, and BLOS data link communications without this modernization effort.					
<i>FY 2016 Accomplishments:</i> N/A					
<i>FY 2017 Plans:</i> Establish/stand-up program office, develop and refine requirements, initiate development activities supporting integration of MUOS radio, and planning for DT&E.					
<i>FY 2018 Base Plans:</i> Continue to develop and refine requirements, initiate development activities supporting integration of MUOS radio, and planning for DT&E					
Accomplishments/Planned Programs Subtotals	0.000	5.941	11.919	-	11.919

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA 05: Line item #	0.000	0.000	0.000	0.000	0.000	14.880	17.863	21.842	22.280	0.00	0.000
B05200: B-52 Crypto Modernization											

Remarks

D. Acquisition Strategy

The B-52 Crypto Modernization Program EMD prime contract is expected to be sole sourced to Boeing Defense, Space & Security (DSS), Oklahoma City, OK. Boeing designs, develops, integrates, tests, and procures necessary equipment from their subcontractors, develops engineering drawings, logistics and technical data.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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. : TBD	-	0.000		5.541	Jan 2017	11.885	Jan 2018	0.000		11.885	Continuing	Continuing	-
Subtotal			-	0.000		5.541		11.885		0.000		11.885	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 : TBD	-	0.000		0.300	Jan 2017	0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			-	0.000		0.300		0.000		0.000		0.000	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 : TBD	-	0.000		0.100	Jan 2017	0.034	Jan 2018	0.000		0.034	Continuing	Continuing	-
Subtotal			-	0.000		0.100		0.034		0.000		0.034	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000	5.941	11.919	0.000	11.919	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force	Date: May 2017
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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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	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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<u>Remarks</u>									
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
MDD																												
Milestone B																												
EMD contract award																												
EMD																												
Milestone C																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS	Project (Number/Name) 675160 / B-52 Crypto Modernization

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDD	1	2017	1	2017
Milestone B	2	2017	2	2017
EMD contract award	2	2017	2	2017
EMD	2	2017	2	2018
Milestone C	4	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676039: B-52 Airspace Compliance	-	0.000	0.000	9.652	0.000	9.652	36.326	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0101113F, project 676039, B-52 Airspace Compliance, is a new start.

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. Global Positioning System (GPS) guidance unit requires upgrade to new military M-Code standard.

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.

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortages (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 B-52 weapon system capability.

BA7 - 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: B-52 Airspace Compliance	0.000	0.000	9.652	0.000	9.652
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. GPS guidance unit requires upgrade to new military M-Code standard.					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS	Project (Number/Name) 676039 / B-52 Airspace Compliance

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<i>FY 2016 Accomplishments:</i> N/A					
<i>FY 2017 Plans:</i> N/A					
<i>FY 2018 Base Plans:</i> 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, Automatic Dependent Surveillance-Broadcast (ADS-B) upgrades, and GPS guidance unit for new military M-Code standard.					
<i>FY 2018 OCO Plans:</i> N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	9.652	0.000	9.652

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line item # B05200: <i>B-52 Airspace Compliance</i>	0.000	0.000	0.000	0.000	0.000	1.970	19.850	16.513	3.600	0.00	0.000

Remarks

D. Acquisition Strategy

GPS M-Code and ADS-B will be executed via a contract with the Original Equipment Manufacturer (OEM), Boeing, OKC.

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.451	0.453	0.463	0.000	0.463	0.472	0.482	0.490	0.500	Continuing	Continuing
674797: <i>ALCM Upgrades</i>	-	0.451	0.453	0.463	0.000	0.463	0.472	0.482	0.490	0.500	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 are used to develop new tests and evaluation procedures, software, and equipment, and provide sustainment solutions for Line Replaceable Units (LRU) 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 and to satisfy the recurring requirements to test Chemical, Biological, Radiological, and Nuclear (CBRN) susceptibility.

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.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.451	0.453	0.462	0.000	0.462
Current President's Budget	0.451	0.453	0.463	0.000	0.463
Total Adjustments	0.000	0.000	0.001	0.000	0.001
• 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	0.001	0.000	0.001

Change Summary Explanation

No Significant Program Changes

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Title: ALCM Test Plan Development and Evaluation	0.451	0.453	0.463
Description: Develop test procedures to implement CJCS-directed requirement for Electromagnetic (EM) testing for nuclear systems.			
FY 2016 Accomplishments: Successfully executed consecutive tests for High Altitude Electromagnetic Pulse (HEMP), High Power Microwave (HPM), and Hazards of Electromagnetic Radiation to Ordnance (HERO).			
FY 2017 Plans: Began development of test plans and procedures for implementation of Chemical Biological Radiological Neutron (CBRN) testing requirements.			
FY 2018 Plans: 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.			
Accomplishments/Planned Programs Subtotals	0.451	0.453	0.463

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• MPAF: BA03: Line Item # MALCBG: <i>ALCM, Missile Modifications</i>	25.019	21.762	36.425	0.000	36.425	25.171	24.804	24.981	25.482	Continuing	Continuing
• MPAF: BA04: Line Item # MALCBG: <i>ALCM, Replenishment Spares</i>	0.000	3.232	2.942	0.000	2.942	2.300	2.339	2.380	2.428	Continuing	Continuing
• OPAF: BA03: Line Item # MALCBG: <i>ALCM, Electronics & Telecommunications Equipment (BP83)</i>	1.908	1.710	1.757	0.000	1.757	1.788	1.820	1.853	1.887	Continuing	Continuing
• MPAF: BA04: Line Item # 999/ Repl...: <i>ALCM, Initial Spares</i>	0.000	0.294	0.304	0.000	0.304	0.311	0.321	0.331	0.388	Continuing	Continuing

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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E. Acquisition Strategy
The Electro Magnetic (EM) test development is currently funded via Military Interdepartmental Purchase Requests to White Sands Missile Range, NM.

Follow-on EM test development and verification strategy (organic or contractor) is expected to be determined 4QFY17 with a focus on existing IDIQ 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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	2.174	5.830	62.471	0.000	62.471	67.101	0.000	18.414	8.020	Continuing	Continuing
675344: <i>B-1B Modernization</i>	-	2.174	5.830	62.471	0.000	62.471	67.101	0.000	18.414	8.020	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0101126F, project 675344, Fully Integrated Targeting Pod, is a new start.
 This program, BA 07 PE 0101126F, project 675344, Mode 5/S Automatic Dependent Surveillance Broadcast (ADS-B) Out, is a new start.
 This program, BA 07 PE 0101126F, project 675344, Radio Crypto Compliance, is a new start.
 This program, BA 07 PE 0101126F, project 675344, Multifunctional Information Distribution System-Joint Tactical Radio System, is a new start.
 This program, BA 07 PE 0101126F, project 675344, Bomb Rack Unit - 56, is a new start.

In FY17 Global Positioning System (GPS) Military-Code (M-Code) was a new start.

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 United States Air Force 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 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)

Fully Integrated Targeting Pod (FITP) Modification permanently integrates the advanced targeting pod (ATP) capability into the B-1B's avionics flight software and replaces the B-1B's Temporary T-1 Beyond Line of Sight (BLOS)/Laptop Controlled Targeting Pod (LCTP) system with increased situational awareness, weapons de-confliction, and intelligence, surveillance and reconnaissance within the Combat Air Forces (CAF). FITP will provide robust combat targeting processing power, computing speed & throughput for aircrew mission planning, a permanent sustainment support structure. It will provide all four crew members access to targeting pod information displayed on digital high definition quality video using the Integrated Battle Station (IBS) multi-function displays (MFDs) and cursor controller. FITP will address the aircrew ergonomic issues caused by the current system configuration, allowing more rapid prosecution of targets with 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 Fully Integrated Targeting Pod (FITP) removes the need for Interim Contractor Support (ICS) sustainment support structure, resolving DMS issue.

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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0101126F / B-1B Squadrons
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B-1 Identification Friend or Foe (IFF) Mode 5 is the replacement for the B-1 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 Air Traffic Control, Air Defense System and/or aircraft. The IFF Mode 5 upgrade uses an automated system that responds to interrogations to avoid loss of B-1 aircraft through fratricide. Upgrades to ADS-B Out and Mode S are required Federal Aviation Administration (FAA) mandates to field by January 2020 and upgrade to Mode 5 is a Joint Requirements Oversight Council (JROC) mandate to field by September 2020. Failure to meet mandates will result in delayed/denied service within controlled airspace in the United States and Europe. Funds are included to accommodate the FAA mandate for ADS-B and Mode S and JROC mandate for Mode 5 as outlined throughout previous AF and DoD budget exhibits.

RADIO CRYPTO COMPLIANCE

The B-1 Radio Crypto Compliance requirements originated to meet DoD mandates by 1 Jan 2020. If the requirements are not met, B-1 is at risk of losing secure line of sight and beyond line of sight communication (BLOS) with ground and air forces. Without the radio crypto compliance the B-1 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 DoD mandate as outlined throughout previous AF and DoD budget exhibits.

Multifunctional Information Distribution System (MIDS) – Joint Tactical Radio System (JTRS)

The B-1 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 Federal Aviation Administration (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 allows rapid inflight retargeting in cooperative combat environment. Funds are included to accommodate DoT/DoD approved Frequency Remap and Crypto Modernization Device Cease Key mandates as outlined throughout previous Air Force (AF) and Department of Defense (DoD) budget exhibits.

Bomb Rack Unit (BRU) 56

Bomb Rack Unit (BRU) 56 will solve a safety risk with 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 resulted in a deficiency with the rivets within the linkage of the rack. This deficiency caused failure in one 2003 Class A mishap, one 2010 Class C mishap 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.

Global Positioning System (GPS) Military-Code (M-Code)

This project will integrate a military GPS receiver delivering improved capabilities to allow for accurate and reliable positioning, navigation, and timing for B-1 primary flight instrumentation, navigation, radar, weapon, and communication systems where current receiver performance might be compromised or unavailable. M-Code has a higher-power signal offering better resistance to jamming and interference; advanced security features to prevent unauthorized access or exploitation by adversaries; and improved message formats and signal modulation techniques for faster and more accurate performance.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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>	
INTEGRATED BATTLE STATION (IBS) SIMULATOR DEVELOPMENT B-1B training systems upgrades (both flight and maintenance simulators/trainers) provide required training assets for the aircraft Central Integrated Test System(CITS),Fully Integrated Data Link (FIDL), and Vertical Situational Display Upgrade (VSDU) modernization projects. These upgrades are required to bring the simulators up to the same configuration of the modernized aircraft. The B-1B training system provides the warfighter with a fully integrated, cost effective, high fidelity training capability in flight operations, weapons employment, and maintenance of the B-1B weapon system.		
FLIGHT TEST AIRCRAFT UPGRADES Upgrades to the B-1B flight test aircraft are included in the modernization projects to keep the test flight systems current. RDT&E funded test jets are currently configured with Engineering and Manufacturing Development (EMD) Line Replaceable Units (LRUs) for CITS, FIDL and VSDU. Replacement of the EMD LRUs is required to bring two flight test aircraft to fleet representative configuration. Maintenance and logistic support from the manufacturer is required until the Air Force supply chain is established. Replacement of the LRUs will ensure maximum supportability, maintainability, and reliability for continued and future flight tests.		
GAP & INTEGRATION ANALYSIS Additionally, program funds cover engineering/planning studies, related engineering efforts, and auxiliary equipment needed for development projects that have not yet fielded. Funds may be used to resolve emerging safety of flight and diminishing manufacturing source issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness. Cost includes Program Management Administrative (PMA) costs and initiatives for anticipated weapon system enhancements, including efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total ownership cost. 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 Program element may include necessary civilian pay expenses required to manage, execute, and deliver B-1B weapon system 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.		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	2.245	5.830	17.932	0.000	17.932
Current President's Budget	2.174	5.830	62.471	0.000	62.471
Total Adjustments	-0.071	0.000	44.539	0.000	44.539
• 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	-0.071	0.000			
• Other Adjustments	0.000	0.000	44.539	0.000	44.539

Change Summary Explanation

FY2016: Program reduced by \$.071M due to Small Business Innovative Research (SBIR)

FY2018: Program increased by \$44.539M due to the inclusion of five B-1B Modernization new start programs: Fully Integrated Targeting Pod, Mode 5/S Automatic Dependent Surveillance Broadcast (ADS-B) Out, Radio Crypto Compliance, Multifunctional Information Distribution System (MIDS) Joint Tactical Radio System (JTRS) and Bomb Rack Upgrade (BRU)56.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Fully Integrated Targeting Pod	-	-	23.283	-	23.283
Description: Fully Integrated Targeting Pod (FITP) Modification permanently integrates the advanced targeting pod (ATP) capability into the B-1B's avionics flight software and replaces the B-1B's Temporary T-1 Beyond Line of Sight (BLOS)/Laptop Controlled Targeting Pod (LCTP) system with increased situational awareness, weapons de-confliction, and intelligence, surveillance and reconnaissance within the Combat Air Forces (CAF). FITP will provide robust combat targeting processing power, computing speed & throughput for aircrew mission planning, a permanent sustainment support structure. It will provide all four crew members access to targeting pod information displayed on digital high definition quality video using the Integrated Battle Station (IBS) multi-function displays (MFDs) and cursor controller. FITP will address the aircrew ergonomic issues caused by the current system configuration, allowing more rapid prosecution of targets with 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 Fully Integrated Targeting					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force				Date: May 2017	
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)					
Pod (FITP) removes the need for Interim Contractor Support (ICS) sustainment support structure, resolving DMS issue.					
FY 2018 Base Plans: Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts.					
Title: Mode 5/S Automatic Dependent Surveillance Broadcast (ADS-B) Out					
Description: B-1 Identification Friend or Foe (IFF) Mode 5 is the replacement for the B-1 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 Air Traffic Control, Air Defense System and/or aircraft. The IFF Mode 5 upgrade uses an automated system that responds to interrogations. Failure to respond to the interrogations may result in loss of B-1 aircraft or fratricide. Upgrades to ADS-B Out and Mode S are required Federal Aviation Administration (FAA) mandates to field by January 2020 and upgrade to Mode 5 is a Joint Requirements Oversight Council (JROC) mandate to field by September 2020. Failure to meet mandates will result in delayed/denied service within controlled airspace in the United States and Europe.					
FY 2016 Accomplishments: N/A					
FY 2017 Plans: N/A					
FY 2018 Base Plans: Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts.					
FY 2018 OCO Plans: N/A					
Title: Radio Crypto Compliance					
Description: The B-1 Radio Crypto Compliance requirements originated to meet DoD mandates by 1 Jan 2020. If the requirements are not met, B-1 is at risk of losing secure line of sight and beyond line of sight communication (BLOS) with ground and air forces. Without the radio crypto compliance the B-1 will not be able					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
	0.000	0.000	13.546	0.000	13.546
	0.000	0.000	5.117	0.000	5.117

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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

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 DoD mandate as outlined throughout previous AF and DoD budget exhibits.

FY 2016 Accomplishments:

N/A

FY 2017 Plans:

N/A

FY 2018 Base Plans:

Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts.

FY 2018 OCO Plans:

N/A

Title: Multifunctional Information Distribution System-Joint Tactical Radio System

Description: The B-1 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 Federal Aviation Administration (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 allows rapid inflight retargeting in cooperative combat environment. Funds are included to accommodate DoT/DoD approved Frequency Remap and Crypto Modernization Device Cease Key mandates as outlined throughout previous Air Force (AF) and Department of Defense (DoD) budget exhibits.

FY 2016 Accomplishments:

N/A

FY 2017 Plans:

N/A

FY 2018 Base Plans:

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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 DoD mandate as outlined throughout previous AF and DoD budget exhibits. FY 2016 Accomplishments: N/A FY 2017 Plans: N/A FY 2018 Base Plans: Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts. FY 2018 OCO Plans: N/A					
Title: Multifunctional Information Distribution System-Joint Tactical Radio System Description: The B-1 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 Federal Aviation Administration (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 allows rapid inflight retargeting in cooperative combat environment. Funds are included to accommodate DoT/DoD approved Frequency Remap and Crypto Modernization Device Cease Key mandates as outlined throughout previous Air Force (AF) and Department of Defense (DoD) budget exhibits. FY 2016 Accomplishments: N/A FY 2017 Plans: N/A FY 2018 Base Plans:	0.000	0.000	8.241	0.000	8.241

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force			Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts. FY 2018 OCO Plans: N/A					
Title: Bomb Rack Unit - 56 Description: Bomb Rack Unit (BRU)56 will solve a safety risk with 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 resulted in a deficiency with the rivets within the linkage of the rack. This caused failure in one 2003 Class A mishap, one 2010 Class C mishap and multiple ground mishaps. The BRU-56 modification avoids the bomb rack mishaps and the possibility of a catastrophic aircraft loss as well as the loss of life. FY 2016 Accomplishments: N/A FY 2017 Plans: N/A FY 2018 Base Plans: Conduct acquisition planning, risk assessments, and other pre-EMD activities. Begin Engineering and Manufacturing Development efforts. FY 2018 OCO Plans: N/A	0.000	0.000	5.898	0.000	5.898
Title: Global Positioning System (GPS) Military-Code (M-Code) Description: This project will integrate a military GPS receiver delivering improved capabilities to allow for accurate and reliable positioning, navigation, and timing for B-1 primary flight instrumentation, navigation, radar, weapon, and communication systems where current receiver performance might be compromised or unavailable. M-Code has a higher-power signal offering better resistance to jamming and interference; advanced security features to prevent unauthorized access or exploitation by adversaries; and improved message formats and signal modulation techniques for faster and more accurate performance. FY 2016 Accomplishments:	0.000	3.038	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0101126F / B-1B Squadrons
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
FY 2017 Plans: Conduct acquisition planning, risk assessments, and other pre-EMD activities.					
FY 2018 Base Plans: N/A					
FY 2018 OCO Plans: N/A					
Title: B-1B IBS Simulator Development	0.151	0.000	0.000	0.000	0.000
Description: B-1B Integrated Battle Station (IBS) simulator development is the upgrade to existing training systems (both flight and maintenance) to simulate IBS configuration. IBS is the combined production phase of Central Integrated Test Systems (CITS), Fully Integrated Data Link (FIDL), and Vertical Situation Display Upgrade (VSDU) development efforts.					
FY 2016 Accomplishments: Contract Closeout activities concluded					
FY 2017 Plans: N/A					
FY 2018 Base Plans: N/A					
FY 2018 OCO Plans: N/A					
Title: B-1B Flight Test Upgrades	1.234	0.000	0.000	0.000	0.000
Description: B-1B Flight Test Upgrades modifies the two flight test aircraft at Edwards AFB to the production IBS configuration; the EMD Line Replacement Units (LRUs) that are currently on the aircraft will be removed and replaced with production units.					
FY 2016 Accomplishments: Completed installation of CITS, FIDL and VSDU Line Replaceable Units.					
FY 2017 Plans:					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0101126F / B-1B Squadrons
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
FY 2018 Base Plans: N/A					
FY 2018 OCO Plans: N/A					
Title: Gap & Integration Analysis 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. FY 2016 Accomplishments: Conducted engineering studies for a gap and integration analysis for upgrade of the current Global Positioning System/Inertial Navigation System (INS) with the required new Military M-Code standard. FY 2017 Plans: Conducted engineering studies for a gap and integration analysis for developmental projects that have not yet fielded. FY 2018 Base 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. FY 2018 OCO Plans: N/A	0.789	2.792	6.386	0.000	6.386
Accomplishments/Planned Programs Subtotals	2.174	5.830	62.471	0.000	62.471

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item # B01B00: <i>Training Support to Units, Mods PE 0809731F</i>	0.434	0.438	0.448	0.000	0.448	0.454	0.462	0.471	0.480	0.00	3.185
• APAF: BA05: Line Item # B01B00: <i>Bomber Tactical Data Link Mods PE 0207446F</i>	1.011	1.380	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	5.778
• APAF: BA05: Line Item # B01B00: <i>B-1B Squadrons, Mods</i>	112.674	114.501	155.634	0.000	155.634	102.780	93.202	122.842	85.889	0.00	732.077
• APAF: BA05: Line Item # B01B00 S...: <i>B-1B Squadrons, Spares</i>	16.543	7.429	4.506	3.300	7.806	0.000	2.532	0.724	0.863	0.00	34.060

Remarks

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

E. Acquisition Strategy

Fully Integrated Targeting Pod acquisition strategy will be a Sole Source Cost Plus Fixed Fee with a two (2) year EMD effort and a Sole Source Firm Fixed Fee (FFP) two (2) year Production and Installation effort.

Mode5/S ADS-B Out, Radio Crypto Compliance and MIDS JTRS will be a Sole Source Cost Plus Fixed Fee (CPFF) two (2) year EMD effort and a competitive Firm Fixed Fee (FFP) three (3) year Production and Installation effort.

The acquisition strategy for the Bomb Rack Unit (BRU-56) will be competitive contract with a three (3) year EMD effort and a three year (3) Production and Installation effort. Contract type to be determined.

The Global Positioning (GPS) System Military Code (M-Code) acquisition strategy will consist of three years EMD and three years production. The EMD portion is anticipated to consist of two Cost Plus Fixed Fee (CPFF) sole source contracts, one for the integration of the GPS receiver card into the Line Replaceable Units (LRUs) and one for the integration of the LRU into the Aircraft.

F. Performance Metrics

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

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Fully Integrated Targeting Bomb	SS/CPFF	Boeing : OKC, OK	-	0.000		0.000		22.786	Apr 2018	0.000		22.786	Continuing	Continuing	-
Mode 5/S Automatic Dependent Surveillance Broadcast (ADS-B) Out	SS/CPFF	Boeing : OKC, OK	-	0.000		0.000		12.385	Feb 2018	0.000		12.385	Continuing	Continuing	-
Radio Crypto Compliance	SS/CPFF	Boeing : OKC, OK	-	0.000		0.000		4.576	Feb 2018	0.000		4.576	Continuing	Continuing	-
Multifunction Information Distribution System	SS/CPFF	Boeing : OKC, OK	-	0.000		0.000		5.118	Feb 2018	0.000		5.118	Continuing	Continuing	-
Bomb Rack Unit - (BRU) 56	C/TBD	TBD : TBD	-	0.000		0.000		5.542	Jun 2018	0.000		5.542	Continuing	Continuing	-
B-1B Global Positioning System (GPS) Military Code (M-Code)	SS/CPFF	Boeing/Honeywell : OKC, OK	-	0.000		1.900	Mar 2017	0.000		0.000		0.000	Continuing	Continuing	-
B-1B IBS Simulator Development (CITS FIDL VSDU)	C/FPIF	AAI : Goose Creek, SC	-	0.151	Dec 2016	0.000		0.000		0.000		0.000	0.000	0.151	-
B-1B Flight Test Aircraft Upgrades	SS/CPFF	Boeing : OKC, OK	-	1.234	Aug 2016	0.000		0.000		0.000		0.000	0.000	1.234	-
Subtotal			-	1.385		1.900		50.407		0.000		50.407	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Gap And Integration Analysis	Various	TBD : TBD	-	0.689	Mar 2016	2.767	Jun 2017	6.361	Apr 2018	0.000		6.361	Continuing	Continuing	-
A&AS	C/TBD	TBD : TBD	-	0.000		0.000		2.709	Jan 2018	0.000		2.709	Continuing	Continuing	-
Trainers	TBD	TBD : TBD	-	0.000		0.000		0.555	Apr 2018	0.000		0.555	Continuing	Continuing	-
Subtotal			-	0.689		2.767		9.625		0.000		9.625	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date: May 2017**

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Simulator Upgrades for CITS/FIDL/VSDU Contract Activities	██████████				██████████																							
Flight Test Aircraft Upgrade Deliveries	██████████																											
Flight Test Aircraft Upgrade Installs					██████████																							
Gap and Integration Analysis Contract Award (Mar 16)	████																											
Gap and Integration Analysis Contract Award (Jun 18)									████																			
Fully Integrated Targeting Pod Contract Award (Apr 18)									████																			
Fully Integrated Targeting Pod EMD Activities									████████████████████																			
IFF Mode 5/S ADS-B Out Contract Award (Feb 18)									████																			
IFF Mode 5/S ADS-B Out EMD Activities									████████████████████																			
Radio Crypto Compliance - Contract Award (Feb 18)									████																			
Radio Crypto Compliance - EMD Activities									████████████████████																			
MIDS JTRS - Milestone B Decision and Contract Award (Feb 18)									████																			
MIDS JTRS - EMD Activities									████████████████████																			
BRU-56 Contract Award									████																			
BRU-56 - EMD Activities									████████████████████																			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Simulator Upgrades for CITS/FIDL/VSDU Contract Activities	1	2016	2	2017
Flight Test Aircraft Upgrade Deliveries	2	2016	4	2016
Flight Test Aircraft Upgrade Installs	4	2016	4	2017
Gap and Integration Analysis Contract Award (Mar 16)	2	2016	2	2016
Gap and Integration Analysis Contract Award (Jun 18)	3	2018	3	2018
Fully Integrated Targeting Pod Contract Award (Apr 18)	3	2018	3	2018
Fully Integrated Targeting Pod EMD Activities	3	2018	3	2020
IFF Mode 5/S ADS-B Out Contract Award (Feb 18)	2	2018	2	2018
IFF Mode 5/S ADS-B Out EMD Activities	2	2018	2	2020
Radio Crypto Compliance - Contract Award (Feb 18)	3	2018	3	2018
Radio Crypto Compliance - EMD Activities	3	2018	3	2020
MIDS JTRS - Milestone B Decision and Contract Award (Feb 18)	2	2018	2	2018
MIDS JTRS - EMD Activities	2	2018	4	2019
BRU-56 Contract Award	3	2018	3	2018
BRU-56 - EMD Activities	3	2018	2	2021

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 / B-2 SQUADRONS
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	0.000	105.914	152.458	193.108	0.000	193.108	314.851	329.242	137.214	136.900	Continuing	Continuing
675345: <i>B-2 Modernization</i>	0.000	88.224	76.212	54.523	0.000	54.523	63.830	59.049	29.348	26.825	Continuing	Continuing
676021: <i>BASELINE SUPPORT</i>	0.000	17.690	13.660	13.967	0.000	13.967	14.195	14.459	14.709	15.011	Continuing	Continuing
676022: <i>AEHF Strategic Comm</i>	0.000	0.000	62.586	124.618	0.000	124.618	236.826	255.734	93.157	95.064	Continuing	Continuing

Note

This program, BA 07 PE 0101127F, project 675345, B-2 IFF Mode 5/S/ADS-B out, is a new start.
 This program, BA 07 PE 0101127F, project 675345, B-2 Crash Survivable Memory Unit (CSMU), is a new start.

In FY 2017 and subsequent the B-2 AEHF strategic communications effort is documented in Project 676022 AEHF Strategic Comm; in FY 2016 \$10.926M for the effort is documented in Project 675345 B-2 Modernization.

A. Mission Description and Budget Item Justification

The B-2 Spirit is the world's most advanced long-range strike asset. The unique combination of range, precision, payload, and ability to penetrate and operate in anti-access/area denial environments allow the B-2 to identify, locate, target, and destroy the highest value enemy targets. The B-2 can, with necessary upgrades, accomplish its mission regardless of location, return to base safely, and permit freedom of movement for follow-on forces, including other long range strike platforms. An array of planned RDT&E projects are necessary to preserve a strategic advantage against 21st century threats as well as increase flexibility, lethality, and survivability of this national asset tasked across a broad spectrum of tactical and national strategic objectives. B-2 will achieve these objectives by adapting mature technologies/ systems in the fleet to rapidly deliver relevant combat capability, leveraging other Department of Defense investments and programs, utilizing innovative acquisition strategies.

The B-2 has a projected service life through 2058. To ensure the fleet can accomplish its nuclear and conventional mission in highly defended and anti-access environments, periodic modernization efforts must be undertaken to upgrade combat capability as well as improve the viability, supportability, and survivability of the weapon system.

Recent and ongoing investments in avionics, structures, communications, and weapons keep the B-2 viable in the immediate future. Current system upgrades include Low Observable Signature and Supportability Modifications, Defensive Management System Modernization, Flexible Strike Phase 1, alternative communication solutions such as Common Very Low Frequency Receiver and B-2 AEHF (Strategic Communications), Joint Air-to-Surface Standoff Missile Extended Range (JASSM-ER) weapon integration, Crash Survivable Memory Unit (CSMU) and Global Positioning System enhancements. The B-2 is also exploring opportunities for architecture updates to reduce future integration costs and improve program affordability. The Defensive Management System effort is documented in the exhibit for PE 0605931F.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date: May 2017**

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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In addition to the B-2 improvements described above, the Air Force has continuing efforts for Training Systems, Mission Planning System improvements, flight test aircraft upgrades and base of operations support, integration and testing of upgraded cryptographic components, as well as B-2 platform studies and acquisition planning.

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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	108.183	152.458	221.403	0.000	221.403
Current President's Budget	105.914	152.458	193.108	0.000	193.108
Total Adjustments	-2.269	0.000	-28.295	0.000	-28.295
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	1.450	0.000			
• SBIR/STTR Transfer	-3.719	0.000			
• Other Adjustments	0.000	0.000	-28.295	0.000	-28.295

Change Summary Explanation

FY 2016: Reduced by \$3.719M for Small Business Innovation Research and increased by \$1.450M by way of a Below Threshold Reprogramming from B-2 DMS-M, PE 0605931F

FY 2018: +\$7.665M B-2 IFF Mode 5/S/ADS-B out, +\$2.365M B-2 Crash Survivable Memory Unit (CSMU), and +\$2.0M Flexible Strike, reduced AEHF Strategic Comm by -\$41.0M

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675345: B-2 Modernization	0.000	88.224	76.212	54.523	0.000	54.523	63.830	59.049	29.348	26.825	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0101127F, project 675345, B-2 IFF Mode 5/S/ADS-B out, is a new start.
 This program, BA 07 PE 0101127F, project 675345, B-2 Crash Survivable Memory Unit (CSMU), 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 receiver will be adaptable for use by other Department of Defense platforms. 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. 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 continues in FY 2017 and subsequent years under Project 676022 AEHF Strategic Comm.

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. B-2 will also integrate the Joint Air-to-Surface Standoff Missile Extended Range (JASSM-ER) weapon to 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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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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).

The B-2 Crash Survivable Memory Unit (CSMU) provides a more capable recorder for flight data recovery following a mishap. The initiative includes replacement of the current CSMU and reprogramming firmware of the Flight Data Recorder Processor (FDRP) which provides data streams to the recorder. 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 modification 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 S provides improved accuracy, altitude resolution and reduced interference from closely spaced aircraft through interrogation of assigned transponder addresses.

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.

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 2016	FY 2017	FY 2018
<p>Title: B-2 Common Very Low Frequency Receiver (CVR)</p> <p>Description: Provides secure, survivable, receive-only strategic nuclear communication for the B-2.</p> <p>FY 2016 Accomplishments: Continued Engineering and Manufacturing Development efforts, conducted Flight Test, and prepared for entry into Production. Procured four shipsets of developmental CVR hardware, of which one will be installed in the dedicated B-2 test aircraft, two will be installed in the Force Development Evaluation aircraft, and one will initially be a ready spare for testing and eventually installed in a fleet aircraft.</p> <p>FY 2017 Plans:</p>	33.647	16.709	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>Complete Engineering and Manufacturing Development (EMD) efforts. Complete two installations of developmental EMD CVR hardware to support additional Emergency Action Message collection required to upgrade B-2 from Interim Authority to Operate to Authority to Operate status, update technical orders, and design and integrate CVR into the B-2 training system.</p> <p>FY 2018 Plans: N/A</p>				
<p>Title: B-2 Flexible Strike Phase 1</p> <p>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.</p> <p>FY 2016 Accomplishments: Continued Engineering and Manufacturing Development efforts, conducted Flight Test, and prepared for entry into Production.</p> <p>FY 2017 Plans: Continue Engineering and Manufacturing Development efforts. Conduct software/hardware integration testing and flight test. Prepare for entry into Production.</p> <p>FY 2018 Plans: Complete Engineering and Manufacturing Development efforts. Complete software/hardware integration and flight test.</p>		35.384	44.832	2.006
<p>Title: Low Observable Signature and Supportability Mods and Trainers</p> <p>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.</p> <p>FY 2016 Accomplishments: Continued development of on-going Low Observable Signature and Supportability Modifications and Training System core upgrades.</p> <p>FY 2017 Plans: Continue development of on-going Low Observable Signature and Supportability Modifications and Training System core upgrades.</p> <p>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</p>		9.394	1.954	24.841

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
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.				
<p>Title: B-2 AEHF (Strategic Communications)</p> <p>Description: B-2 AEHF (Strategic Communications) provides secure, strategic, two-way, survivable Anti-Access/Area Denial communications capability for conventional and nuclear missions.</p> <p>FY 2016 Accomplishments: Conducted acquisition planning, technology maturation, affordability assessments, and other pre-EMD activities associated with satisfying B-2 communications requirements using extremely high frequency (EHF) and other waveforms.</p> <p>FY 2017 Plans: Effort transferred to Project 676022 AEHF Strategic Comm</p> <p>FY 2018 Plans: N/A</p>		9.799	0.000	0.000
<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 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Award Requirements Maturation (RM) effort, affordability assessments, and other pre-EMD activities. JASSM-ER was a new start.</p> <p>FY 2018 Plans: Begin Engineering and Manufacturing Development efforts.</p>		0.000	8.558	15.431
<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 2016 Accomplishments: N/A</p> <p>FY 2017 Plans:</p>		0.000	3.961	1.987

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>Conduct Multifunction Information Distribution System (MIDS) Low Volume Terminal (LVT) Risk Reduction Terminal (RRT) Regression Testing. Cryptographic Modernization was a new start.</p> <p>FY 2018 Plans: Complete Multifunction Information Distribution System (MIDS) Low Volume Terminal (LVT) Risk Reduction Terminal (RRT) Regression Testing.</p>				
<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 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Conduct acquisition planning, affordability assessments, and requirements maturation associated with providing a permanent beyond line of sight integrated mission data, time sensitive targeting, intelligence update, and positive command and control capability. ACS was a new start development project in FY 2017.</p> <p>FY 2018 Plans: Continue 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, continue fielding the ACS 3.2 systems, and address ACS obsolescence issues.</p>		0.000	0.198	0.199
<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 2016 Accomplishments: N/A</p> <p>FY 2017 Plans:</p>		0.000	0.000	7.687

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
N/A			
FY 2018 Plans: Conduct acquisition planning and other pre-EMD activities in preparation for contract award. IFF Mode 5/S/ADS-B Out is an FY 2018 new start.			
Title: B-2 Crash Survivable Memory Unit (CSMU) Description: The B-2 Crash Survivable Memory Unit (CSMU) provides a more capable recorder for flight data recovery following a mishap. The initiative includes replacement of the current CSMU and reprogramming firmware of the Flight Data Recorder Processor (FDRP). FY 2016 Accomplishments: N/A FY 2017 Plans: N/A FY 2018 Plans: Conduct acquisition planning and other pre-EMD activities in preparation for 4Q FY18 EMD contract award. CSMU is an FY 2018 new start.	0.000	0.000	2.372
Accomplishments/Planned Programs Subtotals	88.224	76.212	54.523

C. Other Program Funding Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item #B00200: B-2 CVR Inc 1 Mod Funding, PE 0101127F	24.334	18.592	10.610	0.000	10.610	6.009	1.895	0.000	0.000	0.000	51.123
• APAF: BA05: Line Item # B00200: B-2 Training Support Modification, PE 0809731F	3.131	9.578	9.082	0.000	9.082	7.864	8.001	8.148	8.295	Continuing	Continuing
• APAF:BA05:Line Item #B00200: B-2 Flexible Strike Mod Funding, PE 0101127F	0.000	4.214	6.658	0.000	6.658	7.725	4.933	0.000	0.000	0.00	21.179

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA07: Line Item #B00200: <i>B-2 Post Production Support, B-2A ICS for CVR Inc 1: PE 0101127F</i>	0.000	0.010	0.131	0.000	0.131	0.254	0.114	0.000	0.000	0.00	0.395
• APAF: BA06: Line Item #B00200: <i>B-2 Squadrons, A/ C Initial Spares for CVR Inc 1</i>	0.000	2.036	2.578	0.000	2.578	0.000	0.000	0.000	0.000	0.00	4.610
• APAF:BA07: Line Item #B00200: <i>B-2 Depot Activation for CVR Inc 1, PE 0101127F</i>	2.196	0.761	2.025	0.000	2.025	0.000	0.000	0.000	0.000	0.00	3.465
• APAF:BA05:Line Item #B00200: <i>B-2 LOSSM Mod Funding, PE 0101127F</i>	8.496	8.263	8.454	0.000	8.454	8.599	9.683	20.045	20.447	Continuing	Continuing
• APAF:BA05:Line Item#B00200: <i>B-2 CSMU Mod Funding, PE 0101127F</i>	0.000	0.000	0.000	0.000	0.000	2.500	0.000	0.800	1.615	0.00	4.915
• APAF: BA05:Line Item#B00200: <i>B-2 IFF Mode 5/S Mod Funding, PE 0101127F</i>	0.000	0.000	0.000	0.000	0.000	0.000	2.000	7.300	15.147	10.000	24.385
• APAF:BA05:LineItem #B00200: <i>B-2 B61-12 Integration Mod</i>	0.000	0.000	27.514	0.000	27.514	0.000	0.000	0.000	0.000	0.00	27.470
• APAF:BA05:Line Item#B00200: <i>B-2 MGUE Mod</i>	0.000	4.066	10.704	0.000	10.704	0.583	0.998	0.000	0.000	0.00	16.334

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	27.434	Nov 2015	37.874	Oct 2016	1.899	Nov 2017	0.000		1.899	Continuing	Continuing	-
B-2 Common Very Low Frequency Receiver (CVR)	Various	Various : Various	0.000	29.375	Oct 2015	16.164	Oct 2016	0.000		0.000		0.000	Continuing	Continuing	-
Low Observable Signature and Supportability Mods	Various	Various : Various	0.000	8.177	Feb 2016	1.714	Feb 2017	23.222	Oct 2017	0.000		23.222	Continuing	Continuing	-
B-2 Advanced Extremely High Frequency Communications	Various	Various : Various	0.000	9.065	Mar 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
B-2 Joint Air-to-Surface Standoff Missile - Extended Range (JASSM-ER) Integration	Various	Various : Various	0.000	0.000		8.284	Sep 2017	12.719	Dec 2017	0.000		12.719	0.000	21.003	-
B-2 Cryptographic Modernization	Various	Various : Various	0.000	0.000		3.079	Jul 2017	1.724	Dec 2017	0.000		1.724	0.000	4.803	-
B-2 Adaptable Communications Suite (ACS)	Various	Various : Various	0.000	0.000		0.198	Jul 2017	0.189	Nov 2017	0.000		0.189	0.000	0.387	-
B-2 IFF Mode 5/S/ADS-B Out	Various	Various : Various	0.000	0.000		0.000		7.270	Jan 2018	0.000		7.270	0.000	7.270	-
B-2 Crash Survivable Memory Unit (CSMU)	Various	Various : Various	0.000	0.000		0.000		2.225	Dec 2017	0.000		2.225	0.000	2.225	-
Aircrew Training	Various	Various : Various	0.000	4.291	Dec 2015	1.100	Dec 2016	0.086	Dec 2017	0.000		0.086	Continuing	Continuing	-
Mission Planning	Various	Various : Various	0.000	0.797	Jan 2016	0.014	Jan 2017	0.430	Jan 2018	0.000		0.430	Continuing	Continuing	-
Subtotal			0.000	79.139		68.427		49.764		0.000		49.764	-	-	-

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.
 B-2 AEHF (strategic communication) effort continues in FY 2017 and subsequent years under Project 676022 AEHF Strategic Comm.

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	AFFTC : TBD	0.000	5.076	Nov 2015	5.150	Nov 2016	1.555	Nov 2017	0.000		1.555	Continuing	Continuing	-
Subtotal			0.000	5.076		5.150		1.555		0.000		1.555	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	4.009	Oct 2015	2.635	Oct 2016	3.204	Oct 2017	0.000		3.204	Continuing	Continuing	-
Subtotal			0.000	4.009		2.635		3.204		0.000		3.204	-	-	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	88.224	76.212	54.523	0.000	-	-	-

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: FY 2018 Air Force **Date: May 2017**

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

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																												
AEHF Strategic Comm Acq Planning Contract Award																												
JASSM-ER Acquisition Planning Contract Award																												
JASSM-ER Milestone B																												
Crypto Modification Integ and Regression Testing Contract Award																												
Crypto Modification Integ and Regression Testing																												
IFF Mode 5/S ADS-B Out Milestone B																												
IFF Mode 5/S ADS-B Out EMD Contract Award																												
Crash Survivable Memory Unit Milestone B																												

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 EMD Contract	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
Flexible Strike EMD	1	2016	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	2	2022
Flexible Strike Ph 1 Required Assets Available	3	2020	3	2020
Common Very Low Frequency Receiver EMD	1	2016	2	2018
Common Very Low Frequency Receiver Milestone C	1	2017	1	2017
Common Very Low Frequency Receiver Production Contract Award	2	2017	2	2017
Common Very Low Frequency Production	2	2017	3	2019
Common Very Low Frequency Receiver Required Assets Available	1	2019	1	2019
Low Observable Signature and Supportability Mods and Trainers	1	2016	4	2022
AEHF Strategic Comm Acq Planning Contract Award	2	2016	2	2016
JASSM-ER Acquisition Planning Contract Award	4	2017	4	2017
JASSM-ER Milestone B	3	2018	3	2018
Crypto Modification Integ and Regression Testing Contract Award	4	2017	4	2017
Crypto Modification Integ and Regression Testing	4	2017	3	2019
IFF Mode 5/S ADS-B Out Milestone B	3	2018	3	2018
IFF Mode 5/S ADS-B Out EMD Contract Award	3	2018	3	2018
Crash Survivable Memory Unit Milestone B	1	2018	1	2018
Crash Survivable Memory Unit EMD Contract	2	2018	4	2019

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676021: BASELINE SUPPORT	0.000	17.690	13.660	13.967	0.000	13.967	14.195	14.459	14.709	15.011	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 2016	FY 2017	FY 2018
<p>Title: Baseline Support Acq Plan/Studies/Integr Tst Spt</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 2016 Accomplishments: Continued 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 2017 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 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>	0.395	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>	14.283	10.640	13.670

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 SQUADRONS	Project (Number/Name) 676021 / BASELINE SUPPORT

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> Continued 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><i>FY 2017 Plans:</i> 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.</p> <p><i>FY 2018 Plans:</i> 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><i>Title:</i> Baseline Support Mission Planning</p> <p><i>Description:</i> 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><i>FY 2016 Accomplishments:</i> Continued B-2 Mission Planning activities, keeping pace with aircraft modifications and improving mission planning core systems, to include continuation of the transition from the current AFMSS mission planning to the Joint Mission Planning System (JMPS).</p> <p><i>FY 2017 Plans:</i> Continue B-2 Mission Planning activities, keeping pace with aircraft modifications and improving mission planning core systems. Deliver mission planning release 4.4, i.e. Joint Mission Planning System (JMPS).</p> <p><i>FY 2018 Plans:</i> N/A</p>	3.012	2.723	0.000
Accomplishments/Planned Programs Subtotals	17.690	13.660	13.967

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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101127F / B-2 SQUADRONS	Project (Number/Name) 676021 / BASELINE 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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	4.054	Oct 2015	2.248	Oct 2016	0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			0.000	4.054		2.248		0.000		0.000		0.000	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	9.305	Oct 2015	8.140	Oct 2016	9.965	Oct 2017	0.000		9.965	Continuing	Continuing	-
Subtotal			0.000	9.305		8.140		9.965		0.000		9.965	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	AFFTC : TBD	0.000	3.798	Oct 2015	2.841	Oct 2016	3.200	Oct 2017	0.000		3.200	Continuing	Continuing	-
Subtotal			0.000	3.798		2.841		3.200		0.000		3.200	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.533	Oct 2015	0.431	Oct 2016	0.802	Oct 2017	0.000		0.802	Continuing	Continuing	-
Subtotal			0.000	0.533		0.431		0.802		0.000		0.802	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	17.690	13.660	13.967	0.000	13.967	-	-	-

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: FY 2018 Air Force **Date: May 2017**

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Release 4.4 (JMPS)							■																					
FY16 Flight Test Core Support Contract Award	■																											
FY17 Flight Test Core Support Contract Award							■																					
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																											■	

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mission Planning Release 4.4 (JMPS)	3	2017	3	2017
FY16 Flight Test Core Support Contract Award	1	2016	1	2016
FY17 Flight Test Core Support Contract Award	1	2017	1	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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676022: AEHF Strategic Comm	0.000	0.000	62.586	124.618	0.000	124.618	236.826	255.734	93.157	95.064	Continuing	Continuing
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 Advanced Extremely High Frequency (AEHF) Satellite Communications (SATCOM) system provides the only 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 Milstar/Ultra High Frequency (UHF) SATCOM system (which is nearing system end of life) on the B-2.

The strategic communications effort will select, install, and integrate the radio, antenna and system components required to provide two-way EHF communication for the B-2.

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 2016	FY 2017	FY 2018
Title: B-2 AEHF (Strategic Communication)	0.000	62.586	124.618
Description: B-2 AEHF (Strategic Communication) provides secure, strategic, two-way, survivable Anti-Access/Area Denial communications capability for conventional and nuclear missions.			
FY 2016 Accomplishments: FY16 efforts for B-2 AEHF are documented under Project 675345 B-2 Modernization.			
FY 2017 Plans: Continue acquisition planning, technology maturation, affordability assessments, and other pre-Technology Maturation and Risk Reduction (TMRR) efforts in preparation for a Milestone A decision and entry into TMRR phase. Upon successful Milestone A decision, begin TMRR activities.			
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.			
Accomplishments/Planned Programs Subtotals	0.000	62.586	124.618

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item #B00200: B-2 Squadrons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	121.026	163.254	45.370	329.326

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 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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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/CPIF	Northrop Grumman : Palmdale, CA	0.000	0.000		60.589	Jul 2017	117.484	Oct 2017	0.000		117.484	Continuing	Continuing	-
Subtotal			0.000	0.000		60.589		117.484		0.000		117.484	-	-	-

Remarks
Northrop-Grumman is the prime contractor and lead integrator.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.000		1.997	Oct 2016	7.134	Nov 2017	0.000		7.134	Continuing	Continuing	0.000
Subtotal			0.000	0.000		1.997		7.134		0.000		7.134	-	-	0.000

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000	62.586	124.618	0.000	124.618	-	-	-

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: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 AEHF Milestone A								■																				
B-2 AEHF TMRR Contract Award								■																				
B-2 AEHF TMRR								■	■	■	■	■																
B-2 AEHF Preliminary Design Review												■																
B-2 AEHF Milestone B																■												
B-2 AEHF EMD Contract Award																■												
B-2 AEHF Engineering and Manufacturing Development																■	■	■	■	■								

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
B-2 AEHF Milestone A	4	2017	4	2017
B-2 AEHF TMRR Contract Award	4	2017	4	2017
B-2 AEHF TMRR	4	2017	1	2019
B-2 AEHF Preliminary Design Review	4	2018	4	2018
B-2 AEHF Milestone B	1	2019	1	2019
B-2 AEHF EMD Contract Award	1	2019	1	2019
B-2 AEHF Engineering and Manufacturing Development	1	2019	1	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	0.000	128.492	182.958	210.845	0.000	210.845	84.603	129.930	138.010	121.600	Continuing	Continuing
672983: <i>MM Ground and Comm Equipment</i>	0.000	24.520	114.039	119.384	0.000	119.384	63.381	102.918	122.857	102.311	Continuing	Continuing
672984: <i>MM III Baseline Support</i>	0.000	45.752	40.205	59.812	0.000	59.812	13.342	14.927	9.021	13.033	Continuing	Continuing
672985: <i>MM Support Equip</i>	0.000	27.834	28.714	31.649	0.000	31.649	7.880	12.085	6.132	6.256	Continuing	Continuing
672986: <i>MM Crypto Mods</i>	0.000	30.386	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note
 This program, BA 07 PE 0101213F, project 672984, LGM-30G Arm Disarm Switch Replacement (ADSR), is a new start.
 In CY17, BA 07 PE 0101213F, project 672985, LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) was a new start.
 In CY17, BA 07 PE 0101213F, project 672985, LGM-30G G6B4 Build Equipment Replacement (G6B4 BER) was a new start.
 In CY17, BA 07 PE 0101213F, project 672985, LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) was a new start.

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. These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to GBSD. 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 Phase II (FRPB II), 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 conduct of 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 Flight Test Telemetry and Termination System (FT3), LGM-30G Ground Test Upgrade (GTU), LGM-30G Squadron Data Simulator (SDS) and LGM-30G Arm Disarm Switch Replacement (ADSR). 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. 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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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(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). As other similar equipment is identified for replacement, it will be added to this program.

MM Crypto Mods executes USSTRATCOM, Air Force Global Strike Command, and Nuclear Weapon Safety Center requirements by implementing the KS-60 capabilities in the LGM-30G ICBM Cryptography Upgrade II (ICU II) of remote key/code change and irreversible transformations 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. As other similar equipment is identified for replacement, it will be added to this program.

These efforts also includes any needed nuclear surety and certification and system vulnerability assessments.

This program is in Budget Activity 7, Operational System Development, because 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 years.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	166.729	182.958	186.857	0.000	186.857
Current President's Budget	128.492	182.958	210.845	0.000	210.845
Total Adjustments	-38.237	0.000	23.988	0.000	23.988
• 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	-38.237	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	23.988	0.000	23.988

Change Summary Explanation

FY 2016 funding reflects \$38.237M reprogrammed to higher Air Force priorities. Changes were made to the following programs: decrease for Project 672983, MM Ground and Comm Equipment, (-\$5.016M); a decrease for Project 672984, MM Baseline Support, (-\$7.071M); a decrease for Project 672985, MM Support Equipment, (-\$12.350M); a decrease for Project 672986, MM Crypto Mods, (-\$13.800M). Total net decrease of \$38.237M.

FY 2018 funding reflects a change to the following programs: decrease for Project 672983, MM Ground and Comm Equipment, (-\$15.185M); an increase for Project 672984, MM Baseline Support, (+\$33.412M); an increase for Project 672985, MM Support Equipment, (+\$5.761M). Total net increase of \$23.988M.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons				Project (Number/Name) 672983 / MM Ground and Comm Equipment			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
672983: MM Ground and Comm Equipment	0.000	24.520	114.039	119.384	0.000	119.384	63.381	102.918	122.857	102.311	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 Phase II (FRBP II), 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 2016	FY 2017	FY 2018
Title: LGM-30G Air Launch Control System Replacement (ALCS-R)	9.613	65.887	78.492
<p>Description: ALCS-R will replace the legacy nuclear command and control system that provides the capability to launch 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 equipment 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.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Initiated a source selection to award up to two Technology Maturation and Risk Reduction (TMRR) contracts. • Acquired test equipment to install in the ICBM System Directorate's Nuclear Command and Control (NC2) lab to enable low risk weapon system integration, reduce risk for GBSD commonality, and provide a first ever, end-to-end test capability for the ALCS system <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Award up to two TMRR contracts. Manage contractors to System Requirements Review. Contractors begin full system prototype development, to include: launch facility ground equipment, E-6B airborne equipment, and NC2 cryptographic solution • Complete SIL development at the ICBMSD NC2 lab • Draft acquisition documentation required for the Development Request for Proposal (RFP) Review Milestone • Initiate hardness testing of the National Security Agency (NSA) designed/produced anchor that will be the crypto engine 			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> Initiate analysis of legacy UHF antenna to assess aging/degradation and performance capabilities for current & future ICBMs Initiate & complete Government facility modifications to enable secure management of TMRR contractors Initiate Cost Capability Analysis to support AFGSC's final submission of the ALCS-R CDD <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> Manage contractors through System Functional Review. Contractors continue full system prototype development, to include: launch facility ground equipment, E-6B airborne equipment, and NC2 cryptographic solution Complete trusted anchor hardness testing and provide results to program industry competitors Complete UHF antenna recommendations for long term ICBM Survivable Launch capability Complete Cost Capability Analysis and support AFGSC efforts for final ALCS-R CDD validation 			
<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 unsupportable. 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 2016 Accomplishments:</p> <ul style="list-style-type: none"> Awarded TMRR contract on 13 May 2016 Conducted Site Surveys <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> Conduct a systems requirement review and hold a preliminary design review Conduct Milestone B Award EMD contract Complete hardness and environmental testing <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 	4.592	11.096	10.185
<p>Title: LGM-30G Fast Rising B-Plug Phase II (FRBP II)</p>	0.745	0.863	0.400

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>Description: The FRBP is a security element that delays access to the Launch Facility. It is a 14,000 pound rising door that obstructs the Personal Access Shaft (PAS). The current system can experience uncommanded Raises (UCR) due to component single point failures and transient voltages. The FRBP II will update hardware and software by redesigning circuitry to decrease susceptibility to UCRs while also addressing maintenance, reliability and sustainment issues.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Completed technical requirements and memorandum of agreement with developer • Began pre-EMD design and development of FRBP II <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Program under revision/assessment due to cost/schedule growth <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Program under revision/assessment due to cost/schedule growth 			
<p>Title: LGM-30G Launch Control Center Break-In-Kit (LCCB)</p> <p>Description: 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>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Began design, development, fabrication, and prototype construction of LCC Break-in-Kits <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Continue design, development, fabrication, and prototype construction • Conduct a successful Milestone B and begin EMD <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Conduct a Preliminary Design Review (PDR) / Critical Design Review (CDR) • Prepare test plans for Test Readiness Review (TRR) 	0.602	5.833	3.671
<p>Title: Launch Control Center (LCC) Block Upgrade (LCCBU)</p> <p>Description: The LCCBU program will address several elements within the LCC that are experiencing supportability issues and impacting voice communications in the MM missile fields. The LCCBU program is a single modification effort that replaces five components. 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>	8.198	22.880	22.294

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>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.</p> <p>2) Floppy Disk Drive (FDD) - replaces the legacy FDDs which are no longer manufactured with a modern, supportable hardware solution.</p> <p>3) Voice Communications Control Panel (VCCP) - replaces the current deficient equipment to provide the voice communications quality required to perform the ICBM mission and may require additional components to resolve voice communication degradations.</p> <p>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.</p> <p>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> <p>All LCCBU efforts will support the 45 operational LCCs and additional support equipment/test/maintenance locations.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Performed requirements definition and design of each component <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Continue design/development of all components • Conduct a Preliminary Design Review • Conduct a Milestone B and begin EMD <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Complete Critical Design Review • Complete development • Conduct a Milestone C • Begin Production activities 			
<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 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Began design, development and verification of RVA II requirements 	0.770	7.480	4.342

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> Conducted Milestone B in Aug 2016 <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> Prepare for verification testing and a Functional and Physical Configuration Audit (FCA/PCA) Begin EMD Phase Conduct Preliminary Design Review <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> Complete Critical Design Review Perform verification testing and an FCA/PCA Prepare and conduct successful Milestone C 			
Accomplishments/Planned Programs Subtotals	24.520	114.039	119.384

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF: BA 03: Line Item # M30MLG: <i>Minuteman III Modifications BP21</i>	0.000	1.024	33.007	0.000	33.007	54.696	22.543	14.651	49.296	Continuing	Continuing
• MPAF : BA 01 : Ballistic Missile...: <i>Minuteman III Replacement Eq-Ballistic BP22</i>	11.195	12.123	9.197	0.000	9.197	6.106	3.818	0.000	0.000	Continuing	Continuing
• MPAF: BA 04: Line Item #000999: <i>Replen Spares/Repair Parts BP25/26</i>	0.000	0.033	1.348	0.000	1.348	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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
LGM-30G Airborne Launch Control System (ALCS-R) TMRR	C/TBD	TBD : TBD	0.000	0.140	Jan 2017	49.306	Aug 2017	53.842	Jun 2018	0.000		53.842	Continuing	Continuing	-
LGM-30G ALCS SIL	MIPR	Aerospace : El Segundo, CA	0.000	0.214	Jan 2016	5.699	Jan 2017	5.709	Jan 2018	0.000		5.709	Continuing	Continuing	-
LGM-30G Automatic Switching Unit (ASU) TMRR/EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	0.000	3.627	May 2016	8.546	Apr 2017	7.635	Dec 2017	0.000		7.635	Continuing	Continuing	-
LGM-30G Fast Rising B-Plug Phase II (FRBP II)	PO	TBD : TBD	0.000	0.100	May 2016	0.000		0.000		0.000		0.000	0.000	0.100	-
LGM-30G Launch Control Center Break-In-Kit EMD	MIPR	Navy Crane : Crane, IN	0.000	0.210	Aug 2016	5.036	Apr 2017	3.671	Jul 2018	0.000		3.671	Continuing	Continuing	-
LGM-30G Launch Control Center Block Upgrade TMRR/EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	0.000	7.647	Mar 2016	22.564	Apr 2017	21.894	Apr 2018	0.000		21.894	Continuing	Continuing	-
LGM-30G Remote Visual Assessment Phase II (RVA II) EMD	C/CPFF	Sentry View Systems : Melbourne, FL	0.000	0.000		6.323	Mar 2017	3.173	May 2018	0.000		3.173	Continuing	Continuing	-
Subtotal			0.000	11.938		97.474		95.924		0.000		95.924	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
LGM-30G Airborne Launch Control System Replacement (ALCS)	MIPR	MITRE : Bedford, MA	0.000	3.981	Jan 2016	2.867	Jan 2017	2.930	Jan 2018	0.000		2.930	Continuing	Continuing	-
LGM-30G Automatic Switching Unit A&AS Support	C/FP	BAE : Layton, UT	0.000	0.622	Oct 2015	0.550	Oct 2016	0.550	Oct 2017	0.000		0.550	Continuing	Continuing	-
LGM-30G Fast Rising B-Plug Phase II (FRBP II) A&AS Support	C/FP	BAE : Layton, UT	0.000	0.645	Dec 2015	0.863	Dec 2016	0.400	Dec 2017	0.000		0.400	0.000	1.908	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Remote Visual Assessment II (RVA II) A&AS Support	C/FP	BAE : Layton, UT	0.000	0.612	Feb 2016	0.484	Oct 2016	0.484	Oct 2018	0.000		0.484	Continuing	Continuing	-
Subtotal			0.000	5.860		4.764		4.364		0.000		4.364	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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) FFRDC	MIPR	Aerospace : El Segundo, CA	0.000	1.682	Jan 2016	1.656	Jan 2017	1.651	Jan 2018	0.000		1.651	Continuing	Continuing	-
LGM-30G Air Launch Control System Replacement (ALCS) PMA	Various	Various : Various	0.000	3.596	Mar 2016	6.359	Jan 2017	14.360	Jan 2018	0.000		14.360	Continuing	Continuing	-
LGM-30G Automatic Switching Unit PMA	Various	Various : Various	0.000	0.343	Nov 2015	2.000	Nov 2016	2.000	Nov 2017	0.000		2.000	Continuing	Continuing	-
LGM-30G Launch Control Center Break-In-Kit PMA	Various	Various : Various	0.000	0.392	Jan 2016	0.797	Apr 2017	0.000		0.000		0.000	Continuing	Continuing	-
LGM-30G Launch Control Center Block Upgrade (LCCBU) PMA	Various	Various : Various	0.000	0.551	Feb 2016	0.316	Feb 2017	0.400	Feb 2018	0.000		0.400	Continuing	Continuing	-
LGM-30G Remote Visual Assessment Phase II (RVA II) PMA	Various	Various : Various	0.000	0.158	Feb 2016	0.673	Feb 2017	0.685	Feb 2018	0.000		0.685	Continuing	Continuing	-
Subtotal			0.000	6.722		11.801		19.096		0.000		19.096	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Milestone C (Jan 2019)																												
LCCB Production and Deployment Phase																												
LCCB IOC (Jun 2019)																												
LCCBU Technology Maturation & Risk Reduction Phase																												
LCCBU PDR (Apr 2017)																												
LCCBU Milestone B (May 2017)																												
LCCBU Engineering and Manufacturing Development Phase																												
LCCBU CDR (Oct 2017)																												
LCCBU Milestone C (Jun 2018)																												
LCCBU Production and Deployment Phase																												
LCCBU Required Assets Available (Jan 2020)																												
RVA II PDR (Jul 2017)																												
RVA II Milestone B (Aug 2016)																												
RVA II Engineering and Manufacturing Development Phase																												
RVA II CDR (Mar 2018)																												
RVA II Milestone C (Sep 2018)																												
RVA II Production and Deployment Phase																												
RVA II IOC (Feb 2019)																												
RVA II FOC (Feb 2022)																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
ALCS-R Requirements Development	1	2016	4	2016
ALCS-R Technology Maturation and Risk Reduction Phase	1	2016	3	2020
ALCS-R PDR (Oct 2018)	1	2019	1	2019
ALCS-R Milestone B (Apr 2020)	3	2020	3	2020
ALCS-R Engineering and Manufacturing Development Phase (Jun 2020)	3	2020	3	2022
ALCS-R CDR (Dec 2020)	1	2021	1	2021
ALCS-R Milestone C (May 2022)	3	2020	3	2020
ALCS-R Production and Development Phase	2	2022	4	2022
ASU Technology Maturation and Risk Reduction phase	3	2016	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 (Nov 2018)	1	2019	1	2019
ASU Milestone C (Mar 2019)	2	2019	2	2019
ASU IOC (Apr 2022)	3	2022	3	2022
ASU Production and Deployment Phase	3	2019	4	2022
FRBP II Milestone B (Aug 2016)	4	2016	4	2016
FRBP II Material Solution Analysis Phase	1	2017	4	2018
LCCB Milestone B (Mar 2017)	2	2017	2	2017
LCCB Engineering and Manufacturing Development Phase	2	2017	4	2018
LCCB CDR (Jan 2018)	1	2018	1	2018
LCCB Milestone C (Jan 2019)	1	2019	1	2019
LCCB Production and Deployment Phase	1	2019	2	2019

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
LCCB IOC (Jun 2019)	3	2019	3	2019
LCCBU Technology Maturation & Risk Reduction Phase	1	2016	3	2017
LCCBU PDR (Apr 2017)	3	2017	3	2017
LCCBU Milestone B (May 2017)	3	2017	3	2017
LCCBU Engineering and Manufacturing Development Phase	3	2017	3	2018
LCCBU CDR (Oct 2017)	1	2018	1	2018
LCCBU Milestone C (Jun 2018)	3	2018	3	2018
LCCBU Production and Deployment Phase	3	2018	2	2020
LCCBU Required Assets Available (Jan 2020)	2	2019	2	2020
RVA II PDR (Jul 2017)	4	2017	4	2017
RVA II Milestone B (Aug 2016)	4	2016	4	2016
RVA II Engineering and Manufacturing Development Phase	2	2017	2	2019
RVA II CDR (Mar 2018)	2	2018	2	2018
RVA II Milestone C (Sep 2018)	4	2018	4	2018
RVA II Production and Deployment Phase	2	2019	2	2022
RVA II IOC (Feb 2019)	2	2019	2	2019
RVA II FOC (Feb 2022)	2	2022	2	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
672984: <i>MM III Baseline Support</i>	0.000	45.752	40.205	59.812	0.000	59.812	13.342	14.927	9.021	13.033	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0101213F, project 672984, LGM-30G Arm Disarm Switch Replacement (ADSR), is a new start.

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 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 2016	FY 2017	FY 2018
Title: LGM-30G Arm Disarm Switch Replacement (ADSR)	0.000	0.000	0.272
<p>Description: The ADSR program (FY18 New Start) 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 in FY18 without a repair/refurbish mitigation and by approximately FY22 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 new, more reliable A/D switch that meets requirements and PDM production quantities. ADSR is required to continue Booster and PSRE PDMs through 2030.</p>			
FY 2016 Accomplishments:	N/A		
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
N/A				
<p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Develop acquisition documentation, prepare for Milestone B 				
<p>Title: LGM-30G Cadmium Replacement Program (CaDRP)</p> <p>Description: Program was cancelled in FY16. Cadmium plating is used in the LF and LCC Motor Generators. Motor generator parts are coated with the material to inhibit corrosion, ensure a low electrical signature (bonding and grounding) and aide in the ability to withstand a nuclear environment. Cadmium is one of the EPA-17 chemicals selected for reduction. Executive Directive 13148 and FAR part 23.703 states, "eliminate or reduce the generation of hazardous waste and the need for special material processing." CaDRP will provide a cadmium replacement coating with the same properties for corrosion inhibiting, bonding and grounding, and nuclear event survivability to meet these directives. Process must meet the weapon system parameters for form, fit, function, system safety, and hardness.</p>		2.443	0.000	0.000
<p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Program canceled. 				
<p>FY 2017 Plans:</p> <p>N/A</p>				
<p>FY 2018 Plans:</p> <p>N/A</p>				
<p>Title: LGM-30G Flight Test Telemetry and Termination System (FT3)</p> <p>Description: FT3 designs, develops, fabricates and tests replacements for the Mod 7 Instrumentation Wafer, associated Signal Conditioner Monitor Group (SCMG), as well as the Integrated Instrumentation System (IIS), Flight Destruct System (FDS) and the Launch Safety System (LSS). This will replace the unsupported instrumentation wafer and FDS that do not meet current Range Safety Standards. The Mod 7 instrumentation wafer transmits missile performance telemetry and position data and receives command destruct messages during MM III Operational Test Launches (OTLs) and developmental flight test evaluations. The SCMG and associated cabling capture Reentry System performance data during OTLs and developmental flight tests. FT3 will replace the current MM III OTL flight destruct capability used in the event of a flight anomaly where it would be necessary to destroy the missile. LSS replaces the current unique, specialized test system at Vandenberg AFB used to monitor and control test launch flights and ground support equipment. The current LSS is over 15-years old and experiencing major supportability issues. LSS failure trends are increasing due to hardware aging and obsolescence creating a need for workarounds, waivers and contractor intervention. A new Instrumentation Wafer and FDS are required to continue OTLs through 2030. A new LSS is required to field the Instrumentation Wafer and the FDS.</p>		35.259	20.076	39.868

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018
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<p><i>FY 2016 Accomplishments:</i></p> <ul style="list-style-type: none"> • Conducted System Requirements Review • Conducted the Preliminary Design Review <p><i>FY 2017 Plans:</i></p> <ul style="list-style-type: none"> . Conduct Milestone B to gain entry into the Engineering Manufacturing Development (EMD) phase . Design, develop, fabricate and test prototypes of the IIS, FDS and LSS . Conduct system design and integrate/ verify at component and system level through ground testing . Prepare for Critical Design Review <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> . Conduct CDR . Procure long lead items . Build qualification hardware and conduct qualification testing . Prepare for Production Readiness Review . Conduct Test Readiness Reviews . Conduct Production Readiness Review . 			
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<i>Title:</i> LGM-30G Baseline Support	1.343	0.100	5.000
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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><i>FY 2016 Accomplishments:</i></p> <ul style="list-style-type: none"> • Conducted studies of system performance. • Paid contract closeout costs. • Conducted cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities. <p><i>FY 2017 Plans:</i></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><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> • Conduct studies of system performance. 			
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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> • Pay contract closeout costs. • Conduct cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities. 				
<p>Title: LGM-30G Ground Test Upgrade (GTU)</p> <p>Description: GTU will address parts obsolescence through a design that replaces the Simulated Electronic Launch Minuteman (SELM) and Guided Missile Launcher Electronic Circuit (GMLEC) test sets, and the Re-entry System Simulator. Modifications being added include Reentry System (RS) Fuze Simulator, and A4 drawer interface change. GTU supports AFGSC Force Development Evaluation testing by enabling operational checkout and test of LFs up to the point of an actual MM III launch.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Completed contract modifications • Continued with Technology Maturation Risk Reduction (TMRR) Phase <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Complete TMRR phase with an approved Preliminary Design Review (PDR) • Prepare and conduct successful Milestone B • Begin Engineering and Manufacturing Development (EMD) phase <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Complete Critical Design Review • Develop 3 SELM Prototypes • Develop 3 GMLEC Prototypes • Develop RS Simulator Fix 		0.452	3.530	4.354
<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 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Continued Technology Maturation and Risk Reduction (TMRR) Phase • Continued design, development, verification of SDS requirements <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Conduct Preliminary Design Review (PDR) • Complete Milestone B 		6.255	16.499	10.318

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> • Begin the Engineering and Manufacturing Development phase and complete Critical Design Review • Complete test readiness review, qualification testing, weapon system testing, electromagnetic interference testing, and TMRR phase <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> . Conduct CDR . Build qualification hardware and conduct qualification testing . Prepare for Production Readiness Review . Conduct Test Readiness Reviews . Conduct Production Readiness Review 			
Accomplishments/Planned Programs Subtotals	45.752	40.205	59.812

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• MPAF: BA 03: Line Item #M30MLG: <i>Minuteman III Modifications BP21</i>	5.069	21.867	0.000	0.000	0.000	0.000	0.000	6.600	8.000	Continuing	Continuing
• MPAF: BA 01: Line Item #00099L: <i>Missile Replacement Eq-Ballistic BP22</i>	0.000	0.000	5.205	0.000	5.205	9.623	0.000	0.000	0.000	Continuing	Continuing
• MPAF: BA 04: Line Item #000999: <i>Replen Spares/Repair Parts BP25/26</i>	0.000	0.805	0.224	0.000	0.224	0.000	13.544	13.815	14.163	Continuing	Continuing

Remarks

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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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: FY 2018 Air Force **Date: May 2017**

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Cadmium Replacement Program EMD	C/CPAF	Northrop Grumman : Clearfield, UT	0.000	2.443	Apr 2016	0.000		0.000		0.000		0.000	0.000	2.443	-
LGM-30G Flight Test Telemetry and Termination System (FT3) TMRR/EMD	C/CPIF	Boeing : Clearfield, UT	0.000	32.049	Oct 2016	18.856	Oct 2017	36.055	Oct 2018	0.000		36.055	Continuing	Continuing	-
LGM-30G Ground Test Upgrade (GTU) TMRR/EMD	C/CPAF	Northrop Grumman Technical Services : Clearfield, UT	0.000	0.042	Mar 2016	2.202	Mar 2017	2.999	Mar 2018	0.000		2.999	Continuing	Continuing	-
LGM-30G Squadron Data Simulator (SDS) TMRR/EMD	C/CPFF	Lockheed Martin : Bethesda, MD	0.000	5.350	Sep 2016	12.569	Sep 2017	6.651	Sep 2018	0.000		6.651	Continuing	Continuing	-
Subtotal			0.000	39.884		33.627		45.705		0.000		45.705	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	Boeing : Clearfield, UT	0.000	0.959	Oct 2016	0.600	Oct 2017	0.600	Oct 2018	0.000		0.600	Continuing	Continuing	-
LGM-30G Baseline Support	C/Variou	BAE : Clearfield, UT	0.000	1.343	Mar 2016	0.100	Mar 2017	5.000	Mar 2018	0.000		5.000	Continuing	Continuing	-
LGM-30G Squadron Data Simulator (SDS)	C/FFP	BAE : Clearfield, UT	0.000	0.446	Dec 2015	0.495	Sep 2017	0.505	Sep 2018	0.000		0.505	Continuing	Continuing	-
Subtotal			0.000	2.748		1.195		6.105		0.000		6.105	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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/CPIF	Boeing : Clearfield, UT	0.000	1.289	Oct 2016	0.000		0.347	Sep 2018	0.000		0.347	Continuing	Continuing	-
LGM-30G Ground Test Upgrades NSCCA-PATE / IV&V	C/CPFF	Northrop Grumman Information Technology : Clearfield, UT	0.000	0.000		0.209	May 2017	0.225	May 2018	0.000		0.225	Continuing	Continuing	-
LGM-30G Squadron Data Simulator (SDS)	TBD	TBD : TBD	0.000	0.000		1.535	Nov 2016	1.245	Nov 2017	0.000		1.245	Continuing	Continuing	-
Subtotal			0.000	1.289		1.744		1.817		0.000		1.817	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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/FFP	BAE Systems : Clearfield, UT	0.000	0.000		0.000		0.272	Mar 2018	0.000		0.272	Continuing	Continuing	-
LGM-30G Flight Test Telemetry and Termination System (FT3) PMA	Various	Various : Various	0.000	0.962	Oct 2016	0.620	Oct 2017	2.866	Oct 2018	0.000		2.866	Continuing	Continuing	-
LGM-30G Ground Test Upgrades A&AS	C/FFP	BAE System : Clearfield, UT	0.000	0.410	Jun 2016	0.549	Jun 2017	0.550	Jun 2018	0.000		0.550	Continuing	Continuing	-
LGM-30G Ground Test Upgrades PMA	Various	Various : Various	0.000	0.000		0.570	Mar 2017	0.580	Mar 2018	0.000		0.580	Continuing	Continuing	-
LGM-30G Squadron Data Simulator PMA	Various	Various : Various	0.000	0.459	Apr 2016	1.900	Sep 2017	1.917	Sep 2018	0.000		1.917	Continuing	Continuing	-
Subtotal			0.000	1.831		3.639		6.185		0.000		6.185	-	-	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	45.752	40.205	59.812	0.000	59.812	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force	Date: May 2017
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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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Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 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: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
ADSR Milestone B (Jan 2019)																												
ADSR Engineering and Manufacturing Development Phase																												
ADSR Milestone C (Jan 2021)																												
ADSR Production and Deployment Phase																												
GTU Technology Maturation and Risk Reduction Phase																												
GTU PDR (Mar 2017)																												
GTU Milestone B (May 2017)																												
GTU Engineering and Manufacturing Development Phase																												
GTU CDR (Nov 2017)																												
GTU Milestone C (May 2019)																												
GTU Production and Deployment Phase																												
GTU IOC (Oct 2019)																												
GTU FOC (Mar 2020)																												
FT3 Technology Maturation and Risk Reduction Phase																												
FT3 PDR (Dec 2016)																												
FT3 Milestone B (Feb 2017)																												
FT3 Engineering and Manufacturing Development Phase																												
FT3 CDR (Nov 2017)																												
FT3 Milestone C (March 2019)																												
FT3 Production and Deployment Phase																												
FT3 RAA (Nov 2019)																												

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
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 (Sep 2017)					████																							
SDS Milestone C (Jan 2019)													████															
SDS Production and Deployment Phase													████████████████████															
SDS RAA (May 2020)																	████											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
ADSR Milestone B (Jan 2019)	2	2019	2	2019
ADSR Engineering and Manufacturing Development Phase	2	2019	1	2021
ADSR Milestone C (Jan 2021)	2	2021	2	2021
ADSR Production and Deployment Phase	2	2021	4	2022
GTU Technology Maturation and Risk Reduction Phase	1	2016	2	2017
GTU PDR (Mar 2017)	2	2017	2	2017
GTU Milestone B (May 2017)	3	2017	3	2017
GTU Engineering and Manufacturing Development Phase	3	2017	2	2019
GTU CDR (Nov 2017)	1	2018	1	2018
GTU Milestone C (May 2019)	3	2019	3	2019
GTU Production and Deployment Phase	3	2019	2	2020
GTU IOC (Oct 2019)	1	2020	1	2020
GTU FOC (Mar 2020)	2	2020	2	2020
FT3 Technology Maturation and Risk Reduction Phase	1	2016	3	2016
FT3 PDR (Dec 2016)	1	2017	1	2017
FT3 Milestone B (Feb 2017)	2	2017	2	2017
FT3 Engineering and Manufacturing Development Phase	2	2017	4	2020
FT3 CDR (Nov 2017)	1	2018	1	2018
FT3 Milestone C (March 2019)	2	2019	2	2019
FT3 Production and Deployment Phase	2	2019	4	2022
FT3 RAA (Nov 2019)	1	2020	1	2020
SDS Technology Maturation and Risk Reduction Phase	1	2016	1	2017
SDS Preliminary Design Review (Oct 2016)	1	2017	1	2017

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Events	Start		End	
	Quarter	Year	Quarter	Year
SDS Milestone B (Mar 2017)	2	2017	2	2017
SDS Engineering and Manufacturing Development Phase	2	2017	1	2019
SDS Critical Design Review (Sep 2017)	4	2017	4	2017
SDS Milestone C (Jan 2019)	2	2019	2	2019
SDS Production and Deployment Phase	2	2019	4	2020
SDS RAA (May 2020)	3	2020	3	2020

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
672985: <i>MM Support Equip</i>	0.000	27.834	28.714	31.649	0.000	31.649	7.880	12.085	6.132	6.256	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 2016	FY 2017	FY 2018
Title: LGM-30G G6B4 Build Equipment Replacement (G6B4 BER)	0.000	1.289	6.353
<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 2016 Accomplishments: N/A</p> <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Award TMRR contract and begin design and build of replacement Hydrogen Fill Station, Rotor Balance Test Station, and the Gyro F-coefficient Station non-computer components • Conduct Preliminary Design Review and Milestone B <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> • Continue build and start test of replacement Hydrogen Fill Station and the Gyro F-coefficient Station non-computer components • Continue build and test of the first Rotor Balance Test Station 			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018
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<ul style="list-style-type: none"> • Conduct Test Readiness Review, Production Readiness Review, Functional Configuration Audit, Physical Configuration Audit, and Critical Design Review 			
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Title: LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT)	0.000	0.745	5.974
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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 2016 Accomplishments:
N/A

FY 2017 Plans:

- Prepare and conduct successful Milestone B
- Conduct Source Selection

FY 2018 Plans:

- Initiate Engineering and Manufacturing Development (EMD) contract award actions to validate the design of new software and begin code development.
- Conduct Preliminary Design Review (PDR) and Critical Design Review (CDR)

Title: LGM-30G Transporter Erector Replacement Program (TERP)	3.142	6.984	0.000
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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 2016 Accomplishments:

- Determined maneuverability and axle weight requirements.
- Drafted and sent "Contract Modification Request for Propopsal" to contractor.
- Evaluated contractors proposal.
- Negotiated and awarded contract modification.

FY 2017 Plans:

- Conduct delta CDR for tractor redesign.
- Complete tractor redesign, development, and fabrication.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> • Complete delta Test Readiness Review, delta system qualification testing, and tractor redesign qualification testing. • Verification and delivery of tech data to accompany First Article Test and Evaluations accomplished. • Certify design readiness for Full Rate Production decision. • Conduct Milestone C. <p>FY 2018 Plans: N/A</p>				
<p>Title: LGM-30G Reentry Support Equipment Replacement Program (RSERP)</p> <p>Description: Program cancelled at the end of FY16. Design, develop, fabricate and test the RSERP to modify or replace the over 30 year old suite of test equipment necessary to continue checkout, screening, repair, and refurbishment of Mk12A/Mk21 Arming Fuzing Assemblies.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • RSERP was canceled at the end of FY2016 <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: N/A</p>		9.480	0.000	0.000
<p>Title: LGM-30G Payload Transporter Replacement (PTR)</p> <p>Description: 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>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Completed fabrication of two PTR prototypes. • Conducted Test Readiness Review. • Conducted over 500 system qualification tests. • Closed 140 Test Anomaly Reports. • Completed initial review of 3000 Level three drawings. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • Continue Supporting Engineering and Manufacturing Phase 		9.951	10.938	4.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> Develop trainer requirements <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> Conduct Milestone C Initiate Production and Development Phase 				
<p>Title: LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU)</p> <p>Description: Designs and develops the capabilities to replace the current PADS CEIU mitigating obsolescence and upgrading the system to transmit over the internet using Internet Protocols (IP). The system transmits MM III Inertial Measurement Unit (IMU) Performance Data (IPD) from Launch Control Centers to the PADS located at the support base. The new system will use the more reliable and secure IP transmission method. The update effort consists of rewriting the CEIU embedded software to a robust language using secure coding practices, and change the CEIU design from telephone to IP transmission. In addition, the PADS interfacing system is to be updated to interface with the updated CEIU design.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> Began Technology Maturation and Risk Reduction Phase (TMRR) <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> Conduct a preliminary design review (PDR) Prepare for and conduct a successful Milestone B Begin Engineering Manufacturing Development (EMD) Phase <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> Conduct a Critical Design review (CDR). Prepare for and conduct a successful Milestone C Begin Production and Development Phase 		1.259	4.834	7.704
<p>Title: LGM-30G Alignment Set Test Set (ASTS)</p> <p>Description: 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.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> Performed re-calibration of hardware on Engineering Development Unit (EDU) Resumed software development effort for ASTS software suite Conducted software integration testing on EDU Completed assembly of Production Representative Prototype Unit (PRPU) 		4.002	1.307	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> Conducted confidence testing/integration efforts and perform accuracy verification testing on PRPU <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> Complete Test Readiness Review and qualification and acceptance testing on PRPU Complete the build and testing of second PRPU unit <p>FY 2018 Plans: N/A</p>				
<p>Title: LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER)</p> <p>Description: 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 Fill stations and one Slip Ring/Module Test station.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> Begin evaluation of the seven PIGA Test and Repair stations Purchase Commercial off the Shelf (COTS) items for all 7 test stations Begin drawing updates for the integration of the COTS items <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> Purchase more COTS items for all 7 test stations Continue drawing updates for the integration of the COTS items Conduct Preliminary Design Review Prepare and conduct successful Milestone B Begin Engineering and Manufacturing Development (EMD) Phase Prepare and conduct successful Critical Design Review 		0.000	2.617	7.618
Accomplishments/Planned Programs Subtotals		27.834	28.714	31.649

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• MPAF: BA03: Line Item # M30MLG: <i>MM III Modifications BP21</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.526	0.000	0.000	Continuing	Continuing
• MPAF: BA01: Line Item# 00099L: <i>Missile Replacement Eq-Ballistic BP22</i>	54.523	56.016	76.001	0.000	76.001	34.770	15.231	9.757	0.000	Continuing	Continuing
• MPAF: BA04: Line Item #000999: <i>Replen Spares/ Repair Parts BP25/26</i>	0.000	3.413	0.326	0.000	0.326	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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Reentry Support Equipment Replacement Program (RSERP) TPS	C/TBD	TBD : TBD	0.000	8.056	Jan 2017	0.000		0.000		0.000		0.000	0.000	8.056	-
LGM-30G G6B4 Build Equipment Replacement (G6B4 BER)	SS/FPIF	Boeing : Clearfield, UT	0.000	0.000		1.180	Mar 2017	5.577	Oct 2017	0.000		5.577	Continuing	Continuing	-
LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) EMD	C/FFP	TBD : TBD	0.000	0.000		0.547	Jun 2017	5.828	Dec 2017	0.000		5.828	Continuing	Continuing	-
LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) EMD	TBD	TBD : TBD	0.000	0.000		2.355	May 2017	7.283	May 2018	0.000		7.283	Continuing	Continuing	-
LGM-30G Transporter Erector Replacement Program (TERP) EMD	C/FPIF	DRS Environmental Systems : Cincinnati, OH	0.000	2.546	May 2016	3.484	May 2017	0.000		0.000		0.000	Continuing	Continuing	-
LGM-30G Payload Transporter Replacement (PTR) EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	0.000	6.557	Nov 2015	10.938	May 2017	4.000	Oct 2017	0.000		4.000	Continuing	Continuing	-
LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU) Software Development	SS/CPIF	Boeing : Layton, UT	0.000	1.226	Jul 2016	4.321	Apr 2017	7.284	Apr 2018	0.000		7.284	Continuing	Continuing	-
LGM-30G Alignment Set Test Set (ASTS) Engineering Development	SS/CPAF	Boeing : Heath, OH	0.000	4.000	Jan 2016	1.287	Jan 2017	0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			0.000	22.385		24.112		29.972		0.000		29.972	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-	-	-	-	-	-	-	-	-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 (PTR) Survivability Testing	MIPR	Various : Various	0.000	1.988	Apr 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			0.000	1.988		0.000		0.000		0.000		0.000	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Reentry Support Equipment Replacement Program (RSERP) TPS	Various	Various : Various	0.000	1.424	Mar 2016	0.000		0.000		0.000		0.000	0.000	1.424	-
LGM-30G G6B4 Build Equipment Replacement (G6B4 BER)	C/TBD	BAE Systems : Layton, UT	0.000	0.000		0.109	Mar 2017	0.397	Oct 2017	0.000		0.397	Continuing	Continuing	-
LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) PMA	Various	Various : Various	0.000	0.000		0.198	Jan 2017	0.525	Jan 2018	0.000		0.525	Continuing	Continuing	-
LGM-30G Transporter Erector Replacement Program (TERP) PMA	Various	Various : Various	0.000	0.596	Dec 2015	3.500	Feb 2017	0.000		0.000		0.000	Continuing	Continuing	-
LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) PMA	TBD	TBD : TBD	0.000	0.000		0.262	May 2017	0.335	May 2018	0.000		0.335	Continuing	Continuing	-
LGM-30G Performance Assessment Data	Various	Various : Various	0.000	0.033	Apr 2016	0.513	Apr 2017	0.420	Apr 2018	0.000		0.420	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

G6B4 BER TMRR Phase (Mar 2017)	[Redacted]																											
G6B4 BER PDR (Jul 2017)	[Redacted]																											
G6B4 BER Milestone B (Sep 2017)	[Redacted]																											
G6B4 BER Engineering and Manufacturing Development Phase (Oct 2017)	[Redacted]																											
G6B4 BER CDR (Apr 2018)	[Redacted]																											
G6B4 BER Milestone C (Jun 2019)	[Redacted]																											
G6B4 BER Production and Deployment Phase (Jun 2019)	[Redacted]																											
G6B4 BER FCA/PCA (Jun 2019)	[Redacted]																											
G6B4 BER Required Assets Available (Sep 2020)	[Redacted]																											
CMPT Milestone B (Apr 2017)	[Redacted]																											
CMPT Engineering and Manufacturing Development Phase	[Redacted]																											
CMPT PDR (Oct 2017)	[Redacted]																											
CMPT CDR (May 2018)	[Redacted]																											
CMPT Milestone C (Dec 2019)	[Redacted]																											
CMPT Production and Deployment Phase	[Redacted]																											
CMPT RAA (Jun 2020)	[Redacted]																											
PTR Engineering and Manufacturing Development Phase	[Redacted]																											
PTR Milestone C (Oct 2017)	[Redacted]																											
PTR Production and Deployment Phase	[Redacted]																											
PTR IOC (Jul 2019)	[Redacted]																											
PTR FOC (Dec 2022)	[Redacted]																											

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
TERP Engineering and Manufacturing Development Phase	████████████████																											
TERP Milestone C (Nov 2017)									████																			
TERP Production and Deployment Phase									████████████████████████████████																			
TERP IOC (Nov 2018)													████															
TERP FOC (Apr 2020)																	████											
PADS CEIU Technology Maturation and Risk Reduction (TMRR) Phase					████████████████																							
PADS CEIU Milestone B (Aug 2017)									████																			
PADS CEIU Engineering and Manufacturing Development Phase									████████████████																			
PADS CEIU PDR (Jan 2017)					████																							
PADS CEIU CDR (Dec 2017)									████																			
PADS CEIU Milestone C (Jun 2018)													████															
PADS CEIU Production and Deployment Phase													████████████████															
PADS CEIU RAA (Jul 2019)																	████											
PIGA BER TMRR Phase					████████████████																							
PIGA BER Milestone B (Jun 2018)									████																			
PIGA BER Engineering and Manufacturing Development Phase									████████████████████████████████																			
PIGA BER PDR (Mar 2018)									████																			
PIGA BER CDR (Sep 2018)													████															
PIGA BER Milestone C (Jul 2019)																	████											
PIGA BER Production and Deployment Phase													████████████████															
PIGA BER RAA (Sep 2020)																	████											
ASTS Engineering and Manufacturing Development Phase	████████████████																											

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Production and Deployment Phase								■																				
ASTS FCA/PCA (Jul 2017)												■																
ASTS TRR (Feb 2017)								■																				
ASTS RAA (Sep 2017)												■																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
G6B4 BER TMRR Phase (Mar 2017)	2	2017	4	2017
G6B4 BER PDR (Jul 2017)	4	2017	4	2017
G6B4 BER Milestone B (Sep 2017)	4	2017	4	2017
G6B4 BER Engineering and Manufacturing Development Phase (Oct 2017)	1	2018	2	2020
G6B4 BER CDR (Apr 2018)	3	2018	3	2018
G6B4 BER Milestone C (Jun 2019)	3	2019	3	2019
G6B4 BER Production and Deployment Phase (Jun 2019)	3	2019	4	2020
G6B4 BER FCA/PCA (Jun 2019)	3	2019	3	2019
G6B4 BER Required Assets Available (Sep 2020)	4	2020	4	2020
CMPT Milestone B (Apr 2017)	3	2017	3	2017
CMPT Engineering and Manufacturing Development Phase	3	2017	1	2020
CMPT PDR (Oct 2017)	1	2018	1	2018
CMPT CDR (May 2018)	3	2018	3	2018
CMPT Milestone C (Dec 2019)	1	2020	1	2020
CMPT Production and Deployment Phase	2	2020	4	2020
CMPT RAA (Jun 2020)	3	2020	3	2020
PTR Engineering and Manufacturing Development Phase	1	2016	1	2018
PTR Milestone C (Oct 2017)	1	2018	1	2018
PTR Production and Deployment Phase	1	2018	4	2022
PTR IOC (Jul 2019)	2	2019	2	2019
PTR FOC (Dec 2022)	3	2022	3	2022
TERP Engineering and Manufacturing Development Phase	1	2016	1	2018
TERP Milestone C (Nov 2017)	1	2018	1	2018

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
TERP Production and Deployment Phase	2	2018	3	2020
TERP IOC (Nov 2018)	1	2019	1	2019
TERP FOC (Apr 2020)	3	2020	3	2020
PADS CEIU Technology Maturation and Risk Reduction (TMRR) Phase	4	2016	4	2017
PADS CEIU Milestone B (Aug 2017)	4	2017	4	2017
PADS CEIU Engineering and Manufacturing Development Phase	4	2017	3	2018
PADS CEIU PDR (Jan 2017)	2	2017	2	2017
PADS CEIU CDR (Dec 2017)	1	2018	1	2018
PADS CEIU Milestone C (Jun 2018)	3	2018	3	2018
PADS CEIU Production and Deployment Phase	4	2018	4	2019
PADS CEIU RAA (Jul 2019)	4	2019	4	2019
PIGA BER TMRR Phase	2	2017	3	2018
PIGA BER Milestone B (Jun 2018)	3	2018	3	2018
PIGA BER Engineering and Manufacturing Development Phase	3	2018	1	2020
PIGA BER PDR (Mar 2018)	2	2018	2	2018
PIGA BER CDR (Sep 2018)	4	2018	4	2018
PIGA BER Milestone C (Jul 2019)	4	2019	4	2019
PIGA BER Production and Deployment Phase	4	2019	4	2020
PIGA BER RAA (Sep 2020)	4	2020	4	2020
ASTS Engineering and Manufacturing Development Phase	1	2016	3	2017
ASTS Production and Deployment Phase	3	2017	4	2017
ASTS FCA/PCA (Jul 2017)	4	2017	4	2017
ASTS TRR (Feb 2017)	2	2017	2	2017
ASTS RAA (Sep 2017)	4	2017	4	2017

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
672986: <i>MM Crypto Mods</i>	0.000	30.386	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	12	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 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 2016	FY 2017	FY 2018
Title: LGM-30G ICBM Cryptography Upgrade II (ICU II)	30.386	0.000	0.000
Description: ICU II completes design and development, implements KS-60 remote key/code change, irreversible transformation capabilities, and prevents continuous signal lockout.			
FY 2016 Accomplishments:			
<ul style="list-style-type: none"> Continued weapon system testing with final central processor, nuclear certification for A4 Drawer. Continued development, testing, certification of related system software. Began contract effort to develop Support Equipment (SE) and package manufactured processors for safe storage. 			
FY 2017 Plans:			
<ul style="list-style-type: none"> Continue to support Engineering and Manufacturing Development Phase 			
FY 2018 Plans:			
<ul style="list-style-type: none"> Conduct user training Prepare and conduct successful TRR and Milestone C 			
Accomplishments/Planned Programs Subtotals	30.386	0.000	0.000

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• MPAF: BA 03: Line Item# M30MLG: <i>MM III Modifications BP21</i>	0.000	31.639	29.559	0.000	29.559	58.378	46.082	31.847	3.264	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF: BA 04: Line Item #000999: <i>Replen Spares/ Repair Parts BP25/26</i>	0.000	2.367	1.231	0.000	1.231	4.190	0.150	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 Surety Cross Check Analysis/Performance Analysis and Technical Evaluation (NSCCA/PATE) Independent Validation & Verification (IV&V). This contract is driven by critical nuclear surety requirements to perform an independent assessment of all modifications to nuclear-certified software. The FY16 Pre-Production contract will be awarded on the Ground Systems Sustainment Contract (GSSC). 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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	207.933	26.954	39.148	25.736	0.000	25.736	0.000	0.000	0.000	0.000	0.000	299.771
675029: <i>ISPAN Increment 5</i>	0.000	0.000	8.911	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.911
675059: <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>	201.065	26.954	30.237	25.736	0.000	25.736	0.000	0.000	0.000	0.000	0.000	283.992

Program MDAP/MAIS Code: 481

⁽⁺⁾ The sum of all Prior Years is \$6.868 million less than the represented total due to several projects ending

Note

In FY 2018, PE 0101313F, Strategic War Planning System - USSTRATCOM, Project 675029, ISPAN Increment 5 efforts will transfer to PE 0101324F, Integrated Strategic Planning and Analysis Network, Project 675029, ISPAN Increment 5, in order to provide improved transparency.

A. Mission Description and Budget Item Justification

In FY17 ISPAN Increment 5 was a new start PE 0101313F.

The mission of the US Strategic Command (USSTRATCOM) is to establish and provide full-spectrum global strike, coordinate space and information operations capabilities to meet both deterrent and decisive national security objectives, and to provide operational space support, integrated missile defense, Global Command Control Communications and Computers Intelligence Surveillance and Reconnaissance (C4ISR), and specialized planning expertise to the joint warfighter. This mission has been defined by the 2011 Unified Command Plan (UCP) change 1. To enable completion of these missions, USSTRATCOM is modernizing the Integrated Strategic Planning and Analysis Network (ISPAN) (formerly known as Strategic War Planning System (SWPS)).

ISPAN is a multi-increment effort designed to incrementally add capability for USSTRATCOM and the National Command Authorities (NCA). The program is currently comprised of four increments (ISPAN Block 1, ISPAN Increment 2, Increment 4, and Increment 5.) Block 1, Increment 2, Increment 4, and FY17 Increment 5 are in PE 0101313F. FY18-21 Increment 5 are in PE 0101324F. ISPAN Block 1 modified and delivered capability for both the Global Adaptive Planning Collaborative Information Environment (GAP CIE) and the Mission Planning and Analysis System (MPAS) components. It achieved Full Deployment in July 2010. ISPAN Increment 2 further developed and provided increased capability for GAP CIE. ISPAN Increment 4 starts the modernization of MPAS. ISPAN Increment 5 will complete the modernization. MPAS modernization will enable USSTRATCOM to revitalize its unique Force Planning mission of developing Joint Staff Level 1 through Level IV nuclear and conventional attack options for national and theater requirements. Force planning has become more complicated due to weapons reductions, increased accuracy requirements and delivery options, changing targeting requirements, shortened timelines for senior leader decision-making, and reduced financial resources to develop and sustain these national planning capabilities. ISPAN will modernize MPAS and allow it to fulfill the requirements for a more timely, flexible, and agile planning capability. When ISPAN Increment 5 is complete the system will support the warfighter in both deliberate and adaptive planning environments while allowing the National Command Authority (NCA) to employ the full spectrum of kinetic and non-kinetic weapons. Additionally, studies and analyses will be conducted to identify

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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options for evolving the system as interfacing 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)).

Global Integrated Sensor Network (GSIN) establishes a unified schema integrating disparate Missile Warning/Missile Defense (MW/MD) data into a single exposed data set providing redundant MW/MD data to facilitate the rapid exchange of information across multiple missions and removes information ambiguity that delays time critical national C2 decision-making processes. GSIN networks together all sensors, from tactical to strategic (including the Nation's most modern and capable assets) taking advantage of their larger numbers, improved algorithms, mobility and forward deployment to provide earlier cross-cueing and expanded decision space when every second counts. GSIN will permit an IP-based User Defined Operational Picture (UDOP) to augment voice conferencing and rapidly build a single, unambiguous missile event picture allowing real-time senior collaboration for nuclear C2 and improved senior leader situational awareness (SA) and 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.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	28.358	39.148	25.662	0.000	25.662
Current President's Budget	26.954	39.148	25.736	0.000	25.736
Total Adjustments	-1.404	0.000	0.074	0.000	0.074
• 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	-0.500	0.000			
• SBIR/STTR Transfer	-0.904	0.000			
• Other Adjustments	0.000	0.000	0.074	0.000	0.074

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675029: <i>ISPAN Increment 5</i>	0.000	0.000	8.911	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.911
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018, PE 0101313F, Strategic War Planning System - USSTRATCOM, Project 675029, ISPAN Increment 5 efforts will transfer to PE 0101324F, Integrated Strategic Planning and Analysis Network, Project 675029, ISPAN Increment 5, in order to provide improved transparency.

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 2016	FY 2017	FY 2018
Title: Increment 5	0.000	8.911	-
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 2016 Accomplishments: N/A			
FY 2017 Plans: Funds will be used for acquisition program document development and pre-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 NC2 planning enterprise architecture - Develop cybersecurity architecture - Consequences of execution analysis and visualization planning			
Accomplishments/Planned Programs Subtotals	0.000	8.911	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Remarks

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 and Milestone Decision Authority (MDA) is the Under Secretary of Defense, Acquisition Technology & Logistics (AT&L).

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: FY 2018 Air Force **Date: May 2017**

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.000		5.671	Jan 2017	0.000		0.000		0.000	0.000	5.671	-
Subtotal			0.000	0.000		5.671		0.000		0.000		0.000	0.000	5.671	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.000		1.000	Jan 2017	0.000		0.000		0.000	0.000	1.000	-
Systems Engineering Operations	Various	Offutt AFB : Offutt AFB, NE	0.000	0.000		0.800	Jan 2017	0.000		0.000		0.000	0.000	0.800	-
Program Management Administration	Various	Offutt AFB : Offutt AFB, NE	0.000	0.000		1.440	Jan 2017	0.000		0.000		0.000	0.000	1.440	-
Subtotal			0.000	0.000		3.240		0.000		0.000		0.000	0.000	3.240	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force									Date: May 2017		
Appropriation/Budget Activity 3600 / 7			R-1 Program Element (Number/Name) PE 0101313F / Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM				Project (Number/Name) 675029 / ISPAN Increment 5				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	0.000	0.000	8.911	0.000	0.000	0.000	0.000	8.911	-		
Remarks											

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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 (MPAS) Pre-B Risk Reduction Activities
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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
ISPAN Inc 5 (MPAS) Pre-B Risk Reduction Activities	1	2017	4	2017

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675059: <i>Integrated Strategic Planning and Analysis Network (ISPAN)</i>	201.065	26.954	30.237	25.736	0.000	25.736	0.000	0.000	0.000	0.000	0.000	283.992
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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.

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

	FY 2016	FY 2017	FY 2018
Title: ISPAN Increment 4	26.954	30.237	25.736
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.			
FY 2016 Accomplishments:			
- Completed Spiral 1 Government-sponsored Development Test and Evaluation (GDT&E)			
- Continued requirements analysis, design, coding, and test activities for development of a new Mission Planning and Analysis System (MPAS) capability			
- Completed target development, Nuclear Weaponing/Aimpoint Construction, and TSP Weaponing			
- Initiated development of ISPAN Increment 4 Spiral 2 capability.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
-- Developed ability to provide integrated conventional kinetic and non-kinetic plans for integration into level 4 nuclear plans -- Continued foundational development activities necessary to orchestrate work assignments among MPAS subsystems -- Continued to modernize a portion of the Air Vehicle Planning System to improve maintainability and simplify the addition of new capabilities - Initiated Spiral 2 Government-sponsored Development Test and Evaluation (GDT&E) - Initiated Spiral 3 Development activities FY 2017 Plans: - Complete Spiral 2 Government-sponsored Development Test and Evaluation (GDT&E) - Continue requirements analysis, design, coding, and test activities for development of a new Mission Planning and Analysis System (MPAS) capability with Spiral 3 -- Complete development of initial Spirals 1 and 2 planning capabilities (e.g. Plan Management, Operational Orchestration, Attack Structure Management, Weapon Allocation Optimization, and Deliberate and Crisis Action Planning Application improvements) -- Complete modernization of the Air Vehicle Planning System to enhance sustainment and enhance capabilities to support Deliberate and Crisis Action Planning - Complete Spiral 3 Development - Prepare for Initial Operational Test and Evaluation (IOT&E) of ISPAN Increment 4 capability - Initiate planning for the analysis, design, and coding of the Post Increment Enhancement (PIE) phase FY 2018 Plans: - Initiate and complete the analysis, design, and coding of the Post Increment Enhancement (PIE) phase.			
Accomplishments/Planned Programs Subtotals	26.954	30.237	25.736

C. Other Program Funding Summary (\$ in Millions)										
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>
• OPAF: BA03: Line Item # 833560: <i>Integrated Strategic Planning and Analysis Network</i>	9.597	9.331	9.187	0.000	9.187	9.068	9.228	9.395	9.563	Continuing
Remarks										Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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 and Milestone Decision Authority (MDA) is the Under Secretary of Defense, Acquisition Technology & Logistics (AT&L).

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: FY 2018 Air Force **Date:** May 2017

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>
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	114.006	0.000		0.000		0.000		0.000		0.000	0.000	114.006	114.006
ISPAN Inc 4 Pre-B Risk Reduction	C/CPIF	Various : Various	12.548	0.000		0.000		0.000		0.000		0.000	0.000	12.548	12.548
ISPAN Inc 4 Spiral 1 Dev	C/CPIF	Various : Various	26.363	0.000		0.000		0.000		0.000		0.000	0.000	26.363	26.363
ISPAN Inc 4 Spiral 2 Dev	C/CPIF	Various : Various	10.045	15.195	Jan 2016	0.000		0.000		0.000		0.000	0.000	25.240	26.642
ISPAN Inc 4 Spiral 3 Dev	C/CPIF	Various : Various	0.000	6.683	Jul 2016	24.832	Jul 2017	0.000		0.000		0.000	0.000	31.515	31.516
ISPAN Inc 4 Post IOC Enhancements	C/CPIF	Various : Various	0.000	0.000		0.000		20.331	Jul 2018	0.000		20.331	0.000	20.331	20.257
Subtotal			162.962	21.878		24.832		20.331		0.000		20.331	0.000	230.003	231.332

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	1.712	0.190	Oct 2015	0.210	Oct 2016	0.210	Oct 2017	0.000		0.210	0.000	2.322	2.322
ISPAN Certification and Accreditation	MIPR	JTIC : Ft Hichuaha, AZ	0.776	0.075	Oct 2015	0.075	Oct 2016	0.075	Dec 2017	0.000		0.075	0.000	1.001	1.001
Subtotal			2.488	0.265		0.285		0.285		0.000		0.285	0.000	3.323	3.323

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: FY 2018 Air Force											Date: May 2017				
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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	8.422	1.300	Oct 2015	1.200	Oct 2016	1.200	Jan 2018	0.000		1.200		0.000	12.122	12.122
ISPAN Systems Engineering Operations	C/CPIF	Various : Bellevue, NE	1.170	1.070	Oct 2015	1.190	Jan 2017	1.190	Jan 2018	0.000		1.190		0.000	4.620	4.620
Program Management Administration	C/CPIF	Various : Bellevue, NE	26.023	2.441	Oct 2015	2.730	Jan 2017	2.730	Jan 2018	0.000		2.730		0.000	33.924	33.924
Subtotal			35.615	4.811		5.120		5.120		0.000		5.120		0.000	50.666	50.666
Project Cost Totals			201.065	26.954		30.237		25.736		0.000		25.736		0.000	283.992	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 (MPAS) Spiral 2 Development Testing				■																								
ISPAN Inc 4 (MPAS) Spiral 3 Development				■				■																				
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: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
ISPAN Inc 4 (MPAS) Spiral 2 Development Testing	4	2016	1	2017
ISPAN Inc 4 (MPAS) Spiral 3 Development	4	2016	4	2017
ISPAN Inc 4 (MPAS) Spiral 3 Development Testing	1	2018	3	2018
ISPAN Inc 4 (MPAS) Post IOC Enhancements	1	2018	3	2019
ISPAN Inc 4 (MPAS) FDD (Jun 2018)	3	2018	3	2018

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0101314F I Night Fist - USSTRATCOM
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.087	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675152: NIGHTFIST	-	0.087	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

Classified details upon request.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.087	0.000	0.000	0.000	0.000
Current President's Budget	0.087	0.000	0.000	0.000	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

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

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>
Title: Misc Analysis	0.087	-	-
Description: Provide analysis, assessments and modeling support for proof of concept demonstrations and technical and analytical support during exercises.			
FY 2016 Accomplishments: Provide analysis, assessments and modeling support for proof of concept demonstrations and technical and analytical support during exercises.			
Accomplishments/Planned Programs Subtotals	0.087	-	-

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

N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 0101314F / <i>Night Fist - USSTRATCOM</i>
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D. Other Program Funding Summary (\$ in Millions)

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	3.815	6.042	6.272	0.000	6.272	6.285	0.000	2.501	2.552	Continuing	Continuing
671820: <i>Strategic Automated Command and Control System</i>	-	3.815	6.042	6.272	0.000	6.272	6.285	0.000	2.501	2.552	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 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: FY 2018 Air Force **Date:** May 2017

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)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	5.315	6.042	6.286	0.000	6.286
Current President's Budget	3.815	6.042	6.272	0.000	6.272
Total Adjustments	-1.500	0.000	-0.014	0.000	-0.014
• 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	-1.500	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-0.014	0.000	-0.014

Change Summary Explanation

FY 2016 \$1.5M reprogrammed to higher Air Force priorities.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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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 (e.g. Subnet Communications Processor (SCP), Base Communication Processor (BCP), Port Expansion Processor (PEP), and end user terminals). New equipment resolves 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 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Initiated Technology Maturation and Risk Reduction (TMRR) phase to complete design for a full system modernization <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Continue TMRR phase through successful System Requirements Review (SRR), System Functional Review (SFR), and Preliminary Design Review (PDR) - Complete documentation in support of a Milestone B decision and prepare for Critical Design Review (CDR) in FY18 <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Enter MS B and complete Critical Design Review (CDR) 	3.815	6.042	6.272
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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018
- Begin developmental test and evaluation			
Accomplishments/Planned Programs Subtotals	3.815	6.042	6.272

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA03: Line Item #833140: <i>Strategic Command and Control</i>	0.248	0.246	6.497	0.000	6.497	11.895	3.973	1.514	1.537	Continuing	Continuing
• OPAF: BA05: Line Item <i>#86190A: Spares and Repair Parts</i>	1.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

E. Acquisition Strategy
A TMRR contract was awarded to Northrop Grumman to conduct Pre-EMD risk reduction activities. The Ogden Air Logistics Complex (OO-ALC) is working with the SACCS program office and the Pre-EMD contractor. The OO-ALC will become the lead EMD developer after Milestone B through to Full Operational Capability (FOC). The TMRR contractor will support the OO-ALC throughout the program.

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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0101324F / Integrated Strategic Planning & Analysis Network
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	11.032	0.000	11.032	12.708	12.945	13.169	13.439	0.000	63.293
675029: ISPAN Increment 5	-	0.000	0.000	11.032	0.000	11.032	12.708	12.945	13.169	13.439	0.000	63.293
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

PE 0101324F, Integrated Strategic Planning and Analysis Network, Project 675029, ISPAN Increment 5 prior-year efforts are documented in PE 0101313F, Strategic War Planning System - USSTRATCOM, Project 675029, ISPAN Increment 5.

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.

In FY17 ISPAN Increment 5 was a new start in PE 0101313F.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	11.032	0.000	11.032
Total Adjustments	0.000	0.000	11.032	0.000	11.032
• 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	0.000	0.000	11.032	0.000	11.032

Change Summary Explanation

This is not a New Start. FY17 funding of \$8.91M is explained in PE 0101313F, Program 675029 (ISPAN INC 5) Transfer to this PE 3010324F starts in FY18.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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\$11.032M dollars transferred in FY18 to continue program.

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

	FY 2016	FY 2017	FY 2018
Title: ISPAN Increment 5	0.000	0.000	11.032
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 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: Funds will be used for acquisition program document development and pre-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			
Accomplishments/Planned Programs Subtotals	0.000	0.000	11.032

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Remarks

E. 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)

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 0101324F / <i>Integrated Strategic Planning & Analysis Network</i>

Air Force Program Executive Officer (PEO) for Battle Management (AFPEO/BM) is the PEO and Milestone Decision Authority (MDA) is the Under Secretary of Defense, Acquisition Technology & Logistics (AT&L).

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: FY 2018 Air Force												Date: May 2017				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
3600 / 7				PE 0101324F / Integrated Strategic Planning & Analysis Network					675029 / ISPAN Increment 5							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	
Pre-Milestone B Risk Reduction	Various	Offutt AFB : Offutt AFB, NE	-	0.000		0.000		7.542	Nov 2017	0.000		7.542	Continuing	Continuing	-	
Subtotal			-	0.000		0.000		7.542		0.000		7.542	-	-	-	
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 and Technical Support	Various	Offutt AFB : Offutt AFB, NE	-	0.000		0.000		1.150	Nov 2017	0.000		1.150	Continuing	Continuing	-	
Systems Engineering and Operations	Various	Offutt AFB : Offutt AFB, NE	-	0.000		0.000		0.900	Nov 2017	0.000		0.900	Continuing	Continuing	-	
Program Management Administration	Various	Offutt AFB : Offutt AFB, NE	-	0.000		0.000		1.440	Nov 2017	0.000		1.440	Continuing	Continuing	-	
Subtotal			-	0.000		0.000		3.490		0.000		3.490	-	-	-	

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force							Date: May 2017				
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>				
	Prior Years	FY 2016	FY 2017		FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	0.000	0.000		11.032	0.000	11.032	-	-	-	

Remarks

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
ISPAN Inc 5 (MPAS) Pre-B Risk Reduction Activities	1	2018	4	2018
Estimated program entry at Milestone B, Program Continuing	1	2019	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	14.116	108.617	0.000	108.617	298.690	33.400	15.000	0.000	0.000	469.823
672021: <i>UH-1N Replacement Program</i>	-	0.000	14.116	108.617	0.000	108.617	298.690	33.400	15.000	0.000	0.000	469.823
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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.

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.

In 2017 UH-1N Replacement 3600 funding was a new start.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	14.116	19.675	0.000	19.675
Current President's Budget	0.000	14.116	108.617	0.000	108.617
Total Adjustments	0.000	0.000	88.942	0.000	88.942
• 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	0.000	0.000	88.942	0.000	88.942

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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Change Summary Explanation

FY18 funding was increased \$88.942M based on market research and industry engagement. The Air Force confirmed the UH-1N Replacement program will require non-developmental item (NDI) integration onto an airworthiness-certified helicopter to meet requirements. The exact scope of NDI integration varies based on the potential offerors' platforms. However, this effort will involve one-time non-reoccurring engineering (NRE) activities to complete NDI integration of mature technologies and associated testing and certifications. FY18 will also incrementally fund the procurement of four developmental helicopters and support the integration of UH-1N Replacement operational mission planning and aircrew training systems associated with the aircraft solution. A Developmental Test (DT) effort will be necessary to validate the successful NDI integration and demonstrate performance of new capabilities. Operational Testing (OT) will be necessary to validate the solution's operational performance, effectiveness, and suitability. The DT/OT programs will be integrated to maximum extent possible for schedule efficiency. The Air Force also believes live fire test and evaluation activities will be necessary to assess compliance with the force protection and survivability requirements.

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

	FY 2016	FY 2017	FY 2018
<p>Title: UH-1N Replacement Weapon System Integration</p> <p>Description: Integration of non-developmental equipment and other capabilities into existing aircraft system and technical/manufacturing baselines to achieve UH-1N Replacement operational capability requirements.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Evaluated the design and specifications of potential platforms, to include government systems engineering tasks.</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. Includes incremental funding of four developmental aircraft.</p>	0.000	13.916	108.340
<p>Title: UH-1N Replacement Test and Evaluation</p> <p>Description: System and subsystem test and evaluation of the UH-1N Replacement solution.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans:</p>	0.000	0.200	0.277

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Initiated Developmental Test, Operational Test, and Live Fire Test and Evaluation planning activities to support future test efforts.			
<i>FY 2018 Plans:</i> 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.			
Accomplishments/Planned Programs Subtotals	0.000	14.116	108.617

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA04: Line Item #H0106O: <i>UH-1N Replacement</i>	2.456	18.337	0.000	0.000	0.000	0.000	347.431	373.337	467.203	2,768.798	3,975.562
• APAF: BA05: Line Item #H0106O: <i>UH-1N Replacement</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.291	1.777	4.236	0.00	0.000
• APAF: BA06: Line Item #000999: <i>Initial Spares/Repair Parts</i>	0.000	0.000	0.000	0.000	0.000	0.000	16.271	16.733	17.207	133.544	183.755
• MILCON: PE 0207576F: <i>Consolidated Helicopter Operations, Tactical Response Force Alert, and Aircraft Maintenance Facilities</i>	19.700	0.000	61.900	0.000	61.900	58.600	0.000	0.000	0.000	0.00	136.600

Remarks

E. Acquisition Strategy
The Air Force intends to procure an airworthiness-certified baseline helicopter that requires NDI integration (e.g. forward looking infrared sensors, 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 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: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 7				PE 0102110F / UH-1N Replacement Program				672021 / UH-1N Replacement Program							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
UH-1N Replacement weapon system integration and type/airworthiness certification	C/TBD	TBD : TBD	-	0.000		13.916	Dec 2017	103.051	Jun 2018	0.000		103.051	Continuing	Continuing	-
Subtotal			-	0.000		13.916		103.051		0.000		103.051	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
UH-1N Replacement live fire, qualification, and operational test and evaluation planning and technical support	Various	Various : TBD	-	0.000		0.200	Dec 2017	0.277	Dec 2018	0.000		0.277	Continuing	Continuing	-
Subtotal			-	0.000		0.200		0.277		0.000		0.277	-	-	-
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
UH-1N Replacement program management activity	Various	Various : TBD	-	0.000		0.000	Jan 2017	5.289		0.000		5.289	Continuing	Continuing	-
Subtotal			-	0.000		0.000		5.289		0.000		5.289	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force							Date: May 2017				
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				
	Prior Years	FY 2016	FY 2017		FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	0.000	14.116		108.617	0.000	108.617	-	-	-	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
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: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Acquisition Strategy Panel	2	2017	2	2017
Pre-Milestone C Review and Contract Award	3	2018	3	2018
Weapon System Integration	3	2018	4	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	4	2020	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: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	10.868	3.347	0.000	3.347	9.322	0.000	6.475	0.789	0.000	30.801
674592: <i>R/SAOC MODERNIZATION</i>	-	0.000	10.868	3.347	0.000	3.347	9.322	0.000	6.475	0.789	0.000	30.801
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Regional/Sector Operation Center Modification 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 at the Air Defense Sectors from ADS-B equipped aircraft. 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.

In FY17, BCS-F Modification 1 was a new start.

This program is in Budget Activity 7, Operational System Development because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0102326F I Region/Sector Operation Control Center Modernization Program
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	10.868	12.721	0.000	12.721
Current President's Budget	0.000	10.868	3.347	0.000	3.347
Total Adjustments	0.000	0.000	-9.374	0.000	-9.374
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-9.374	0.000	-9.374

Change Summary Explanation

FY2018 reduction of 9.374M for higher AF priorities.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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Title: BATTLE CONTROL SYSTEMS MODIFICATION 1	0.000	10.868	3.347
Description: The 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 2016 Accomplishments: - N/A			
FY 2017 Plans: Activities include, but are not limited to: - Developing a test strategy and systems engineering related documentation - Conducting test and evaluation, risk reduction, and integration for ADS-B and ECEF			
FY 2018 Plans: Activities include, but are not limited to: - Will continue developing test strategy and systems engineering related documentation - Will continue conducting test and evaluation, risk reduction, and integration for ADS-B and ECEF - Will execute source selection activities and award a competitively selected contract - 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: FY 2018 Air Force	Date: May 2017
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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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Will continue to identify, monitor and mitigate technical risks			
Accomplishments/Planned Programs Subtotals	0.000	10.868	3.347

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF:BA03 Line Item # 833030: <i>Battle Control System - Fixed</i>	2.018	5.677	6.415	0.000	6.415	3.033	3.086	3.142	3.199	0.000	26.570

Remarks

E. Acquisition Strategy
Acquisition Strategy: The Program Management Office (PMO) will pursue full and open competition for BCS 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 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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	9.388	8.674	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
670373: <i>DCIP</i>	-	0.497	0.491	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>	-	3.825	2.693	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A011: <i>Space Analysis and Application Development</i>	-	5.066	5.490	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 0105921F, Service Support to STRATCOM - Space Activities efforts were transferred to PE 125921F Service Support to STRATCOM - Space Activities due to the creation of a new Major Force Program for Space. FY2016 and FY2017 funding is now documented in the exhibits for PE 125921F.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	9.388	8.674	0.000	0.000	0.000
Total Adjustments	9.388	8.674	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	9.388	8.674	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
670373: DCIP	-	0.497	0.491	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.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
672486: <i>JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES</i>	-	3.825	2.693	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: FY 2018 Air Force										Date: May 2017		
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>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
67A011: <i>Space Analysis and Application Development</i>	-	5.066	5.490	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.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	958.691	124.695	151.373	201.394	0.000	201.394	197.573	185.807	177.999	169.807	1,445.080	3,612.419
675246: <i>MQ-9 Development and Fielding</i>	958.691	124.695	120.481	119.783	0.000	119.783	72.932	30.935	26.677	33.245	3.918	1,491.357
675247: <i>Squadron Operations Centers (SOC)</i>	0.000	0.000	0.000	7.264	0.000	7.264	5.795	0.000	0.000	0.000	0.000	13.059
675249: <i>MQ-9 Upgrade</i>	0.000	0.000	30.892	74.347	0.000	74.347	118.846	154.872	151.322	136.562	1,441.162	2,108.003

Program MDAP/MAIS Code: 424

Note

This program, BA 07 PE 0205219F, project 675247, Squadron Operations Center, is a new start.

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Reliability and Maintainability, is a new start.

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Test Support, is a new start.

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Communications, is a new start.

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Urgent Services, is a new start.

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 FY17, MQ-9 Upgrade, was a new start.

In FY18 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.
2. Squadron Operations Centers (SOC). This effort is for development and fielding of standardized operations centers to provide mission data and tasking information to the aircrew and disseminate and/or exchange mission data with decision-makers and the intelligence community.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0205219F / MQ-9 UAV
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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.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	122.731	151.373	163.951	0.000	163.951
Current President's Budget	124.695	151.373	201.394	0.000	201.394
Total Adjustments	1.964	0.000	37.443	0.000	37.443
• 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	6.145	0.000			
• SBIR/STTR Transfer	-4.181	0.000			
• Other Adjustments	0.000	0.000	37.443	0.000	37.443

Change Summary Explanation

FY2016 delta due to \$6.145M BTR to fund Hybrid Release 1 and -\$4.181M for Small Business Innovation Research (SBIR).

FY2018 increase to fully fund MQ-9 Upgrade program.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675246: MQ-9 Development and Fielding	958.691	124.695	120.481	119.783	0.000	119.783	72.932	30.935	26.677	33.245	3.918	1,491.357
Quantity of RDT&E Articles	3	-	-	-	-	-	-	-	-	-		

Note

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 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, and safety issues. Activities also include 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.

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 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 2016 Accomplishments: Continued MQ-9 Block 5 Remotely Piloted (RPA) system capability development to include, but not limited to:</p> <ul style="list-style-type: none"> • Developmental test for High Capacity Starter Generator • Predator Primary Data Link (PPDL) that will lead to CDL compliance • Two ARC-210 Radios, Redesigned Forward Avionics Bay • Dashboard w/ Integrated Sensor Control System (ISCS) • Mission Control Module/Payload Control Computer • Improved BRU- 71/A Bomb Rack • Improved Stores Management System • High Definition Multi-spectral Targeting System (MTS-B) • Improved Heavyweight Landing Gear • Software development to include integration of numerous approved Software Change Requests (SCRs) • Conducted Electromagnetic Environmental Effects (E3) and Hazards of Electromagnetic Radiation to Ordnance (HERO) testing on the developed MQ-9 Block 5 aircraft system <p>Began and completed Follow-on Operational Test and Evaluation (FOT&E) execution as required to field the Block 5 aircraft and software to include, but not limited to:</p> <ul style="list-style-type: none"> • Development of verified Technical Orders (Flight Manual and Maintenance Manual) • Training completed following successful Developmental Test (DT) completion • Software regression testing with the fielded Block 1 aircraft system • Trained aircrew for FOT&E • Initiated development to resolve FOT&E identified deficiencies 	11.737	17.511	0.000	0.000	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> • Tested and fielded MQ-9 Cold Weather Kit <p>Developed and conducted proof install of MQ-9 Block 1 to Block 5 retrofit kit to consolidate MQ-9 fleet to a common baseline. Completed Vortex phase 1 for Block 1 &5</p> <p>FY 2017 Plans: Continue MQ-9 Follow-on Operational Test and evaluation (FOT&E) execution as required to field aircraft and software, to include, but not limited to:</p> <ul style="list-style-type: none"> • Will complete non-FOT&E dependent Predator Primary Data Link (PPDL) characterization efforts on the MQ-9 Block 5 Remotely Piloted Aircraft (RPA) system • Will complete software integration and testing of numerous approved Software Change Requests (SCRs) and identify FOT&E deficiencies • Will complete High capacity starter generator testing. <p>FY 2018 Base Plans: N/A</p> <p>FY 2018 OCO Plans: N/A</p>					
<p>Title: Block 30 Ground Control Station (GCS) Development</p> <p>Description: Develop Block 30 GCS capabilities.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Completed Block 30 GCS development • Continued Field Service Representative (FSR) support during FOT&E <p>FY 2017 Plans: N/A</p> <p>FY 2018 Base Plans: N/A</p> <p>FY 2018 OCO Plans: N/A</p>	1.191	0.000	0.000	0.000	0.000
<p>Title: Block 50 Ground Control Station (GCS) Development</p>	52.185	50.341	46.281	-	46.281

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>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.</p> <p>FY 2016 Accomplishments: Continued Block 50 design/development of hardware and software: <ul style="list-style-type: none"> • Completed Preliminary Design Review to allow initial test asset procurement • Developed Integrated Communication System </p> <p>FY 2017 Plans: Continue Block 50 design/development, manufacturing and test including, but not limited to: <ul style="list-style-type: none"> • Hardware/Software Development • Integration and test • Cockpit Evaluation Team 3 • Critical Design Review • Sub-system TIMs in support of Critical Design Review • Completed initial hardware purchase of 3 Block 50 GCS Development Test assets (3 of 7 total Development Test assets) • Begin Contractor test build • Maintenance evaluation team event • Military Flight release </p> <p>FY 2018 Base Plans: Will continue Block 50 design/development, manufacturing and test including: <ul style="list-style-type: none"> • Hardware/Software Development • Integration and test • Procure an additional 4 Block 50 GCS Development Test assets • Continue Contractor test build one and two • Maintenance evaluation team event • Military Flight Release </p>					
<p>Title: MQ-9 MTS-B Electro-Optic/Infrared (EO/IR) Sensor</p> <p>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</p>	1.056	0.344	0.345	0.000	0.345

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 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>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> Continued management of HD TLA MTS-B system parts obsolescence Supported final integration and test of all functions of HD TLA MTS-B system on MQ-9 platforms Completed third round of developmental testing which resulted in a decision to start production of the HD TLA MTS-B(DAS-4) system Support software development integration develop integrate, improve EO/IR sensor capabilities, enhanced laser spot tracker capabilities Continue progress towards improved organic field & depot support & sustainment <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> Support final integration and test of all functions of the DAS-4 system Support operational test of DAS-4 system and MTS software on MQ-9 platforms Generate production level documentation to support production cut-in and fielding of DAS-4 and MTS Software on MQ-9 platforms <p>FY 2018 Base Plans:</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 <p>FY 2018 OCO Plans: N/A</p>					
<p>Title: Operator Simulator</p> <p>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.</p> <p>FY 2016 Accomplishments: Continued 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 	6.000	4.417	7.088	-	7.088

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> • Databases • Weapons upgrades <p>FY 2017 Plans: 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 <p>FY 2018 Base Plans: 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 					
<p>Title: Synthetic Aperture Radar (SAR) Enhancements</p> <p>Description: Improvements in MQ-9 capability to disseminate SAR data via a fleet-wide common architecture, improve Moving Target Indicator (MTI) tracking, automation of data exploitation via Continuous Look Attack Management for Predator (CLAMP) and improvement of all-weather GPS weapon targeting.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> • Completed development for initial GCS Block 15 and Block 30 fielding of MQ-9 data dissemination common architecture using multi-intelligence Smart Processing (MISP) capability • Adjusted GPS targeting development to decouple from GCS development schedule • Completed 7 test flights on surrogate aircraft • Evaluate solutions to implement Net-Centric Collaborative Targeting (NCCT) standard fleet-wide using MISP. <p>FY 2017 Plans: N/A</p> <p>FY 2018 Base Plans: N/A</p> <p>FY 2018 OCO Plans:</p>	0.400	0.000	0.000	0.000	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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N/A					
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Title: Release 1 and Release 2	50.849	36.706	49.208	0.000	49.208
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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: TOLD, MTS-B Integration, GCS Block 50, Counter IED, IP Migration, SAR Development, GCS Block 30, Extended Range Phase I, Extended Range Phase II, Extended Range Accel, Enablers Development, Multi Transit Ops, software development required to support new capabilities.

- FY 2016 Accomplishments:**
 Began developing and integrating the software and data to update the MQ-9 Block 5 UAS to include Hybrid Release 1 capabilities: Video Oriented Transceiver for EXchange of Information (VORTEX) Phase 1 data link and AGM-114R Hellfire missile with Common Weapon Library. Activities included:
- Completed System Requirements Review (SRR) and Preliminary Design Review (PDR)
 - Systems Integration Laboratory and Hardware In Loop Laboratory testing
 - Systems engineering data development, technical orders (TOs) and training documentation development, and test planning
 - Software development required to support new capabilities
- Began Tech Maturation development on MQ-9 Block 5 UAS capabilities: Stations 1&7 Wiring (BLOS), Extended Range for Block 5 aircraft and Payload Multi-Plexing. Activities included:
- Drawings
 - T-2 Mods/Technical Orders
 - Systems Integration Laboratory and Hardware In Loop Laboratory testing
 - Safety and Airworthiness certifications
 - Start of specification work
 - Software development required to support new capabilities

FY 2017 Plans:

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Continue developing and integrating the software and data to upgrade the MQ-9 Block 5 UAS to include Hybrid Release 1 capabilities: Video Oriented Transceiver for EXchange of Information (VORTEX) Phase 1 data link and AGM-114R Hellfire missile with Common Weapon Library. Activities include:</p> <ul style="list-style-type: none"> • Critical Design Review (CDR) • Systems engineering data development • Systems Integration Laboratory and Hardware In Loop Laboratory testing • Safety and Airworthiness certifications • 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 <p>Continue Tech Maturation development to MQ-9 Block 5 UAS capabilities: Stations 1&7 Wiring (BLOS), Extended Range for Block 5 aircraft and Payload Multi-Plexing. Activities include, but not limited to:</p> <ul style="list-style-type: none"> • Critical Design Review (CDR) • Technology Readiness Review (TRR) • Drawings • T-2 Mods/Technical Orders • Laboratory, ground and flight test • Safety and Airworthiness certifications • Specification work • Software Development to support new capabilities <p>FY 2018 Base Plans:</p> <p>Continue developing and integrating the software and data to update the MQ-9 Block 5 UAS capabilities to include but not limited to:</p> <ul style="list-style-type: none"> • 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 					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> • Integrated test execution (development test & operational test) • Initial training • Preparation for limited fielding of aircraft (logistics activities) • Software Development to support new capabilities <p>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:</p> <ul style="list-style-type: none"> • Drawings • T-2 Mods/Technical Orders • Ground test • Safety and Airworthiness certifications • Specification work • Software Development to support new capabilities <p>FY 2018 OCO Plans: N/A</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 2016 Accomplishments: Continued test support.</p> <p>FY 2017 Plans: Continue test support.</p> <p>FY 2018 Base Plans: Will continue test support.</p> <p>FY 2018 OCO Plans: N/A</p>	0.402	0.730	1.114	0.000	1.114
<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</p>	0.875	0.171	0.123	0.000	0.123

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>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 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 2016 Accomplishments: Continued the development of:</p> <ul style="list-style-type: none"> • Fixed Site Satellite Terminal (FSST) and Satellite Earth Terminal Sub-System (SETSS) and relay site equipment • Delivered 1 Satellite Earth Terminal Sub-System (SETSS) and 2 test and monitor subsystems relay site equipment • Electronics Technical Orders • BE-CDL and BE-SATCOM • Remote Split Operations (RSO) Technical Orders • Training courses • Logistics support analysis • IP-based equipment upgrades <p>FY 2017 Plans: Continue the development of:</p> <ul style="list-style-type: none"> • Fixed Site Satellite Terminal (FSST), Satellite Earth Terminal Sub-System (SETSS), and relay site equipment • Electronics Technical Orders • BE-CDL and BE-SATCOM • Qualify IP Remote Split Operations (RSO) Network for use by MQ-1/MQ-9 • Development and delivery of SATCOM ground terminal training courses • SATCOM operational durability <p>FY 2018 Base Plans:</p> <ul style="list-style-type: none"> • Will SATCOM and Predator Primary Data Link (PPDL), both Line Of Sight (LOS) and Beyond Line of Sight (BLOS), improvements and upgrades 					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> • Will enhance Remote Split Operations (RSO) network and supporting communications equipment, including associated Tech Orders, training, and interface updates. <p>FY 2018 OCO Plans: N/A</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 2016 Accomplishments: Funded with prior year.</p> <p>FY 2017 Plans: • 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 Base 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 OCO Plans: N/A</p>	0.000	9.292	12.430	0.000	12.430
<p>Title: Reliability and Maintainability</p> <p>Description: Develop MQ-9 modification improvements for aircraft and ground base infrastructure. Includes engineering change orders and associated studies and general research.</p> <p>FY 2016 Accomplishments: Continued development of MQ-9 modification improvements for aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability costs.</p> <p>FY 2017 Plans: Continue development of MQ-9 modification improvements for aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability costs.</p> <p>FY 2018 Base Plans:</p>	0.000	0.969	3.194	0.000	3.194

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop MQ-9 modification improvements for aircraft and ground based infrastructure to improve mission capable rates and reduce reliability and maintainability cost.					
FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	124.695	120.481	119.783	0.000	119.783

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA04: Line Item # PRDTB1: MQ-9	656.428	575.552	117.141	271.080	388.221	95.527	181.517	151.667	204.976	458.062	7,722.603
• APAF: BA06: Line Item # PRDTB1: MQ-9 Spares	133.588	40.943	48.693	0.000	48.693	119.760	57.714	57.409	51.436	0.00	509.543
• APAF: BA05: Line Item # PRDTB2: MQ-9 Mods	184.051	253.997	264.740	56.400	321.140	382.191	177.759	190.615	163.115	2,692.166	4,812.202
• APAF: BA07: Line Item # PRDTB1: MQ-9	5.000	35.650	36.368	0.000	36.368	25.882	26.818	26.846	27.383	0.00	205.209

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-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 a Hybrid 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 (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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	338.306	8.053	Aug 2016	16.094	May 2017	0.000		0.000		0.000	0.000	362.453	362.453
Block 30 Ground Control Station (GCS) Development	SS/CPFF	GA-ASI : Poway, CA	23.688	1.191	Apr 2016	0.000		0.000		0.000		0.000	0.000	24.879	24.879
Block 50 Ground Control Station (GCS) Development	SS/CPFF	GA-ASI : Poway, CA	138.609	44.678	Mar 2016	46.267	Oct 2016	38.229	Oct 2017	0.000		38.229	82.035	349.818	349.818
MQ-9 Electro-Optical / Infrared (EO/IR) Sensor	SS/CPFF	Raytheon : McKinney, TX	111.199	1.056	Jul 2016	0.344	Feb 2017	0.345	Jun 2018	0.000		0.345	0.000	112.944	112.944
Operator Simulator	SS/CPIF	L3 Comm : Salt Lake City, UT	28.856	6.000	Aug 2016	4.417	Jan 2017	7.088	Apr 2018	0.000		7.088	10.151	56.512	56.512
Synthetic Aperture Radar (SAR) Enhancements	SS/CPFF	GA-MS : Poway, CA	47.707	0.400	Apr 2016	0.000		0.000		0.000		0.000	0.000	48.107	48.107
Hybrid R1 and R2	SS/CPFF	GA-ASI : Poway, CA	0.000	47.027	Mar 2016	33.736	Jun 2017	40.476	Jun 2018	0.000		40.476	39.857	161.096	161.096
Communication	SS/CPFF	GA-ASI : Poway, CA	15.976	0.875	Mar 2016	0.171	Mar 2017	0.123	Mar 2018	0.000		0.123	0.191	17.336	17.336
MQ-9 Program Protection Technology Insertion	SS/CPFF	GA-ASI : Poway, CA	39.431	0.000		8.540	Apr 2017	10.268	Apr 2018	0.000		10.268	0.000	58.239	58.239
Reliability and Maintainability	SS/CPFF	GA-ASI : Poway, CA	3.860	0.000		0.969	May 2017	3.194	Jan 2018	0.000		3.194	0.000	8.023	8.023
Completed Efforts	SS/ Various	Various : Various	77.805	0.000		0.000		0.000		0.000		0.000	0.000	77.805	77.805
Miscellaneous Prior	Various	Various : Various	71.556	0.000		0.000		0.000		0.000		0.000	0.000	71.556	71.556
Subtotal			896.993	109.280		110.538		99.723		0.000		99.723	132.234	1,348.768	1,348.768

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Hybrid Release 2 Initial Fielding Support																												
Test Support																												
Communications																												
MQ-9 Technology Insertion																												
Reliability & Maintainability																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Continuing MQ-9 System Development and Demonstration (SDD) / Modernization	1	2016	1	2018
MQ-9 System Development and Demonstration (SDD) / Modernization FOT&E	2	2016	2	2018
Block 30 Ground Control Station (GCS) Development	1	2016	4	2016
Block 50 Ground Control Station (GCS) Development	1	2016	4	2022
Block 50 GCS Preliminary Design Review (PDR) (June, 2016)	3	2016	3	2016
Block 50 GCS Critical Design Review (CDR) (June, 2017)	3	2017	3	2017
MTS-B Updates (Electro-Optical/Infrared (EO/IR) Sensor)	1	2016	4	2019
MTS-B Target Location Accuracy Improvements Integration and Test on Block 5 aircraft	2	2017	4	2019
Operator Simulator	1	2016	4	2022
Synthetic Aperture Radar (SAR) enhancements	1	2016	3	2017
Hybrid Release 1	3	2016	2	2019
Hybrid Release 1 Dev/Integration	3	2016	4	2017
Hybrid Release 1 Test	4	2017	2	2018
Hybrid Release 1 Initial Fielding Support	3	2018	2	2019
Technology Maturation Effort	4	2016	3	2018
Hybrid Release 2	1	2018	4	2020
Hybrid Release 2 Dev/Integration	1	2018	2	2019
Hybrid Release 2 Test	2	2019	4	2019
Hybrid Release 2 Initial Fielding Support	1	2020	4	2020
Test Support	1	2016	4	2022
Communications	1	2016	4	2022
MQ-9 Technology Insertion	1	2016	1	2019
Reliability & Maintainability	3	2017	1	2019

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675247: Squadron Operations Centers (SOC)	0.000	0.000	0.000	7.264	0.000	7.264	5.795	0.000	0.000	0.000	0.000	13.059
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY18, Squadron Operations Centers (SOC), is a new start.

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 develop standardized configurations and interfaces, define component standards and develop and stand up a SOC Systems Integration Lab (SIL). This is a FY18 NEW START.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Squadron Operations Center	0.000	0.000	7.264	-	7.264
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 2016 Accomplishments: N/A					
FY 2017 Plans: N/A					
N/A					
FY 2018 Base Plans:					
- Design and develop Remotely Piloted Aircraft Squadron Operations Center (RPA SOC) capabilities					
- Preliminary Design Review					
- Initial hardware purchase for test asset					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Hardware/Software Development					
Accomplishments/Planned Programs Subtotals	0.000	0.000	7.264	-	7.264

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA03: Line Item # 837300: <i>Base Communications Infrastructure</i>	0.000	0.000	7.529	0.000	7.529	20.784	3.666	6.006	6.115	0.000	37.617

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
 Beginning in FY18, Air Force is centrally managing acquisition for SOC within AFLCMC/WII. As part of that effort, this year will include the development of new capabilities and future upgrades for the SOC. AFLCMC/WII will manage the SOC Program for ACC, AFSOC, and ANG through organic development, and hardware/software procurement using 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-3, RDT&E Project Cost Analysis: FY 2018 Air Force												Date: May 2017				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0205219F / MQ-9 UAV				675247 / Squadron Operations Centers (SOC)								
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	
RPA SOC Development	Various	402nd SMXG : Robins AFB, GA	0.000	0.000		0.000		7.264	Mar 2018	0.000		7.264	5.795	13.059	-	
Subtotal			0.000	0.000		0.000		7.264		0.000		7.264	5.795	13.059	-	
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Project Cost Totals			0.000	0.000		0.000		7.264		0.000		7.264	5.795	13.059	-	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 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																											■	

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675249: MQ-9 Upgrade	0.000	0.000	30.892	74.347	0.000	74.347	118.846	154.872	151.322	136.562	1,441.162	2,108.003
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Reliability and Maintainability, is a new start.
 This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Test Support, is a new start.
 This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Communications, is a new start.
 This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade - Urgent Services, is a new start.

A. Mission Description and Budget Item Justification

In FY17, the MQ-9 Upgrade Program was a new start.

The MQ-9 Upgrade Program will develop improvements for existing systems and field new capabilities for the MQ-9 fleet through a Hybrid Acquisition Strategy. The objective is to enable fielding of new hardware and/or software for integration into the MQ-9 fleet on an 18-month schedule. The first two releases are under the auspices of the baseline MQ-9 Development and Fielding program. Candidate Release 3 and 4 upgrades include, but are not limited to, implementing an Autonomous Systems upgrade, upgrading the data links to use the new Bandwidth Efficient Common Data Link (BE-CDL), enhancing Joint Direct Attack Munition (JDAM) and AGM-114 HELLFIRE targeting and employment, integration of new weapons such as Guided Bomb Unit (GBU)-54, and Joint Air-to-Ground Missile (JAGM) implementing the results of the Technology Insertion program, and software updates needed to support new configurations and development. Development efforts will address reliability, maintainability, sustainability, and safety issues. Activities also include 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: MQ-9 Upgrade - Release 3 and Release 4	0.000	30.892	67.663	0.000	67.663
<p>Description: Develop upgrade capabilities to support Releases 3 and 4 of the Hybrid Acquisition 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 (referred to as a Release). New capabilities will include upgrades of existing aircraft, GCS, communication, payload systems, and software updates needed to support new configurations and development as well as the addition of new capabilities and subsystems.</p> <p>Final lists of upgrades included in each release will be determined as part of future Executive Oversight Council direction and inputs from JUONs and UON requests. Formal approval of Release 3 content will be established in</p>					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>FY 2018 and is currently subject to fluctuation pending customer priorities. Some current candidates for Release 3 include, but not limited to:</p> <ul style="list-style-type: none"> • Tech Insertion integration • AGM-114 HELLFIRE enhancements • JAGM Integration • GBU-54 • Auto Take-off and Landing Capability (ATLC) • Software Development to support new capabilities <p>Some current candidates for Release 4 include the following:</p> <ul style="list-style-type: none"> • Autonomous Systems upgrades • Differential Global Positioning System (GPS) enhancements • Bandwidth Efficient (BE) Common Data Link (CDL) for Command and Control (C2) and Intelligence, Surveillance, and Reconnaissance (ISR) transmission to Ground Control Stations (GCS) • Improved (including BE) Beyond Line of Sight (BLoS) military SATCOM usage • Will provide 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. • Software Development to support new capabilities <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Begin Technology Maturation Effort (TME) developing upgrade capabilities to include, but not limited to:</p> <ul style="list-style-type: none"> • JAGM Blk 5 • JAGM integration • GBU-54 & integration • Tech Insertion (TI) & TI integration • Auto-lock & integration • Secure Comm & integration • DAS-4 Tos/Training • Tracking Thru Clouds & integration • Software fixes 					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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<ul style="list-style-type: none"> • NCCT • Minotaur • AGM-114 HELLFIRE enhancements • 3 button Mouse • ATLC • BE-CDL • STIG JDAM • M Code • ADS-B • Mode 5 • Block 50 Sync • Link 16 • Next Gen SAR • Block 50 Impr 1 • GPS Jamming • KU Jamming • ER Cross Satellite • NCCT • Formal approval of Release 3 content will be established in FY2018 and is currently subject to fluctuation pending customer priorities • Provide 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. • Software development required to support new capabilities <p>FY 2018 Base Plans: Will continue Tech Maturation effort (TME) developing upgrade capabilities to include, but not limited to:</p> <ul style="list-style-type: none"> • JAGM Bik 5 • JAGM integration • GBU-54 & integration • Tech Insertion (TI) & TI integration • Auto-lock & integration • Secure Comm & integration • DAS-4 Tos/Training 					
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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> • Tracking Thru Clouds & integration • Software fixes • NCCT • Minotaur • AGM-114 HELLFIRE enhancements • 3 button Mouse • ATLC • BE-CDL • STIG JDAM • M Code • ADS-B • Mode 5 • Block 50 Sync • Link 16 • Next Gen SAR • Block 50 Impr 1 • GPS Jamming • KU Jamming • ER Cross Satellite • NCCT • Formal approval of Release 3 content will be established in FY2018 and is currently subject to fluctuation pending customer priorities • Software development required to support new capabilities • 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. <p>FY 2018 OCO Plans: N/A</p>					
<p>Title: MQ-9 Upgrade - Reliability and Maintainability</p> <p>Description: Develop MQ-9 modification improvements for aircraft and ground base infrastructure. Includes engineering change orders and associated studies and general research</p> <p>FY 2018 Base Plans:</p>	-	-	3.330	-	3.330

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Development of MQ-9 upgrades for aircraft and ground base infrastructure to improve mission capable rates and reduce reliability and maintainability costs.					
<p>Title: MQ-9 Upgrade - Test Support</p> <p>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.</p> <p>FY 2018 Base Plans: Start Test Support</p>	-	-	1.242	-	1.242
<p>Title: MQ-9 Upgrade - Communications</p> <p>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.</p> <p>FY 2018 Base Plans: 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.</p>	-	-	0.188	-	0.188
<p>Title: MQ-9 Upgrade - Urgent Services</p> <p>Description: Urgent Services, engineering change orders, program office support, studies and general research, and other high level initiatives directed by the Air Force.</p> <p>FY 2018 Base Plans: Urgent services, engineering change orders, studies and general research, and other higher level initiatives directed by the Air Force</p>	-	-	1.924	-	1.924
Accomplishments/Planned Programs Subtotals	0.000	30.892	74.347	0.000	74.347

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV	Project (Number/Name) 675249 / MQ-9 Upgrade

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

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	
			Base	OCO	Total					Complete	Total Cost
• APAF: BA06 Line Item # PRDTB1: MQ-9 Spares	5.000	35.650	36.368	0.000	36.368	25.882	26.818	26.846	27.383	0.000	205.209
• APAF: BA05 Line Item # PRDTB2: MQ-9 Mods	184.051	253.997	264.740	56.400	321.140	382.191	177.759	190.615	163.115	2,682.166	4,812.202

Remarks

D. Acquisition Strategy

This program, BA 07 PE 0205219F, project 675249, MQ-9 Upgrade, is a new start.

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 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: FY 2018 Air Force **Date: May 2017**

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 - Hybrid Release 3 and out	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		28.937	Aug 2017	60.694	Jun 2018	0.000		60.694	1,567.092	1,656.723	1,656.723
Operator Simulator	SS/CPIF	L3 Comm : Salt Lake City, UT	0.000	0.000		0.000		0.000		0.000		0.000	137.452	137.452	137.452
Reliability and Maintainability	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		0.000		3.330	Jan 2018	0.000		3.330	38.960	42.290	42.290
Communications	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		0.000		0.188	Mar 2018	0.000		0.188	2.195	2.383	2.383
Urgent Services	SS/CPFF	GA-ASI : Poway, CA	0.000	0.000		0.000		1.924	Mar 2018	0.000		1.924	22.510	24.434	24.434
Subtotal			0.000	0.000		28.937		66.136		0.000		66.136	1,768.209	1,863.282	1,863.282

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.000		0.000		1.242	Mar 2018	0.000		1.242	23.565	24.807	24.807
Subtotal			0.000	0.000		0.000		1.242		0.000		1.242	23.565	24.807	24.807

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 : TBD	0.000	0.000		1.955	May 2017	6.969	May 2018	0.000		6.969	197.404	206.328	206.328
Subtotal			0.000	0.000		1.955		6.969		0.000		6.969	197.404	206.328	206.328

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force								Date: May 2017				
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0205219F / MQ-9 UAV				Project (Number/Name) 675249 / MQ-9 Upgrade				
	Prior Years	FY 2016	FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	30.892		74.347		0.000		74.347	1,989.178	2,094.417	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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				
Technology Maturation Effort																																
Release 3																																
Release 3 Dev/Integration																																
Release 3 Test																																
Release 3 Initial Fielding Support																																
Release 4																																
Release 4 Dev/Integration																																
Release 4 Test																																
Reliability and Maintainability																																
Test Support																																
Communications																																
Urgent Services																																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
Technology Maturation Effort	3	2017	4	2022
Release 3	3	2019	2	2022
Release 3 Dev/Integration	3	2019	4	2020
Release 3 Test	4	2020	2	2021
Release 3 Initial Fielding Support	3	2021	2	2022
Release 4	1	2021	4	2022
Release 4 Dev/Integration	1	2021	2	2022
Release 4 Test	2	2022	4	2022
Reliability and Maintainability	1	2018	4	2022
Test Support	1	2018	4	2022
Communications	1	2018	4	2022
Urgent Services	1	2018	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300
674518: JCREW VEHICLE INTEGRATION	-	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.300	0.000	0.000	0.000	0.000
Current President's Budget	0.300	0.000	0.000	0.000	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

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

	FY 2016	FY 2017	FY 2018
Title: CREW device integration	0.300	-	-
Description: CREW device integration is FY16 OCO funding only.			
FY 2016 Accomplishments:			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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>Joint Counter RCIED Electronic Warfare</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
CREW device integration			
Accomplishments/Planned Programs Subtotals	0.300	-	-

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA04: Line Item # 845100: <i>Engineering and EOD Equipment</i>	64.656	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207040F I Multi-Platform Electronic Warfare Equipment
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	3.980	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675310: EA Pod DRFM Upgrade	-	3.980	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

Overall this program element(PE) funds on-going sustainment, maintenance, and upgrades of Multi-Platform Electronic Attack (EA) jamming pods and associated combat test equipment as well as sustainment of various other Electronic Warfare equipment. Specifically, this program provides procurement, research, and development, and operations and maintenance for sustaining the ALQ-131 and ALQ-184 EA jamming pods. These pods are the sole self-protection jamming systems for the US Air Force A-10 aircraft and most models of the F-16 aircraft. This upgrade to the EA pod is necessary to keep pace with adversary technological advances in surface-to-air and air-to-air missile systems. Digital Radio Frequency Memory (DRFM) allows an electronic system to digitally record and store characteristics of received signals in order to produce a jamming pulse that more precisely replicated the threat system's pulse. The PE is in Budget Activity 7 - Operational System Development because it supports upgrade development of the A-10 and F-16 pods which are fielded systems.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	3.980	0.000	0.000	0.000	0.000
Total Adjustments	3.980	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	3.980	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)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>
Title: EA Pod Upgrade	3.980	-	-
Description: DRFM upgrade to the AN/ALQ-131			
FY 2016 Accomplishments:			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0207040F / <i>Multi-Platform Electronic Warfare Equipment</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Testing Support			
Accomplishments/Planned Programs Subtotals	3.980	-	-

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA 07: Line Item # 000075: <i>Other Production Charges</i>	25.395	61.522	1.103	0.000	1.103	60.079	43.462	44.262	45.149	Continuing	Continuing

Remarks

E. Acquisition Strategy

All major contracts within this project will be awarded through full and open competition

F. Performance Metrics

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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	16.200	21.353	17.459	0.000	17.459	31.355	36.816	23.000	23.000	Continuing	Continuing
674809: <i>A-10 Squadrons</i>	-	16.200	21.353	17.459	0.000	17.459	31.355	36.816	23.000	23.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0207131F, project 674809, ADS-B Out, is a new start.

A. Mission Description and Budget Item Justification

The A-10 is a twin engine, single seat weapon system capable of delivering a full range of air-to-ground munitions and self-defense air-to-air missiles. The A-10 is an essential capability for successful joint air operations and represents a crucial component of the Combat Air Forces. The A-10 concept of operations requires a flexible, adaptable and survivable weapon system to conduct close air support (CAS), combat search and rescue 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, accommodate technology insertion and fulfill FAA and other mandates to ensure continued aircrew safety and mission effectiveness 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, increase situational awareness and enhance targeting capabilities as they become available. The funds budgeted continue regular OFP suite development efforts.

Additionally, these OFP funds provide for updates and incorporation of capabilities for weapons integration, targeting pod updates, and communication/navigation/ data link improvements (e.g., M-Code, Mobile User Objective System (MUOS) communication system, Automatic Dependent Surveillance Broadcast (ADS-B), Anti-Jam Embedded Global Positioning System/Inertial Navigation System (Embedded GPS/ INS) 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).

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.

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: FY 2018 Air Force	Date: May 2017
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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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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	16.200	14.853	13.409	0.000	13.409
Current President's Budget	16.200	21.353	17.459	0.000	17.459
Total Adjustments	0.000	6.500	4.050	0.000	4.050
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	6.500	4.050	0.000	4.050

Change Summary Explanation

FY17 \$6.5M increase for OFP Upgrades

FY18 increase of \$4.0M for ADS-B out

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: OFP Development	16.200	21.353	13.459	0.000	13.459
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.					
FY 2016 Accomplishments: Funded Suite 9 design, and candidate software development and integration.					
FY 2017 Plans: Funds Suite 9 candidate development by completing the software design, development and integration. In addition, we will complete Suite 10 requirement maturation efforts and start software design.					
FY 2018 Base Plans: Continues Suite 9 development and funds Suite 10 candidate development by completing the software design, development and integration.					
FY 2018 OCO Plans:					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207131F I A-10 Squadrons
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: ADS-B Out Description: 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. FY 2016 Accomplishments: N/A FY 2017 Plans: N/A FY 2018 Base Plans: This effort initiates Operational and Developmental Testing for AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B) Out. FY 2018 OCO Plans: N/A	0.000	0.000	4.000	0.000	4.000
Accomplishments/Planned Programs Subtotals	16.200	21.353	17.459	0.000	17.459

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item # A01000: A-10 Squadrons, PE 0207131F	0.000	25.139	6.010	0.000	6.010	19.530	0.000	0.000	0.000	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 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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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

R-1 Program Element (Number/Name)
PE 0207131F / *A-10 Squadrons*

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	2.200	Jan 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
OFP Development (309th SMXG)	PO	309th SMXG : Hill AFB, UT	-	6.900	Mar 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
OFP Development 3rd Qtr FY16 (309 SMXG)	PO	309th SMXG : Hill AFB, UT	-	2.200	Apr 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
OFP Development 4th Qtr (309 SMXG)	PO	309th SMXG : Hill AFB, UT	-	3.933	Jul 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
OFP Development (309 SMXG) FY16	PO	309th SMXG : Hill AFB, UT	-	0.622	May 2017	0.000		0.000		0.000		0.000	Continuing	Continuing	-
OFP Development (309 SMXG) FY16 BTR	PO	309th SMXG : Hill AFB, UT	-	0.015	May 2017	0.000		0.000		0.000		0.000	Continuing	Continuing	-
OFP Development (309 SMXG) FY17	PO	309th SMXG : Hill AFB, UT	-	0.000		20.679	May 2017	0.000		0.000		0.000	Continuing	Continuing	-
OFP Development 1st Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	0.000		0.000		1.180	Nov 2017	0.000		1.180	Continuing	Continuing	-
OFP Development 2nd Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	0.000		0.000		1.800	Jan 2018	0.000		1.800	Continuing	Continuing	-
OFP Development 3rd Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	0.000		0.000		4.800	Apr 2018	0.000		4.800	Continuing	Continuing	-
OFP Development 4th Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	0.000		0.000		2.870	Jun 2018	0.000		2.870	Continuing	Continuing	-
Subtotal			-	15.870		20.679		10.650		0.000		10.650	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.192	Sep 2016	0.514	May 2017	4.799	Jan 2018	0.000		4.799	Continuing	Continuing	-
Subtotal			-	0.192		0.514		4.799		0.000		4.799	-	-	-

Remarks
FY16 \$0.125M - SIM SPO Full Mission Trainers (FMT)

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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															

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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		0.000		1.850	Sep 2018	0.000		1.850	Continuing	Continuing	-
Subtotal			-	0.000		0.000		1.850		0.000		1.850	-	-	-

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.138	Mar 2017	0.160	Aug 2017	0.160	Aug 2018	0.000		0.160	Continuing	Continuing	-
Subtotal			-	0.138		0.160		0.160		0.000		0.160	-	-	-

Remarks
FY16 contracts were six month increments with the last awarded 1/Mar/17. FY17 and beyond are contingent on the EPASSCCTO contract being awarded by Wright Patterson AFB.

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	16.200	21.353	17.459	0.000	17.459	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date: May 2017**

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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

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	

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
Suite 9 - OFP System Design, Development and Flight Test	2	2016	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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	153.611	147.795	246.578	0.000	246.578	213.296	143.021	146.216	149.210	Continuing	Continuing
672671: <i>F-16 Squadrons</i>	-	153.611	147.795	246.578	0.000	246.578	213.296	143.021	146.216	149.210	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0207133F, project 672671, Hybrid Flight Control Computer (HFLCC) Auto Ground Collision Avoidance System (AGCAS), is a new start.
 This program, BA 07 PE 0207133F, project 672671, Digital Radar Warning Receiver, is a new start.
 This program, BA 07 PE 0207133F, project 672671, Automatic Dependent Surveillance – Broadcast (ADS-B) Out, is a new start.

A. Mission Description and Budget Item Justification

This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-16 weapon system capability.

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.

The modification programs are separated as fleet wide, Pre-Block (25/30/32) or Post-Block (40/42/50/52). Modification programs include: Operational Flight Program (OFP) development on Post-Block 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 Post-Block 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 Post-Block 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 Post-Block aircraft, and includes NRE, test assets, SEEK EAGLE, integration, and flight test; improved satellite communication (SATCOM) radio upgrade with Mobile User Objective System (MUOS) capability on F-16 Post-Block aircraft 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 alert control mission; Hybrid Flight Control Computer (HFLCC) Auto Ground Collision Avoidance System (AGCAS) development and integration prevents most controlled flight into

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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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 Pre-Block 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.

This program is in Budget Activity 7, 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 in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	166.297	132.795	235.894	0.000	235.894
Current President's Budget	153.611	147.795	246.578	0.000	246.578
Total Adjustments	-12.686	15.000	10.684	0.000	10.684
• 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	-12.686	15.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	10.684	0.000	10.684

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 2016	FY 2017
	40.000	0.000
	40.000	0.000
	40.000	0.000

Change Summary Explanation

FY16 reduction of -\$12.686M for higher Air Force priorities

FY17 adds \$15M for Active Electrically Scanned Array (AESA) to complete the Joint Urgent Operational Need (JUON) development effort (started with \$40M Congressional Add in FY16).

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0207133F / <i>F-16 Squadrons</i>
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FY18 adds funds for Hybrid Flight Control Computer (HFLCC) Auto Ground Collision Avoidance System and Automatic Dependent Surveillance – Broadcast (ADS-B)

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

	FY 2016	FY 2017	FY 2018
<p>Title: OFP Updates on Post-Block (40/42/50/52) aircraft</p> <p>Description: OFP M-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 fields in 2017. M7.2+ OFP is in SW design 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.</p> <p>FY 2016 Accomplishments: M7.1+ finished DT and entered dedicated Operational Test (OT) for fielding in FY 2017. M7.2+ continued design and code of selected candidates. The program office finalized procurement of M7.2+ test assets to meet OFP Mandates. Began M8+ assessment for incorporating MMC Upgrade architecture and Display Generator Upgrade, continued PMA support activities.</p> <p>FY 2017 Plans: M7.1+ completes OT and fields in FY 2017. M7.2+ begins SIL and developmental flight test. Finalize procurement of M7.2+ test assets to meet OFP Mandates. M8+ Conduct Multifunctional Cockpit Review (MCR) of baseline candidates, initiate early SW design and code for rehosting MMC upgrade architecture and Display Generator Upgrade, begin assessment for Design Try Out (DTO) test planning, and initiate procurement of test assets. Continue PMA support activities.</p> <p>FY 2018 Plans: Continue M7.2+ combined developmental flight and Operational Flight Test, initiate dedicated OTE. M8+ conduct System Functional Review of baseline candidates, start SW design and code for rehosting MMC upgrade architecture and Display Generator Upgrade, begin assessments for Design Try Out (DTO) test planning, and initiate procurement of test assets. M9+ begins early assessment for requirements. Continue PMA support activities.</p>	57.456	87.823	76.882
<p>Title: Flight Test</p> <p>Description: Development Test and Evaluation (DTE) at Edwards AFB and Development Test/Operational Test (DT/OT) at Eglin AFB including integration test of associated subsystems and weapons as well as maintain test schedule for F-16 Block 40/42/50/52 MMC OFPs, weapons integration, and sub-systems to ensure capabilities meet CAF's fielding schedule.</p> <p>FY 2016 Accomplishments:</p>	9.219	17.718	16.692

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
Continued support of DTE infrastructure. Completed M7.1+ combined DT/OT testing, entered dedicated M7.1+ OTE, initiated M7.2+ DTO test planning. Supported out-of-cycle regression testing. FY 2017 Plans: M7.1+ completes dedicated OT and fields in FY 2017. Continue support of DTE infrastructure. Initiate M7.2+ test planning for AESA JUON, M7.2+ begins developmental flight test, support out-of-cycle regression testing. FY 2018 Plans: Initiate AESA development flight test with M7.2+ OFF, continue M7.2+ combined developmental flight and Operational flight test, initiate dedicated OTE, continue support of DTE infrastructure, support out-of-cycle regression testing.				
Title: Legacy Post-Block (40/42/50/52) Service Life Extension Program (SLEP) Structures 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 Block 40/42/50/52 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 2016 Accomplishments: Received final FSDT tear-down report and submitted airworthiness Compliance Report for Kit Proof aircraft, finalized EMD contract efforts for design development and integration efforts, completed Milestone B June 2016 and initiated Kit Proof in 2016. FY 2017 Plans: N/A FY 2018 Plans: N/A		31.382	0.000	0.000
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, lab and/or on-aircraft evaluation of potential subsystem changes/capability improvements. FY 2016 Accomplishments:		2.500	0.200	0.200

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
Continued 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 2017 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 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.				
Title: MMC Upgrade / Display Generator Upgrade on F-16 Post-Block (40/42/50/52) aircraft Description: The MMC upgrade on Block 40/42/50/52 aircraft resolves shortfalls in mission computer memory and throughput. Funding includes NRE, design, development, integration, and ground/flight test for fielding with the M8+ OFP. The addition of an Ethernet High Speed Data Network (HSDN) facilitates future increments of combat capability with the OFP (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 2016 Accomplishments: Continued NRE activities for HSDN, and test asset procurement. FY 2017 Plans: 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 2018 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.		11.004	16.618	20.942
Title: JASSM-ER on F-16 Post-Block (40/42/50/52) aircraft Description: Integrates JASSM-ER on F-16 Block 40/42/50/52 aircraft, including NRE, SEEK EAGLE, test assets, integration, and flight test. This capability will be fielded with M7.2+. FY 2016 Accomplishments:		0.000	4.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
Continued NRE for integration of JASSM-ER capability on F-16 Block 40/42/50/52 aircraft. FY 2017 Plans: Finalize NRE for integration of JASSM-ER capability on F-16 Block 40/42/50/52 aircraft. FY 2018 Plans: N/A				
Title: Simulator Trainers Description: Enables the USAF to exercise and train using the latest F-16 capabilities available to Block 40/42/50/52 aircraft configurations, while reducing the overall cost of maintenance and aircrew training. In order to maintain concurrency with the aircraft OFF, this funding supports development, test, and integration of simulator upgrades. FY 2016 Accomplishments: Began contract efforts for managing and maintaining F-16 simulator trainers, to include tech order development. This funding also supported development, test, and integration of simulator upgrades, to include new aircraft OFFs. FY 2017 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 OFFs. 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 OFFs.		2.050	2.475	2.049
Title: AESA Radars (1) Description: This is a continuation of the Active Electronically Scanned Array(AESA) Radar congressional add funding line in FY16. 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. FY 2016 Accomplishments: N/A FY 2017 Plans:		0.000	15.000	40.766

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
Continues/completes development efforts for the Phase I & II JUON development(began under FY16 Congressional Add). FY 2018 Plans: Complete the necessary JEON efforts associated with OFP integration and initiate full CDD Phase III EMD development, procure EMD test assets, and exercise options in 2018.				
Title: Comm Suite Radio Upgrade Post-Block (40/42/50/52) aircraft Description: Provides updates to the ARC-210 satellite communication (SATCOM) radios on F-16 Block 40/42/50/52 aircraft including Second Generation Anti-Jam Tactical radio for NATO (SATURN) with Mobile User Objective System (MUOS) and improved crypto capability. FY 2016 Accomplishments: N/A FY 2017 Plans: Initiate contract effort for NRE, Integration and test on the F-16. FY 2018 Plans: Continue NRE efforts, procure Group B test assets		0.000	3.961	12.416
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 2016 Accomplishments: N/A FY 2017 Plans: N/A 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.		0.000	0.000	18.962
Title: Digital Radar Warning Receiver		0.000	0.000	54.587

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017	
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 2016	FY 2017
<p>Description: Digital Radar Warning Receiver improves on existing radar warning receiver performance and improves Electronic Warfare (EW) threat detection range.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: 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."</p>			
<p>Title: Automatic Dependent Surveillance – Broadcast (ADS-B) Out</p> <p>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.</p> <p>Funds are included to accommodate the FAA mandate for ADS-B as outlined throughout previous AF and DoD budget exhibits.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: N/A</p> <p>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 Block 25/30/32 aircraft.</p> <p>Funds are included to accommodate the FAA mandate for ADS-B as outlined throughout previous AF and DoD budget exhibits.</p>		0.000	0.000
			3.082
Accomplishments/Planned Programs Subtotals		113.611	147.795
			246.578
		FY 2016	FY 2017
Congressional Add: AESA Radars		40.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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	FY 2016	FY 2017
FY 2016 Accomplishments: Initiated contract efforts for Phase 1 and II JUON Development source selection on the active electronically scanned array (AESAs) radar, contract award expected 2017. FY 2017 Plans: N/A		
Congressional Adds Subtotals	40.000	0.000

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item # F01600: <i>F-16 Aircraft Modifications</i>	12.134	257.331	203.864	0.000	203.864	308.517	322.119	581.899	416.695	Continuing	Continuing
• APAF: BA07: Line Item # F0160P: <i>F-16 Post Production Support</i>	8.969	15.155	18.051	0.000	18.051	18.613	22.021	25.611	19.873	Continuing	Continuing
• APAF: BA06: Line Item # F01600: <i>F-16 Initial Spares</i>	0.472	2.059	14.417	0.000	14.417	11.115	30.489	25.389	15.756	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 be continually updated on a 3-year cycle to bring new capabilities to the warfighter. M7+ OFP SW development effort is now completely developed at Hill AFB (309 SMXG). Numerous Integration contracts (CPFF, FFP) are required to allow for 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, PDG Upgrade programs have completed source selection. 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)

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force Date: May 2017

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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The Active Electronically Scanned Array (AESA) Joint Urgent Operational Need (JUON) development is currently in negotiations with the prime vendor for a development contract award for the EMD phase.

The new start programs in FY18; Digital Radar Warning Receiver, ADS-B Out Pre-Blocks and Auto-GCAS Pre-Block 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.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Updates on Post-Block (40/42/50/52) aircraft	Various	309th SMG : Hill AFB, UT	-	49.594	Nov 2015	79.503	Nov 2016	68.342	Nov 2017	0.000		68.342	Continuing	Continuing	-
Legacy Post-Block (40/42/50/52) Service Life Extension Program (SLEP) Structures	Various	Various : Various	-	31.382	Nov 2015	0.000		0.000		0.000		0.000	0.000	31.382	-
MMC Upgrade / Display Generator Upgrade on F-16 Post-Block (40/42/50/52) aircraft	Various	TBD : TBD	-	11.004	Sep 2016	16.618	Jan 2017	20.942	Jan 2018	0.000		20.942	Continuing	Continuing	-
JASSM-ER on F-16 Post-Block (40/42/50/52) aircraft	Various	Various : Various	-	0.000	Mar 2016	4.000	Mar 2017	0.000		0.000		0.000	0.000	4.000	24.500
EMD HW / Advanced Capabilities	Various	Various : Various	-	2.500	Aug 2016	0.200	Aug 2017	0.200	Aug 2018	0.000		0.200	Continuing	Continuing	-
Simulator Trainers	Various	Various : Various	-	2.050	Mar 2016	2.475	Mar 2017	2.049	Mar 2018	0.000		2.049	Continuing	Continuing	-
AESA Radars	Various	TBD : TBD	-	40.000	Aug 2017	15.000	Aug 2017	40.766	Jan 2018	0.000		40.766	Continuing	Continuing	-
Digital Radar Warning Receiver	Various	TBD : TBD	-	0.000		0.000		54.587	Feb 2018	0.000		54.587	Continuing	Continuing	-
Comm Suite Radio Upgrade on F-16 Post-Block (40/42/50/52) aircraft	Various	TBD : TBD	-	0.000		3.961	Apr 2017	12.416	Feb 2018	0.000		12.416	Continuing	Continuing	-
Hybrid Flight Control Computer (HFLCC) AGCAS	Various	TBD : TBD	-	0.000		0.000		18.962	Mar 2018	0.000		18.962	Continuing	Continuing	-
Automatic Dependent Surveillance – Broadcast (ADS-B) Out	Various	TBD : TBD	-	0.000		0.000		3.082	Mar 2018	0.000		3.082	Continuing	Continuing	-
Subtotal			-	136.530		121.757		221.346		0.000		221.346	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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				-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
Flight Tests	Various	Various : Various	-	9.219	Nov 2015	17.718	Nov 2016	16.692	Nov 2017	0.000		16.692	Continuing	Continuing	-	
Subtotal				-		9.219		17.718		16.692		0.000		16.692	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
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 Mgmt Administrative (PMA) Support	Various	Various : Various	-	7.862	Apr 2016	8.320	Apr 2017	8.540	Apr 2018	0.000		8.540	Continuing	Continuing	-	
Subtotal				-		7.862		8.320		8.540		0.000		8.540	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract											
		Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost														
Project Cost Totals											-		153.611		147.795		246.578		0.000		246.578	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Service Life Extension Program (SLEP) MS B			■																									
MMC Upgrade / Display Generator Upgrade HW MS B				■																								
MMC Upgrade Contract Award			■																									
Begin SLEP Kit Proof			■																									
M7.1+ OFP Field				■																								
M8+ OFP Multifunctional Cockpit Review #1					■																							
Comm Suite Radio Upgrad Contract Award						■																						
Homeland Defense (HLD) AESA JUON Contract Award							■																					
Hybrid Flight Control Computer (HFLCC) AGCAS ASP								■																				
Hybrid Flight Control (HFLCC) AGCAS CDR									■																			
ADS-B OUT Contract Award										■																		
MMC Upgrade / Display Generator Upgrade Flt Test Release													■															
M9+ OFP System Functional Review																			■									
AESA JUON 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: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
Service Life Extension Program (SLEP) MS B	3	2016	3	2016
MMC Upgrade / Display Generator Upgrade HW MS B	4	2016	4	2016
MMC Upgrade Contract Award	4	2016	4	2016
Begin SLEP Kit Proof	4	2016	4	2016
M7.1+ OFP Field	1	2017	1	2017
M8+ OFP Multifunctional Cockpit Review #1	2	2017	2	2017
Comm Suite Radio Upgrad Contract Award	3	2017	3	2017
Homeland Defense (HLD) AESA JUON Contract Award	4	2017	4	2017
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
MMC Upgrade / Display Generator Upgrade Flt Test Release	3	2019	3	2019
M9+ OFP System Functional Review	4	2020	4	2020
AESA JUON Initial Fielding	3	2019	3	2019
Hybrid Flight Control Computer (HFLCC) ACGAS Field	1	2021	1	2021
Digital Radar Warning Receiver Flt Test Complete	3	2021	3	2021
Digital Radar Warning Receiver Fielding Recommendation	4	2021	4	2021
M8+ OFP Fielding with MMC Upgrade, Display Generator Upgrade	3	2022	3	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	0.000	210.029	356.717	320.271	0.000	320.271	251.334	209.020	254.894	245.179	Continuing	Continuing
670131: <i>Initial Operational Test and Evaluation</i>	0.000	66.344	86.926	51.513	0.000	51.513	0.000	0.000	0.002	0.000	0.000	204.785
676020: <i>F-15</i>	0.000	143.685	269.791	268.758	0.000	268.758	251.334	209.020	254.892	245.179	Continuing	Continuing

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 "double-digit" 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 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: FY 2018 Air Force	Date: May 2017
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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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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	205.979	356.717	216.006	0.000	216.006
Current President's Budget	210.029	356.717	320.271	0.000	320.271
Total Adjustments	4.050	0.000	104.265	0.000	104.265
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.999	0.000			
• SBIR/STTR Transfer	-5.949	0.000			
• Other Adjustments	0.000	0.000	104.265	0.000	104.265

Change Summary Explanation

FY16 increase for ADCP II

FY18 increase of \$129.987M to cover ADCP II and IRST increase, and Wing Replacement (New Start).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
670131: <i>Initial Operational Test and Evaluation</i>	0.000	66.344	86.926	51.513	0.000	51.513	0.000	0.000	0.002	0.000	0.000	204.785
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. The 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.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Display Core Processor (ADCP) II	66.344	78.626	51.513	0.000	51.513
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 2016 Accomplishments: Conducted EMD activities. Completed Flight Worthiness Testing (FWT) and continued qualification activities and Electronic Systems Integration Lab (ESIL) testing. Began F-15C ESIL Testing. Continuation of hardware deliveries for ADCP II LRU, VSDR & RIU. Began F-15E Developmental Flight Test. Completed F-15E System Verification Review #1. Began F-15C Developmental Flight Test aircraft modification. This includes technical and acquisition-related studies.					
FY 2017 Plans: Complete F-15E Development Flight Test, begin F-15C Development Flight Test, and begin F-15C and F-15E Force Development Evaluation (FDE). Conduct and complete F-15C System Verification Review #1. Conduct					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Milestone C and conduct Functional Qualification Testing (FQT). This includes technical and acquisition-related studies. FY 2018 Base 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. FY 2018 OCO Plans: N/A					
Title: Automatic Dependent Surveillance Broadcast (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 2016 Accomplishments: N/A FY 2017 Plans: Funding will be used for Automatic Dependent Surveillance Broadcast (ADS-B)development. This includes technical and acquisition-related studies. FY 2018 Base Plans: N/A FY 2018 OCO Plans: N/A	0.000	8.300	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	66.344	86.926	51.513	0.000	51.513

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item # F01500: F-15 Modification of in	4.055	5.624	55.377	0.000	55.377	76.464	136.516	123.192	174.471	52.829	628.528

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
<i>Service Aircraft (PEs 0207130F, 0207134F, 0207445F, 0809731F)</i>											

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: FY 2018 Air Force											Date: May 2017				
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				

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	54.907	Nov 2015	75.331	Nov 2016	49.013	Nov 2017	0.000		49.013	0.000	179.251	-
F-15 ADCP II	C/Various	Various : Various	0.000	10.210	Mar 2016	2.076	Mar 2017	0.000		0.000		0.000	0.000	12.286	-
F-15 C/D/E ADS-B	TBD	TBD : TBD	0.000	0.000		8.300	Aug 2017	0.000		0.000		0.000	0.000	8.300	-
Subtotal			0.000	65.117		85.707		49.013		0.000		49.013	0.000	199.837	-

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.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	1.227	Sep 2016	1.219	Sep 2017	2.500	Sep 2018	0.000		2.500	0.000	4.946	-
Subtotal			0.000	1.227		1.219		2.500		0.000		2.500	0.000	4.946	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date: May 2017**

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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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	66.344	86.926	51.513	0.000	51.513	0.000	204.783	-

Remarks

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
ADCP II EMD	1	2016	4	2018
ADCP II F-15E DT	4	2016	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: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676020: F-15	0.000	143.685	269.791	268.758	0.000	268.758	251.334	209.020	254.892	245.179	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Cabin Pressure Indicator was approved by Congress as a safety modification and \$250K was moved from IRST in FY16 to fund the Cabin Pressure Indicator replacement effort.

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) and Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS). 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 introduces EP into the C/D-model fleet. Initial EP capability for APG-82(V)1 equipped E model aircraft will take place in Suite 8E. Suite 9 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 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-denied 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.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Operational Flight Program (OFP) Development Efforts	66.320	114.077	112.322	0.000	112.322
Description: Provides OFP program software and hardware updates to integrate new capabilities on all F-15 aircraft. This includes technical and acquisition related studies.					
FY 2016 Accomplishments:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Delivered S7C to the field. Continued integration of Sniper on the F-15C to meet critical PACOM requirement. Completed S8E development and flight testing. Completed JASSM-ER and Litening integration and flight testing to field with S8E. Awarded contract for B61-12 LEP integration into S8.01N. Continued S9 development and integration of major line items; such as Data Transfer Module (DTM) II, Passive Attack Display (PAD), and EPAWSS. Additionally, MIDS-JTRS will be integrated into F-15 OFPs. Continued organic software support and Special Projects development efforts. Continued funding support for all F-15 trainers. Continued 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>FY 2017 Plans: Deliver S8E to the field. Continue B61-12 weapon integration into S8.0.1N OFF. Continue S9 development and integration of major line items: such as DTM II, PAD, EPAWSS, MIDS-JTRS and rehosting B61-12LEP. Additionally, MIDS-JTRS will be integrated into the F-15 OFPs. Continuation of organic software support and Special Projects development efforts. Continue funding support for all F-15 trainers. Continue 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>FY 2018 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. Additionally, radar updates will be 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 OCO Plans: N/A</p>					
<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 Initial Operational Test & Evaluation (IOT&E) operations. Purchased</p>	14.636	21.549	19.347	0.000	19.347

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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B. Accomplishments/Planned Programs (\$ in Millions)

long-lead test support assets and unique aircraft test instrumentation. This included technical and acquisition related studies.

FY 2016 Accomplishments:

F-15 Flight Test Support provides prime contractor support cadre at Eglin and Nellis for DT/IOT&E 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. Completed Richter Lab security upgrades and lay in provisions for AESA radar equipment. Provided field-ready AESA radar target generators for Eglin and Nellis. Repaired APG-63 and APG-82 radar test aircraft instrumentation. This includes technical and acquisition-related studies.

FY 2017 Plans:

F-15 Flight Test Support provides contractor support cadre at Eglin and Nellis for DT/IOT&E 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. Complete Richter Labs AESA radar provisions. This includes technical and acquisition-related studies.

FY 2018 Base Plans:

F-15 Flight Test Support provides contractor support cadre at Eglin and Nellis for DT/IOT&E 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. Complete Richter Labs AESA radar provisions. This includes technical and acquisition-related studies.

FY 2018 OCO Plans:

N/A

Title: F-15 Radar Enhancements

Description: Improvements to F-15 Radar Enhancements (EP). This includes technical and acquisition related studies.

FY 2016 Accomplishments:

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>long-lead test support assets and unique aircraft test instrumentation. This included technical and acquisition related studies.</p> <p>FY 2016 Accomplishments: F-15 Flight Test Support provides prime contractor support cadre at Eglin and Nellis for DT/IOT&E 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. Completed Richter Lab security upgrades and lay in provisions for AESA radar equipment. Provided field-ready AESA radar target generators for Eglin and Nellis. Repaired APG-63 and APG-82 radar test aircraft instrumentation. This includes technical and acquisition-related studies.</p> <p>FY 2017 Plans: F-15 Flight Test Support provides contractor support cadre at Eglin and Nellis for DT/IOT&E 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. Complete Richter Labs AESA radar provisions. This includes technical and acquisition-related studies.</p> <p>FY 2018 Base Plans: F-15 Flight Test Support provides contractor support cadre at Eglin and Nellis for DT/IOT&E 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. Complete Richter Labs AESA radar provisions. This includes technical and acquisition-related studies.</p> <p>FY 2018 OCO Plans: N/A</p> <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 2016 Accomplishments:</p>	18.421	64.191	50.814	0.000	50.814

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Continued implementation of EP into S8E & S9. Continued Special Projects testing support. Began EP and Combat ID candidate risk reduction for future OFP integration. Developed jammers to be used in F-15 System Integration Labs.</p> <p>FY 2017 Plans: Continue implementation of EP into S8E & S9. Continue Special Projects testing support. Continue EP and Combat ID candidate risk reduction for future OFP integration. Study and analyze F-15 radar performance against future threat baselines. Develop and test low technology readiness level (TRL) radar 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 Base Plans: Continue implementation of EP into S9 and begin implementation into S10. Continue Special Projects testing support. Continue EP and Combat ID candidate risk reduction for future OFP integration. Study and analyze F-15 radar performance against future threat baselines. Develop and test low technology readiness level (TRL) radar 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 OCO Plans: 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 2016 Accomplishments: Initiated technical and acquisition related studies. Continued acquisition planning. Executed risk reduction activities required to support the Integration phase.</p> <p>FY 2017 Plans: Continue technical and acquisitions studies. Execute risk reduction activities. Begin integration into OFP, EMD asset build, and test planning.</p> <p>FY 2018 Base Plans:</p>	11.774	41.838	50.765	0.000	50.765

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue technical and acquisitions studies, integration into OFP and EMD asset build. Begin qualification and integration testing. FY 2018 OCO Plans: 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 2016 Accomplishments: Finalized investigation request for MIDS-JTRS platform interface through MIDS Program Office. Started development on F-15 platform-specific integrated build for MIDS-JTRS terminal. Continued development planning with prime integrator. FY 2017 Plans: Finalize integrated build for MIDS-JTRS and deliver to prime integrator for platform integration in ESIL. Begin aircraft OFP integration and deliver test assets to flight test locations. This includes technical and acquisition-related studies. FY 2018 Base Plans: Finalize ESIL and being flight test program. This includes technical and acquisition-related studies. FY 2018 OCO Plans: N/A	12.284	25.136	12.010	0.000	12.010
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 Base Plans: Initiate developmental testing for the F-15C Wing variant and internal components. Conduct airworthiness assessment activities. This includes technical and acquisition-related studies.	-	-	23.500	-	23.500
Title: F-15D APG-63(v)3 Radar Upgrade	20.000	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: The Non Recurring Effort (NRE) will develop and deliver draft Time Compliance Technical Orders (TCTO) to upgrade F-15 D aircraft to the APG-63 (V)3 configuration. This includes aircraft currently equipped with the APG-63(V)0 and APG-63(V)1 Mechanically Scanned Array (MSA) radar systems. This effort will also allow for the retention of the existing APX-114 AAI and the APX-119 Mode 5 IFF Modification.</p> <p>FY 2016 Accomplishments: Developed technical documentation and designed kits. Ensured Mode 5 capability is retained. Conducting a technical evaluation and expecting contract award 1QFY17.</p> <p>FY 2017 Plans: N/A</p> <p>FY 2018 Base Plans: N/A</p> <p>FY 2018 OCO Plans: N/A</p>					
<p>Title: Cabin Pressure Indicator</p> <p>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</p> <p>FY 2016 Accomplishments: Selected, tested and integrated the Cabin Pressure Indicator onto the F-15 aircraft.</p> <p>FY 2017 Plans: Selected, tested and integrated the Cabin Pressure Indicator onto the F-15 aircraft.</p> <p>FY 2018 Base Plans: N/A</p> <p>FY 2018 OCO Plans: N/A</p>	0.250	3.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	143.685	269.791	268.758	0.000	268.758

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item # F01500: F-15 Modification of In- Service Aircraft, PEs 0207130, 0207134, 0207445, 0809731	594.877	100.061	429.489	0.000	429.489	493.989	750.925	847.882	683.950	Continuing	Continuing
• APAF: BA06: Line Item # 000999: Initial Spares/Repair Parts (BP16)	55.721	49.476	37.732	0.000	37.732	41.411	42.868	48.029	48.893	Continuing	Continuing
• APAF: BA07: Line Item # F0150P: F-15 Post Production Support	3.225	2.980	2.520	0.000	2.520	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: FY 2018 Air Force **Date: May 2017**

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Suite 7/8/9/10 Development and Test	SS/ Various	Boeing : St. Louis, MO	0.000	65.203	Aug 2016	112.927	Aug 2017	109.822	Aug 2018	0.000		109.822	Continuing	Continuing	-
ADS-B	C/Various	Various : Various	0.000	0.000		0.000		0.000		0.000		0.000	Continuing	Continuing	-
F-15 Radar Enhancement	SS/ Various	Boeing : St. Louis, MO	0.000	18.421	Aug 2016	64.191	Aug 2017	50.814	Aug 2018	0.000		50.814	Continuing	Continuing	-
F-15 Infrared Search and Track	SS/ Various	TBD : TBD	0.000	11.774	Aug 2016	41.838	Jul 2017	50.765	Aug 2018	0.000		50.765	Continuing	Continuing	-
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS)	SS/ Various	Boeing : St. Louis, MO	0.000	12.284	Aug 2016	25.136	Jun 2017	12.010	Jul 2018	0.000		12.010	Continuing	Continuing	-
Service Life Extension Program (SLEP) Wing Replacement	TBD	Not specified. : TBD	0.000	0.000		0.000		23.500	Aug 2018	0.000		23.500	0.000	23.500	-
V3	SS/ Various	Boeing : St. Louis, MO	0.000	20.000	Dec 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Cabin Pressure Indicator	TBD	TBD : Various	0.000	0.250	Sep 2016	3.000	Sep 2017	0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			0.000	127.932		247.092		246.911		0.000		246.911	-	-	-

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.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Boeing (Contractor Test Support)	SS/CPFF	Boeing : St. Louis, MO	0.000	14.636	Sep 2016	21.549	Aug 2017	19.347	Aug 2018	0.000		19.347	Continuing	Continuing	-
Subtotal			0.000	14.636		21.549		19.347		0.000		19.347	-	-	-

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	1.117	Sep 2016	1.150	Sep 2017	2.500	Sep 2018	0.000		2.500	Continuing	Continuing	-
Subtotal			0.000	1.117		1.150		2.500		0.000		2.500	-	-	-

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	143.685	269.791	268.758	0.000	268.758	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Continuous Development																												
OFP Suite 7C Fielding																												
OFP Suite 8E Fielding																												
OFP Suite 9 MS B																												
OFP Suite 9 EMD Award																												
OFP Suite 9 Fielding																												
Radar Enhancements Suite 8E 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 DT																												
Cabin Pressure Indicator Testing																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
OFP Continuous Development	1	2016	4	2022
OFP Suite 7C Fielding	1	2016	3	2017
OFP Suite 8E Fielding	1	2017	1	2018
OFP Suite 9 MS B	2	2016	3	2017
OFP Suite 9 EMD Award	3	2016	2	2017
OFP Suite 9 Fielding	1	2019	3	2021
Radar Enhancements Suite 8E Fielding	4	2016	4	2016
Infrared Search and Track Integration and Test	1	2016	3	2022
Infrared Search and Track Integration and Test MS B	4	2017	1	2018
Infrared Search and Track Integration and Test EMD Award	3	2017	2	2018
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) Development	4	2016	2	2020
SLEP Wing Replacement Contract Award	3	2018	3	2018
APG-63-V3 Radar NRE Contract Award	1	2017	1	2017
ADS-B DT	3	2017	3	2018
Cabin Pressure Indicator Testing	4	2016	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207136F I Manned Destructive Suppression
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	14.400	14.773	15.106	0.000	15.106	15.353	15.638	15.911	16.236	Continuing	Continuing
674595: F-16 HARM Targeting Sys	-	14.400	14.773	15.106	0.000	15.106	15.353	15.638	15.911	16.236	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 and Material Shortage (DMSMS) issues.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	14.860	14.773	15.062	0.000	15.062
Current President's Budget	14.400	14.773	15.106	0.000	15.106
Total Adjustments	-0.460	0.000	0.044	0.000	0.044
• 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	-0.460	0.000			
• Other Adjustments	0.000	0.000	0.044	0.000	0.044

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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>		
Change Summary Explanation 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.				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Title: P3I R7 Software Upgrade (SWUP)		11.200	12.823	12.756
Description: P3I R7 Software Upgrade (SWUP)				
FY 2016 Accomplishments: Continued HTS R7.8 SWUP software development and formal development flight testing, test data analysis, software fixes, and release of updated software for iterative flight testing. Risk reduction included a minor software update (maintenance release) in support of F-16 Operational Flight Program (OFP) M7.2+ and studies continued risk reduction efforts for future P3I phase(s). Mission support (i.e., program management for administrative and technical support) continued.				
FY 2017 Plans: Continue HTS R7.8 SWUP software development and complete flight testing, test data analysis, software fixes, and software FCA. Risk reduction includes minor software updates (maintenance releases) in support of F-16 OFP M7.2+ and studies continue on risk reduction efforts for future P3I phase(s). Mission support (i.e., program management for administrative and technical support) continues.				
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.				
Title: Flight Test		2.300	1.050	1.500
Description: Flight Test				
FY 2016 Accomplishments: Government flight test operations continued in formal development flight testing of R7.8 SWUP software capabilities. Developmental test included test data analysis support and baselining requirements from actual test data results during flight testing. Conducted ground testing such as anechoic chamber testing, as needed. The test organization conducted each mission				

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018
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 was accomplished.			
FY 2017 Plans: Government flight test operations continues in formal development flight testing of R7.8 SWUP software capabilities. This funding also includes test data analysis support and baselining requirements from actual test data results during flight testing. Conduct ground testing such as anechoic chamber testing, as needed. The test organization will conduct each mission to include F-16 test aircraft operations, threat/test ranges and associated support, air re-fueling, and range control support. Post-mission support for each mission is planned.			
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.			
Title: Mission Planning	0.900	0.900	0.850
Description: Joint Mission Planning System (JMPS) (Formerly Air Force Mission Support System (AFMSS))			
FY 2016 Accomplishments: Continued mission planning in conjunction with HTS R7.8 software upgrade and future P3I upgrades. This effort included continued development and testing of candidate upgrades and incremental engineering releases in support of fielding.			
FY 2017 Plans: Continue mission planning in conjunction with HTS R7.8 software upgrade and future P3I upgrades. This effort includes continued development and testing of candidate upgrades and incremental engineering releases in support of fielding.			
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.			
Accomplishments/Planned Programs Subtotals	14.400	14.773	15.106

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
	Base	OCO	Total								
• No other investment funding: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	10.271	May 2016	12.064	Jul 2017	11.566	May 2018	0.000		11.566	Continuing	Continuing	-
JMPS (Formerly AFMSS)	MIPR	Multiple : Multiple	-	0.900	Jan 2016	0.900	Jan 2017	0.850	Jan 2018	0.000		0.850	Continuing	Continuing	-
Subtotal			-	11.171		12.964		12.416		0.000		12.416	-	-	-

Remarks
HTS R7.8 SWUP risk reduction completed in May 2013. HTS R7.8 development began in May 2013 and is projected to continue until 2017.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	2.300	Jan 2016	1.050	Jan 2017	1.500	Jan 2018	0.000		1.500	Continuing	Continuing	-
Subtotal			-	2.300		1.050		1.500		0.000		1.500	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.929	Oct 2015	0.759	May 2017	1.190	Oct 2017	0.000		1.190	Continuing	Continuing	-
Subtotal			-	0.929		0.759		1.190		0.000		1.190	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force							Date: May 2017				
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>				
	Prior Years	FY 2016	FY 2017		FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	14.400	14.773		15.106	0.000	15.106	-	-	-	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
R7.8 SWUP Contract	██████████																											
R7.8 SWUP Flight test (CT&E/DT&E)	██████████																											
R7.8 Software Release					████																							
R7.9 SWUP (R7.8X MNX Updates) Risk Reduction	██																											
R7.8X MNX1 Update Release					████																							
R7.9 SWUP Contract									██																			
R7.9 SWUP (CT&E/DT&E)													██															
R7.9 Software Release																					██████████							
R7.8X MNX2 Update Release													████															

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
R7.8 SWUP Contract	1	2016	2	2017
R7.8 SWUP Flight test (CT&E/DT&E)	1	2016	1	2017
R7.8 Software Release	3	2017	3	2017
R7.9 SWUP (R7.8X MNX Updates) Risk Reduction	2	2016	3	2018
R7.8X MNX1 Update Release	3	2017	3	2017
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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	3,674.494	224.550	387.564	610.942	0.000	610.942	514.005	500.028	664.530	476.668	Continuing	Continuing
674785: <i>F-22</i>	3,671.531	172.848	286.270	413.149	0.000	413.149	315.587	423.296	485.152	476.668	Continuing	Continuing
674788: <i>F-22 Tactical Mandates</i>	2.963	51.702	101.294	197.793	0.000	197.793	198.418	76.732	179.378	0.000	0.000	808.280

Note
 In FY 2013, a separate Program Element (0605213F) was created for Increment 3.2B. All Increment 3.2B efforts and associated funding prior to FY2013 are included in the F-22A Squadrons (0207138F) budget documentation.

In FY 2015, a separate Project (Budget Program Activity Code [BPAC] 674788) was created for F-22 Tactical Mandates, formerly known as F-22 Mandates.

In FY 2017 HMDCS was a new start
 In FY 2017 GPS military code was 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 25+ years. The F-22 is the only operational 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 FY 2018 funding request increased by \$187.937 million as compared to the FY 2017 funding request. This request includes a \$95M RMD for the TacLink 16 and Advanced Technology Development, in support of early Sensor Enhancement work. The FY 2018 President's Budget included \$50M increase in PE 0207138F for Laboratory Test and Operations (LTO) work associated with technology refresh. Additionally, there was a \$28M increase as TacMan continues its development work and \$14M to support ongoing F-22 Small Projects.

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 program is in Budget Activity 7, Operational Systems Development because this budget activity includes development efforts 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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	231.599	387.564	423.005	0.000	423.005
Current President's Budget	224.550	387.564	610.942	0.000	610.942
Total Adjustments	-7.049	0.000	187.937	0.000	187.937
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-7.049	0.000			
• Other Adjustments	0.000	0.000	187.937	0.000	187.937

Change Summary Explanation

2018: The increase of \$187.937M includes a \$95M increase for the TacLink 16 program and Advanced Technology Development, for Sensor Enhancement work. Additionally, the FY 2018 President's Budget includes \$50M in PE 0207138F for Laboratory Test and Operations (LTO) work associated with technology refresh.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674785: F-22	3,671.531	172.848	286.270	413.149	0.000	413.149	315.587	423.296	485.152	476.668	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0207138F, project 674785, F-22 Sensor Enhancements will be a new start in FY 2019.

In FY 2013, a separate Program Element, 0605213F, was created for Increment 3.2B upon designation as an ACAT I program. All Increment 3.2B efforts and associated funding prior to FY 2013 are included in the F-22A Squadrons, 0207138F, budget documentation.

In FY 2015, a separate Budget Project Activity Code (BPAC 674788) was created for F-22 Tactical Mandates, formerly known as F-22 Mandates.

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 25+ 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.

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 2016	FY 2017	FY 2018
Title: Increment 3.2A	0.427	0.104	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 2016 Accomplishments: Continued Increment 3.2A implementation.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
Increment 3.2A implementation is complete.				
FY 2018 Plans: N/A				
Title: Update 6 Interoperability		43.190	56.700	48.530
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.				
FY 2016 Accomplishments: Contract was awarded for remaining OFP content development. Update 6 Interoperability began design, code, and test for IFDL/Link 16 interoperability and TSV modernization. Continued integration and test of crypto modernization.				
FY 2017 Plans: Update 6 Interoperability continuing code/system test, and began formal Development Test for IFDL/Link 16 interoperability and TSV modernization. Continuing integration and test of crypto modernization. Completed Preliminary Design Review (PDR) and Milestone B.				
FY 2018 Plans: Update 6 Interoperability continues code/system test, and continues formal development test for IFDL/Link 16 interoperability and TSV modernization. Continued integration and test of crypto modernization.				
Title: Software Support		1.015	0.000	3.400
Description: Software support develops, tests and fields new capabilities and capability enhancements for training devices and Integrated Maintenance Information System (IMIS) software in order to maintain concurrency with aircraft configuration and capability. Software Support includes Pilot Training Systems (PTS) and IMIS software development to include Integrated Maintenance Data System (IMDS) and Reliability and Maintainability Information System (REMIS) interface development.				
FY 2016 Accomplishments: Implemented Advanced Diagnostic Interface Tool (ADIT) and Multiplex Bus Fault Isolation (MBFI) capability within IMIS.				
FY 2017 Plans:				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
N/A				
<p>FY 2018 Plans: Modify and field four Man in the Loop (MITL) stations at the Nellis AFB, Virtual Warfare Center, ensuring F-22 capability and concurrency with the F-22 weapon system.</p> <p>Title: Advanced Technology Development (ATD)</p> <p>Description: Technology maturation, risk reduction, studies, and demonstrations of classified F-22 development efforts.</p> <p>FY 2016 Accomplishments: Completed technology maturation and risk reduction projects in support of various classified F-22 development efforts.</p> <p>FY 2017 Plans: Continuing technology maturation and risk reduction projects in support of various classified F-22 development efforts. During FY 2017, ATD will begin providing technology maturation and acquisition planning in support of the F-22 Sensor Enhancements Program.</p> <p>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.</p>		20.676	66.466	126.400
<p>Title: System Engineering/Program Management Support</p> <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 2016 Accomplishments: Provided 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 2017 Plans: Providing 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>		7.710	8.500	9.470
<p>Title: Reliability and Maintainability Maturation Program (RAMMP)</p>		0.700	0.700	2.500

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>Description: The RAMMP Program provides for solution identification and integration of upgrades to improve reliability, availability and maintainability (RAM) for the F-22 combined test fleet, located at Edwards AFB. The associated RAMMP effort develops candidate RAMMP initiatives which are down-selected for implementation based on their development maturity, reduction to Mean Time Between Failure (MTBF), Mean Time to Repair (MTTR), impacts to the safety of the pilot or aircraft and the return on investment (ROI) as associated with the total F-22 life cycle costs. The RAMMP program includes modifications to address corrosion, and urgent response requirements for the aircraft such as Automatic Back-Up Oxygen System (ABOS).</p> <p>FY 2016 Accomplishments: Completed 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.</p> <p>FY 2017 Plans: Continuing 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.</p> <p>FY 2018 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. 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>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 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.</p> <p>FY 2016 Accomplishments: Continued F-22 technology studies and demonstrations for DT Weapon Assets, Threat Modeling Support, Test Support, Test Aircraft Modifications, continue Common Range Integrated Instrumentation System Implementation (CRIIS) Network development effort, PT, Dynamic SAR, Flutter Excitation System (FES), GFE, and continue acquisition planning for EW enhancements.</p> <p>FY 2017 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 Plans:</p>	19.500	24.100	30.380

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
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>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.</p> <p>FY 2016 Accomplishments: Conducted flight testing at Air Force Flight Test Center (AFFTC). The significant programs undergoing flight test at AFFTC included: Increment 3.2B, F-22 Tactical Mandates planning, Update 6, CRIIS, and Low Drag Pylons.</p> <p>FY 2017 Plans: Continued flight testing at AFFTC and required technology refresh. Significant flight test programs at AFFTC included Increment 3.2B, Seek Eagle, and Low Drag Pylons. Also accomplished flight test planning for the following upcoming programs: F-22 Tactical Mandates, TACLInk 16, Update 6, Sensor Enhancements, Advanced Technology Development (ATD), Flutter Excitation System (FES), and Common Range Integrated Instrumentation System (CRIIS).</p> <p>FY 2018 Plans: Significant programs scheduled for flight test at AFFTC include: Update 6, refueling certifications, Sensor Enhancements, ATD, FES, and CRIIS. In FY 2018, the F-22 program will add an additional operational test aircraft to the fleet by bringing an aircraft out of flyable storage.</p>		46.100	48.500	54.600
<p>Title: Laboratory Test & Operations (LTO)</p> <p>Description: The LTO is a continuous activity that plans and conducts development, integration, test, & verification (IT&V) 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.</p> <p>FY 2016 Accomplishments: Increased lab availability in support of F-22 programs. Updated critical systems as required to support new aircraft configurations and capabilities. Accomplished OFP verification and risk reduction. Supported pilot training for Air Combat Command exercises and war gaming; Air Force Operation Test & Evaluation Center test planning; and test event rehearsals. Supported periodic Air</p>		33.530	53.200	129.859

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>Force Wargaming Center (AFWC) operational mission data updates. The significant programs that executed in lab tests were Increment 3.2B, F-22 TACLink 16, F-22 Tactical Mandates, Update 6, Advanced Technologies and AFWC mission data loads.</p> <p>FY 2017 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. Accomplished OFP verification and risk reduction. Supported pilot training for Air Combat Command exercises and war gaming; Air Force Operation Test & Evaluation Center test planning; and test event rehearsals. Supported periodic AFWC operational mission data updates. The significant programs that executed in lab tests were Increment 3.2B, F-22 TACLink 16, F-22 Tactical Mandates, Update 6, Advanced Technologies and AFWC mission data loads.</p> <p>FY 2018 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. The significant programs planned for lab test are F-22 TacLink 16, F-22 Tactical Mandates, Update 6, Advanced Technologies and AFWC mission data loads.</p>				
<p>Title: Helmet Mounted Display and Cueing System (HMDCS)</p> <p>Description: The HMDCS program will select, integrate, test and field a mature 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.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Conduct studies, analysis and acquisition planning for the HMDCS.</p> <p>FY 2018 Plans: Continue studies, analysis and acquisition program planning. Release request for proposal.</p>		0.000	3.500	4.810
<p>Title: F-22 Global Positioning System (GPS) Military Code (M-Code)</p> <p>Description: The F-22 GPS M-Code program 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>		0.000	24.500	3.200

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<i>FY 2016 Accomplishments:</i> Not applicable.			
<i>FY 2017 Plans:</i> F-22 GPS M-Code development activities support hardware design and development of the CRPA and integration of the Embedded GPS/Inertial Navigation System (INS) Modernization (EGI-M), and begin design, code and software integration testing for the F-22 platform interface. Release pre-EMD request for proposal.			
<i>FY 2018 Plans:</i> Continue hardware design and development of the CRPA and integration of the Embedded GPS/Inertial Navigation System (INS) Modernization (EGI-M), and continue design, code and software integration testing for the F-22 platform interface.			
Accomplishments/Planned Programs Subtotals	172.848	286.270	413.149

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item # F02200: <i>F-22A Squadrons, PE 0207138F*</i>	111.077	163.008	176.630	0.000	176.630	257.891	257.310	2,347.665	457.265	Continuing	Continuing
• RDT&E: BA07: PE 0605213F: <i>Increment 3.2B, RDT&E**</i>	115.603	70.290	13.600	0.000	13.600	0.000	0.000	0.000	0.000	0.000	562.070
• APAF: BA05: Line Item # F2232B: <i>F-22 Increment</i> <i>3.2B, PE 0207138F***</i>	64.325	78.410	105.756	0.000	105.756	13.081	20.373	6.013	0.000	0.000	316.458
• MILCON: PE 0207138F: <i>MILCON</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	24.900
• RDT&E: BA07: PE 0207163F: <i>AIM-120D, AMRAAM, RDT&E****</i>	5.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	50.450
• RDT&E: BA07: PE 0207138F: <i>F-22 Tactical Mandates</i>	51.702	101.294	197.793	0.000	197.793	198.418	76.732	179.378	0.000	0.000	808.280

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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
**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.											
****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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Increment 3.2A	SS/CPPIF	Lockheed Martin : Fort Worth, TX	398.495	0.427		0.104		0.000		0.000		0.000	0.000	399.026	-
Update 6 Interoperability	SS/Various	Lockheed Martin : Fort Worth, TX	46.026	43.190	Feb 2016	56.700	Mar 2017	54.990		0.000		54.990	3.850	204.756	-
Software Support	SS/Various	Lockheed Martin : Fort Worth, TX	290.504	1.015	Nov 2015	0.000		0.000		0.000		0.000	0.000	291.519	-
Advanced Technology Development	Various	Various : Various	97.182	20.676	Feb 2016	66.466	Dec 2016	141.949	Nov 2017	0.000		141.949	Continuing	Continuing	-
Sensor Enhancements	SS/Various	Lockheed Martin : Fort Worth, TX	0.000	0.000		0.000		0.000		0.000		0.000	809.080	809.080	-
System Engineering / Program Management	SS/CPFF	Lockheed Martin : Fort Worth, TX	210.322	7.710	Mar 2016	8.500	Jan 2017	9.470	Jan 2018	0.000		9.470	Continuing	Continuing	-
RAMMP	SS/CPFF	Lockheed Martin : Fort Worth, TX	168.511	0.700	Dec 2015	0.700	Dec 2016	0.700	Dec 2017	0.000		0.700	Continuing	Continuing	-
F-22 Small Projects	Various	Various : Various	554.710	19.500	Nov 2015	24.100	Nov 2016	38.730	Dec 2017	0.000		38.730	Continuing	Continuing	-
HMDCS	SS/Various	Lockheed Martin : Fort Worth, TX	0.000	0.000		3.500	Jul 2017	4.810	Jul 2018	0.000		4.810	27.419	35.729	-
Global Positioning System (GPS) M-Code	SS/CPPIF	Lockheed Martin : Fort Worth, TX	0.000	0.000		24.500	Sep 2017	3.200	Aug 2018	0.000		3.200	0.000	27.700	-
Subtotal			1,765.750	93.218		184.570		253.849		0.000		253.849	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Combined Test Force	Various	Various : Various	827.360	46.100	Nov 2015	48.500	Nov 2016	54.600	Nov 2017	0.000		54.600	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Update 5 Fleet Release Block 20	■																											
Update 5 Fleet Release Block 30/35	■																											
Update 6 Interoperability Requirements Analysis/Design	■	■	■	■	■	■	■	■																				
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	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
HMDCS Development, Integration and Test													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
GPS M-Code Development, Integration, and Test													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Update 5 Fleet Release Block 20	1	2016	1	2016
Update 5 Fleet Release Block 30/35	1	2016	1	2016
Update 6 Interoperability Requirements Analysis/Design	1	2016	2	2017
Update 6 Interoperability Development, Integration, & Test	1	2016	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)	3	2018	3	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)	4	2019	4	2019
Advanced Technology Development Demonstrations	1	2016	4	2021
Advanced Technology Development Studies & Analysis	1	2016	4	2021
HMDCS Development, Integration and Test	4	2018	4	2022
GPS M-Code Development, Integration, and Test	4	2017	1	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674788: F-22 Tactical Mandates	2.963	51.702	101.294	197.793	0.000	197.793	198.418	76.732	179.378	0.000	0.000	808.280
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 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.

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.

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

	FY 2016	FY 2017	FY 2018
Title: TACLink 16	0.000	69.614	130.400
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.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> The program began its pre-Engineering and Manufacturing Development (Pre-EMD) effort. The program had a successful Preliminary Design Review for its Link 16 radio solution.</p> <p><i>FY 2017 Plans:</i> TACLink 16 will continue design, software modeling and test. Work will begin on development of prototype units for the OSA rack.</p> <p><i>FY 2018 Plans:</i> The contract for Engineering and Manufacturing Development (EMD) will be awarded. TACLink 16 will continue design, software and modeling. Development units will be delivered to begin systems level lab test. Hardware qualification efforts will commence.</p>			
<p><i>Title:</i> F-22 Tactical Mandates (TACMan)</p> <p><i>Description:</i> 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.</p>	51.702	31.680	59.700
<p><i>FY 2016 Accomplishments:</i> The program began its pre-Engineering and Manufacturing Development effort. F-22 Tactical Mandates continued capabilities analysis, design, and software modeling and test.</p> <p><i>FY 2017 Plans:</i> F-22 TACMan will continue design, software modeling, and test. The program will begin prototyping efforts.</p> <p><i>FY 2018 Plans:</i> The contract for EMD will be awarded. F-22 TACMan will continue design, software modeling, and begin system lab test.</p>			
<p><i>Title:</i> Lab and Combined Test Force (CTF)</p> <p><i>Description:</i> 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.</p> <p>The F-22 Combined Test Force, 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 of TACMAN and TACLink 16 early before they are more difficult and costly to resolve.</p>	0.000	0.000	7.693

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<i>FY 2016 Accomplishments:</i> CTF and Lab planning efforts were conducted for TACMan.			
<i>FY 2017 Plans:</i> Continue to plan CTF and begin Lab testing of F-22 TACMan and TACLink 16.			
<i>FY 2018 Plans:</i> Continue lab testing and continue planning for CTF testing for TACMan and TACLink 16.			
Accomplishments/Planned Programs Subtotals	51.702	101.294	197.793

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDT&E: BA07: PE 0207138F: F-22A Squadrons*	172.848	286.270	413.149	0.000	413.149	315.578	423.296	485.152	476.668	Continuing	Continuing
• APAF: BA05: Line Item #F02200: F-22A Squadrons, PE 0207138F**	111.077	1,630.008	176.630	0.000	176.630	257.891	257.310	347.665	457.265	Continuing	Continuing
• RDT&E, BA05, PE 0605213F: F-22A Increment 3.2B***	115.603	70.290	13.600	0.000	13.600	0.000	0.000	0.000	0.000	0.000	562.070
• APAF: BA05: Line Item #F2232B: F-22A Increment 3.2B, PE 0207138F****	64.325	78.410	105.756	0.000	105.756	13.081	20.373	6.013	0.000	0.000	316.458

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.

****F-22 Squadrons, APAF/PE 0207138F/F2232B, includes funding for F-22 Increment 3.2B BPs 11 (Aircraft Modifications) and 16 (Initial Spares) only.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force Date: May 2017

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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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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	2.963	51.702	May 2016	31.680	Nov 2017	59.700	Mar 2018	0.000		59.700	308.656	454.701	-
F-22 TACLink 16	SS/CPIF	Lockheed Martin : Ft Worth, TX	0.000	0.000		69.614	Nov 2017	130.400	Mar 2018	0.000		130.400	106.345	306.359	-
Subtotal			2.963	51.702		101.294		190.100		0.000		190.100	415.001	761.060	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.000		0.000		7.693	Nov 2017	0.000		7.693	39.527	47.220	-
Subtotal			0.000	0.000		0.000		7.693		0.000		7.693	39.527	47.220	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		2.963	51.702	101.294	197.793	0.000	197.793	454.528	808.280	-

Remarks

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TACLink 16 Development , Integration & Test	2	2017	2	2020
TACLink 16 Preliminary Design Review (PDR)	4	2017	4	2017
TACLink 16 Milestone B	1	2018	1	2018
TACLink 16 Production Readiness Review	1	2019	1	2019
TACLink 16 Installs	2	2021	4	2022
F-22 Tactical Mandates Requirements Analysis	1	2016	3	2016
F-22 Tactical Mandates Program Backlog Review	2	2017	2	2017
F-22 Tactical Mandates Design	3	2016	1	2018
F-22 Tactical Mandates Development , Integration & Test	2	2017	3	2021
F-22 Tactical Mandates Preliminary Design Review (PDR)	4	2017	4	2017
F-22 Tactical Mandates Milestone B	1	2018	1	2018
F-22 Tactical Mandates Production Readiness Review	4	2019	4	2019
F-22 Tactical Mandates Installs	2	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	61.782	51.990	153.045	334.530	0.000	334.530	510.637	523.997	463.528	326.147	Continuing	Continuing
675346: <i>F-35</i>	36.485	47.023	127.302	299.408	0.000	299.408	463.621	474.971	396.488	263.548	Continuing	Continuing
676011: <i>JSF DUAL CAPABLE AIRCRAFT</i>	25.297	4.967	25.743	35.122	0.000	35.122	47.016	49.026	67.040	62.599	Continuing	Continuing

Program MDAP/MAIS Code: 198

Note
 Schedule changed to reflect impacts from previous budget changes and direction from the Milestone Decision Authority

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 Navy, United States Air Force, United States Marine Corps and International Partners countries. The three variants are the F-35A Conventional Takeoff and Landing; 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 the FOM continue as Initial Operational Capability (IOC) is met for each variant during System Development and Demonstration (SDD).

The JSF FoM efforts provide incremental warfighting capability improvements to maintain joint air dominance against current and evolving threats. FoM 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 FoM Mission Decomposition analysis completed in FY2014. These analyses serve as the basis for the F-35 FoM Capabilities Development Document (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. Pre-modernization activities in FY2017 and FY2018 include systems engineering, risk reduction, and infrastructure upgrades to support initial fleet availability of FoM upgrades in 2021.

FoM 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 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 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 Marine Corps funding. Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants. Foreign Military Sales are ongoing separately.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0207142F / <i>F-35 Squadrons</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	53.921	153.045	349.389	0.000	349.389
Current President's Budget	51.990	153.045	334.530	0.000	334.530
Total Adjustments	-1.931	0.000	-14.859	0.000	-14.859
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.931	0.000			
• Other Adjustments	0.000	0.000	-14.859	0.000	-14.859

Change Summary Explanation

FY 2018 Decrease: General program reduction and HPSI (Hybrid Product Support Integrator) increase net to -\$14.859M FY 2018 decrease.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675346: F-35	36.485	47.023	127.302	299.408	0.000	299.408	463.621	474.971	396.488	263.548	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Total cost, including International partner contributions, USN, USMC, and USAF funding: FY2016 \$110.517M; FY2017 \$373.463M; FY2018 \$739.755M

R-2A table shown above reflects service funding only.

R-2A (section B)/R-3 displays combined program for JSF Follow-on Modernization (FoM).

JSF FoM Includes:

USAF PE 0207142F BPAC 675346

USN PE 0604810N Project Unit 2936

USMC PE 0604810M Project Unit 2935

USN PE 0604800N Project Unit 9999 (FY14): \$1.500M

USMC PE 0604800M Project Unit 9999 (FY14): \$1.500M

International Partner Contributions

A. Mission Description and Budget Item Justification

F-35 FoM provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential mission improvements 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 Block 4 acquisition strategy is based upon incremental deliveries of capabilities in 4 sub-blocks. The strategy includes deliveries on a two year cycle with a focus on hardware and tech refresh change every four years. FoM capability planning includes an efficient transition from F-35 SDD to Follow-on Modernization. As SDD development activities ramp down FoM will assume responsibility for improvements and modernization efforts. Block 4 capability planning includes sub-block 4.1 through 4.4 modernization efforts with initial increment of capability available in FY2021 and subsequent releases every two years.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Block 4 Planning and System Engineering	85.478	265.280	311.270	-	311.270
Description: Block 4 Planning and Systems Engineering preliminarily design and delta SRR for all variants of the F-35 Aircraft. 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					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>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 FoM 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 and pre-planning for subsequent Block 4 Modernization events are included. Capability planning effort and preparations will lead to formal acquisition approval of a Block 4 Modernization contract.</p> <p>FY 2016 Accomplishments: Continued FoM requirements analysis and technical requirements development and decomposition, systems engineering, and technical planning.</p> <p>FY 2017 Plans: Continue requirements analysis and technical requirements development and decomposition, systems engineering, and technical planning. Conduct Block 4.1 System Requirements Review (SRR).</p> <p>FY 2018 Base Plans: Conduct a Block 4.1 System Functional Review (SFR) followed by initiation of preliminary design. Release the Block 4 modernization Request for Proposal (RFP) 1QFY2018 with contract award planned for 1QFY2019.</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 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).</p> <p>FY 2016 Accomplishments: TR-3 Program produced 5 government-owned specifications to inform the new F-35 avionics hardware redesign required to support 4X processing growth factor based on current processing estimates for all 3F capabilities.</p>	14.214	32.515	150.370	-	150.370

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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The program also started the design of the new Integrated Core Processor (ICP), Panoramic Cockpit Display (PCD), and Aircraft Memory System (AMS).

FY 2017 Plans:
The TR-3 program continued to design the Integrated Core Processor (ICP), Panoramic Cockpit Display (PCD), and Aircraft Memory System (AMS). The program will hold System Requirements Review and Preliminary Design Review for the ICP, PCD, and AMS to ensure on-time Critical Design Review, which drives timely first article delivery to the production line in FY23.

FY 2018 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.

Title: Infrastructure and Support Costs	10.825	70.668	114.115	-	114.115
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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 2016 Accomplishments:
Continue development support for defining, managing and acquiring the F-35 capability enhancements identified in approved requirements documents.

FY 2017 Plans:
Continue development support for defining, managing and acquiring the F-35 capability enhancements identified in approved requirements documents.

FY 2018 Base 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 FoM 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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
transition to a final integrated support plan. Conduct strategic basing analysis to determine permanent location for core of HPSI.					
Title: Test and Evaluation	0.000	5.000	164.000	-	164.000
Description: 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 common 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 FoM Capability Development Document(CDD). Execution all DT activities in support of Block 4.					
FY 2016 Accomplishments: N/A					
FY 2017 Plans: Award initial contract in support of the non-recurring engineering effort.					
FY 2018 Base 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 FoM efforts. This funding also supports laboratory upgrades required to support development and verification of capabilities in a relevant environment.					
Accomplishments/Planned Programs Subtotals	110.517	373.463	739.755	-	739.755
Other Service Program Funding Adjustment	63.494	246.161	440.347	-	440.347
Air Force Subtotals	47.023	127.302	299.408	-	299.408

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE: BA05: PE 0604800F	497.031	403.505	255.745	0.000	255.745	69.655	7.796	5.598	0.000	0.00	22,265.228
3831: JSF SDD, BPAC 653831											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE: BA05: PE 0604800F 3832: <i>JSF Deployability and Suitability Enhancements, BPAC 653832</i>	78.901	46.962	37.202	0.000	37.202	0.000	0.000	0.000	0.000	0.00	238.599
• RDTE: BA07: PE 0207142F 6011: <i>Dual Capable Aircraft (DCA), BPAC 676011</i>	4.967	25.743	35.122	0.000	35.122	47.016	49.026	67.040	62.599	Continuing	Continuing
• APAF: BA01: Line Item # ATA000 AP: <i>JSF CTOL Advance Procurement, PE 0207142F, BP10 AP</i>	460.260	404.500	780.300	0.000	780.300	405.200	1,003.600	965.300	414.700	20,154.954	27,497.747
• APAF: BA01: Line Item # ATA000: <i>JSF CTOL, PE 0207142F, BP10</i>	5,259.812	4,997.394	4,544.684	0.000	4,544.684	4,253.696	4,209.813	4,862.684	4,796.042	148,685.767	201,649.676
• APAF: BA06: Line Item # F03500 BP16: <i>JSF Initial Spares, PE 0207142F, BP16</i>	229.582	362.792	320.831	0.000	320.831	319.151	416.722	399.361	394.654	3,893.112	7,567.519
• APAF: BA05: Line Item # F03500 BP11: <i>JSF Modifications, PE 0207142F, BP11</i>	70.167	175.811	68.270	0.000	68.270	230.448	279.814	259.978	301.899	Continuing	Continuing
• USAF OM: <i>Operations and Maintenance</i>	312.557	425.978	452.906	0.000	452.906	555.687	873.270	998.979	958.708	Continuing	Continuing
• OPAF: BA01: Line Item # 821800: <i>Joint Strike Fighter, PE 0207142F</i>	3.858	2.333	3.326	0.000	3.326	3.310	2.993	2.463	2.507	Continuing	Continuing
• MILCON: BA01: PE 0207142F: <i>USAF JSF Military Construction Operations</i>	132.850	305.700	80.000	0.000	80.000	27.500	0.000	0.000	0.000	1,312.100	2,511.350
• MILCON: BA01: PE 0207597F: <i>USAF JSF Military Construction Training</i>	65.400	20.000	21.000	0.000	21.000	34.000	15.900	0.000	0.000	0.00	156.300
• MILCON: BA01: PE 0502635F: <i>USAF JSF Military Construction Air National Guard</i>	0.000	15.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	15.100
• RDTEN: BA05: PE 0604800N 2261: <i>JSF SDD (CV)</i>	453.037	504.296	103.144	0.000	103.144	61.179	1.637	0.454	0.467	0.00	19,983.056

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE: BA05: PE 0604800N 3352: F-35C Sustainment/ Capability Enhancements (CV)	35.666	24.420	5.787	0.000	5.787	4.995	0.000	0.000	0.000	0.00	108.345
• RDTE: BA05: PE 0604810N 2936: F-35C Follow-on Modernization (CV), BPAC 2936	20.544	63.387	143.855	0.000	143.855	225.442	229.055	189.104	121.613	Continuing	Continuing
• APN: BA01: Line Item # 0147C: JSF Advance Procurement (CV), PE 0204146N	48.630	80.908	263.112	0.000	263.112	144.282	252.453	262.416	267.646	2,417.943	5,140.935
• APN: BA01: Line Item # 0147: JSF (CV), PE 0204146N	1,033.142	890.650	582.324	0.000	582.324	1,105.952	1,805.276	2,582.852	2,730.285	27,953.966	50,644.344
• APN: BA06: Line Item # 0605 USN: Initial Spares (CV), PE 0204146N	16.914	61.076	77.177	0.000	77.177	87.846	82.735	238.090	170.365	1,063.155	2,162.723
• APN: BA05: Line Item # 0593: Modifications (CV), PE 0204146N	48.527	26.004	31.689	0.000	31.689	22.344	14.155	13.404	13.672	Continuing	Continuing
• OPN BA03: ALIS Ship ALTS Installs	1.924	0.329	2.024	0.000	2.024	1.890	1.933	1.972	0.986	Continuing	Continuing
• OPN: BA03: Spares for Aviation Support Equipment	2.946	0.881	2.297	0.000	2.297	2.321	0.139	1.977	0.000	Continuing	Continuing
• USN OM: Operations and Maintenance	78.529	120.648	207.302	0.000	207.302	211.332	236.682	281.622	327.009	Continuing	Continuing
• DoN MILCON: USN/ USMC MILCON	94.420	230.900	64.660	121.990	186.650	121.900	119.800	0.000	0.000	642.400	1,406.074
• RDTE: BA05: PE 0604800M 2262: JSF SDD (STOVL)	495.428	507.078	141.534	0.000	141.534	55.952	1.727	0.547	0.564	0.00	3,874.211
• RDTE: BA05: PE 0604800M 3350: F-35B Sustainment/ Capability Enhancements (STOVL), BPAC 3350	30.819	24.348	11.400	0.000	11.400	0.000	0.000	0.000	0.000	0.00	99.115
• RDTE: BA05: PE 0604810M 2935: F-35B Follow-on Modernization (STOVL), BPAC 2935	20.157	74.227	144.958	0.000	144.958	226.310	230.383	190.442	123.531	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017	
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons				Project (Number/Name) 675346 / F-35			

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

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	
			Base	OCO	Total					Complete	Total Cost
• APN: BA01: Line Item # 0152C: <i>JSF Advance Procurement (STOVL), PE 0204146M</i>	203.060	233.648	413.450	0.000	413.450	228.491	231.802	220.822	225.245	1,959.119	4,802.154
• APN: BA01: Line Item # 0152: <i>JSF (STOVL), PE 0204146M</i>	2,147.714	2,040.681	2,398.139	0.000	2,398.139	2,338.179	2,404.257	2,585.039	2,600.750	20,548.402	42,209.667
• APN: BA06: Line Item # 0605 USMC: <i>Initial Spares (STOVL), PE 0204146M</i>	154.569	214.252	144.819	0.000	144.819	92.360	160.490	141.468	199.767	Continuing	Continuing
• APN: BA05: Line Item # 0592: <i>Modifications (STOVL), PE 0204146M</i>	204.464	34.928	34.963	0.000	34.963	70.305	67.039	79.174	80.761	Continuing	Continuing
• USMC OM: <i>Operations and Maintenance</i>	184.171	233.576	315.630	0.000	315.630	375.578	412.813	470.490	544.031	Continuing	Continuing
• International 1: <i>International SDD</i>	17.000	22.000	27.450	0.000	27.450	0.000	0.000	0.000	0.000	0.00	5,013.463
• International 2: <i>International Production</i>	189.922	185.641	124.114	0.000	124.114	151.776	150.588	149.848	87.113	Continuing	Continuing
• International 3: <i>International FoM</i>	83.595	84.602	158.273	0.000	158.273	159.649	162.023	167.383	160.111	Continuing	Continuing
• International 4: <i>International Unique (SDD/PSFD)</i>	38.483	32.374	15.566	0.000	15.566	22.812	29.409	5.357	0.000	0.00	482.417

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 Navy. 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.

Note: The USAF/USN/USMC procurement lines include Aircraft Procurement and Advanced Procurement only. Initial Spares and Repair Parts for all Services are reflected in separate lines. International Partner Funding also includes funds provided under the Italy and Netherlands Bilateral agreements.

RELATED RDT&E: Funding prior to JSF SDD (FY94-FY01): USN PE 0603800N \$1,950,617; USAF PE 0603800F \$1,907,352; DARPA PE 0603800E \$118,056; and International Partner contributions of \$253,921 for a total of \$4,229,946.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

D. Acquisition Strategy

The FoM 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 FoM 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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 TBD PHASE II	SS/CPFF	Lockheed Martin : Ft Worth, TX	0.000	0.000		171.760	Dec 2017	130.370	Dec 2017	0.000		130.370	657.019	959.149	959.149
Prime LM BOA 0020 (Nimble Lightning+Pilot Training)	C/CPFF	Lockheed Martin : Ft Worth, TX	0.000	1.206	Dec 2015	0.000		0.000		0.000		0.000	5.470	6.676	6.676
Prime LM 02-C-3002	SS/CPFF	Lockheed Martin : Ft Worth, TX	19.485	3.707	Dec 2015	0.000		0.000		0.000		0.000	23.192	46.384	46.384
Prime LM 16-C-0008	SS/CPFF	Lockheed Martin : Ft Worth, TX	38.868	80.299	Dec 2015	39.853	Dec 2016	0.000		0.000		0.000	86.812	245.832	245.832
Prime LM 14-G-0020(TR3)	C/CPFF	Lockheed Martin : Ft Worth, TX	0.000	14.214	Mar 2017	32.515	Mar 2017	150.370	Dec 2017	0.000		150.370	466.040	663.139	663.139
Prime LM TBD (Modernization)	C/CPFF	Lockheed Martin : Ft Worth, TX	0.000	0.000		40.297	Dec 2017	115.900	Dec 2017	0.000		115.900	1,878.246	2,034.443	2,034.443
Prime LM IDIQ TBD	SS/CPFF	Lockheed Martin : Ft Worth, TX	0.000	0.000		0.000		65.000	Dec 2017	0.000		65.000	65.000	130.000	65.000
Product Development Sys Engineering	Various	Various : TBD	0.000	0.266	Dec 2015	13.370	Dec 2016	0.000	Dec 2017	0.000		0.000	84.010	97.646	97.646
Program Management	Various	Not specified. : TBD	0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000	-
Subtotal			58.353	99.692		297.795		461.640		0.000		461.640	3,265.789	4,183.269	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development Support	Various	Various : TBD	6.277	1.626	Dec 2015	8.714	Dec 2016	8.215	Dec 2017	0.000		8.215	68.103	92.935	92.935
AFFTC / Eglin AFB	Various	Eglin : Various	0.015	0.000		1.940	Dec 2016	3.220	Dec 2017	0.000		3.220	18.882	24.057	24.057
NAWC Paxutent River	WR	NAWCAD : Paxutent River, MD	0.400	7.503	Dec 2015	20.970	Dec 2016	15.496	Dec 2017	0.000		15.496	138.721	183.090	188.090
NAWC China Lake	WR	NAWCWD : China Lake, CA	0.000	0.429	Dec 2016	7.383	Dec 2016	4.808	Dec 2017	0.000		4.808	Continuing	Continuing	-
Edwards Air Force Base	Various	Edwards AFB : Various	0.000	0.986	Dec 2016	0.000		2.200	Dec 2017	0.000		2.200	11.380	14.566	14.566

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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/AFRL	MIPR	AFLCMC : Wright Patterson AFB, OH	0.000	0.281	Dec 2016	0.232	Dec 2016	0.464	Dec 2017	0.000		0.464	3.037	4.014	4.014
Subtotal			6.692	10.825		39.239		34.403		0.000		34.403	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Paxuent River	Various	Various : Paxuent River, MD	0.000	0.000		0.000		10.478	Dec 2017	0.000		10.478	174.872	185.350	185.350
NAWC China Lake	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		1.050	Dec 2017	0.000		1.050	24.396	25.446	25.446
Developmental Test & Evaluation Edwards/AFB	Various	Edwards AFB : Edwards AFB, CA	0.000	0.000		0.000		12.471	Dec 2017	0.000		12.471	289.067	301.538	301.538
Developmental Test & Evaluation	Various	Various : TBD	0.000	0.000		0.000		6.001	Dec 2017	0.000		6.001	57.087	63.088	63.088
Developmental Test Aircraft Viability	C/CPFF	Lockheed Martin : Ft Worth, TX	0.000	0.000		5.000	Sep 2017	134.000	Dec 2017	0.000		134.000	0.000	139.000	139.000
Subtotal			0.000	0.000		5.000		164.000		0.000		164.000	545.422	714.422	714.422

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Functional Wyle	C/CPFF	Wyle : Arlington, VA	0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000	-
AFLCMC Civilian Pay	Various	AFLCMC CIV PAY : Wright Patterson AFB, OH	0.000	0.000		30.550	Nov 2016	40.000	Nov 2017	0.000		40.000	231.610	302.160	302.160
Financial Mgmt Database Support IDS	C/CPAF	IDS : Arlington, VA	0.000	0.000		0.760	Nov 2016	0.800	Nov 2017	0.000		0.800	4.301	5.861	5.861
Earned Value/Finance/ Cost ACT-I	C/CPAF	ACT-I : Arlington, VA	0.000	0.000		0.000		3.178	Nov 2017	0.000		3.178	23.518	26.696	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CIO Jacobs	C/CPAF	Jacobs : TBD	0.000	0.000		0.000		20.000	Nov 2017	0.000		20.000	95.066	115.066	-
Systems System High BOS	Various	Various : TBD	0.000	0.000		0.000		9.336	Nov 2017	0.000		9.336	45.342	54.678	-
Security Mantech	C/CPAF	Mantech : TBD	0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000	-
Other CIO Services	Various	Not specified. : TBD	0.000	0.000		0.000		4.739	Nov 2017	0.000		4.739	22.579	27.318	-
Travel	Various	Not specified. : TBD	0.000	0.000		0.119	Nov 2016	1.659	Nov 2017	0.000		1.659	8.569	10.347	-
Program Management	Various	Not specified. : TBD	0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000	-
Subtotal			0.000	0.000		31.429		79.712		0.000		79.712	430.985	542.126	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	65.045	110.517	373.463	739.755	0.000	739.755	-	-	-
Other Service Program Funding Adjustment	28.560	63.494	246.161	440.347	-	440.347	0.000	778.562	-
Project Cost Totals	36.485	47.023	127.302	299.408	0.000	299.408	0.000	-778.562	-

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, Follow-on Modernization (FoM) Memorandum of Agreement.

Prior Years reflects \$26.660M USAF/\$11.802M USN/\$11.586M USMC/\$14.997M International/Total \$65.045M

FY 2016 reflects \$47.023M USAF/\$20.544M USN/\$20.157M USMC/\$22.793M International/Total \$110.517M

FY 2017 reflects \$127.302M USAF/\$63.387M USN/\$74.227M USMC/\$108.547M International/Total \$373.463M

FY 2018 reflects \$299.832M USAF/\$143.855M USN/\$144.958M USMC/\$151.110M International/Total \$739.755M

F-35 FoM Includes:
 USAF PE 0207142F BPAC 675346
 FY13: USN PE 0604800N Project Unit 2261
 FY14: USN PE 0604800N Project Unit 3353
 FY15: USN PE 0604810N Project Unit 2936
 FY13: USMC PE 0604800M Project Unit 2262

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date: May 2017**

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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FY14: USMC PE 0604800M Project Unit 3351 FY15: USMC PE 0604810M Project Unit 2935									
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date: May 2017**

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022											
	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								
Requirements: Final CDD (JROC)							■																													
Acquisition: Modernization RFP Decision									■																											
Acquisition: Modernization Contract Decision															■																					
Acquisition: Interim Program Review (IPR) FY18									■																											
Acquisition: Interim Program Review (IPR) FY19													■																							
Acquisition: Interim Program Review (IPR) FY20																	■																			
Acquisition: Interim Program Review (IPR) FY21																							■													
Acquisition: Interim Program Review (IPR) FY22																											■									
Contracting: Block 4 Pre-Modernization	■																																			
Contracting: Block 4 Modernization													■																							
Systems Engineering: Initial Preliminary Design Review (PDR) 4.1															■																					
Systems Engineering: Initial Preliminary Design Review (PDR) 4.2																											■									
Systems Engineering: Initial System Requirements Review (SRR) 4.1							■																													
Systems Engineering: Initial System Functional Review (SFR) 4.1											■																									
Test & Evaluation: 4.1 Test																	■																			
Test & Evaluation: 4.2 Test																									■											
Fielding: Block 4.1 Fleet Availability																											■									
Fielding: Block 4.12Fleet Availability																												■								

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons	Project (Number/Name) 675346 / F-35

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Requirements: Final CDD (JROC)	3	2017	3	2017
Acquisition: Modernization RFP Decision	1	2018	1	2018
Acquisition: Modernization Contract Decision	1	2019	1	2019
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
Contracting: Block 4 Pre-Modernization	1	2016	2	2018
Contracting: Block 4 Modernization	3	2018	4	2022
Systems Engineering: Initial Preliminary Design Review (PDR) 4.1	2	2019	2	2019
Systems Engineering: Initial Preliminary Design Review (PDR) 4.2	3	2020	3	2020
Systems Engineering: Initial System Requirements Review (SRR) 4.1	1	2017	1	2017
Systems Engineering: Initial System Functional Review (SFR) 4.1	1	2018	1	2018
Test & Evaluation: 4.1 Test	4	2019	4	2020
Test & Evaluation: 4.2 Test	2	2021	4	2022
Fielding: Block 4.1 Fleet Availability	4	2020	4	2020
Fielding: Block 4.12Fleet Availability	4	2022	4	2022

Note

Schedule details reflect fiscal years

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons				Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
676011: JSF DUAL CAPABLE AIRCRAFT	25.297	4.967	25.743	35.122	0.000	35.122	47.016	49.026	67.040	62.599	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

F-35 FoM Includes:
USAF: PE 0207142F BPAC 675346

USN: PE 0604810N Project Unit 2936

USMC: PE 0604810M Project Unit 2935

F-35 DCA Includes:
USAF: PE 0207142F BPAC 676011

A. Mission Description and Budget Item Justification

F-35 Follow-on Modernization (FoM) provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential mission improvements 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 Block 4 acquisition strategy is based upon incremental deliveries of capabilities in 4 sub-blocks. The strategy includes deliveries on a two year cycle with a focus on hardware and tech refresh change every four years. FoM capability planning includes an efficient transition from F-35 SDD to Follow-on Modernization. As SDD development activities ramp down, FoM will assume responsibility for improvements and modernization efforts. Block 4 capability planning includes Block 4.1 through 4.4 modernization efforts with initial increment of capability available in 2020 and subsequent releases every two years.

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 two B-61s. Due to extensive certification requirements, the Follow-on Modernization Capability Development Document (CDD).

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Dual Capable Aircraft (DCA)(F-35 JSF)	4.967	25.743	35.122	-	35.122

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 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 2016 Accomplishments: Continued pre-modernization integration efforts to mature DCA unique requirements on the F-35A Air System. Evaluated and identified impacts to the design to enable all aspects of carriage and employment of the B61-12 weapon, to include a survivability analysis to understand impacts of weapon to F-35 materiel components. Other efforts included initiation of Nuclear Certification activities focused on generating preliminary design reports, nuclear safety evaluation plans, and nuclear safety analysis reports.</p> <p>FY 2017 Plans: Continue Nuclear Certification activities focused on generating preliminary design reports, nuclear safety evaluation plans, and nuclear safety analysis reports. Conduct sub-block 4.1 System Requirements Review (SRR) and continue DCA requirements decomposition.</p> <p>FY 2018 Base 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. Complete interagency resource planning 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>					
Accomplishments/Planned Programs Subtotals	4.967	25.743	35.122	-	35.122

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDTE: BA05: PE 0604800F 3831: JSF SDD, BPAC 653831	497.031	403.505	255.745	0.000	255.745	69.655	7.796	5.598	0.000	0.000	22,265.228
• RDTE: BA05: PE 0604800F 3832: JSF Deployability and Suitability Enhancements, BPAC 653832	78.901	46.962	37.202	0.000	37.202	0.000	0.000	0.000	0.000	0.00	238.599

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDTE: BA07: PE 0207142F	47.023	127.302	299.408	0.000	299.408	463.321	474.971	396.488	263.548	Continuing	Continuing
5346: JSF Follow-on Modernization (FoM), BPAC 675346											
• APAF: BA01: Line Item # ATA000 AP: JSF CTOL Advance Procurement, PE 0207142F, BP10 AP	460.260	404.500	780.000	0.000	780.000	405.200	1,003.600	965.300	414.700	13,451.541	20,181.883
• APAF: BA01: Line Item # ATA000: JSF CTOL, PE 0207142F, BP10	5,259.812	4,997.394	4,544.684	0.000	4,544.684	4,253.696	4,209.813	4,862.684	4,796.042	144,128.756	198,657.199
• APAF: BA06: Line Item # F03500 BP16: JSF Initial Spares, PE 0207142F, BP16	229.582	362.792	320.831	0.000	320.831	319.151	416.722	399.361	394.654	3,893.112	7,567.519
• APAF: BA05: Line Item # F03500 BP11: JSF Modifications, PE 0207142F, BP11	70.167	175.811	68.270	0.000	68.270	230.448	279.814	259.978	301.899	Continuing	Continuing
• USAF OM: Operations and Maintenance	312.557	425.978	452.906	0.000	452.906	555.687	873.270	998.979	958.708	Continuing	Continuing
• OPAF: BA01: Line Item # 821800: Joint Strike Fighter, PE 0207142F	3.858	2.333	3.326	0.000	3.326	3.310	2.993	2.463	2.507	Continuing	Continuing
• MILCON: BA01: PE 0207142F: USAF JSF Military Construction Operations	132.850	305.700	80.000	0.000	80.000	27.500	0.000	0.000	0.000	1,312.100	2,511.350
• MILCON: BA01: PE 0207597F: USAF JSF Military Construction Training	65.400	20.000	21.000	0.000	21.000	34.000	15.900	0.000	0.000	0.00	156.300
• MILCON: BA01: PE 0502635F: USAF JSF Military Construction Air National Guard	0.000	15.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	15.100
• RDTEN: BA05: PE 0604800N 2261: JSF SDD (CV)	453.036	504.296	103.144	0.000	103.144	61.179	1.637	0.454	0.467	0.00	19,983.056
• RDTEN: BA05: PE 0604800N 3352: F-35C Sustainment/ Capability Enhancements (CV)	35.666	24.420	5.787	0.000	5.787	4.995	0.000	0.000	0.000	0.00	108.345

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

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 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RD TEN: BA05: PE 0604810N 2936: F-35C Follow-on Modernization (CV), BPAC 2936	20.544	63.387	143.855	0.000	143.855	225.442	229.055	189.104	121.613	Continuing	Continuing
• APN: BA01: Line Item # 0147C: JSF Advance Procurement (CV), PE 0204146N	48.630	80.908	263.112	0.000	263.112	144.282	252.453	262.416	267.146	2,147.943	5,140.935
• APN: BA01: Line Item # 0147: JSF (CV), PE 0204146N	1,033.142	890.650	582.324	0.000	582.324	1,105.952	1,805.276	2,582.852	2,730.285	27,953.966	55,785.279
• APN: BA06: Line Item # 0605 USN: Initial Spares (CV), PE 0204146N	59.914	26.076	84.591	0.000	84.591	44.971	52.858	303.608	309.680	Continuing	Continuing
• APN: BA05: Line Item # 0593: Modifications (CV), PE 0204146N	48.527	26.004	31.689	0.000	31.689	22.344	14.155	13.404	13.672	Continuing	Continuing
• OPN: BA03: Line Item # 4268: JSF Aviation Support Equipment ALIS Ship Alts	48.773	39.099	34.032	29.245	63.277	37.742	46.019	47.389	62.299	Continuing	Continuing
• OPN: BA03: ALIS Ship ALTS Installs	1.924	0.329	2.024	0.000	2.024	1.890	1.933	1.972	0.986	Continuing	Continuing
• OPN: BA03 USN: Optical Landing System Investment	0.000	1.800	1.800	0.000	1.800	1.800	3.300	0.000	0.000	Continuing	Continuing
• OPN: BA03: Spares for Aviation Support Equipment	2.946	0.881	2.297	0.000	2.297	2.321	0.139	1.977	0.000	Continuing	Continuing
• USN OM: Operations and Maintenance	78.529	120.648	207.302	0.000	207.302	211.332	236.682	281.622	327.009	Continuing	Continuing
• USN MILCON: USN JSF Military Construction	94.420	203.900	64.660	0.000	64.660	121.990	119.800	0.000	0.000	642.400	1,406.074
• RD TEN: BA05: PE 0604800M 2262: JSF SDD (STOVL)	495.428	507.078	141.534	0.000	141.534	55.952	1.721	0.547	0.564	0.000	3,874.211
• RD TEN: BA05: PE 0604800M 3350: F-35B Sustainment/ Capability Enhancements (STOVL), BPAC 3350	30.819	24.348	11.400	0.000	11.400	0.000	0.000	0.000	0.000	0.00	99.115

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017	
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207142F / F-35 Squadrons				Project (Number/Name) 676011 / JSF DUAL CAPABLE AIRCRAFT			

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

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	
			Base	OCO	Total					Complete	Total Cost
• RD TEN: BA05: PE 0604810M 2935: F-35B Follow-on Modernization (STOVL), BPAC 2935	20.157	74.227	144.958	0.000	144.958	226.310	230.383	190.442	123.531	Continuing	Continuing
• APN: BA01: Line Item # 0152C: JSF Advance Procurement (STOVL), PE 0204146M	203.060	233.648	413.450	0.000	413.450	228.492	231.802	220.822	225.245	1,959.119	4,802.154
• APN: BA01: Line Item # 0152: JSF (STOVL), PE 0204146M	2,147.714	2,040.681	2,398.139	0.000	2,398.139	2,338.179	2,404.257	2,585.039	2,600.750	20,548.402	42,209.667
• APN: BA06: Line Item # 0605 USMC: Initial Spares (STOVL), PE 0204146M	111.569	123.252	105.671	0.000	105.671	92.198	160.150	140.989	143.809	Continuing	Continuing
• APN: BA05: Line Item # 0592: Modifications (STOVL), PE 0204146M	204.464	34.928	34.963	0.000	34.963	70.305	67.039	79.174	80.761	Continuing	Continuing
• USMC OM: Operations and Maintenance	184.171	233.576	315.630	0.000	315.630	375.578	412.813	470.490	544.031	Continuing	Continuing
• USMC MILCON: USMC JSF Military Construction	21.960	219.100	64.660	0.000	64.660	121.990	119.800	0.000	0.000	642.400	1,966.114
• International 1: International SDD	17.000	22.000	27.450	0.000	27.450	0.000	0.000	0.000	0.000	0.00	5,013.463
• International 2: International Production	189.922	185.641	124.114	0.000	124.114	151.776	150.588	149.848	87.113	Continuing	Continuing
• International 3: International FoD	83.595	84.602	158.273	0.000	158.273	159.649	162.023	167.383	160.111	Continuing	Continuing
• International 4: International Unique (SDD/PSFD)	38.483	32.374	15.566	0.000	15.566	22.812	29.409	5.357	0.000	0.000	482.417

Remarks

F-35 Follow-on Modernization (FoM) provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential mission improvements 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 Block 4 acquisition strategy is based upon incremental deliveries of capabilities in 4 sub-blocks. The strategy includes deliveries on a two year cycle with a focus on hardware and tech refresh change every four years. FoM capability planning includes an efficient transition from F-35 SDD to Follow-on Modernization. As SDD development activities ramp down, FoM will assume responsibility for improvements and modernization efforts. Block 4 capability planning includes Block 4.1 through 4.4 modernization efforts with initial increment of capability available in 2020 and subsequent releases every two years.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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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 two B-61s. Due to extensive certification requirements, the Follow-on Modernization Capability Development Document (CDD).

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.

D. Acquisition Strategy

The DCA effort will leverage contracting vehicles for the overall Block 4 F-35 Follow-on Modernization (FoM) effort. Fee provisions will be used to target and motivate contractor performance.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Lockheed Martin - DCA Integration	SS/CPFF	Lockheed Martin : Ft. Worth, TX	23.525	4.967	Mar 2016	25.743	Jul 2017	35.122	Mar 2018	0.000		35.122	Continuing	Continuing	-
DCA Requirements Decomposition	SS/CPAF	Lockheed Martin : Ft. Worth, TX	0.948	0.000		0.000		0.000		0.000		0.000	0.000	0.948	-
Subtotal			24.473	4.967		25.743		35.122		0.000		35.122	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 IDIQ 13-D-0005 B61-12 Test Support	SS/CPFF	Lockheed Martin : Ft. Worth, TX	0.820	0.000		0.000		0.000		0.000		0.000	0.000	0.820	-
B61-12 Risk Reduction Test Support	PO	Air Force Seek Eagle Office : Eglin AFB, FL	0.004	0.000		0.000		0.000		0.000		0.000	0.000	0.004	-
Subtotal			0.824	0.000		0.000		0.000		0.000		0.000	0.000	0.824	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date: May 2017**

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	25.297	4.967	25.743	35.122	0.000	35.122	-	-	-

Remarks
 F-35 FoM Includes:
 USAF: PE 0207142F BPAC 675346

 USN: PE 0604810N Project Unit 2936

 USMC: PE 0604810M Project Unit 2935

 F-35 DCA Includes:
 USAF: PE 0207142F BPAC 676011

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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>

FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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

DCA Risk Reduction																												
Nuclear Certification																												
Requirements Decomposition Contract (Nuclear Certification Tasks)																												
Pre-Modernization Contract (Nuclear Certification Tasks) and Preliminary Engineering & Design																												
Modernization Contract (Nuclear Certification Tasks) and Design, Build & Test																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
DCA Risk Reduction	1	2016	4	2017
Nuclear Certification	1	2016	4	2022
Requirements Decomposition Contract (Nuclear Certification Tasks)	1	2016	1	2017
Pre-Modernization Contract (Nuclear Certification Tasks) and Preliminary Engineering & Design	1	2016	3	2018
Modernization Contract (Nuclear Certification Tasks) and Design, Build & Test	3	2018	4	2022

Note

Schedule details reflect fiscal years

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	96.110	33.615	52.898	34.952	0.000	34.952	24.711	13.367	13.598	13.877	0.000	283.128
674132: <i>AIM-9 Product Improvement</i>	96.110	33.615	52.898	34.952	0.000	34.952	24.711	13.367	13.598	13.877	0.000	283.128
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

Air Intercept Missile-9X is a long-term evolution of the AIM-9 series of fielded missiles, 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. 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 employing advanced Digital Radio Frequency Memory (DRFM) jamming, cruise missiles, and Unmanned Aerial Vehicles.

The Block II program has completed Independent Operational Testing and found to be Operationally Effective and Suitable. The program obtained a Full Rate Production decision in August 2015, with the first Full Rate Production Lot contract awarded in September 2015. This budget line will continue technical refresh of critical obsolete components, implement cost reduction initiatives, improve insensitive munitions performance, correct deficiencies, increase capabilities through software enhancements, and conduct testing to ensure platform integration onto threshold US Air Force aircraft.

AIM-9X Block I concluded in FY 2011 and all funding/quantity data in the documents are associated with Block II activities.

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: FY 2018 Air Force **Date:** May 2017

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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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	43.360	52.898	44.751	0.000	44.751
Current President's Budget	33.615	52.898	34.952	0.000	34.952
Total Adjustments	-9.745	0.000	-9.799	0.000	-9.799
• 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	-8.403	0.000			
• SBIR/STTR Transfer	-1.342	0.000			
• Other Adjustments	0.000	0.000	-9.799	0.000	-9.799

Change Summary Explanation

FY 2016 decrease for higher Air Force priorities.

FY 2018 change due to SIP III rephasing

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: AIM- 9X Product Development	32.590	50.598	30.645	0.000	30.645
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 (SEPM), as well as associated governmental and contractor support required to ensure AIM-9X missile integration with threshold aircraft platforms. Also, includes efforts to redesign missile components in order to resolve Block II component obsolescence, 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.					
FY 2016 Accomplishments: Continued EMD efforts to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Continue development of v9.4 Block II software and integration efforts with threshold aircraft platforms including improvements associated with the F-15 to utilize full capability of the Block II missile. Continued study on IM alternatives and risk reduction methods to enhance IM performance.					
FY 2017 Plans:					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0207161F / <i>Tactical AIM Missiles</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Continue EMD 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. Continue to develop missile hardware design improvements necessary to enhance IM performance.</p> <p>FY 2018 Base Plans: Complete Developmental Testing and Integrated Testing (DT/IT-D1) and Operational Test Readiness Review, then begin Operational Testing (OT-D1) of Operational Flight Software version 9.4 including improvements associated with further integrating the threshold aircraft to utilize full capability of the Block II missile.</p> <p>FY 2018 OCO Plans: N/A</p>					
<p>Title: AIM- 9X, Test and Evaluation</p> <p>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, F-16, F-22, F-35). Beginning in FY 2016 the program joined in with the US Navy efforts in testing the next tech refresh version of software improvements to the missile, Operation Flight Software version 9.4.</p> <p>FY 2016 Accomplishments: Continued EMD efforts to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Continue development of v9.4 Block II software and integration efforts with threshold aircraft platforms including improvements associated with the F-15 to utilize full capability of the Block II missile. Continued study on IM alternatives and risk reduction methods to enhance IM performance.</p> <p>FY 2017 Plans: Continue Developmental and Integrated Testing (DT/IT-D1) of Operational Flight Software version 9.4.</p> <p>FY 2018 Base Plans: Complete Developmental Testing and Integrated Testing (DT/IT-D1) and Operational Testing Readiness Review, then begin Operational Testing (OT-D1) of Operational Flight Software version 9.4 including improvements associated with further integrating the threshold aircraft to utilize full capability of the Block II missile.</p>	1.025	2.300	4.307	-	4.307
Accomplishments/Planned Programs Subtotals	33.615	52.898	34.952	0.000	34.952

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF: BA02: Line Item # M09HAI: <i>Sidewinder (AIM-9X)</i>	198.247	127.438	125.350	0.000	125.350	122.340	125.299	168.454	120.827	122.343	1,579.432
• MPAF: BA04: Line Item # 000999: <i>Replen Spares, USAF</i>	10.755	11.015	11.199	0.000	11.199	11.350	11.543	11.748	11.959	Continuing	Continuing
• MPAF: BA04: Line Item # 000999: <i>Initial Spares, USAF</i>	0.604	7.684	5.708	0.000	5.708	4.294	4.324	1.881	1.915	9.115	41.367
• RDTE: BA07: PE 0207161N: <i>Tactical AIM Missile</i>	59.053	56.285	42.884	0.000	42.884	33.458	0.513	0.539	0.554	0.000	298.864
• WPN: BA02: Line Item # 2209: <i>Sidewinder</i>	92.497	70.912	79.692	0.000	79.692	79.047	82.261	89.842	91.638	491.373	1,414.998

Remarks

E. Acquisition Strategy

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 Initial Operational Capability in September 2016. The program modified the production contract in July 2016 to award option year 1 for FRP-2 and add option year 2 for FRP-3 with both awards FFP contracts. Option year 2 will be awarded in March 2017. The program plans to award FRP-4 in May 2018.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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/OFPP Upgrade	SS/CPFF	RMS : Tucson, AZ	62.481	29.052	Mar 2016	46.443	Jan 2017	26.613	Jan 2018	0.000		26.613	50.217	214.806	214.806
Munitions Improvement Study (USG)	SS/CPFF	NAWC WD : China Lake, CA	2.977	3.148	Mar 2016	3.175	Jan 2017	3.202	Jan 2018	0.000		3.202	6.579	19.081	19.081
Systems Engineering (USG)	WR	NAWC WD : China Lake, CA	1.903	0.390	Aug 2016	0.480	Aug 2017	0.330	Aug 2018	0.000		0.330	0.330	3.433	3.433
Aircraft Integration	SS/CPFF	Boeing : St. Louis, MO	0.000	0.000		0.500	Jun 2017	0.500	Jun 2018	0.000		0.500	1.000	2.000	2.000
Subtotal			67.361	32.590		50.598		30.645		0.000		30.645	58.126	239.320	239.320

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 for P3I	PO	Eglin AFB : Eglin, FL	21.836	0.800	Mar 2016	1.960	Mar 2017	3.590	Mar 2018	0.000		3.590	5.950	34.136	34.136
IT/OT Support F-15	MIPR	Various : Various	0.000	0.000		0.080	Apr 2017	0.457	Jan 2018	0.000		0.457	0.457	0.994	0.994
Subtotal			21.836	0.800		2.040		4.047		0.000		4.047	6.407	35.130	35.130

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	MIPR	PMA-259 : Patuxent River, MD	6.913	0.225	Mar 2016	0.260	Mar 2017	0.260	Mar 2018	0.000		0.260	1.020	8.678	8.678
Subtotal			6.913	0.225		0.260		0.260		0.000		0.260	1.020	8.678	8.678

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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
FY16 Decrease in CS support.

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	96.110	33.615	52.898	34.952	0.000	34.952	65.553	283.128	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force	Date: May 2017
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>	

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

Production Milestones - Block II: Contract Awards: Lot 16 (FRP 2)																												
Production Milestones - Block II: Contract Awards: Lot 17 (FRP 3)																												
Production Milestones - Block II: Contract Awards: Lot 18 (FRP 4)																												
Production Milestones - Block II: Contract Awards: Lot 19 (FRP 5)																												
Production Milestones - Block II: Contract Awards: Lot 20 (FRP 6)																												
Production Milestones - Block II: Contract Awards: Lot 21 (FRP 7)																												
Production Milestones - Block II: Contract Awards: Lot 22 (FRP 78)																												
Production Deliveries: Low Rate Initial Production 4 (Lot 14)																												
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)																												
AIM-9X Block II: System Improvement Program Contract Award: System Improvement Program II Engineering Manufacturing Development Contract																												

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Block II: Hardware & Software (v9.3) Improvements: Air Force Initial Operational Capability				■																								
AIM-9X Block II: Hardware and Software (v9.3) Improvements : Operational Flight Software Release v9.315	■																											
AIM-9X Block II: Hardware and Software (v9.3) Improvements : Operational Flight Software Release v9.316								■																				
AIM-9X Block II: Hardware and Software (v9.3) Improvements : Operational Flight Software Release v9.317								■																				
AIM-9X Block II Tech Refresh: Tech Refresh Development Contracts: System Improvement Program III Engineering Manufacturing Development Contract	■																											
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware (CAS Battery & Block 2+)	■																											
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Preliminary Design Review	■																											
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Critical Design Review				■																								
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Engineering Change Proposal								■																				
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Hardware (CAS, IMU, Dome & Processor)	■																											

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Preliminary Design Review								■																				
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Critical Design Review												■																
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Engineering Change Proposal																■												
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Testing (DT-D1)	■																											
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Test / Integrated Testing (DT- D1 / IT-D1)												■																
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Testing (OT-D1)												■																
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Software v9.4 Release																■												
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Development Testing	■																											
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Release																												■

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Production Milestones - Block II: Contract Awards: Lot 16 (FRP 2)	4	2016	4	2016
Production Milestones - Block II: Contract Awards: Lot 17 (FRP 3)	2	2017	2	2017
Production Milestones - Block II: Contract Awards: Lot 18 (FRP 4)	2	2018	2	2018
Production Milestones - Block II: Contract Awards: Lot 19 (FRP 5)	2	2019	2	2019
Production Milestones - Block II: Contract Awards: Lot 20 (FRP 6)	2	2020	2	2020
Production Milestones - Block II: Contract Awards: Lot 21 (FRP 7)	2	2021	2	2021
Production Milestones - Block II: Contract Awards: Lot 22 (FRP 78)	2	2022	2	2022
Production Deliveries: Low Rate Initial Production 4 (Lot 14)	4	2016	4	2016
Production Deliveries: Lot 15 (FRP 1)	4	2016	4	2017
Production Deliveries: Lot 16 (FRP 2)	4	2017	4	2018
Production Deliveries: Lot 17 (FRP 3)	4	2018	4	2019
Production Deliveries: Lot 18 (FRP 4)	4	2019	4	2020
Production Deliveries: Lot 19 (FRP 5)	4	2020	4	2021
Production Deliveries : Lot 20 (FRP 6)	4	2021	4	2022
AIM-9X Block II: System Improvement Program Contract Award: System Improvement Program II Engineering Manufacturing Development Contract	1	2016	2	2017
AIM-9X Block II: Hardware & Software (v9.3) Improvements: Air Force Initial Operational Capability	4	2016	4	2016
AIM-9X Block II: Hardware and Software (v9.3) Improvements : Operational Flight Software Release v9.315	2	2016	2	2016
AIM-9X Block II: Hardware and Software (v9.3) Improvements : Operational Flight Software Release v9.316	2	2017	2	2017
AIM-9X Block II: Hardware and Software (v9.3) Improvements : Operational Flight Software Release v9.317	1	2017	1	2017

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
AIM-9X Block II Tech Refresh: Tech Refresh Development Contracts: System Improvement Program III Engineering Manufacturing Development Contract	1	2016	4	2020
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware (CAS Battery & Block 2+)	1	2016	1	2017
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Preliminary Design Review	1	2016	1	2016
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Critical Design Review	3	2016	3	2016
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Engineering Change Proposal	3	2017	3	2017
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Hardware (CAS, IMU, Dome & Processor)	1	2016	1	2019
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Preliminary Design Review	2	2017	2	2017
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Critical Design Review	4	2018	4	2018
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Engineering Change Proposal	1	2020	1	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Testing (DT-D1)	1	2016	4	2017
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Test / Integrated Testing (DT-D1 / IT-D1)	4	2017	4	2018
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Testing (OT-D1)	4	2018	4	2018
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Software v9.4 Release	2	2020	2	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Development Testing	1	2016	4	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Release	1	2022	1	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	459.428	44.335	62.470	61.322	0.000	61.322	65.254	66.461	67.620	69.004	43.600	939.494
673777: <i>AMRAAM</i>	459.428	44.335	62.470	61.322	0.000	61.322	65.254	66.461	67.620	69.004	43.600	939.494
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 July 2014 and the Air Force and Navy authorized operational fielding in January 2015. The Navy declared Initial Operational Capability (IOC) in January 2015 and the Air Force declared IOC in July 2015. The program continues to address aircraft integration efforts to maintain compatibility/performance of the missile with changes occurring on threshold AMRAAM platforms per the 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 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: FY 2018 Air Force	Date: May 2017
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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207163F I Advanced Medium Range Air-to-Air Missile (AMRAAM)
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	46.160	62.470	61.145	0.000	61.145
Current President's Budget	44.335	62.470	61.322	0.000	61.322
Total Adjustments	-1.825	0.000	0.177	0.000	0.177
• 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	-0.119	0.000			
• SBIR/STTR Transfer	-1.706	0.000			
• Other Adjustments	0.000	0.000	0.177	0.000	0.177

Change Summary Explanation

No Significant Changes

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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Title: System Improvement Program (SIP) / Electronic Protection Improvement Program (EPIP)	26.341	41.298	37.853
Description: Provide system improvements/electronic protection improvements			
FY 2016 Accomplishments:			
1. EPIP Advanced: Completed Tape 1 development effort to address advanced threats in AIM-120C-7 missiles. Tape 1 Functional Configuration Audit (FCA) completed on 12 July 2016 and started Tape 1 dedicated OT program. Completed Tape 2 Critical Design Review (CDR) in November 2015; conducted subsequent development captive flight test.			
2. AIM-120D SIP: Completed SIP-1 OT to support FY 17 deployment of the first AIM-120D improvement software increment to the Air Force and Navy AMRAAM inventory. Continued SIP-2 Engineering and Manufacturing Development (EMD) and completed Critical Design Review (CDR) on 13 July 2016. Continued SIP-3 Technology Maturation and Risk Reduction (TMRR) with a successful System Requirement Review (SRR), as well as the AIM-120D SIP Candidate Selection Process. Released a SIP-3 EMD request for proposal to implement advanced threat countermeasures into the AIM-120D inventory.			
FY 2017 Plans:			
1. EPIP Advanced: Complete Tape 1 dedicated OT program and field Tape 1 EPIP Advanced capability improvements in AIM-120C-7 missiles (Tape 9 Rev 5). Complete Tape 2 live fire program and development effort. Conduct FCA and begin Tape 2 dedicated OT program.			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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)		FY 2016	FY 2017	FY 2018
<p>2. AIM-120D SIP: Field SIP-1 software to Air Force and Navy units. Continue SIP-2 EMD, to include three Integrated Test (IT) missions to show improved AMRAAM capabilities against electronic attack techniques. Continue SIP-3 TMRR to System Functional Review (SFR) and PDR, and award the follow-on SIP-3 EMD contract. Solicit and award the SIP-4 TMRR effort to mature AIM-120D capabilities, optimizing F3R missile configuration hardware. Continue the AIM-120D SIP Candidate Selection Process to analyze solutions of the warfighters' priority deficiencies and enhancements.</p> <p>FY 2018 Plans:</p> <p>1. EPIP Advanced: Finish Tape 2 dedicated OT efforts.</p> <p>2. AIM-120D SIP: Conduct SIP-2 FCA and Operational Test Readiness Review (OTRR) to approve the start of dedicated SIP-2 OT. Continue SIP-3 EMD to CDR. Continue SIP-4 TMRR to SRR and SFR. Continue the AIM-120D SIP Candidate Selection Process to analyze solutions of the warfighters' priority deficiencies and enhancements.</p>				
<p>Title: Test and Evaluation</p> <p>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</p> <p>FY 2016 Accomplishments: Continued infrastructure investments to support AIM-120D DT, OT, SIP, and EPIP activities. Developed test assets necessary to meet SIP 2 and beyond requirements. Provide support personnel and test resources to complete Advanced EPIP Tape 1 final IT live-fire shots and with follow on dedicated OT live-fire shots. Continue to provide support personnel and resources to complete Advanced EPIP Tape 2 development efforts and captive flight test, AIM-120D SIP-1 OT, and begin SIP-2 DT/captive flight testing during EMD. Provided equipment and support for various aircraft integration captive test and live-fire shots.</p> <p>FY 2017 Plans: Continue infrastructure investments to support AIM-120D DT, OT, SIP, and AEPPIP activities. Develop new test assets necessary to meet SIP-3 and beyond requirements. Provide support personnel and test resources to complete Advanced EPIP Tape 1 OT reporting, and the software fields. Provide support personnel and test resources to complete Advanced EPIP Tape 2 IT live-fire shots and then the dedicated OT live-fire shots. Continues to provide support personnel and test resources to complete AIM-120D SIP-2 DT/captive program and prepares for a SIP-2 OTRR at the end of FY17. Continue to provide equipment and support for various aircraft integration captive test and live-fire shots.</p> <p>FY 2018 Plans: Continue infrastructure investments to support AIM-120D DT, OT, SIP, and AEPPIP activities. Develop new test assets necessary to meet SIP-3 and beyond requirements. Provide support personnel and test resources to complete Advanced EPIP and support a fielding recommendation. Continues to provide support personnel and test resources to complete AIM-120D SIP-3 DT and OT</p>		12.174	17.814	18.969

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018
events and prepares for a SIP-3 OTRR. Continue to provide equipment and support for various aircraft integration captive test and live-fire shots.			
Title: Aircraft Integration	5.820	3.358	4.500
Description: Aircraft Integration - Integrate AIM-120D on multiple aircraft platforms			
FY 2016 Accomplishments: Continued integration and testing of AIM-120D on multiple threshold aircraft platforms.			
FY 2017 Plans: Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.			
FY 2018 Plans: Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.			
Accomplishments/Planned Programs Subtotals	44.335	62.470	61.322

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF: BA02: Line Item # MAMRA0: <i>Missile Procurement, Air Force</i>	362.028	342.144	304.327	0.000	304.327	470.016	430.962	468.452	444.471	1,444.425	12,966.907
• MPAF: BA04: Line Item # 000999: <i>Initial Spares/Repair Parts</i>	1.996	2.072	2.067	0.000	2.067	2.041	2.076	2.113	2.155	6.715	102.212
• MPAF: BA04: Line Item # R...: <i>Replen Spares/Repair Parts</i>	0.810	0.817	0.834	0.000	0.834	0.847	0.861	0.877	0.895	2.788	9.528
• WPN: BA02: Line Item # 2206: <i>Weapons Procurement, Navy</i>	202.773	204.697	197.109	0.000	197.109	284.679	288.445	299.484	302.831	644.555	4,565.796
• RDTE: BA07: Line Item # 0981: <i>RDTE, Navy</i>	31.215	40.350	25.360	0.000	25.360	32.358	32.738	33.405	24.069	49.447	396.980

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 June 2012 as a CPFF with performance awards. This development effort is planned for completion in July 2017.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force Date: May 2017

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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Post-OT System Improvement Program (SIP) is underway as part of the AIM-120D missile upgrade program. SIP Increment 1 (SIP-1) awarded in 2009 as a CPFF effort aims to improve baseline AIM-120D capabilities. SIP-2 EMD, which incorporates basic EPIP in the AIM120D, was awarded in July 2015. This CPIF effort was awarded for 19 months. SIP-3 TMRR was awarded in September 2015 as a 19-month CPFF effort with SIP-3 EMD award planned for FY 17. SIP-3 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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	194.534	25.338	Mar 2016	39.873	Jun 2017	36.382	Jun 2018	0.000		36.382	182.658	478.785	478.785
F-22 Aircraft Integration	MIPR	Wright-Patterson AFB : Dayton, OH	109.070	5.820	Jan 2016	0.000		0.000		0.000		0.000	0.000	114.890	114.890
RMS Aircraft Integration	SS/CPFF	Raytheon : Tucson, AZ	6.662	0.000	Jan 2016	3.358	May 2017	4.500	May 2018	0.000		4.500	30.900	45.420	45.420
Subtotal			310.266	31.158		43.231		40.882		0.000		40.882	213.558	639.095	639.095

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.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	62.527	2.844	Jan 2016	6.273	Jan 2017	5.579	Jan 2018	0.000		5.579	33.093	110.316	110.316
RMS Test	SS/CPFF	Raytheon : Various, AZ	74.193	9.330	Jan 2016	11.541	Jan 2017	13.390	Jan 2018	0.000		13.390	56.280	164.734	164.734
Subtotal			136.720	12.174		17.814		18.969		0.000		18.969	89.373	275.050	275.050

Remarks
Various = T&E activities take place at numerous locations across the US. Too many activities and locations to list.

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
AIM-120D SIP-1 OT	1	2016	4	2016
AIM-120D SIP-1 IOC	4	2016	3	2017
AIM-120D SIP-2 CDR	4	2016	4	2016
AIM-120D SIP-2 EMD	1	2016	4	2018
AIM-120D SIP-2 IOC	2	2019	2	2019
AIM-120D SIP-3 TMRR	1	2016	3	2017
AIM-120D SIP-3 CDR	3	2018	3	2018
AIM-120D SIP-3 IOC	2	2021	2	2021
AIM-120D SIP-4 CDR	3	2020	3	2020
AIM-120D F-22 IOC	2	2018	2	2018
EPIP Adv Tape 1 FCA	4	2016	4	2016
EPIP Adv Tape 2 CDR	1	2016	1	2016
EPIP Adv Tape 2 FCA	4	2017	4	2017
Form, Fit, Function (F3R) FCA	2	2021	2	2021
F3R IOC	2	2022	2	2022

Note

The EPIP Advanced program is underway to keep AIM-120C missiles capable against the growing electronic attack threat environment. This effort was awarded in June 2012 as a CPFF with performance awards. This development effort is planned for completion in July 2017.

Post-OT System Improvement Program (SIP) is underway as part of the AIM 120D missile upgrade program. SIP Increment 1 (SIP-1) awarded in 2009 as a CPFF effort aims to improve baseline AIM-120D capabilities. SIP-2 EMD, which incorporates basic EPIP in the AIM120D, was awarded in July 2015. This CPIF effort was awarded for 19 months. SIP-3 TMRR was awarded in September 2015 as a 19-month CPFF effort with SIP-3 EMD award planned for FY 17. SIP-3 primarily incorporates AEPiP software capabilities in the AIM-120D.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 0207224F / <i>Combat Rescue and Recovery</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.398	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.398
676016: <i>Avionics Development and Integration</i>	-	0.398	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.398
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force Rotary Wing Avionics Development and Integration effort is a program to develop a fully integrated avionics upgrade that includes predictive terrain awareness. This program focuses on developing and integrating technologies that will increase the situational awareness of helicopter crews in a degraded visibility environment. A severable portion of this program is Brown Out Symbology Software & Landing Guidance (BOSS-LG), which provides precision approach cues to command navigation to a landing point in adverse weather and/or reduced visibility conditions. This total effort was initiated by the Defense Safety Oversight Council.

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 and subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.412	0.000	0.000	0.000	0.000
Current President's Budget	0.398	0.000	0.000	0.000	0.000
Total Adjustments	-0.014	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.014	0.000	0.000	0.000	0.000

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

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>
Title: Avionics Development and Integration	0.398	-	-
Description: Program focuses on developing and integrating technologies that will increase the situational awareness of helicopter crews in a degraded visibility environment.			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0207224F / <i>Combat Rescue and Recovery</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<i>FY 2016 Accomplishments:</i> Provides program management to advance Laser Radar development and landing guidance symbology integration. N/A			
Accomplishments/Planned Programs Subtotals	0.398	-	-

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

Remarks

E. Acquisition Strategy
The Air Force is in the process of integrating the Three Dimensional Landing Zone (3D-LZ) technology into an airworthy payload. This payload will be integrated with existing forward looking infrared turrets to minimize additional equipment and weight on the aircraft. Once the payload is tested, the Air Force will finalize its strategy for fleet implementation.

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 <i>Combat Rescue - Pararescue</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.636	0.362	0.693	0.000	0.693	0.652	0.663	0.675	0.689	Continuing	Continuing
675352: <i>Guardian Angel RDT&E</i>	-	0.636	0.362	0.693	0.000	0.693	0.652	0.663	0.675	0.689	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, Technical Recovery, Oxygen Systems, Medical Monitoring, Aerial Insertion 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. 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: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.657	0.362	0.691	0.000	0.691
Current President's Budget	0.636	0.362	0.693	0.000	0.693
Total Adjustments	-0.021	0.000	0.002	0.000	0.002
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.021	0.000	0.002	0.000	0.002

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Title: Guardian Angel Family of Systems (FoS)	0.636	0.362	0.693
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 2016 Accomplishments:			
- GA program continued development for incremental software updates for the BAO Kit (G) Information Management System.			
- GA program supported and funded developmental test for Aerial Insertion capabilities, specifically the RA-1 military free fall parachute.			
FY 2017 Plans:			
-Will complete test, study, strategic planning, and development activities for increased capability and address Engineering Change Proposals as needed.			
-Program will support, but not be limited to, testing of the RA-1 parachute system.			
-Joint Precision Airdrop System (JPADS) Ultra-Light weight integration will be pursued as funding permits.			
-Continue software upgrades for BAO kit (G) information management 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 2018 Plans:			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018
-Will continue to complete studies, strategic planning, and development activities for increased capability. -Continue software upgrades for BAO kit (G) information management system. -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.			
Accomplishments/Planned Programs Subtotals	0.636	0.362	0.693

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA04: Line Item # 842990: <i>Items Less than \$5M (Safety)</i>	11.924	28.317	25.635	0.000	25.635	21.856	22.242	22.642	23.050	Continuing	Continuing
• OPAF: BA02: Line Item# 823230: <i>Security and Tactical Vehicles</i>	3.885	3.920	0.089	0.000	0.089	0.060	0.131	0.205	0.281	Continuing	Continuing
• OPAF: BA04: Line Item# 842140: <i>Night Vision Goggles</i>	4.381	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

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 (Phase 1). The program will also address future requirements for the weapon system that will encompass the needs of all three GA career fields (Phase 2).

 Phase 2 of 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 Operations by HQ Air Combat Command. The program has been divided into two 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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	37.489	28.413	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
670001: <i>Air Force TENCAP</i>	-	37.489	28.413	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 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	37.489	28.413	0.000	0.000	0.000
Total Adjustments	37.489	28.413	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	37.489	28.413	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	1.064	0.649	1.714	0.000	1.714	15.004	10.777	11.188	12.372	Continuing	Continuing
675347: <i>Advanced Targeting Pod</i>	-	1.064	0.649	1.714	0.000	1.714	15.004	10.777	11.188	12.372	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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	1.105	0.649	1.124	0.000	1.124
Current President's Budget	1.064	0.649	1.714	0.000	1.714
Total Adjustments	-0.041	0.000	0.590	0.000	0.590
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.002	0.000			
• SBIR/STTR Transfer	-0.039	0.000			
• Other Adjustments	0.000	0.000	0.590	0.000	0.590

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date: May 2017**

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Targeting Pod - Sensor Enhancement (ATP-SE) Requirements Description: ATP-SE technology improvements, requirements definition (studies, analysis and assessments). FY 2016 Accomplishments: Accomplished further ATP-SE technology improvements, requirements definition, studies, analysis and assessments. FY 2017 Plans: Accomplish further ATP-SE technology improvements, requirements definition, studies, analysis and assessments. FY 2018 Base 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. FY 2018 OCO Plans: N/A	1.064	0.649	1.714	0.000	1.714
Accomplishments/Planned Programs Subtotals	1.064	0.649	1.714	0.000	1.714

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APAF: BA05: Line Item #057: <i>Other Aircraft, Precision Attack Systems Modifications</i>	37.987	0.821	43.857	0.000	43.857	42.838	43.827	45.286	15.256	Continuing	Continuing
• APAF: BA06: Line Item #000999: <i>Initial Spares/Repair Parts</i>	0.000	1.445	3.284	0.000	3.284	3.337	3.394	3.457	3.526	Continuing	Continuing
• APAF: BA07: Line Item #000751: <i>Other Production Charges</i>	14.024	24.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	32.024	23.923	14.040	0.000	14.040	14.006	16.007	16.002	16.040	Continuing	Continuing
674804: <i>Compass Call</i>	-	32.024	23.923	14.040	0.000	14.040	14.006	16.007	16.002	16.040	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 interdicts 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 combat system is capable of surgical denial or disruption of adversary radio frequency (RF) communications systems and sensors. 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. 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). Due to the rapid advances in electronic attack technology, COMPASS CALL was designed to be easily modified and must continue to 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 requirements provide the worldwide operational proficiency needed to comply with continually evolving communications, navigation, surveillance/air traffic management (CNS/ATM) and required navigation performance (RNP) 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 2018 RDT&E efforts will concentrate on support for Baseline 3 (BL3) prime mission equipment (PME) upgrades, integration of BL3 PME into a new platform, and ground systems/simulators. The programmed BL3 upgrades will advance the PME capabilities as the 2018 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 2018 RDT&E efforts include studies and analyses to support current program planning and execution including, but not limited to, Advanced Radar Countermeasure System (ARCS) and environmental characterizations. FY2018 RDT&E efforts include future Baseline 4 (BL4) and future baseline capability planning, specifications and requirements.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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Due to the rapidly changing threat environment encountered during our 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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	14.187	13.723	13.996	0.000	13.996
Current President's Budget	32.024	23.923	14.040	0.000	14.040
Total Adjustments	17.837	10.200	0.044	0.000	0.044
• 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	17.837	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	10.200	0.044	0.000	0.044

Change Summary Explanation

FY 2016 Increase due to adjustments:

Above Threshold Reprogramming (ATR) \$15.0M to accelerate Compass Call BL3 Development

Below Threshold Reprogramming (BTR) \$2.837M for development of additional capability against emerging communication and radar targets

FY17 Increase due to adjustments:

Request for Additional Appropriation (RAA) \$10.2M supports BL3 ARCS software, Environmental Characterization efforts and BL4 initial specifications.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Baseline Upgrade Development	32.024	23.923	14.040	-	14.040
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.					
FY 2016 Accomplishments:					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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Continued MBL2 development efforts and channeled efforts towards BL3 development of:

- Digital Frequency Updates
- New Counter Radar and Receiver Technologies
- Human Machine Interface
- New Array and Target Development
- Advanced Commercial and Military Communications
- Counter Satellite Navigation Technique
- Digital Avionics (glass cockpit) Enhancements
- Platform upgrades and associated non-recurring engineering
- Studies and analysis for current/future planning and execution

FY 2017 Plans:
Continuing efforts for BL3 development and initiating efforts for BL4 development on upgraded platform for:

- 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

FY 2018 Base Plans:
Will continue efforts for BL3 and BL4 development on upgraded platform for:

- 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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
• Studies and analysis for current/future baseline development planning and execution (transmit/receive)					
Accomplishments/Planned Programs Subtotals	32.024	23.923	14.040	-	14.040

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line item# CALL00: <i>Compass Call Mods</i>	81.990	212.657	166.541	56.720	223.261	159.295	160.109	160.308	161.028	Continuing	Continuing
• APAF: BA06: Line item# CALL00: <i>Compass Call Mod Spares</i>	10.128	50.172	10.228	0.000	10.228	10.705	10.891	11.092	11.314	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-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Baseline Upgrade Development Primary Mission Equipment	SS/CPFF	BAE Sytems : Nashua, NH	-	32.024	Dec 2015	23.923	Dec 2016	14.040	Dec 2017	0.000		14.040	Continuing	Continuing	-
Subtotal			-	32.024		23.923		14.040		0.000		14.040	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	32.024	23.923	14.040	0.000	14.040	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
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: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
Mid Baseline 2 Integration and Test	1	2016	3	2017
Mid Baseline 2 Fielding	3	2016	2	2018
Baseline 3 Development	1	2016	1	2019
Baseline 3 Integration and Test	2	2018	2	2020
Baseline 3 Fielding	2	2020	3	2022
Baseline 4 Development	3	2017	2	2021
Baseline 4 Integration and Test	3	2019	4	2022
Future Baseline Development	3	2020	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	104.092	109.859	109.243	0.000	109.243	111.116	113.350	115.480	117.842	Continuing	Continuing
671012: <i>Aircraft Engine Component Improvement Program</i>	-	73.763	78.293	76.969	0.000	76.969	78.314	79.938	81.488	83.155	Continuing	Continuing
675365: <i>F135 Aircraft Engine Component Improvement Program</i>	-	30.329	31.566	32.274	0.000	32.274	32.802	33.412	33.992	34.687	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 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: FY 2018 Air Force	Date: May 2017
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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 0207268F / <i>Aircraft Engine Component Improvement Program</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	103.942	109.859	108.928	0.000	108.928
Current President's Budget	104.092	109.859	109.243	0.000	109.243
Total Adjustments	0.150	0.000	0.315	0.000	0.315
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	3.500	0.000			
• SBIR/STTR Transfer	-3.350	0.000			
• Other Adjustments	0.000	0.000	0.315	0.000	0.315

Change Summary Explanation

FY16 increase of \$3.5M for LCMC/Aircraft Engine CIP program

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
671012: Aircraft Engine Component Improvement Program	-	73.763	78.293	76.969	0.000	76.969	78.314	79.938	81.488	83.155	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 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 2016	FY 2017	FY 2018
Title: F100 Aircraft Engine Component Improvement Program	9.562	6.434	6.325
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.			
FY 2016 Accomplishments: F100-220 and F100-229: - Executed 30+ tasks. Budget addressed engine issues associated with the F-15 and F-16 aircraft. - Addressed engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Validated redesigned parts and new repair procedures. - Maintained engine flight safety, addressed obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustained 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 2017 Plans: F100-220 and F100-229:</p> <ul style="list-style-type: none"> - 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>FY 2018 Plans: F100-220 and F100-229:</p> <ul style="list-style-type: none"> - 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. 				
Title: F110 Aircraft Engine Component Improvement Program		12.957	16.237	15.963
<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 2016 Accomplishments: F101, F110-100, F110-129, F118-100, and F118-101:</p>				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>- Executed 35+ tasks. The budget addressed engine issues associated with the B1, B-2, F-15, F-16, and U-2 aircraft.</p> <p>- Addressed safety of flight, engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis.</p> <p>- Validated redesigned parts and new repair procedures.</p> <p>- Maintained engine flight safety, addressed obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustained 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 2017 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 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>				
Title: F119 Aircraft Engine Component Improvement Program		24.512	26.017	25.578
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.				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017	
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 2016	FY 2017
<p>FY 2016 Accomplishments: F119: - Executed 25+ tasks. The budget addressed engine issues associated with the F-22 aircraft. - Addressed engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validated redesigned parts and new repair procedures. - Maintained engine flight safety, addressed obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustained 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 2017 Plans: F119: - 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> <p>FY 2018 Plans: F119: - 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>			
Title: Other Aircraft Engine Component Improvement Program		26.732	29.605
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		29.103	

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>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 2016 Accomplishments: Other Engines (e.g., T56, T700, T400, J85, APUs, F107): - Executed 15+ tasks. The budget addressed engine issues associated with the C-130, T38, UH-1N, UH/MH-60/60G aircraft, and aircraft APUs. - Addressed engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validated redesigned parts and new repair procedures. - Maintained engine flight safety, addressed obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustained 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 2017 Plans: Other Engines (e.g., T56, T700, T400, J85, APUs, F107): - 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> <p>FY 2018 Plans: Other Engines (e.g., T56, T700, T400, J85, APUs, F107): - 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.</p>				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.				
Accomplishments/Planned Programs Subtotals		73.763	78.293	76.969
C. Other Program Funding Summary (\$ in Millions) N/A				
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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Aircraft Engine CIP: Develop aircraft engine improvements - F110/F101/F118	SS/CPFF	GE : Evendale, OH	-	17.180	Dec 2015	17.162	Dec 2016	16.873	Dec 2017	0.000		16.873	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-F100/F119/TF33	SS/CPFF	Pratt & Whitney : Hartford, CT	-	36.775	Dec 2015	41.337	Dec 2016	40.606	Dec 2017	0.000		40.606	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-TF34/J85/T700	SS/CPFF	GE : Lynn, MA	-	4.638	Dec 2015	4.272	Dec 2016	4.200	Dec 2017	0.000		4.200	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-T56	SS/CPFF	Rolls Royce : Indianapolis, IN	-	2.377	Dec 2015	1.120	Dec 2016	1.101	Dec 2017	0.000		1.101	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft auxiliary power unit improvements	SS/CPFF	Honeywell : Phoenix, AZ	-	4.589	Dec 2015	4.610	Dec 2016	4.532	Dec 2017	0.000		4.532	Continuing	Continuing	-
Aircraft Engine CIP: Develop engine improvements-F107	SS/CPFF	Teledyne : Toledo, OH	-	1.856	Sep 2016	4.365	Dec 2016	4.291	Dec 2017	0.000		4.291	Continuing	Continuing	-
Subtotal			-	67.415		72.866		71.603		0.000		71.603	-	-	-

Remarks
FY18 increases due to inflation adjustments.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Aircraft Engine CIP: Non-OEM CIP Tasks	Various	Various : Various	-	1.568	Oct 2015	0.220	Oct 2016	0.216	Oct 2017	0.000		0.216	Continuing	Continuing	-
Subtotal			-	1.568		0.220		0.216		0.000		0.216	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	1.972	Oct 2015	1.860	Oct 2016	1.860	Oct 2017	0.000		1.860	Continuing	Continuing	-
Subtotal			-	1.972		1.860		1.860		0.000		1.860	-	-	-

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	1.141	Oct 2015	1.737	Oct 2016	1.707	Oct 2017	0.000		1.707	Continuing	Continuing	-
Aircraft Engine CIP: In House Support/Misc	Various	Various : Various	-	1.667	Oct 2015	1.610	Oct 2016	1.583	Oct 2017	0.000		1.583	Continuing	Continuing	-
Subtotal			-	2.808		3.347		3.290		0.000		3.290	-	-	-

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: FY 2018 Air Force								Date: May 2017					
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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	73.763		78.293		76.969		0.000		76.969	-	-	-

Remarks
FY18 increases due to inflation adjustments.

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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-100 Engine CIP activities	[Redacted]																											
F-110 Engine CIP Activities	[Redacted]																											
F-119 Engine CIP Activities	[Redacted]																											
Other Legacy Engine CIP Activities	[Redacted]																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
F-100 Engine CIP activities	1	2016	4	2022
F-110 Engine CIP Activities	1	2016	4	2022
F-119 Engine CIP Activities	1	2016	4	2022
Other Legacy Engine CIP Activities	1	2016	4	2022

Note
Traditional schedule does not lend itself to Engine CIP activities.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675365: F135 Aircraft Engine Component Improvement Program	-	30.329	31.566	32.274	0.000	32.274	32.802	33.412	33.992	34.687	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.

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

	FY 2016	FY 2017	FY 2018
Title: F135 Aircraft Engine Improvement Program	30.329	31.566	32.274
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 2016 Accomplishments:			
<ul style="list-style-type: none"> - Executed approximately 25+ AF-funded F135 engine tasks supporting initial flying operations. - Addressed safety of flight, engine component redesign, repair/rework procedures and life limit/mission analysis. - Validated redesigned parts and new repair procedures. - Maintained/improved engine flight safety, improve system operational readiness and reliability & maintainability, reduce engine life cycle cost, and sustain engine throughout service life. 			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Execute approximately 25+ AF-funded F135 engine tasks supporting initial 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 Plans:</p> <ul style="list-style-type: none"> - Execute approximately 25+ AF-funded F135 engine tasks supporting initial 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. 				
Accomplishments/Planned Programs Subtotals		30.329	31.566	32.274
C. Other Program Funding Summary (\$ in Millions)				
N/A				
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.				
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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	22.068	Jan 2016	22.804	Jan 2017	16.573	Jan 2018	0.000		16.573	Continuing	Continuing	-
Subtotal			-	22.068		22.804		16.573		0.000		16.573	-	-	-

Remarks
FY18 Cost increase (\$93K) due to adjustment for inflation

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	7.909	Oct 2015	8.464	Oct 2016	15.400	Oct 2017	0.000		15.400	Continuing	Continuing	-
Subtotal			-	7.909		8.464		15.400		0.000		15.400	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.352	Oct 2015	0.298	Oct 2016	0.301	Oct 2017	0.000		0.301	Continuing	Continuing	-
Subtotal			-	0.352		0.298		0.301		0.000		0.301	-	-	-

Remarks
PMA Description: Program Management support, travel, and A&AS.

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force							Date: May 2017				
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				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	30.329	31.566	32.274	0.000	32.274	-	-	-		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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-135 Engine CIP Tasks																												
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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
F-135 Engine CIP Tasks	1	2016	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.000	5.750	5.750	0.000	0.000	0.000	0.000	Continuing	Continuing
675373: <i>ISR Innovations Program</i>	-	0.000	0.000	0.000	5.750	5.750	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0207277F, project 675373, ISR Innovations, is a new start.

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: FY 2018 Air Force **Date:** May 2017

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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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 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	5.750	5.750
Total Adjustments	0.000	0.000	0.000	5.750	5.750
• 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	5.750	5.750

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: ISR Innovations	0.000	0.000	0.000	5.750	5.750
Description: NOWcasting, ASAPS, and Caldera.					
FY 2016 Accomplishments: N/A					
FY 2017 Plans: N/A					
FY 2018 Base Plans: N/A					
FY 2018 OCO Plans: 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.					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.000	5.750	5.750

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207325F I Joint Air-to-Surface Standoff Missile (JASSM)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	209.212	9.221	30.002	29.932	0.000	29.932	60.514	79.794	36.482	20.012	24.245	499.414
675356: JASSM Extended Range (JASSM-ER)	209.212	9.221	30.002	29.932	0.000	29.932	60.514	79.794	36.482	20.012	24.245	499.414
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 555

Note

This program, BA 07 PE 0207325F, project 675356, Warfighting Capability Enhancement, is a new start.

Note: Procurement quantities can change based on negotiated options/pricing bands and available funding, in accordance with Title 10, U.S Code Section 2308 BUY-TO-BUDGET ACQUISITION.

A. Mission Description and Budget Item Justification

This project provides a long range (over twice the range of baseline JASSM), conventional air-to-surface, autonomous, precision-guided, low observable, standoff cruise missile compatible with fighter and bomber aircraft. The requirement for JASSM-ER is given in 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 its development/integration efforts on the Intelligent Telemetry Instrumentation Kit (ITIK), the Electronic Safe and Arm Fuze (ESAF), and the Military Code (M-Code) receiver, and FTS-TIK batteries. Our studies in FY16/17 led to safety/survivability via Wing Replacement/China Development/Integration, and Warfighting Capability Enhancement (Software) to enhance the aerodynamic performance against emerging threats. Future efforts added are Anti-Radiation Homing System (ARHS), improved Data Link capability for relocatable target attack, alternate payloads, and improved Guidance Navigation Control (GNC), and alternative FTS-TIK battery studies. The program is also evaluating Diminishing Manufacturing Sources Material Shortages (DMSMS) and reviewing obsolescence issues.

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: FY 2018 Air Force	Date: May 2017
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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207325F I Joint Air-to-Surface Standoff Missile (JASSM)
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	9.793	30.002	20.297	0.000	20.297
Current President's Budget	9.221	30.002	29.932	0.000	29.932
Total Adjustments	-0.572	0.000	9.635	0.000	9.635
• 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	-0.572	0.000			
• Other Adjustments	0.000	0.000	9.635	0.000	9.635

Change Summary Explanation

FY18 cost data updated to include Warfighting Capability Enhancement and Wing Replacement/ Chine Development and Integration

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Title: Warfighting Capability Enhancement</p> <p>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 certain operational scenarios.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: N/A</p> <p>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 certain operational scenarios.</p>	0.000	0.000	6.646
<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 2016 Accomplishments:</p>	0.000	0.000	11.457

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
N/A				
FY 2017 Plans: N/A				
FY 2018 Plans: Continue to initiate design and development of replacement wings. This effort is not a new start. Survivability enhancements were addressed in FY17PB BPAC 675356.				
Title: JASSM ER Intelligent Telemetry Instrumentation Kit (ITIK) (cost shared by both projects)		5.521	0.500	0.500
Description: ITIK replaces the current TIK used during flight testing. The ITIK is common to JASSM, JASSM-ER and Long Range Anti Ship Missile (LRASM).				
FY 2016 Accomplishments: Awarded ITIK development contract to support Critical Design Review (CDR), safety certification, and qualification testing.				
FY 2017 Plans: Complete ITIK development and testing in preparation for production.				
FY 2018 Plans: N/A				
Title: JASSM ER Electronic Safe and Armed Fuze (ESAF) - Common to JASSM baseline and JASSM-ER (cost shared by both projects)		1.987	2.510	6.320
Description: ESAF will resolve FMU-156 obsolescence and reliability issues, improve yield, and potentially lower costs.				
FY 2016 Accomplishments: Awarded ESAF prototype demonstration contract. Continued design work and pre-qualification testing to include cannon and sled testing. Began work on qualification follow-on effort.				
FY 2017 Plans: Award ESAF Qualification contract. Complete design verification and Insensitive Munitions testing. Conduct Critical Design Review.				
FY 2018 Plans: Complete ESAF environmental, safety, and aging qualification testing.				
Title: Military Code (M-Code) receiver		0.005	12.175	1.600

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>Description: Development and integration of a GPS receiver capable of receiving Military Code (M-Code)</p> <p>FY 2016 Accomplishments: Completed M-Code study.</p> <p>FY 2017 Plans: Complete Brassboard development and testing. Award Pre-EMD contract with EMD option.</p> <p>FY 2018 Plans: Continue Pre-EMD efforts.</p>				
<p>Title: JASSM ER Other Development/Safety/Survivability</p> <p>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 Wing Replacement/ Chine Development and Integration, safety certification, flight testing, Diminishing Manufacturing Sources and Material Shortages (DMSMS), improved Data Link, ARHS, improved GNC, alternate payloads, and obsolescence issues.</p> <p>FY 2016 Accomplishments: Other development contracts awarded for TIK/ITIK Flight Termination System (FTS) Lithium Ion battery, Bomb Impact Assessment (BIA) Weapons Portal, IT Dashboard Software Support, LM engineering support for Aviation and Missile Research, Development, and Engineering Center (AMRDEC).</p> <p>FY 2017 Plans: Continue development/evaluations activities addressing JASSM's obsolescence plan directed activities: Improved GNC, anti-jam/anti-spoofing system, wing analysis, and other survivability enhancements. Continue Lithium Ion battery development, individual cell monitoring capability and qual testing. Support ground and flight tests required to verify hardware changes before introducing into production.</p> <p>FY 2018 Plans: Continue development/evaluations activities addressing JASSM's obsolescence plan directed activities: Improved GNC, anti-jam/anti-spoofing system, and survivability enhancements. Support ground and flight test activity required to verify changed hardware before cutting into production. Continue study for long-term FTS-TIK battery development.</p>		1.076	14.717	2.909
<p>Title: JASSM ER Test Support</p> <p>Description: Government Test Support for ESAF, ITIK, Wing Replacement, and M-Code. Includes flight test equipment, targets, test wing and range support, and other ground/flight test support.</p>		0.632	0.100	0.500

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> Completed ESAF Cannon (8) and Sled tests (4). Continue ITIK development and flight test support to include test equipment, targets, range support, and other ground test support.</p> <p><i>FY 2017 Plans:</i> Continue ESAF and ITIK development tests. Begin Qual and flight test support to include test equipment, targets, range support, and other ground test support.</p> <p><i>FY 2018 Plans:</i> Continue ESAF, Warfighting Capability Enhancement, and Wing Replacement/Chine development and Integration. Begin Qual and flight test support to include test equipment, targets, range support, and other ground test support.</p>			
Accomplishments/Planned Programs Subtotals	9.221	30.002	29.932

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• MPAF: BA02 Line Item # JASSM0: JASSM	425.578	431.645	441.367	0.000	441.367	416.791	477.688	512.462	470.545	504.500	5,923.762

Remarks

E. Acquisition Strategy

JASSM-ER is the extended range version of the JASSM baseline missile (currently in full rate production). The initial JASSM-ER development contract, awarded in 2004, was Cost-Plus-Award-Fee. In 2008, the program office awarded a Cost-Plus-Incentive-Fee (CPIF) contract with performance incentives to complete the development effort. Current contract for ESAF is a Cost Plus Fixed Fee (CPFF) contract. The ITIK contract is a Cost Plus Fixed Fee (CPFF) 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: FY 2018 Air Force **Date:** May 2017

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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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000		0.000		6.646	Jan 2018	0.000		6.646	57.778	64.424	67.724
Wing Replacement/Chine Development, survivability enhancements, and Integration	SS/CPFF	Lockheed Martin : Orlando, FL	0.000	0.000		0.000		11.457	Jan 2018	0.000		11.457	67.200	78.657	84.000
ITIK	SS/CPFF	Lockheed Martin : Orlando, FL	0.398	5.521	Jun 2016	0.500	Jun 2017	0.500		0.000		0.500	0.000	6.919	7.819
ESAF	SS/CPFF	Lockheed Martin : Orlando, FL	6.186	1.987	Jun 2016	2.510	Jan 2017	6.320	Nov 2017	0.000		6.320	0.000	17.003	18.872
Military Code (M code) receiver	SS/CPFF	Lockheed Martin : Orlando, FL	0.900	0.005		12.175	Nov 2016	1.600	Jul 2018	0.000		1.600	47.512	62.192	74.610
JASSM-ER Phase ,I/ II development Test Missile Procurement (for DT/IT), parts upgrade, software updates, product improvements, survivability enhancements, LTIK, and obsolescence.	Various	Lockheed Martin : Orlando, FL	136.778	0.943	Mar 2016	14.517	Mar 2017	2.609	Mar 2018	0.000		2.609	45.057	199.904	192.109
Subtotal			144.262	8.456		29.702		29.132		0.000		29.132	217.547	429.099	445.134

Remarks
 -Intelligent Telemetry Instrumentation Kit (ITIK)
 -Legacy Telemetry Instrumentation Kits (L-TIK)
 -Electronic Safe and Arm Fuze (ESAF)

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 support, and other ground/flight test support as necessary.	Various	96 TW : Eglin AFB, FL	25.962	0.632	Jun 2016	0.100	Jun 2017	0.500	Jun 2018	0.000		0.500	2.100	29.294	31.644
6 IT/6 OT assets	SS/CPAF	Lockheed Martin : Orlando, FL	12.733	0.000		0.000		0.000		0.000		0.000	0.000	12.733	12.733
12 Operational Test (OT) assets	SS/FFP	Lockheed Martin : Orlando, FL	24.643	0.000		0.000		0.000		0.000		0.000	0.000	24.643	24.643
Subtotal			63.338	0.632		0.100		0.500		0.000		0.500	2.100	66.670	69.020

Remarks
AEDC: Arnold Engineering Development Complex located at Arnold AFB, TN

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	1.612	0.133	Jul 2016	0.200	Jul 2017	0.300	Jul 2018	0.000		0.300	1.400	3.645	3.771
Subtotal			1.612	0.133		0.200		0.300		0.000		0.300	1.400	3.645	3.771

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		209.212	9.221	30.002	29.932	0.000	29.932	221.047	499.414	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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)

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Warfighting Capability Enhancement																												
Wing Replacement/Chine Development, survivability enhancements, and Integration																												
ITIK Battery Development and Qualification (Phase 1,2, and 3)																												
ITIK Integration with JASSM and Test Equipment Development																												
ITIK Critical Design Review (CDR)																												
ITIK EMI																												
ITIK Flight Testing (LRASM)																												
ESAF Prototyping																												
ESAF Cannon Testing																												
ESAF Critical Design Review (CDR)																												
ESAF Sled Testing																												
ESAF Qualification Testing																												
ESAF Flight Testing																												
ESAF Production Readiness Review (PRR)																												
M-Code Study																												
M-Code brass board development and testing																												
M-Code Pre-EMD																												
M-Code Engineering and Manufacturing Development (EMD)																												
Diminishing Manufacture Sources and Obsolescence Evaluation/Development																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Warfighting Capability Enhancement	3	2018	4	2020
Wing Replacement/Chine Development, survivability enhancements, and Integration	3	2017	3	2020
ITIK Battery Development and Qualification (Phase 1,2, and 3)	1	2016	1	2020
ITIK Integration with JASSM and Test Equipment Development	3	2017	3	2018
ITIK Critical Design Review (CDR)	2	2016	2	2016
ITIK EMI	4	2016	3	2017
ITIK Flight Testing (LRASM)	3	2017	3	2017
ESAF Prototyping	1	2016	3	2017
ESAF Cannon Testing	3	2016	3	2016
ESAF Critical Design Review (CDR)	1	2018	3	2018
ESAF Sled Testing	4	2016	1	2017
ESAF Qualification Testing	2	2017	2	2020
ESAF Flight Testing	4	2019	2	2020
ESAF Production Readiness Review (PRR)	2	2019	2	2019
M-Code Study	1	2016	4	2016
M-Code brass board development and testing	1	2017	4	2017
M-Code Pre-EMD	4	2017	3	2019
M-Code Engineering and Manufacturing Development (EMD)	3	2019	3	2021
Diminishing Manufacture Sources and Obsolescence Evaluation/Development	1	2016	3	2022

Note

Prototype development/component level testing.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	0.000	20.588	37.621	26.956	0.000	26.956	8.673	7.872	13.287	13.595	Continuing	Continuing
674596: <i>AOC WS Modifications</i>	0.000	0.000	12.278	7.700	0.000	7.700	0.000	0.000	0.000	0.000	0.000	19.978
675218: <i>Applications Development</i>	0.000	15.052	15.285	15.429	0.000	15.429	7.653	6.831	7.932	8.094	Continuing	Continuing
675220: <i>Unit Level</i>	0.000	3.187	7.666	3.827	0.000	3.827	1.020	1.041	5.355	5.501	Continuing	Continuing
675221: <i>Personnel Recovery Command and Control (PRC2)</i>	0.000	2.349	2.392	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

This program, BA 07 PE 0207410F, project 675218, C2AOS-C2IS Modifications, is a new start.

In FY 2018, PE 0207410F, Air & Space Operations Center (AOC), Project Number 675221, Personnel Recovery Command and Control (PRC2), efforts were transferred to PE 0305984F, Personnel Recovery Command & Ctrl (PRC2), Project Number 675221, Personnel Recovery Command and Control (PRC2), in order to improve visibility on Service's fair share of development funding for this joint interest program.

A. Mission Description and Budget Item Justification

In FY 2017, AOC WS Modifications was a new start.

In FY 2017, C2AOS-C2IS Modifications was a new start. This effort was delayed one year as a result of the AOC 10.2 Critical Change which delayed integration into current AOC WS baseline.

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. 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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 0207410F / <i>Air & Space Operations Center (AOC)</i>
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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.

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.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	21.102	37.621	17.761	0.000	17.761
Current President's Budget	20.588	37.621	26.956	0.000	26.956
Total Adjustments	-0.514	0.000	9.195	0.000	9.195
• 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	-0.514	0.000			
• Other Adjustments	0.000	0.000	9.195	0.000	9.195

Change Summary Explanation

FY 2018 funding increased \$7.700M in AOC WS Modifications to accelerate C2AOS-C2IS integration on AOC 10.1; increased \$7.900M to Applications Development to fund completion of C2AOS-C2IS development efforts; increased \$0.040M for reprogramming of non-pay inflation rates; decreased \$4.000M in Unit Level as Unit Command and Control (UC2) Rel 1.3 efforts complete; transferred \$2.445M from PRC2 to new PE 0305984F.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674596: AOC WS Modifications	0.000	0.000	12.278	7.700	0.000	7.700	0.000	0.000	0.000	0.000	0.000	19.978
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018: Funding increased \$7.700M in AOC WS Modifications to accelerate C2AOS-C2IS integration on AOC 10.1.

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 2017, AOC WS Modifications was a new start.

In FY18, AOC WS Modifications are required to enable the retirement of Theater Battle Management Core System Force Level (TBMCS FL) and the legacy AOC 10.1 system. Further, 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. Additionally, in FY18 AOC WS Modification activities evolve the AOC through 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 (CCMD), cyber requirements, and next generation weapon systems/weapons.

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 2016	FY 2017	FY 2018
Title: AOC WS Modifications Development	0.000	10.228	6.416
Description: Conduct AOC WS infrastructure development and mission capability integration. 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. Conduct system maintenance and interoperability updates.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: - Integrate C2 Air Operations Suite - C2 Information Services (C2AOS-C2IS) into the AOC WS to enable retirement of TBMCS FL - Integrate 3rd party GOTS mission application updates (e.g., C2AOS-C2IS, Global Command and Control-Joint (GCCS-J), Master Air Attack Plan Tool Kit (MAAPTK), etc.) - This includes infrastructure updates (e.g., Agile Core Services, etc.) and modifying automated business process (Mission Threads) implementations</p> <p>FY 2018 Plans: - Conduct combined DT of the five projects (ASMA-ASIS, RISC2, C2 of IAMD, ATOMS, and AXIS) - Plan for combined OT</p>			
<p>Title: AOC WS Modifications Test and Evaluation</p> <p>Description: Plan and implement 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.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: - Conduct frequent contractor and developmental testing, including Warfighter Assessment Workshops, Risk Reduction Events, Information Assurance Assessments, etc.</p> <p>FY 2018 Plans: - Conduct frequent contractor and developmental testing, including Warfighter Assessment Workshops, Risk Reduction Events, Information Assurance Assessments, etc.</p>	0.000	1.800	1.128
<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 courseware / material development, instructor training, class / Computer Based Training conduct, and training surveys / analysis / updates / enhanced simulation capabilities.</p>	0.000	0.250	0.156

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: - Plan and conduct training updates to reflect baseline changes (3rd party applications, infrastructure, automated business processes, etc.) and operational training needs</p> <p>FY 2018 Plans: - Integrate C2 Air Operations Suite - C2 Information Services (C2AOS-C2IS) into the AOC WS to enable retirement of TBMCS FL - Integrate 3rd party GOTS mission application updates (e.g., C2AOS-C2IS, Global Command and Control-Joint (GCCS-J), Master Air Attack Plan Tool Kit (MAAPTK), etc.) - This includes infrastructure updates (e.g., Agile Core Services, etc.) and modifying automated business process (Mission Threads) implementations</p>			
Accomplishments/Planned Programs Subtotals	0.000	12.278	7.700

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA03: Line Item # 834520: <i>Theater Battle Mgt C2 System</i>	3.139	5.114	4.976	0.000	4.976	4.526	4.606	4.690	4.775	Continuing	Continuing
• OPAF: BA03: Line Item # 834530: <i>Air and Space Operations Ctr-WPN SYS</i>	9.993	15.474	25.553	0.000	25.553	36.081	36.527	37.270	42.163	Continuing	Continuing

Remarks

D. Acquisition Strategy
The acquisition strategy builds on 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, evolves the AOC to a Net-Centric environment, compliant with DoD SOA standards. The AOC WS Modifications program 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 3QFY17, 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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

Engineer. Additionally, significant technical expertise will be provided by MITRE, MIT Lincoln Laboratory, and Engineering & Technology Acquisition Support Services contractors.

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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675218: <i>Applications Development</i>	0.000	15.052	15.285	15.429	0.000	15.429	7.653	6.831	7.932	8.094	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0207410F, project 675218, C2AOS-C2IS Modifications, is a new start.

FY 2018: Funding increased \$7.900M in Applications Development to fund completion of C2AOS-C2IS development efforts.

A. Mission Description and Budget Item Justification

This project funds operational development necessary to acquire and modify segments of Air Force's (AF) Command and Control (C2) capabilities and services. Applications Development provides worldwide operational capabilities for AF C2 in support of DoD, Coalition Partners, and other government agencies. These efforts focus on support of the Joint Forces Air Component Commander (JFACC) that provides air, space and cyber support as presented to the AOC and to other AF and Joint Services C2 systems. Application Development efforts deliver capabilities identified in the Joint Command and Control (JC2) Capability Development Document (CDD) (2013). These activities include C2 Air Operations Suite - C2 Information Services (C2AOS-C2IS) needs identified in the Capability Definition Package (CDP) (2012). C2AOS-C2IS creates web-enabled information services to expose air operations data using standardized schemas, such as those developed by the Air Operations Community of Interest. C2AOS-C2IS also develops, matures, fields, and maintains 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.

In FY 2017, C2AOS-C2IS Modifications was a new start. This effort was delayed one year as a result of the AOC 10.2 Critical Change which delayed integration into current AOC WS baseline.

In FY18, core development activities will be complete and focus will be on testing, addressing discrepancies discovered during testing, Information Assurance (IA), and the start of modernization planning for 4th/5th generation fighter platforms.

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: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>Title: C2AOS-C2IS Development</p> <p>Description: C2AOS-C2IS Development program 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 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) & 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 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Continued development of ATOMS (Rel 4), RISC2, ASMA-ASIS and C2 of IAMD (Rel 3) - Conducted Contractor and Development Tests (DT) for ASMA-ASIS, RISC2, and C2 of IAMD (Rel 3) - Awarded contract for AXIS (Rel 1) <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Complete DT on ASMA-ASIS, RISC2, and C2 of IAMD (Rel 3) - Accomplish bug fixes from testing of ASMA-ASIS, RISC2, C2 of IAMD (Rel 3) and ATOMS (Rel 4) - Conduct ATOMS (Rel 4) Contractor and DT - Prioritize Baseline Change Requests (BCR) - Conduct integration activities - Complete development, conduct Contractor and DT of AXIS (Rel 1) - Maintain IA posture - Support integration into AOC WS - Award Test and Integration contracts <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct combined DT - Continue integration activities, bug fixes, BCR, and IA posture - Support integration into AOC WS 	13.042	13.971	13.388
<p>Title: C2AOS-C2IS Modifications</p> <p>Description: The C2AOS-C2IS Modifications program updates the fielded C2AOS-C2IS baseline to remain interoperable, certified, supportable, and compliant through the development, integration, testing, fielding, of new capabilities and upgrades. C2AOS-C2IS Modifications fine tunes capabilities for C2 of 4th and 5th Generation Fighter Platforms, maintains IA posture via</p>	0.000	0.000	0.300

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
cyber updates, and updates user interfaces as needed. C2AOS-C2IS Modifications FY17 new start effort was delayed one year due to delay of integration into AOC WS.				
FY 2016 Accomplishments: N/A				
FY 2017 Plans: N/A				
FY 2018 Plans: - Prioritize and work requirements for modification contract - Release Request for Proposal for C2AOS-C2IS modification contract				
Title: Test and Evaluation				
Description: Test and Evaluation				
FY 2016 Accomplishments: - Participated in multiple Warfighter Assessments (WA), Risk Reduction Testing (RRT) and DT events and regression testing - Prepared for combined DT and Operational Test (OT)				
FY 2017 Plans: - Conduct integration tests, RRTs, and regression testing - Conduct AXIS (Rel 1) and ATOMS (Rel 4) DT - Conduct C2AOS RRT - Prepare for combined DT of the five projects (ASMA-ASIS, RISC2, C2 of IAMD, ATOMS and AXIS) - Prepare for OT				
FY 2018 Plans: - Conduct combined DT of the five projects (ASMA-ASIS, RISC2, C2 of IAMD, ATOMS, and AXIS) - Plan for combined OT				
Accomplishments/Planned Programs Subtotals		2.010	1.314	1.741
		15.052	15.285	15.429
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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/Variou	Lockheed Martin : Colorado Springs, CO	0.000	3.169	Mar 2016	2.876	Dec 2016	0.000		0.000		0.000	0.000	6.045	-
Request Information Services for Command and Control (RISC2)	C/Variou	Leidos, Inc. : Reston, VA	0.000	0.776	Jan 2016	0.119	Nov 2016	0.000		0.000		0.000	0.000	0.895	-
Air Space Management Application-Air Space Information Service (ASMA-ASIS)	C/Variou	Leidos, Inc. : Reston, VA	0.000	1.009	Mar 2016	0.131	Dec 2016	0.000		0.000		0.000	0.000	1.140	-
Command and Control of Integrated Air and Missile Defense (C2 of IAMD)	C/Variou	Lockheed Martin : Colorado Springs, CO	0.000	0.573	May 2016	0.347	Jan 2017	0.000		0.000		0.000	0.000	0.920	-
Air Execution Information System (AXIS)	C/CPFF	Leidos, Inc. : Reston, VA	0.000	1.809	Jun 2016	1.648	Dec 2016	0.000		0.000		0.000	Continuing	Continuing	-
Test and Integration 1	C/T&M	Leidos, Inc. : Reston, VA	0.000	0.000	Dec 2016	1.075	Mar 2017	2.556	Oct 2017	0.000		2.556	Continuing	Continuing	-
Test and Integration 2	C/T&M	Lockheed Martin : Colorado Springs, CO	0.000	0.000	Feb 2017	2.184	Feb 2017	4.385	Oct 2017	0.000		4.385	Continuing	Continuing	-
Mobility Enterprise Information Services (MEIS)	MIPR	DISA : Scott AFB, IL	0.000	0.000		0.665	Mar 2017	0.766	Oct 2017	0.000		0.766	0.000	1.431	-
Modification	C/TBD	TBD : TBD	0.000	0.000		0.000		0.300	Nov 2017	0.000		0.300	Continuing	Continuing	-
Subtotal			0.000	7.336		9.045		8.007		0.000		8.007	-	-	-

Remarks
 FINANCIAL PERFORMANCE: ATOMS is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, 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: FY 2018 Air Force **Date:** May 2017

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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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-	-	-	-	-	-	-	-	-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Huachucha, AZ	0.000	0.028	Apr 2016	0.012	Oct 2017	0.037	Jan 2018	0.000		0.037	0.000	0.077	-
Lead Developmental Test and Evaluation Organization	PO	46th Test Squadron : Eglin AFB, FL	0.000	1.982	Jan 2016	1.302	Mar 2017	1.704	Jan 2018	0.000		1.704	0.000	4.988	-
Subtotal			0.000	2.010		1.314		1.741		0.000		1.741	0.000	5.065	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	3.129	Oct 2015	3.051	Oct 2016	3.106	Oct 2017	0.000		3.106	0.000	9.286	-
Program Management Administration	C/Various	Various : Hanscom AFB, MA	0.000	2.302	Oct 2015	1.777	Oct 2016	2.395	Oct 2017	0.000		2.395	0.000	6.474	-
Cyber Support	MIPR	Various : Hanscom AFB, MA	0.000	0.275	Mar 2016	0.098	Jul 2017	0.180	Oct 2017	0.000		0.180	0.000	0.553	-
Subtotal			0.000	5.706		4.926		5.681		0.000		5.681	0.000	16.313	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		0.000	15.052	15.285	15.429	0.000	15.429	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675218 / Applications Development

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
ATOMS CP 1 Rel 4 Development	██████████																											
ATOMS CP 1 Rel 4 Integration and Test					██████████																							
RISC2 CP 1 Development	██████████																											
RISC2 CP 1 Integration and Test					██████████																							
C2 of IAMD Planner CP 2 Rel 3 Development	██████████																											
C2 of IAMD Planner CP 2 Rel 3 Integration and Test					██████████																							
ASMA-ASIS CP 2 Development	██████████																											
ASMA-ASIS CP 2 Integration and Test					██████████																							
AXIS CP 3 Rel 1 Development					██████████																							
AXIS CP 3 Rel 1 Integration and Test									██████████																			
Test and Integration 1 (TI1) - Leidos									██████████																			
Test and Integration 2 (TI2) - Lockheed Martin									██████████																			
C2AOS-C2IS Modifications program													██████████															

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
ATOMS CP 1 Rel 4 Development	1	2016	4	2017
ATOMS CP 1 Rel 4 Integration and Test	2	2017	4	2017
RISC2 CP 1 Development	1	2016	2	2017
RISC2 CP 1 Integration and Test	3	2016	2	2017
C2 of IAMD Planner CP 2 Rel 3 Development	1	2016	2	2017
C2 of IAMD Planner CP 2 Rel 3 Integration and Test	3	2016	2	2017
ASMA-ASIS CP 2 Development	1	2016	2	2017
ASMA-ASIS CP 2 Integration and Test	3	2016	2	2017
AXIS CP 3 Rel 1 Development	3	2016	4	2017
AXIS CP 3 Rel 1 Integration and Test	3	2017	4	2017
Test and Integration 1 (TI1) - Leidos	2	2017	3	2019
Test and Integration 2 (TI2) - Lockheed Martin	2	2017	3	2019
C2AOS-C2IS Modifications program	2	2018	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675220: <i>Unit Level</i>	0.000	3.187	7.666	3.827	0.000	3.827	1.020	1.041	5.355	5.501	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018: Funding decreased \$4.000M in Unit Level as Unit Command and Control (UC2) Rel 1.3 efforts complete.

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.

In FY18, core development activities will be to complete development of UC2 1.3 which will allow UC2 to be accessed on mobile platforms. Additional FY18 activities will include resolving deficiencies discovered during developmental tests (DT), maintaining information assurance (IA) posture, and ensuring integration and testing of UC2 interfaces with other applications.

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 2016	FY 2017	FY 2018
Title: Software Development	2.547	7.478	3.257
Description: UL/UC2 and UC2 capabilities development/integration.			
FY 2016 Accomplishments:			
- Completed development of UC2 Rel 1.1			
- Started development of UC2 Rel 1.1.1			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Started development of UC2 Rel 1.2 which completes the resource management modernization, provides modernization of base situational awareness map, and adds/modernizes the interfaces. FY 2017 Plans: - Complete development of UC2 Rel 1.1.1 - Complete development of UC2 Rel 1.2 - Start development of UC2 Rel 1.3 FY 2018 Plans: - Complete development of UC2 Rel 1.3			
Title: Testing and Test Support Description: UC2 Testing and test support activities. FY 2016 Accomplishments: - Supported UC2 Warfighter Assessments - Completed testing of UC2 Rel 1.1 FY 2017 Plans: - Support UC2 Warfighter Assessments - Complete testing of UC2 Rel 1.1.1 - Complete testing of UC2 Rel 1.2 FY 2018 Plans: - Support UC2 Warfighter Assessments - Complete testing of UC2 Rel 1.3	0.640	0.188	0.570
Accomplishments/Planned Programs Subtotals	3.187	7.666	3.827

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item # 834520: Theater Battle Management C2 System	3.079	3.293	3.384	0.000	3.384	3.444	3.507	3.570	3.635	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207410F / Air & Space Operations Center (AOC)	Project (Number/Name) 675220 / Unit Level

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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675221: <i>Personnel Recovery Command and Control (PRC2)</i>	0.000	2.349	2.392	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018, PE 0207410F, Air & Space Operations Center (AOC), Project Number 675221, Personnel Recovery Command and Control (PRC2), efforts were transferred to PE 0305984F, Personnel Recovery Command & Ctrl (PRC2), Project Number 675221, Personnel Recovery Command and Control (PRC2), in order to improve visibility on Service's fair share of development funding for this joint interest program.

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.

In FY 2018, PE 0207410F, Air & Space Operations Center (AOC), Project Number 675221, Personnel Recovery Command and Control (PRC2), efforts were transferred to PE 0305984F, Personnel Recovery Command & Ctrl (PRC2), Project Number 675221, Personnel Recovery Command and Control (PRC2), in order to improve visibility on Service's fair share of development funding for this joint interest program.

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 2016	FY 2017	FY 2018
Title: Personnel Recovery Command and Control (PRC2)	2.149	2.058	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: PRC2 is developing and delivering tools and services for planning and managing search and rescue efforts, and disseminating related information.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed development and fielded PRMS 4.0 (formerly PRC2 Inc 4 Build 4.0.0 Virtualization) and PRMM Version 2 (formerly PRC2 Inc 5 Build 5.0.0 Mission Manager Inc 2) capability - Focused follow on activities for concept and risk reduction to support the development of Mission Manager in the Joint environment <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Field PRMS 4.0 (formerly PRC2 inc 4 build 4.0.0 virtualization) - Complete development and field PRMM version 2.0.0 (formerly PRC2 Inc 5.0.0 Mission Manager Inc 2) - Start development of PRMM version 3.0.0 (formerly PRMM version 2.0.0) - Start development of PRMS version 5.0 <p>FY 2018 Plans: N/A</p>				
<p>Title: Test and Evaluation</p> <p>Description: Test and Evaluation</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Focused Test and Evaluation activities to field PRMS Version 4.0 (formerly PRC2 Inc 4 Build 4.0.1 and 4.0.2 Maintenance Releases) and PRMM Version 2.0 (formerly PRC2 Inc 5 Build 5.0.1 Maintenance Release) capability <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Test and evaluation focuses of activities to field PRMM version 2.0.0 (formerly PRC2 Inc 5.0.0 Mission Manager Inc 2) <p>FY 2018 Plans: N/A</p>		0.200	0.334	0.000
Accomplishments/Planned Programs Subtotals		2.349	2.392	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item # 834520: Theater Battle Management C2 System	1.255	1.252	1.286	0.000	1.286	1.310	1.333	1.357	1.392	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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.557	13.292	2.450	0.000	2.450	0.009	9.484	13.191	9.849	Continuing	Continuing
67485L: <i>Theater Air Control System Imp (TACSI)</i>	-	0.557	13.292	2.450	0.000	2.450	0.009	9.484	13.191	9.849	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PE 0207412F 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 begins its Phase 1 Modernization effort in FY17. Phase 1 addresses, but is not limited to, AN/TYQ-23A(V)1 OM Increment 1 (Multiple Source Correlator Tracker (MSCT) software upgrades, 3DELRR Integration and Secret Internet Protocol Router Network (SIPRnet) integration), JM Link 16 upgrade and Diminishing Manufacturing Sources and Material Shortages (DMSMS).

In FY17, OM Mod Increment 1 was a new start.

This program is in Budget Activity 7, Operational System Development. 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: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207412F I Control and Reporting Center (CRC)
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.557	13.292	2.443	0.000	2.443
Current President's Budget	0.557	13.292	2.450	0.000	2.450
Total Adjustments	0.000	0.000	0.007	0.000	0.007
• 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	0.007	0.000	0.007

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: JM Link 16 Upgrade</p> <p>Description: JM Link 16 Upgrade will provide for crypto modernization and will meet the DoD mandated frequency re-mapping requirements. FY 2017 Integrates JM Link 16 upgrade into CRC modernization Phase 1.</p> <p>FY 2016 Accomplishments: Initial JM Link 16 upgrade analysis, document preparation and program support.</p> <p>FY 2017 Plans: JM Link 16 Upgrade effort was integrated into CRC Modernization Phase 1 in FY17.</p> <p>FY 2018 Base Plans: N/A</p>	0.557	0.000	0.000	-	0.000
<p>Title: CRC Modernization Phase 1</p> <p>Description: CRC Modernization Phase 1 (OM Increment 1 (MSCT software upgrades and 3 Dimensional Expeditionary Long Range Radar(3DELRR) Integration, SIPR integration) and JM Link 16 Upgrade) will meet AOR user requirements for the CRC system.</p> <p>FY 2017 Plans:</p>	-	13.292	2.450	-	2.450

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Phase 1 FY17 provides for AN/TYQ-23A(V)1 Increment 1 MSCT 5.X software development, integration and test; integration of 3DELRR into MSCT software; SIPR integration; and JM Link 16 upgrade development, prototype and test. <i>FY 2018 Base Plans:</i> FY18 will provide for 3DELRR Integration testing, cyber security updates, future phase updates planning and program support.					
Accomplishments/Planned Programs Subtotals	0.557	13.292	2.450	-	2.450

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item # 833040: <i>Theater Air Control Sys Improvements</i>	22.710	1.163	23.233	4.970	28.203	20.131	2.901	2.951	7.216	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 2037 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 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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	124.457	86.644	151.726	0.000	151.726	124.067	92.428	81.441	78.731	Continuing	Continuing
67411L: <i>Airborne Warning & Control System (AWACS)</i>	-	124.457	86.644	151.726	0.000	151.726	124.067	92.428	81.441	78.731	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0207417F, project 67411L, Automatic Dependent Surveillance-Broadcast Out Acceleration, 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 is 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: FY 2018 Air Force		Date: May 2017
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. Funding is shared between Research, Development, Test, and Evaluation (RDT&E) and production funds. 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, production, 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 the 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>In FY17 CID was a new start.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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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. 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). In previous budget cycle, this effort was referred to as Multifunctional Information Distribution System Joint Tactical Radio System (MIDS JTRS). Risk reduction activities are being executed in cooperation with foreign partners.

In FY17 CNU was a new start

8. E-3 Automatic Dependent Surveillance Broadcast (ADS-B) Out Acceleration: Updates flight deck to address known Air Traffic Management restrictions; replace analog equipment with modern digital avionics to include ADS B Out and Mode 5 transponder; DRAGON's IOC 2020 – FOC 2026 does not meet ADS B out or Mode 5 mandates. Accelerates ADS-B Out and Mode 5 transponder from DRAGON – moves FOC for this DRAGON subset from FY25 to FY21.

This program is in Budget Activity 7, Operational Systems 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	131.812	86.644	121.067	0.000	121.067
Current President's Budget	124.457	86.644	151.726	0.000	151.726
Total Adjustments	-7.355	0.000	30.659	0.000	30.659
• 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	-3.012	0.000			
• SBIR/STTR Transfer	-4.343	0.000			
• Other Adjustments	0.000	0.000	30.659	0.000	30.659

Change Summary Explanation

FY2016 delta due to a \$3.012M Below Threshold Reprogramming to fund higher Air Force priorities and -\$4.343M for Small Business Innovation Research (SBIR).

FY2018 funding request was increased by \$30.659M to include: Aircraft Dependent Surveillance - Broadcast (ADS-B) acceleration for \$26.493M and \$3.716M to investigate and develop further capabilities of the AWACS weapon system.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Title: E-3 DMS Replacement of Avionics for Global Operations and Navigation (DRAGON)	53.943	34.656	18.345

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>Description: DRAGON</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Completed N-1 (common) Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) -Performed D-1 Installation & Checkout -Started D-1 Ground and Flight Test -Conducted D-1 Tech Order validation -Completed flight testing on N-1 -Awarded contract for DRAGON simulators <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> -Starting D-1 FCA and PCA -Completing development of D-1 FCA and PCA -Boeing delivering D-1 -Boeing delivering two virtual desktop trainer kits -Delivering First Flight Training Device -Completing N-1 Type 1 training -Completing ADSB-Out development and test -Boeing delivering N-1 -Starting D-1 Ops Type 1 training -Delivering Fixed Trainer Simulator <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> -Will develop Motion Trainer Simulator 				
<p>Title: E-3 Electronic Protection (EP)</p> <p>Description: EP</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Conducted EMD contract Kick-off meeting -Conducted delta System Requirements Review (SRR) -Conducted System Level Preliminary Design Review (PDR) -Continued development of classified technology solutions to mitigate issues/concerns identified in the RMP study 		41.217	16.792	30.895

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>-Conducted Critical Design Review (CDR)</p> <p>FY 2017 Plans:</p> <p>-Conducting Test Readiness Review (TRR)</p> <p>-Scheduling Installation and Check Out (I&CO)</p> <p>-Continuing development and maturation of classified technology radar solutions in both the Systems Integration Lab (SIL)/ Software Development Facility (SDF) and Avionics Integration Laboratory (AIL) in preparation for the EMD ground and flight test</p> <p>FY 2018 Plans:</p> <p>-Will Complete Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA)</p> <p>-Will DD250 & PoP complete</p>				
<p>Title: E-3 Training, Support and Infrastructure (TSI)</p> <p>Description: TSI</p> <p>FY 2016 Accomplishments:</p> <p>-Supported AWACS developmental and production program lab integration efforts</p> <p>-Provided system lab support to EP, Block 40/45, DRAGON, NGIFF, IPEC, radar improvement efforts, integration and test</p> <p>-Supported E-3 and other OSD mandated interoperability testing and provided support for mandatory Operational, Safety, and Suitability and Effectiveness efforts</p> <p>-Supported the E-3 AWACS Developmental Test and Evaluation AIL</p> <p>FY 2017 Plans:</p> <p>-Awarding follow-on contract(s)</p> <p>-Supporting AWACS developmental and production programs lab integration efforts</p> <p>-Providing system lab support to EP, Block 40/45, DRAGON, NGIFF, IPEC, radar improvement, integration and test</p> <p>-Supporting AWACS and other OSD mandated interoperability testing and support mandatory E-3 Operational, Safety, and Suitability and Effectiveness program</p> <p>-Supporting the E-3 AWACS Developmental Test & Evaluation AIL</p> <p>FY 2018 Plans:</p> <p>-Will continue to maintain and provide DT&E labs to AWACS programs</p> <p>-Will support AWACS development and production programs lab integration & test efforts</p> <p>-Will provide system lab support to EP, Block 40/45, DRAGON, NGIFF, IPEC, CID and CNU improvement, integration and test</p>		9.500	13.181	15.179

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
-Will support AWACS and other OSD mandated interoperability testing and support mandatory E-3 Operational, Safety, and Suitability and Effectiveness program				
Title: E-3 Command and Control, Intelligence, Surveillance and Reconnaissance (C2ISR) Description: C2ISR FY 2016 Accomplishments: -Conducted engineering / integration studies to determine required modifications and associated costs to upgrade and support Risk Reduction activities for program planning -Continued to execute International Cooperative Research & Development (ICR&D) FY 2017 Plans: -Conducting engineering / integration studies to determine required modifications and associated costs to upgrade and support risk reduction activities for program planning -Executing cooperative IR&D FY 2018 Plans: -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 IR&D		4.008	5.735	7.992
Title: E-3 Internet Protocol Enabled Communication (IPEC) Description: IPEC FY 2016 Accomplishments: -Continued EMD activities in preparation for contractor Development Test (DT) and Government DT and Operational Test (OT) FY 2017 Plans: -Completing EMD, DT, and OT FY 2018 Plans: N/A		15.789	14.280	0.000
Title: E-3 Combat Identification (CID) Diminishing Manufacturing Sources (DMS) Description: CID DMS FY 2016 Accomplishments:		0.000	1.000	27.572

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
N/A				
FY 2017 Plans: -Planning work on risk reduction effort to buy down development risk -Planning for award of 2nd phase of risk reduction contract prior to EMD -Releasing RFP for Sensor Electronics Unit (SEU)				
FY 2018 Plans: -Will award EMD contract -Will award SEU Production Contract				
Title: E-3 Communication Network Upgrade (CNU) Description: CNU		0.000	1.000	25.160
FY 2016 Accomplishments: N/A				
FY 2017 Plans: -Conducting a study focused on buying down development				
FY 2018 Plans: -Will award EMD contract				
Title: Automatic Dependent Surveillance-Broadcast Out Acceleration Description: ADS-B Acceleration		0.000	0.000	26.583
FY 2016 Accomplishments: N/A				
FY 2017 Plans: N/A				
FY 2018 Plans: -Will integrate new CDU and APX-119 on flight deck of E-3 Sentry -Will design series of flight deck alert lights				
Accomplishments/Planned Programs Subtotals		124.457	86.644	151.726

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF: BA05: Line Item # E00300: <i>E-3</i>	12.828	89.386	189.772	0.000	189.772	153.386	167.173	152.250	159.675	Continuing	Continuing
• APAF: BA05: Line Item # E34045: <i>Airborne Warning and Control System</i>	178.308	245.227	164.786	0.000	164.786	66.604	31.360	1.068	0.000	0.00	767.373
• APAF: BA06: Line Item # 000999: <i>Initial Spares/Repair Parts</i>	15.616	22.061	23.539	0.000	23.539	23.938	24.366	21.472	21.903	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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
(U) E-3 DMS Replacement of Avionics for Global Operations and Navigation (DRAGON)	SS/FPIF	Boeing : Seattle, WA	-	49.451	Jan 2016	30.585	Jan 2017	18.345	Jan 2018	0.000		18.345	Continuing	Continuing	-
(U) E-3 Electronic Protection (EP)	SS/CPIF	Boeing : Seattle, WA	-	38.750	Feb 2016	14.143	Jan 2017	27.717	Jan 2018	0.000		27.717	Continuing	Continuing	-
(U) E-3 Command and Control, Intelligence, Surveillance, and Reconnaissance	SS/ Various	Boeing : Seattle, WA	-	1.961	Jan 2016	3.188	Jan 2017	5.442	Jan 2018	0.000		5.442	Continuing	Continuing	-
(U) E-3 Internet Protocol Enabled Communication (IPEC)	SS/ Various	Boeing : Oklahoma City, OK	-	13.560	Mar 2016	12.511	Jan 2017	0.000		0.000		0.000	Continuing	Continuing	-
(U) E-3 Combat Identification (CID) Diminishing Manufacturing Sources (DMS)	TBD	TBD : TBD	-	0.000		1.000	Jun 2017	24.592	Jan 2018	0.000		24.592	Continuing	Continuing	-
(U) E-3 Communication Network Upgrade (CNU)	TBD	TBD : TBD	-	0.000		1.000	May 2017	22.038	Jan 2018	0.000		22.038	Continuing	Continuing	-
(U) ADS-B Acceleration	TBD	TBD : TBD	-	0.000		0.000		24.083	Jan 2018	0.000		24.083	Continuing	Continuing	-
Subtotal			-	103.722		62.427		122.217		0.000		122.217	-	-	-

Remarks
Total Program does not include NATO funds.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
DRAGON EMD	1	2016	3	2017
DRAGON DT/OT	1	2017	2	2020
DRAGON Milestone C (May, 2017)	3	2017	3	2017
EP EMD	1	2016	2	2018
EP Milestone C (Jul, 2018)	4	2018	4	2018
EP DT/OT	4	2017	2	2018
TSI	1	2016	4	2022
C2ISR	1	2016	4	2022
IPEC EMD	1	2016	4	2017
IPEC DT/OT (Jul 2017 - Aug 2017)	4	2017	4	2017
IPEC Milestone C (Apr 2018)	3	2018	3	2018
CID DMS TD	1	2017	2	2018
CID DMS Milestone B (Oct, 2017)	1	2018	1	2018
CID DMS EMD	3	2018	4	2020
CID DT/OT	3	2020	4	2020
CID DMS Milestone C (Sep, 2020)	4	2020	4	2020
CNU TD Phase	1	2018	3	2019
CNU Milestone B (Jun, 2019)	3	2019	3	2019
CNU EMD	3	2019	4	2021
CNU Milestone C (Sep, 2021)	4	2021	4	2021
ADS-B Accel Milestone B (Jun, 2018)	3	2018	3	2018
ADS-B EMD	2	2018	2	2020

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force			Date: May 2017	
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)		

Events	Start		End	
	Quarter	Year	Quarter	Year
ADSB Milestone C (Jun, 2019)	3	2019	3	2019

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	5.786	2.442	3.656	0.000	3.656	3.715	3.785	3.849	3.928	Continuing	Continuing
675234: <i>TACP Support</i>	-	5.786	2.442	3.656	0.000	3.656	3.715	3.785	3.849	3.928	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: FY 2018 Air Force **Date:** May 2017

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.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	6.001	2.442	3.645	0.000	3.645
Current President's Budget	5.786	2.442	3.656	0.000	3.656
Total Adjustments	-0.215	0.000	0.011	0.000	0.011
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.215	0.000	0.011	0.000	0.011

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Title: JTC TRS Trainer Development</p> <p>Description: Development and test of Engineering Change Proposals (ECPs) for TACP-Close Air Support System (CASS) and Small Diameter Bomb (SDB) II.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Development of Legacy System (AFSOC JTAC Training System (AJS) and JTAC-TACP/Operational Simulation Suite (J-T/OSS)) compatibility for use with JTC TRS in scenario generation and After Action Review (AAR).</p> <p>FY 2018 Plans: Development and test of Engineering Change Proposals (ECPs) for TACP-CASS and SDB II.</p>	0.200	0.600	1.200
<p>Title: JTAGSS Trainer Development</p> <p>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</p> <p>FY 2016 Accomplishments: • Stood up JTAGSS 1.0 deployed testbed at 111th ASOS (used in three exercises); To include Army integration</p>	5.586	1.842	2.456

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> • Transitioned JTAGSS to a server based infrastructure eliminating computing stations at each position • Stood up JTAGSS 2.0 (beta version) deployed testbed at 5th ASOS • Two agent prototypes complete; Warfighters bought off on external agents - "How soon can we get them" • Established a R&D MOA with 5th and 111th ASOS • Established JTAGSS Users Group • Participated in Bold Quest 16.1 on the JTEN <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> • JTAGSS TRADOC demonstration • JTAGSS LVC demonstration at I/ITSEC • External agent integration • Procedural Controller (internal agent) demonstration • Standup six research and development testbeds at operational unit locations • Investigate and potentially integrate TBMCS Lite • Complete JTAGSS 2.0 <p>FY 2018 Plans:</p> <p>Complete JTAGSS 3.0. Integrate TACP Close Air Support System 1.4.4. and complete internal agents.</p>			
Accomplishments/Planned Programs Subtotals	5.786	2.442	3.656

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u> <u>Continuing</u>
• OPAF: BA 03: Line Item # 837100: <i>Tactical C-E Equipment</i>	43.187	15.599	1.181	0.000	1.181	13.023	3.891	3.961	0.000	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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force Date: May 2017

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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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).

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	6.793	10.911	13.420	0.000	13.420	10.393	10.446	10.637	10.862	Continuing	Continuing
675306: <i>Analysis Enterprise</i>	-	0.000	0.000	1.003	0.000	1.003	0.000	0.000	0.000	0.000	Continuing	Continuing
675307: <i>TARGETING ENTERPRISE RESEARCH</i>	-	5.050	6.263	11.717	0.000	11.717	9.522	9.695	9.872	10.081	Continuing	Continuing
675309: <i>GEO Info & Serv Software</i>	-	1.743	4.648	0.700	0.000	0.700	0.871	0.751	0.765	0.781	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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	6.793	10.911	10.552	0.000	10.552
Current President's Budget	6.793	10.911	13.420	0.000	13.420
Total Adjustments	0.000	0.000	2.868	0.000	2.868
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	2.868	0.000	2.868

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675306: <i>Analysis Enterprise</i>	-	0.000	0.000	1.003	0.000	1.003	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Mission Description not provided.

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

	FY 2016	FY 2017	FY 2018
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 acq of weapon systems 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.			
Accomplishments/Planned Programs Subtotals	-	-	1.003

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

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

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675307: <i>TARGETING ENTERPRISE RESEARCH</i>	-	5.050	6.263	11.717	0.000	11.717	9.522	9.695	9.872	10.081	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.

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

	FY 2016	FY 2017	FY 2018
Title: Targeting Enterprise Research	5.050	6.263	11.717
<p>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.</p> <p>FY 2016 Accomplishments: Moved applications within the Targeting and Geospatial Intelligence (T&G) Program Management Office (PMO) portfolio to the DI2E environment which provides transparency into the work being performed and shortens delivery timelines. This migration to DI2E will enable a phased transition to a Continuous Integration/DevOps environment. DI2E also allows for the use of an automated test infrastructure on multiple projects in the portfolio. Incorporated Agile development methodologies on JTT, eGPL, ISRStake, and GCCS-I3. Continued efforts to address operator desired changes and improve/increase interoperability of applications. Migrated and consolidated targeting capabilities into one portfolio under the T&G PMO.</p> <p>FY 2017 Plans: T&G is incorporating User Centered Design into its capabilities in support of increasing usability of capabilities built around operational needs. Initial modernization focus will be on IOTA, JTT, and GCCS-I3. Initial pilot of JTT as a capability package decoupled from GCCS-J at CAOC-N & 363rd ISR Wing to demonstrate new architectural approach for T&G capabilities. Continuing to migrate and consolidate targeting capabilities into one portfolio under the T&G PMO. Implementing a modernization effort which will provide the capability to facilitate agile development for new tools and applications.</p> <p>FY 2018 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Continue the phased modernization of the remaining capabilities within the T&G portfolio, expand test automation, and migrate to a true Continuous Integration/DevOps environment.			
Accomplishments/Planned Programs Subtotals	5.050	6.263	11.717

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item #832070: <i>Intelligence Comm Equipment</i>	3.894	6.294	6.534	0.000	6.534	6.273	4.384	4.464	0.000	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: FY 2018 Air Force												Date: May 2017				
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207431F / Combat Air Intelligence System Activities				Project (Number/Name) 675307 / TARGETING ENTERPRISE RESEARCH								
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	-	3.710	Dec 2015	5.084	Dec 2016	9.374	Dec 2017	0.000		9.374	Continuing	Continuing	-	
Subtotal			-	3.710		5.084		9.374		0.000		9.374	-	-	-	
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	-	0.581	Nov 2015	0.598	Dec 2016	0.603	Jan 1901	0.000		0.603	Continuing	Continuing	-	
DMS, MilCloud	Various	Various : NA, NA	-	0.000		0.174		0.920		0.000		0.920	Continuing	Continuing	-	
Subtotal			-	0.581		0.772		1.523		0.000		1.523	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	-	0.265	Jan 2016	0.295	Dec 2016	0.351	Dec 2017	0.000		0.351	Continuing	Continuing	-	
Subtotal			-	0.265		0.295		0.351		0.000		0.351	-	-	-	
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	-	0.494	Dec 2015	0.112	Dec 2016	0.469	Dec 2017	0.000		0.469	Continuing	Continuing	-	
Subtotal			-	0.494		0.112		0.469		0.000		0.469	-	-	-	

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Software/Hardware Development	[REDACTED]																											
Test and Evaluation	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Software/Hardware Development	1	2016	4	2021
Test and Evaluation	1	2016	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675309: <i>GEO Info & Serv Software</i>	-	1.743	4.648	0.700	0.000	0.700	0.871	0.751	0.765	0.781	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.

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

	FY 2016	FY 2017	FY 2018
Title: Enhanced Geospatial Product Library (EGPL)	1.743	4.648	0.700
Description: Provide continuing support for EGPL software and storage to meet future and evolving IT and GEOINT standards and support.			
FY 2016 Accomplishments: Continued efforts to reduce duplication of functionality, increase communication between enterprise tools, and increase functions in critical mission areas. Began to enhance data services and data access across base and network design and continue existing development support (EGPL data update, system security certification, etc).			
FY 2017 Plans: Continue eGPL Version 3.0 development, test efforts, sustainment, (Development Test (DT), and Force Development Evaluation (FDE)).			
FY 2018 Plans: Continue eGPL Version 3.0 development, test efforts, sustainment, (Development Test (DT), and Force Development Evaluation (FDE)).			
Accomplishments/Planned Programs Subtotals	1.743	4.648	0.700

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF:BA03: Line Item #832070: <i>Intelligence Comm Equipment</i>	3.894	6.294	6.534	0.000	6.534	6.273	4.384	4.464	0.000	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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	10.747	11.843	10.623	0.000	10.623	10.794	10.996	11.188	11.418	Continuing	Continuing
676013: <i>Equipment Modernization</i>	-	10.747	11.843	10.623	0.000	10.623	10.794	10.996	11.188	11.418	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	12.411	11.843	10.592	0.000	10.592
Current President's Budget	10.747	11.843	10.623	0.000	10.623
Total Adjustments	-1.664	0.000	0.031	0.000	0.031
• 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	-1.300	0.000			
• SBIR/STTR Transfer	-0.364	0.000			
• Other Adjustments	0.000	0.000	0.031	0.000	0.031

Change Summary Explanation

FY2016 Below Threshold Reprogramming of -1.3M to JSTARS Recap, Radar Risk Reduction activities.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Title: Close Air Support System (CASS)	10.747	11.843	10.623
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.			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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FY 2016 Accomplishments:

- This included, but was not limited to:
- Completed Dismount testing.
- Continued integration and testing for Dismount CASS software developed for the Operational Control System (OCS).
- Continued development, integration and testing for CASS software developed for ATM.
- Continued developing software to operate on new TACP-M platforms such as; Mobile Communications System (MCS), TACP-M Transportable Gateway (TTG), and other TACP systems.
- Continued to develop, integrate, and test Machine to Machine (MTM) interfaces with C2 Nodes, USAF aircraft, and Ground Forces as well as interoperability with the Army Tactical Network (ATN), which will enhance communication capability among TACP and Army warfighters.
- Continued the integration and test of the software modem capability for the Dismount software.
- Continued Call For Fires (CFF) and Small Diameter Bomb II (SDB) engineering builds to enhance interoperability of future CASS software.

FY 2017 Plans:

- This includes, but is not limited to:
- Complete fielding of the Dismounted CASS v1.4.5 software, including the software modem, for use with the Operational Control System (OCS)
- Continue testing, training and fielding CASS v1.4.5 software for use in ASOCs, TOCs, and Mobil Systems (ATM).
- Initiate risk reduction, design, development and integration of CASS version 2.0 software for government testing starting in late FY18.
- Continue to integration, and test of CASS data communications interfaces with C2 Nodes, CAS aircraft, Army Tactical Networks, Soldier Radio Waveform (SRW) networks, and Mobile User Objective System (MUOS) SATCOM networks to enhance interoperability between TACPs, and other joint warfighters.
- Continue development of Call-for-Fire (CFF) and Small Diameter Bomb II (SDB II) control messages.
- Training in FY 17 for both Dismounted and ATM.

FY 2018 Plans:

- This includes, but is not limited to:
- Complete fielding of the Dismount software, including the software modem, for use with the OCS
- Complete fielding of ATM.
- Will continue risk reduction and initiate test activities for developing of the initial CASS v2.0 software.
- 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.

	FY 2016	FY 2017	FY 2018

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Will conduct source selection activities to provide additional feature (capabilities) for the CASS software. - Will continue 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 continue to develop CFF and SDBII control messages.			
Accomplishments/Planned Programs Subtotals	10.747	11.843	10.623

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> Base	<u>FY 2018</u> OCO	<u>FY 2018</u> Total	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> Complete	<u>Total Cost</u>
• OPAF: BA03: Line item #837100: <i>Tactical C-E Equipment</i>	33.327	41.823	43.084	0.000	43.084	56.096	30.159	30.701	31.256	Continuing	Continuing

Remarks

E. Acquisition Strategy
 TACP-M is executing an incremental development for the TACP-M CASS software. CASS v2.0 strategy continues the incremental development through conducting risk reduction efforts with DoD's Defense Innovation Unit Experimental (DIUx) initiative 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 late FY17, with contract award in late FY18. CASS v2.0 contract to provide new open-system, modular software to support Android and/or Windows OS platforms, with additional capabilities interfacing with the ATN as well. PEO for Special Operations Forces/ISR will be exercising management control.

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: FY 2018 Air Force **Date:** May 2017

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>
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 1.4.5 Sys Int Software Dev	C/CPIF	Rockwell Collins : Poway, CA	-	6.094	Feb 2016	0.000	Jan 2017	0.000		0.000		0.000	Continuing	Continuing	-
CASS 2.0 Sys INT Software Dev't	TBD	TBD : TBD	-	0.000		0.000		5.296	Jun 2018	0.000		5.296	Continuing	Continuing	-
CASS 1.4.5 Sys Int Software Dev't	TBD	TBD : TBD	-	0.000		1.310	Jun 2017	0.000		0.000		0.000	Continuing	Continuing	-
CASS 1.4.5 NSWC Crane (Naval Surface Warfare Center)	MIPR	NSWC Crane : Crane, IN	-	1.000	Feb 2016	2.179	Jan 2017	2.431	Jan 2018	0.000		2.431	Continuing	Continuing	-
CASS 2.0 Application Logic Plug-ins	TBD	TBD : TBD	-	0.000		2.500	Oct 2017	0.000		0.000		0.000	Continuing	Continuing	-
CASS 1.4.5 GFE (DIUx)	TBD	TBD : TBD	-	0.000		1.000	Jun 2017	0.000		0.000		0.000	Continuing	Continuing	-
CASS 1.4.5 Risk Reduction (DIUx)	MIPR	Rockwell Collins : Cedar Rapids, IA	-	0.522	Feb 2017	1.000	Feb 2017	0.000		0.000		0.000	Continuing	Continuing	-
CASS 2.0 Risk Reduction (DIUx)	TBD	TBD : TBD	-	0.000		2.000	Oct 2017	0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			-	7.616		9.989		7.727		0.000		7.727	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.818	Jan 2016	0.906	Jan 2017	0.896	Jan 2018	0.000		0.896	Continuing	Continuing	-
Subtotal			-	0.818		0.906		0.896		0.000		0.896	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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>
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Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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
Development, operational and interoperability testing

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	2.313	Jan 2016	0.948	Jan 2017	2.000	Oct 2017	0.000		2.000	Continuing	Continuing	-
Subtotal			-	2.313		0.948		2.000		0.000		2.000	-	-	-

Remarks
PMA funds MITRE, ETASS, PASS, SCS, all multiple contractors.

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.747	11.843	10.623	0.000	10.623	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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) v1.4.5 Force Dev Eval (FDE)	██████████	
Close Air Support System (CASS) v1.4.5 IOC	████████████████████	
Close Air Support System (CASS) v1.4.5 FOC	██████████	
Close Air Support System (CASS) v2.0 Contract Award	██████████	
Close Air Support System (CASS) v2.0 ASOC/TOC and Dismount/Mount Design and Development Rel 1	████████████████████	
Close Air Support System (CASS) v2.0 ASOC/TOC and Dismount/Mount Design and Development Rel 2	████████████████████	
Close Air Support System (CASS) v2.0 ASOC/TOC and Dismount/Mount Rel 3 Design and Dev	████████████████████	
Close Air Support System(CASS) v 2.0 ASOC/TOC and Dismount/Mount Rel 4 Design and Development	██████████	

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Close Air Support System (CASS) v1.4.5 Force Dev Eval (FDE)	3	2016	4	2016
Close Air Support System (CASS) v1.4.5 IOC	1	2017	1	2018
Close Air Support System (CASS) v1.4.5 FOC	2	2018	3	2018
Close Air Support System (CASS) v2.0 Contract Award	4	2018	1	2019
Close Air Support System (CASS) v2.0 ASOC/TOC and Dismount/Mount Design and Development Rel 1	2	2019	3	2020
Close Air Support System (CASS) v2.0 ASOC/TOC and Dismount/Mount Design and Development Rel 2	4	2020	3	2021
Close Air Support System (CASS) v2.0 ASOC/TOC and Dismount/Mount Rel 3 Design and Dev	4	2021	3	2022
Close Air Support System(CASS) v 2.0 ASOC/TOC and Dismount/Mount Rel 4 Design and Development	4	2022	4	2022

Note

IOC & FOC dates are based on Objective and not Threshold dates.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	1.629	1.515	1.754	0.000	1.754	1.751	1.783	1.814	1.852	Continuing	Continuing
675045: <i>C2ISR Tactical Data Link</i>	-	1.629	1.515	1.754	0.000	1.754	1.751	1.783	1.814	1.852	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, Situational 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-6016E) 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.

This program is in Budget Activity 7, Operational System Development. These budget activities include development efforts to upgrade systems currently fielded or has 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: FY 2018 Air Force **Date:** May 2017

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 / C2ISR Tactical Data Link
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	1.674	1.515	1.749	0.000	1.749
Current President's Budget	1.629	1.515	1.754	0.000	1.754
Total Adjustments	-0.045	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	-0.045	0.000			
• Other Adjustments	0.000	0.000	0.005	0.000	0.005

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Title: E-3 AWACS Block 40/45 Mode 5 and MIL-STD- 6016E Link 16 Enhancements</p> <p>Description: Improve E-3 AWACS Block 40/45 Link 16 interoperability and compatibility by incorporating key changes to communications software baseline.</p> <p>FY 2016 Accomplishments: -Upgraded advanced Multifunction Informational Distribution System (MIDS) terminal lab assets for integration prototyping -Conducted a study to evaluate the top technical risks for replacing the AWACS Joint Tactical Information Distribution System (JTIDS) Class 2H terminal with a more advanced MIDS terminal -Completed the assessment for the use of Ethernet instead of a MIL-STD-1553B interface to the AWACS JTIDS Class 2H terminal and the implementation of a TTNT IP communication capability with the terminal -Completed documentation and evaluation of a report that will address an upgraded High Powered Antenna (HPA) and antenna interface options for AWACS, to include potential modification of the current JTIDS Class 2H HPA</p> <p>FY 2017 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 -Fund further integration prototyping of the upgraded High Power Amplifier (HPA) and antenna interface</p> <p>FY 2018 Plans: -Will continue to integrate a more advanced MIDS terminal</p>	0.965	0.801	0.930

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
--This will include required Human/Computer Interface (HCI) changes and advanced terminal capabilities such as Concurrent Multinetting (CMN4) for AWACS)				
<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 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Performed C2-focused airborne networking studies that supported data link enhancements -Began lab demonstrations to better understand impacts of advanced Link-16 radio terminal modernization --This included strengthening the network against jamming <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> -Perform C2-focused airborne networking studies to support data link enhancements -Continue 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 2018 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 		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 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Implemented user-identified critical ICPs 		0.332	0.382	0.492

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018
--This included time slot reallocation, strength track reporting and correlation, GARS, and MILSTD updates			
FY 2017 Plans: -Implement user-identified critical ICPs and MIL-STD updates			
FY 2018 Plans: -Will continue to implement user-identified critical ICPs and MIL-STD updates			
Accomplishments/Planned Programs Subtotals	1.629	1.515	1.754

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE:BA05:PE	49.495	82.380	38.250	0.000	38.250	100.028	46.839	42.914	35.171	Continuing	Continuing
0604281F: <i>TDN Enterprise</i>											
• APAF:BA05:Line Item #F01500: <i>F-15</i>	2.837	0.000	0.000	0.000	0.000	46.903	53.211	40.167	20.933	Continuing	Continuing
• APAF:BA05:Line Item #F01600: <i>F-16</i>	3.200	6.447	0.000	0.000	0.000	6.755	8.371	8.525	8.695	Continuing	Continuing
• APAF:BA05:Line Item #B00200: <i>B-2A</i>	0.474	0.415	1.718	0.000	1.718	0.884	0.201	0.206	0.210	Continuing	Continuing
• APAF:BA05:Line Item #B01B00: <i>B-1B</i>	1.011	1.380	0.000	0.000	0.000	1.431	0.000	0.000	0.000	Continuing	Continuing
• OPAF:BA03:Line Item #834010: <i>General Information Technology</i>	0.002	1.842	0.312	0.000	0.312	0.177	0.180	1.698	1.701	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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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*

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.

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	186.286	12.909	14.979	17.382	0.000	17.382	14.171	11.090	4.000	3.409	49.100	313.326
674801: <i>DCAPEs INC 2B</i>	0.000	12.014	14.979	17.382	0.000	17.382	14.171	11.090	4.000	3.409	49.100	126.145
674802: <i>DCAPEs Increment 2A</i>	186.286	0.895	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	187.181

Program MDAP/MAIS Code: 500

A. Mission Description and Budget Item Justification

The mission of Deliberate and Crisis Action Planning and Execution Segments (DCAPEs) is to support Joint and Air Force Adaptive Planning and Execution (APEX) needs by enabling the warfighter to rapidly respond to a Combatant Commander's (COCOM's) force requirements through the development, management, presentation, and execution of scalable packages of manpower and equipment comprising our Aerospace Expeditionary Forces (AEF). Provide real-time command, control, planning, and execution information supporting the United States Air Force (USAF) manpower, personnel, operations and logistics force presentation and execution processes while providing a single integrated data environment to project aerospace power anywhere in world. DCAPEs enables force projection C2 to all missions requiring USAF presence regardless of mission type (contingency, humanitarian, disaster relief, etc.).

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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	16.723	14.979	13.761	0.000	13.761
Current President's Budget	12.909	14.979	17.382	0.000	17.382
Total Adjustments	-3.814	0.000	3.621	0.000	3.621
• 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	-3.227	0.000			
• SBIR/STTR Transfer	-0.587	0.000			
• Other Adjustments	0.000	0.000	3.621	0.000	3.621

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force Date: May 2017

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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Change Summary Explanation

FY2016: Funding was reprogrammed to support higher Air Force priorities.

FY2018: Funding was increased in order to support Joint Information Environment (JIE) Migration/Legacy Re-host mandate.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674801: DCAPES INC 2B	0.000	12.014	14.979	17.382	0.000	17.382	14.171	11.090	4.000	3.409	49.100	126.145
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

DCAPES Increment 2B provides capabilities that enable the Air Force to posture trained and equipped forces, organized in effects-based operational capability packages, to deliver effective aerospace capabilities to the Joint warfighter. Furthermore, it includes the migration of the application from four regionally fielded strategic server enclaves fielded on the Global Command and Control System – Air Force to a virtualized platform in Defense Information Systems Agency Defense Enterprise Computing Centers. Additional 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 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 2016	FY 2017	FY 2018
Title: DCAPES INCREMENT 2B	12.014	14.979	17.382
<p>Description: DCAPES Increment 2B includes Infrastructure Support, Business Intelligence, and the development of multiple War Fighter Capabilities; the Program will begin execution of War Fighter Capabilities 1-3 during the FY17 President's Budget, War Fighter Capability 4 during the FY18 President's Budget, War Fighter Capability 5 during the FY19 President's Budget, War Fighter Capability 6 during the FY20 President's Budget.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Continued efforts for Clinger Cohen Act compliance documentation required for Milestone B approval - Began Increment 2B Risk Reduction Activities: <ul style="list-style-type: none"> --Completed Proof of Concept for Infrastructure Re-hosting platform --Began the Feature Driven Planning for new Warfighter Requirements <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Complete Increment 2 Milestone B - Begin Joint Information Environment (JIE) Data Center Optimization Initiative (DCOI)/Legacy Re-Host mandate - Continue Infrastructure and Integration builds - Begin development of War Fighter Capabilities 1-3: <ul style="list-style-type: none"> -- Capability 1: Eliminate Social Security Number from DCAPES and replace with the Department of Defense Electronic Data Interface Personnel Identifier (EDIPI) 			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPEs	Project (Number/Name) 674801 / DCAPEs INC 2B

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
-- Capability 2: DCAPEs and Global Force Management-Data Initiative Interoperability (GFM-DI)			
-- Capability 3: Enhanced Contingency-Rotational Air Expeditionary Force Scheduling Tool Interface (ECAST)			
FY 2018 Plans:			
- Will complete Joint Information Environment (JIE) Migration Data Center Optimization Initiative (DCOI)/Legacy Re-Host mandate			
- Will continue maintaining builds for infrastructure			
- Will continue development of War Fighter Capabilities 1-3			
- Will begin development of War Fighter Capability 4:			
-- Capability 4: Provides users the capability to build, manage, and maintain Manpower & Equipment Force Packaging (MEFPAK)			
Accomplishments/Planned Programs Subtotals	12.014	14.979	17.382

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

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 46th 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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / <i>DCAPES</i>	Project (Number/Name) 674801 / <i>DCAPES INC 2B</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: FY 2018 Air Force **Date: May 2017**

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
DCAPES Increment 2B - Risk Reduction	Various	Various : Various	0.000	2.164	Aug 2016	2.226	Feb 2017	0.000		0.000		0.000	0.000	4.390	3.090
DCAPES Increment 2B/ Prime Contract	C/Various	Array Information Technology, Inc. : Greenbelt, MD	0.000	2.955	Apr 2016	5.305	Apr 2017	11.435	Apr 2018	0.000		11.435	40.991	60.686	40.991
DCAPES Infrastructure/ Integration	C/CPFF	DATUM Software Inc. : John Creek, GA	0.000	0.911	Feb 2016	0.930	Feb 2017	0.958	Feb 2018	0.000		0.958	5.152	7.951	5.152
DCAPES Architecture Documentation Development	C/FFP	Copper River IT : Anchorage, AK	0.000	0.330	Aug 2016	0.619	Aug 2017	0.629	Aug 2018	0.000		0.629	3.756	5.334	13.756
DCAPES DCOI Migration	MIPR	DISA : Pensacola, FL	0.000	1.155	Apr 2016	1.796	Apr 2017	0.735	Apr 2018	0.000		0.735	13.230	16.916	13.230
Subtotal			0.000	7.515		10.876		13.757		0.000		13.757	63.129	95.277	76.219

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
DCAPES HIB Integration Contract Support	C/FFP	TM Capture Services, LLC : Dayton, OH	0.000	1.684	Apr 2016	0.676	Apr 2017	0.700	Apr 2018	0.000		0.700	3.225	6.285	3.225
DCAPES Cost Analysis Contract Support	C/CPFF	BTAS, Inc. : Beavercreek, OH	0.000	0.399	Oct 2016	0.327	May 2017	0.332	May 2018	0.000		0.332	1.908	2.966	1.908
DCAPES Engineering Contract Support	C/CPFF	Oasis Systems, LLC : Lexington, MA	0.000	0.510	Apr 2016	1.218	Apr 2017	1.021	Apr 2018	0.000		1.021	5.392	8.141	5.392
DCAPES FFRDC Engineering	SS/CPFF	Mitre : Bedford, MA	0.000	0.371	Oct 2016	0.000		0.000		0.000		0.000	0.000	0.371	0.371
DCAPES Requirement Elaboration Contract Support	C/FFP	Certified Tech. Expert : Montgomery, AL	0.000	0.002		0.000		0.000		0.000		0.000	0.000	0.002	0.002
DCAPES Contract System Integration/Tech Support	MIPR	AFLCMC/HNIZ CIE : MAFB-Gunter Annex, AL	0.000	0.325	Sep 2016	0.430	Sep 2017	0.443	Sep 2018	0.000		0.443	2.051	3.249	2.051

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date: May 2017**

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Environment HW	C/Variou	Various : Various	0.000	0.848	Aug 2016	0.000		0.000		0.000		0.000	0.800	1.648	0.800
DCAPES Licenses (Software/Hardware)	C/Variou	Various : Various	0.000	0.073	Feb 2016	0.536	Feb 2017	0.341	Feb 2018	0.000		0.341	1.580	2.530	1.580
DCAPES Government Purchase Card	Reqn	Various : Various	0.000	0.000		0.012	Aug 2017	0.012	Aug 2018	0.000		0.012	0.057	0.081	0.057
Subtotal			0.000	4.212		3.199		2.849		0.000		2.849	15.013	25.273	15.386

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	46 Test Sqdn : Eglin AFB, FL	0.000	0.030	Jan 2016	0.533	Jan 2017	0.338	Jan 2018	0.000		0.338	1.562	2.463	1.562
DCAPES Interoperability Testing and Evaluation	MIPR	DISA JITC : Huachuca, AZ	0.000	0.000	Oct 2015	0.093	Oct 2016	0.159	Oct 2017	0.000		0.159	0.737	0.989	0.737
DCAPES User Test Support	Various	Various : Various	0.000	0.222	Sep 2016	0.213	Sep 2017	0.218	Sep 2018	0.000		0.218	1.010	1.663	1.010
Subtotal			0.000	0.252		0.839		0.715		0.000		0.715	3.309	5.115	3.309

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.017	Sep 2016	0.030	Sep 2017	0.030	Sep 2018	0.000		0.030	0.158	0.235	0.158
DCAPES Business Integration Support	Various	Various : Various	0.000	0.018	Sep 2016	0.035	Sep 2017	0.031	Sep 2018	0.000		0.031	0.161	0.245	0.161
Subtotal			0.000	0.035		0.065		0.061		0.000		0.061	0.319	0.480	0.319

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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																													
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: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
DCAPES Increment 2B	1	2016	4	2021
MS B Preparation	1	2016	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)	3	2016	2	2018
---- Capability 1 Electronic Data Interface Personnel Identifier (EDIPI)	3	2017	1	2022
---- Capability 2 Global Force Management Interoperability (GFM-DI)	3	2017	3	2019
---- Capability 3 Enhanced Contingency-Rotational Air Expeditionary Force Scheduling Tool Interface (ECAST)	4	2017	3	2018
---- Capability 4 Manpower & Equipment Force Packaging (MEFPAK)	3	2018	2	2021
---- Capability 5 Logistics Factor File	4	2019	1	2020
---- Capability 6 Force Availability Analysis	1	2020	2	2021
DCAPES Future Modifications	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207452F / DCAPES				Project (Number/Name) 674802 / DCAPES Increment 2A			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674802: DCAPES Increment 2A	186.286	0.895	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	187.181
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

DCAPES Increment 2A delivered Air Force functional specific capabilities as well as technical changes necessary for the Air Force to migrate from a directly connected architectural relationship with the Joint Operations Planning and Execution System (JOPES) to one utilizing data services across the Wide Area Network (WAN). This 'Loose Coupling' solution enabled DCAPES to be interoperable with JOPES and at the same time significantly reduced interoperability costs.

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 2016	FY 2017	FY 2018
Title: DCAPES Increment 2A (Loose Coupling)	0.895	0.000	0.000
Description: Increment 2A includes Loose Coupling between Deliberate and Crisis Action Planning and Execution Segment (DCAPES) and Joint Operational Planning and Execution System (JOPES), Infrastructure Support, and Business Intelligence. Increment 2A also includes requirements definition, prototyping, development, testing, interoperability, sustainment, and service oriented architecture transition.			
FY 2016 Accomplishments: - Completed FDD activities and entered FD - Completed v5.0.0.2 (JOPES Outbound) - Completed Increment 2A Requirements			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals			0.000

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674802 / DCAPES Increment 2A
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

Increment 2A used the Waterfall approach to develop functional capabilities and maintain interoperability with JOPES. The DCAPES program successfully awarded the DCAPES Development Task Order using the NETCENTS 2 Application Services Small Business Indefinite delivery Indefinite Quantity (IDIQ) contract. This task order was used to close out Increment 2A.

The DCAPES Program Management Office (PMO) utilized a mix of agreements (Service Level Agreements and Memorandums) with DCAPES interface 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: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674802 / DCAPES Increment 2A
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 2A SW DEV/FOE - HIB-1342)	SS/ Various	Computer Science Corp. : Falls Church, VA	91.707	0.000		0.000		0.000		0.000		0.000	0.000	91.707	91.707
DCAPES SW DEV New Prime Contract (Increment 2A HIB-1670)	C/Various	Array Information Technology, Inc. : Greenbelt, MD	0.913	0.000		0.000		0.000		0.000		0.000	0.000	0.913	0.913
DCAPES Risk Reduction	Various	Various : Various	0.000	0.895	Mar 2016	0.000		0.000		0.000		0.000	0.000	0.895	0.895
DCAPES Infrastructure / Integration (HIB-1470)	C/CPFF	DATUM Software Inc. : John Creek, GA	3.000	0.000		0.000		0.000		0.000		0.000	0.000	3.000	3.000
DCAPES BI Tools / Tech Refresh (HIB-1373)	C/CPFF	Array IT : Greenbelt, MD	7.581	0.000		0.000		0.000		0.000		0.000	0.000	7.581	7.581
DCAPES Architecture Documentation Development (HIB-1367)	C/FFP	Copper River IT : Anchorage, AK	4.148	0.000		0.000		0.000		0.000		0.000	0.000	4.148	4.148
LOGFAC S/W Development (HIB-1372)	C/FFP	Harris IT services Corp. : Dulles, VA	18.374	0.000		0.000		0.000		0.000		0.000	0.000	18.374	18.374
LOGFAC Architecture Documentation Development (HIB-1367)	C/FFP	Cooper River IT : Anchorage, AK	1.035	0.000		0.000		0.000		0.000		0.000	0.000	1.035	1.035
Subtotal			126.758	0.895		0.000		0.000		0.000		0.000	0.000	127.653	127.653

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Contract Acquisition (HIB-1340)/ Logistic Functional Support (HIB-1343)	C/CPFF	OASIS Systems Inc : Lexington, MA	6.462	0.000		0.000		0.000		0.000		0.000	0.000	6.462	6.462
DCAPES HIB INTEGRATION CONTRACT SUPPORT (HIB-1705)	C/Various	TM Capture Services, LLC : Dayton, OH	5.944	0.000		0.000		0.000		0.000		0.000	0.000	5.944	5.944

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date: May 2017**

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674802 / DCAPES Increment 2A
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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Contract Cost Analysis Support (HIB-1366)	C/CPFF	Tecolote Research, Inc. : Goleta, CA	3.577	0.000		0.000		0.000		0.000		0.000	0.000	3.577	3.577
DCAPES Contract Engineering Support (HIB-1380)	C/CPFF	Jacobs Technology, Inc : Lincoln, MA	3.798	0.000		0.000		0.000		0.000		0.000	0.000	3.798	3.798
DCAPES FFRDC (Engineering - HIB-1368)	SS/CPFF	Mitre : Bedford, MA	6.249	0.000		0.000		0.000		0.000		0.000	0.000	6.249	6.249
DCAPES Contract Requirement Elaboration Support (HIB-1671)	C/FFP	Certified Tech. Expert : Montgomery, AL	3.014	0.000		0.000		0.000		0.000		0.000	0.000	3.014	3.014
DCAPES Contract System Security-Information Assurance (HIB-1377)	C/CPFF	Centech Group : Falls Church, VA	2.458	0.000		0.000		0.000		0.000		0.000	0.000	2.458	2.458
DCAPES Contract Sys Integration/Tech Support (CIE - HIB-1376)	Various	Various : Various	6.462	0.000		0.000		0.000		0.000		0.000	0.000	6.462	6.462
DCAPES Licenses Software/Hardware (HIB-1377)	C/Various	Various : Various	1.180	0.000		0.000		0.000		0.000		0.000	0.000	1.180	1.180
DCAPES SIPRNET Comm. Line-Information Assurance (HIB-1330)	MIPR	Various : Various	0.647	0.000		0.000		0.000		0.000		0.000	0.000	0.647	0.647
DCAPES GOVERNMENT PURCHASE CARD (HIB-1371/1706)	Various	Various : Various	0.015	0.000		0.000		0.000		0.000		0.000	0.000	0.015	0.015
LOGFAC Contract Acquisition (HIB-1340) / Logistics Support (HIB-1343)	C/CPFF	Oasis Systems Inc. : Lexington, KY	0.343	0.000		0.000		0.000		0.000		0.000	0.000	0.343	0.343
LOGFAC Contract Cost Analysis Support (HIB-1366)	C/CPFF	Tecolote Research Inc : Goleta, CA	0.396	0.000		0.000		0.000		0.000		0.000	0.000	0.396	0.396

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674802 / DCAPES Increment 2A
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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LOGFAC Contract Engineering Support (HIB-1380)	C/CPFF	Jacobs Technology Inc : Lincoln, MA	0.419	0.000		0.000		0.000		0.000		0.000	0.000	0.419	0.419
LOGFAC Contract Requirement Elaboration Support (HIB-1671)	C/FFP	Certified Technical Experts : Montgomery, AL	0.335	0.000		0.000		0.000		0.000		0.000	0.000	0.335	0.335
LOGFAC Contract Systems Security / IA Support (HIB-1377)	C/CPFF	Centech Group Inc : Falls Church, VA	0.426	0.000		0.000		0.000		0.000		0.000	0.000	0.426	0.426
LOGFAC FFRDC (HIB-1368)	SS/CPFF	MITRE : Bedford, MA	0.685	0.000		0.000		0.000		0.000		0.000	0.000	0.685	0.685
Subtotal			42.410	0.000		0.000		0.000		0.000		0.000	0.000	42.410	42.410

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 (HIB-1369)	MIPR	46 Test Sqdn : Eglin AFB, FL	6.736	0.000		0.000		0.000		0.000		0.000	0.000	6.736	6.736
DCAPES Operational Test and Evaluation (HIB-1369)	Various	605 Test Sqdn : Hurlburt Field, FL	0.700	0.000		0.000		0.000		0.000		0.000	0.000	0.700	0.700
DCAPES Interoperability Testing and Evaluation (HIB-1369)	MIPR	DISA JITC : Ft Haachuca, AZ	3.669	0.000		0.000		0.000		0.000		0.000	0.000	3.669	3.669
DCAPES User Test Support (HIB-1341)	Various	Various : Various	2.367	0.000		0.000		0.000		0.000		0.000	0.000	2.367	2.367
LOGFAC Development Test and Evaluation (HIB-1374)	MIPR	46 Test Sqdn : Eglin AFB, FL	2.238	0.000		0.000		0.000		0.000		0.000	0.000	2.238	2.238
LOGFAC Operational Test and Evaluation (HIB-1374)	Various	605 Test Sqdn : Hurlburt Field, FL	0.236	0.000		0.000		0.000		0.000		0.000	0.000	0.236	0.236

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674802 / DCAPES Increment 2A
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 2A (Nov 16)	■																											
--- v5.0.0.2 (JOPES Outbound - Loose Coupling Complete) Fielding (Nov 15)	■																											
--- Full Deployment Decision (FDD) (Oct 15)	■																											
--- Full Deployment (FD) (Oct 15)	■																											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207452F / DCAPES	Project (Number/Name) 674802 / DCAPES Increment 2A
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DCAPES Increment 2A (Nov 16)	1	2016	1	2016
--- v5.0.0.2 (JOPES Outbound - Loose Coupling Complete) Fielding (Nov 15)	1	2016	1	2016
--- Full Deployment Decision (FDD) (Oct 15)	1	2016	1	2016
--- Full Deployment (FD) (Oct 15)	1	2016	1	2016

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	2.307	0.000	2.307	1.801	1.801	0.400	0.000	0.000	6.309
674881: <i>Prompt Diagnostics</i>	-	0.000	0.000	2.307	0.000	2.307	1.801	1.801	0.400	0.000	0.000	6.309
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018, PE 0604257F, BPAC 644818 , Advanced Technology and Sensors, Project Imaging and Targeting Support, Nuclear Forensics - Prompt Diagnostics efforts were transferred to PE 0207573F, BPAC 674881 National Technical Nuclear Forensics, Project Prompt Diagnostics. This is not a new start.

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. NTNF will develop prompt diagnostic detection systems to record signals emitted immediately following a nuclear detonation.

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 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	2.307	0.000	2.307
Total Adjustments	0.000	0.000	2.307	0.000	2.307
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	2.307	0.000	2.307

Change Summary Explanation

In FY18, NTNF efforts under PE0604257F, BPAC 644818 will transfer to this PE.

C. Accomplishments/Planned Programs (\$ in Millions)	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>
Title: Nuclear Forensics - Prompt Diagnostics	0.000	0.000	2.307

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: Develop diagnostic detection systems to immediately record signals resulting from a nuclear detonation.</p> <p>FY 2016 Accomplishments: FY 2016 efforts were funded and reported under OSD program 0603161D8Z, Nuclear and Conventional Physical Security Equipment.</p> <p>FY 2017 Plans: FY 2017 efforts are funded and reported under Air Force program 0604257F, Advanced Technology and Sensor.</p> <p>FY 2018 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>			
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.307

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

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	Total Cost
			Base	OCO	Total					Complete	
• APAF:BA03:Line Item # 834320: <i>National Technical Nuclear Forensics</i>	0.000	0.000	5.711	0.000	5.711	6.053	5.854	7.144	7.273	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 four phase approach with a single integrator to incrementally deliver technical data and logistics product data by funding various nuclear related government organizations/FFRDC's throughout the nation. Phase 1 and 2 are focused on documenting and delivering technical data packages.

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	21.131	25.308	25.397	0.000	25.397	24.885	25.349	25.788	26.317	Continuing	Continuing
674037: <i>SEEK EAGLE Certifications</i>	-	21.131	25.308	25.397	0.000	25.397	24.885	25.349	25.788	26.317	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: FY 2018 Air Force **Date:** May 2017

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 is in Budget Activity 7, Operational System Development. These budget activities include development efforts to upgrade systems currently fielded or which have approval for full rate production and anticipate production funding in the current or subsequent year.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	21.564	25.308	25.324	0.000	25.324
Current President's Budget	21.131	25.308	25.397	0.000	25.397
Total Adjustments	-0.433	0.000	0.073	0.000	0.073
• 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	-0.433	0.000			
• Other Adjustments	0.000	0.000	0.073	0.000	0.073

Change Summary Explanation

No Significant Changes

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: F-22A	0.800	1.000	0.800	0.000	0.800
Description: F-22A Capability Development and Weapons Certification.					
FY 2016 Accomplishments:					
- Completed certification of AIM-9X					
- Began aircraft/store compatibility (ASC) efforts for requested configurations					
FY 2017 Plans:					
- Continue Aircraft/Store Compatibility (ASC) efforts for requested configurations					
N/A					
FY 2018 Base Plans:					
- Continue Aircraft/Store Compatibility (ASC) efforts for requested configurations					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force				Date: May 2017	
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>			
C. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
FY 2018 OCO Plans: N/A					
Title: F-35	1.500	3.200	3.715	0.000	3.715
Description: F-35 Capability Development for SEEK EAGLE to support Combat Air Force's (CAF's) anticipated requirements after Initial Operational Capability (IOC).					
FY 2016 Accomplishments:					
<ul style="list-style-type: none"> - Continued development of F-35 engineering capability in all eight SEEK EAGLE engineering disciplines - Completed certification of GBU-12 and GBU-31 mixed loads - Supported integration of the GBU-28E/B and FMU-167 into GWTS and CWDS to meet required fielding dates - Supported B-2 migration to JMPS environment using Mission Planning UAI integration 					
FY 2017 Plans:					
<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) - Transitioning development environment to Falconview Graphical Display System and Windows 10 per ACC requirements - Implementing multiple high priority user requirements reviewed by ACC 					
FY 2018 Base Plans:					
<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 					
FY 2018 OCO Plans: N/A					
Title: M&S Capability	2.600	3.558	3.000	0.000	3.000
Description: Modeling and Simulation (M&S) capability development in support of store certification					
FY 2016 Accomplishments:					
<ul style="list-style-type: none"> - Continued development and improvement of M&S capability to support store certification disciplines. 					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force				Date: May 2017	
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>			
C. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>- Developed tools necessary to characterize F-22 and F-35 weapons bay environments/wing buffet.</p> <p>FY 2017 Plans:</p> <p>- Continue development and improvement of M&S capability to support store certification disciplines.</p> <p>- Develop tools necessary to characterize F-22 and F-35 weapons bay environments/wing buffet.</p> <p>FY 2018 Base Plans:</p> <p>- Continue development and improvement of M&S capability to support store certification disciplines.</p> <p>- Develop tools necessary to characterize F-22 and F-35 weapons bay environments/wing buffet.</p> <p>FY 2018 OCO Plans:</p> <p>N/A</p>					
<p>Title: Aircraft/Store Compatibility (ASC) Analysis</p> <p>Description: Evaluate aircraft/store compatibility through analysis, M&S and flight and ground test. Provide flight recommendations to airworthiness authorities.</p> <p>FY 2016 Accomplishments:</p> <p>- Continued to support provide compatibility flight recommendations as requested by ACC/A8, AFLCMC, AFSOC, AFGSC and other agencies.</p> <p>- Performed extensive SDB II, AIM-9X and B-61 (MOD 12) flight testing.</p> <p>FY 2017 Plans:</p> <p>- Continue to provide compatibility flight recommendations as requested by ACC/A8, AFLCMC, AFSOC, AFGSC and other agencies.</p> <p>- Perform extensive SDB II, AIM-9X and B-61 (MOD 12) flight testing.</p> <p>FY 2018 Base Plans:</p> <p>- Continue to provide compatibility flight recommendations as requested by ACC/A8, AFLCMC, AFSOC, AFGSC and other agencies.</p> <p>- Perform extensive SDB II, AIM-9X and B-61 (MOD 12) flight testing.</p> <p>FY 2018 OCO Plans:</p> <p>N/A</p>					
Title: AFSEO Mission and Planning Support					
	3.344	3.800	3.820	0.000	3.820
	12.887	13.750	14.062	0.000	14.062

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: AFSEO Mission and Planning Support for all disciplines. Previously titled "Organic F-35 and CWDS Capabilities"</p> <p>FY 2016 Accomplishments: - AFSEO Mission and Planning supported for all disciplines to include, but not limited to, mission planning, loads, flutter, separations, safe escape, engineering analysis, information assurance, and organic F-35 and CWDS support for B61-12 and APKWS, and immediate warfighter support such as Operation Inherent Resolve and Operation Noble Eagle.</p> <p>FY 2017 Plans: - 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 5th generation aircraft and immediate warfighter support.</p> <p>FY 2018 Base Plans: - 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.</p> <p>FY 2018 OCO Plans: N/A</p>					
Accomplishments/Planned Programs Subtotals	21.131	25.308	25.397	0.000	25.397

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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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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: FY 2018 Air Force **Date: May 2017**

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	C/CPFF	Lockheed Martin : Marietta, GA	-	0.450	Mar 2016	0.600	Mar 2017	0.450	Mar 2018	0.000		0.450	Continuing	Continuing	-
F-22 Capabilities (1)	C/CPFF	Raytheon : Waltham, MA	-	0.350	Mar 2016	0.400	Mar 2017	0.350	Mar 2018	0.000		0.350	Continuing	Continuing	-
AFSEO Mission and Planning Support	C/CPFF	Survice : Ft. Walton Beach, FL	-	12.264	Mar 2016	13.348	Mar 2017	13.246	Mar 2018	0.000		13.246	Continuing	Continuing	-
F-35 Capabilities	C/CPFF	Lockheed Martin : Marietta, GA	-	1.500	Apr 2016	3.200	Nov 2016	3.715	Nov 2017	0.000		3.715	Continuing	Continuing	-
Multiple fighter and weapon capability support	C/CPFF	Lockheed Martin : Marietta, GA	-	0.200	Nov 2015	0.200	Nov 2016	0.150	Nov 2017	0.000		0.150	Continuing	Continuing	-
F15 Test Support	C/CPFF	Boeing : St Louis, MO	-	0.010	Jan 2016	0.010	Jan 2017	0.010	Jan 2017	0.000		0.010	Continuing	Continuing	-
Enhance Existing and Develop Organic Electro EMI Capabilities	C/CPFF	Applied Research : Baltimore, MD	-	0.250	Mar 2016	0.250	Mar 2017	0.250	Mar 2018	0.000		0.250	Continuing	Continuing	-
Subtotal			-	15.024		18.008		18.171		0.000		18.171	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	5.200	Oct 2015	6.250	Oct 2016	6.300	Oct 2018	0.000		6.300	Continuing	Continuing	-
AEDC	PO	Arnold Engineering Dev Complex : Arnold AFB, TN	-	0.520	Jan 2016	0.530	Jan 2017	0.515	Jan 2018	0.000		0.515	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
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

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: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Store compatabilty analysis on legacy fighter/bomber/RPA aircraft and weapons modifications	1	2016	4	2022
F-35 Capability Development: Initial Operational Capability	1	2016	4	2017
F-35 Capability Development: Full Operational Capability	4	2017	4	2022
F-22A Capability Development and Weapons Certification	1	2016	4	2022
Modeling and Simulation Capability: development and refresh of analysis tools	1	2016	4	2022
AFSEO Mission and Planning Support	1	2016	4	2022

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: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	20.358	16.666	10.175	0.000	10.175	10.341	10.533	10.716	10.936	Continuing	Continuing
674567: <i>M&S Foundations</i>	-	11.215	5.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675135: <i>Warfighter Readiness</i>	-	9.143	10.990	10.175	0.000	10.175	10.341	10.533	10.716	10.936	Continuing	Continuing

Note
 In FY 2018, PE 0207601F, USAF Modeling and Simulation, Project 674567, M&S Foundations (MSF) efforts were transferred to PE 0207605F, Wargaming and Simulation Centers, Project 672888, Distributed Mission Operations Center (DMOC), in order to support the Air, Space, and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS).

A. Mission Description and Budget Item Justification

United States Air Force (USAF) Modeling and Simulation (M&S) Program Element (PE) is broken into two thrust areas: Modeling and Simulation Foundations, and Warfighter Readiness. It directly supports USAF, Joint and Coalition composite training and rehearsal, concept development, and acquisition and testing through modeling and simulation development as well as the integration of these across and within Live, Virtual, and Constructive (LVC) environments. This program focuses on support of Department of Defense (DoD) Training Transformation (T2). It allows the authoritative portrayal of new and emerging USAF capabilities within DoD and coalition LVC environments; as well as reciprocating capabilities within USAF LVC environments.

LVC environments today are used as the most cost effective and practical means to meet mission needs. In support of the DoD T2 initiative, USAF M&S program thrust areas develop and modernize models and simulations that are the constructive backbone of USAF and joint training and rehearsal. Once these models and simulations are developed, they are integrated across training LVC environments for use by Major and Combatant Commands. This development and integration is 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. These, in turn, enable joint, coalition, and interagency training required to prepare forces for combat by generating the air and space picture for the Air and Space Operations Center (AOC), Joint Force Air Component Commander (JFACC), and Joint Force Commander in combat exercises; training over 100,000 personnel per year in exercises (e.g., Ulchi Freedom Guardian, Red & Blue Flags, Unified Endeavor, etc). These programs also provide the current foundational environment that enables warfighters to interact with high-fidelity tactical cockpit simulators, which replicate high demand/low density platforms that are often unavailable for training due to real-world operations; while simultaneously linking it to warfighters using their current command and control systems 1,000 miles away and the constructive simulations being run from key operational wargaming and simulation centers worldwide.

USAF M&S is integral to inter-agency Homeland Defense (HLD) exercises chartered to train combat units tasked to protect the Homeland. This generates equipment and manpower efficiencies by using simulations which reduce fuel consumption, aircraft wear and tear, and manpower costs. In support of the DoD drive to improve the effectiveness and efficiency of its enterprise-wide acquisition business processes, the USAF M&S Program Element develops and supports enhancements to models, simulations, tools, and the LVC infrastructure to provide for system-of-systems M&S capabilities across the lifecycle, reduce developmental costs, and minimize risks.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	24.945	16.666	16.877	0.000	16.877
Current President's Budget	20.358	16.666	10.175	0.000	10.175
Total Adjustments	-4.587	0.000	-6.702	0.000	-6.702
• 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	-3.988	0.000			
• SBIR/STTR Transfer	-0.599	0.000			
• Other Adjustments	0.000	0.000	-6.702	0.000	-6.702

Change Summary Explanation

FY16: Reduction of \$3.988 million reprogrammed for higher Air Force priorities.

FY18: Reduction of \$6.702 million to PE 0207605F, Wargaming and Simulation Centers for Distributed Mission Operations Center (DMOC).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation				Project (Number/Name) 674567 / M&S Foundations			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674567: M&S Foundations	-	11.215	5.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018, PE 0207601F, USAF Modeling and Simulation, Project 674567, (MSF) efforts were transferred to PE 0207605F, Wargaming and Simulation Centers, Project 672888, DMOC, in order to support ACE-IOS.

A. Mission Description and Budget Item Justification

MSF focuses on integrating foundational capabilities needed to improve the usefulness of 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 rehearsal.

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 Commands (COMD) battle staffs during Joint and Service exercises and experimentations.

Simulation and Analysis Facility (SIMAF) focuses on fostering M&S tools, data, and infrastructure to enable high confidence acquisition of capabilities to support the joint warfighter. This includes Live-Virtual-Constructive (LVC) infrastructure, tools and processes supporting LVC events, and models, tools, data, simulations/stimulation to support requirements definition, systems engineering and test activities. Activities include M&S support for studies and analysis to support both current program planning and execution and future program planning. These efforts will 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.

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

	FY 2016	FY 2017	FY 2018
Title: Air Constructive Environment - Information Operations Suite (ACE-IOS)	6.248	5.676	0.000
Description: ACE-IOS provides the authoritative representation of Air Force information operations. IOS is comprised of models that support training and mission rehearsal for the USAF, Joint Task Force commanders, and CCMD battle staffs during Joint and Service exercises and experimentations.			
FY 2016 Accomplishments:			
- Completed ACE-IOS version 5.0.17			
- Developed design/development plan and initiated ACE-IOS transition to an open systems architecture design			
- Used DISA DI2E development environment			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 674567 / M&S Foundations		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Enhanced functional capability enabling Air Force Synthetic Environment for Reconnaissance and Surveillance (AFSERS) full two-way engagements, damage, and reporting - Completed the integration of DTED and LOS service remaining modules (Jamming, EW, and Networks) - Designed cross-initialization and run-time synchronization interface to Suter Project System - Created USMTF production module with enhanced user features, message content options, and additional message types <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Complete ACE-IOS version 5.0.18 - Continue to ACE-IOS open systems architecture design with IOC of July 2018 - Design and implement secure process communication and standardized protocols - Design and develop USMTF production module to free Java Server Pages (JSP) implementation - Design and initiate license-free replacements for two commercial licensed applications - Design and develop SCADA plus additional functionality projecting first-order network effects onto cascading battlefield effects <p>FY 2018 Plans: N/A</p>				
<p>Title: Simulation and Analysis Facility (SIMAF)</p> <p>Description: Develop, enhance and verify models, tools, data, simulations/stimulation environments for systems engineering and test activities.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Supported activities that include studies and analysis of current program planning/execution and future program planning -- Enabled more efficient delivery of effective capabilities to the warfighter -- Reduced the time and resources required for design, development, test and evaluation, maintainability and sustainment - Supported the development and maturation of collaborative processes and capabilities within airborne network and air-ground layer interaction systems-of-systems assessments <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: N/A</p>		4.967	0.000	0.000
Accomplishments/Planned Programs Subtotals		11.215	5.676	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 674567 / M&S Foundations

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

N/A

Remarks

D. Acquisition Strategy

Air Force Life Cycle Management Center (AFLCMC) at Hanscom AFB, MA and the Simulation and Analysis Facility, Wright-Patterson AFB, OH manage the project's acquisition process. AFLCMC develops threats through engineering assessments and analysis. SIMAF focuses on M&S tools, data, and infrastructure to enable a high confidence of acquisition capabilities to support the warfighter. Their acquisition goals are achieved through incremental development of the project's M&S activities. 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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation				Project (Number/Name) 675135 / Warfighter Readiness			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675135: Warfighter Readiness	-	9.143	10.990	10.175	0.000	10.175	10.341	10.533	10.716	10.936	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 Combat Commanders battle staffs. The primary models in the AFMSTT are the Air Warfare Simulation (AWSIM) and Air Base Simulation (ABS).

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

	FY 2016	FY 2017	FY 2018
Title: Air, Space, and Cyberspace Constructive Environment (ASCCE)	9.143	10.990	10.175
Description: Air Force Modeling & Simulation Training Toolkit (AFMSTT)/Air Warfare Simulation (AWSIM)			
FY 2016 Accomplishments:			
- Initiated development for AFMSTT Version 5.11 to be fielding in FY17.			
- Completed the transition of the new AFMSTT five year single award ID/IQ contract			
- Completed successful transition of the AFMSTT 5.10 developmental baseline to the new contract/contractor			
- Continued AFMSTT legacy product improvements			
- Updated C2 M&S relative to blue and red low observable aircraft and Earth Gravitational Modeling			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Complete the development, test, and fielding of AFMSTT Version 5.11 - Initiate development of AFMSTT Version 5.13 - Continue with new diagnostic software enhancements and model control enhancements - Continue with deprecation of select legacy point to point interfaces; address integration changes with AF role in Joint and Army federations - Continue modeling updates associated with real world operational and technical changes; new C2 systems' interfaces to ensure continued accurate and realistic AF LVC support - Start long lead prototyping to thin client interfaces <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will complete the development, test, and fielding of AFMSTT Version 5.13 - Will initiate development of AFMSTT Version 6.1 - Will continue with new Risk Management Framework (RMF) Accreditation, security enhancements, and new C2 interfaces with AOC WS - Will complete new joint requirements and model interface changes to the Federate Object Models (FOMs) to support training objectives - Will complete transition to AFMSTT Unified Mission Control (UMC) architecture with early deprecation of additional legacy point to point - Will continue long lead prototyping to thin client interfaces 				
Accomplishments/Planned Programs Subtotals		9.143	10.990	10.175
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Air Force Life Cycle Management Center (AFLCMC) at Hanscom AFB, MA manages the project's acquisition process. AFLCMC develops threats through engineering assessments and analysis. Acquisition goals are achieved through incremental development of the project's M&S activities. 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: FY 2018 Air Force												Date: May 2017				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)						
3600 / 7				PE 0207601F / USAF Modeling and Simulation						675135 / Warfighter Readiness						
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	
AFMSTT	C/CPFF	Aegis Technologies Group, INC : Huntsville, AL	-	4.920	Jun 2011	0.000		0.000		0.000		0.000	Continuing	Continuing	-	
AFMSTT/AWSIM	C/CPFF	Cole Engineering Services, Inc : Orlando, FL	-	2.600	Mar 2016	9.733	Feb 2017	8.968	Feb 2018	0.000		8.968	Continuing	Continuing	-	
Subtotal			-	7.520		9.733		8.968		0.000		8.968	-	-	-	
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			-	-		-		-		-		-	-	-	-	
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	C/Various	AFRLCMC : Hanscom AFB, MA	-	1.623	Oct 2015	1.257	Oct 2016	1.207	Oct 2017	0.000		1.207	Continuing	Continuing	-	
Subtotal			-	1.623		1.257		1.207		0.000		1.207	-	-	-	

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation	Project (Number/Name) 675135 / Warfighter Readiness

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
- AFMSTT v5.11																												
- AFMSTT v5.13																												
- AFMSTT v6.1																												
- AFMSTT v6.3																												
- AFMSTT v6.5																												
- AFMSTT v6.7																												
- AFMSTT v6.9																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
- AFMSTT v5.11	2	2016	2	2017
- 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	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	5.819	4.245	12.839	0.000	12.839	13.054	13.298	13.530	13.805	Continuing	Continuing
672888: <i>Distributed Mission Operations Center (DMOC)</i>	-	5.819	4.245	12.839	0.000	12.839	13.054	13.298	13.530	13.805	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY 2018, PE 0207601F, USAF Modeling and Simulation, Project 674567, M&S Foundations efforts were transferred to PE 0207605F, Wargaming and Simulation Centers, Project 672888, Distributed Mission Operations Center (DMOC), in order to support the Air, Space, and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS).

A. Mission Description and Budget Item Justification

Distributed Mission Operations Center (DMOC) & Air, Space and Cyberspace Collaborative Environment – Information Operations Suite (ACE-IOS)

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 Distributed Mission Operations Center - Cyber (DMOC-C) provides the Air, Space and Cyberspace Collaborative Environment – Information Operations Suite (ACE-IOS) to support Air Force information operations. 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. The DMOC “Replay Tool” facilitates a more complete mission review and debrief capability of the exercises as more sites and systems are added to events. Future DMO Tool development includes: a. 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; b. Development of Intelligence, Surveillance, and Reconnaissance (ISR)/Battle Damage Assessment (BDA) to improve damage state models used by intelligence analysts in exercises, and c. development of solutions for integrating Contested Degraded Operations (geographical and communications jamming) into DMO events; and simulator enhancement efforts 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.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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>	
<p>2. Certification & Accreditation (C&A) and Networthiness: The DMOC supports requirements definition, integration test support, analysis, systems engineering support, and C&A and Networthiness of core systems. It implements requirements of Cybersecurity and is working toward the application of the Risk Management Framework and Continuous Monitoring. Efforts include Cross-Domain Information Sharing / Multi-national Information Sharing (CDIS/MNIS) ruleset development, load sharing, and testing; accreditation of various newly developed / updated systems such as the DMOC Replay Tool, Dr. J, DIS Filter, and the DMOC Battlespace.</p> <p>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 Commanders (CCDRs) emerging requirements.</p> <p>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 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, 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. This program also supports the DoD Training Transformation Initiative.</p> <p>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.</p> <p>Certification and Accreditation is maintained via the Information Technology (IT) systems Risk Management Framework (RMF) for six classified systems and two 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.</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 anticipated production funding in the current or subsequent fiscal year.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	6.035	4.245	6.071	0.000	6.071
Current President's Budget	5.819	4.245	12.839	0.000	12.839
Total Adjustments	-0.216	0.000	6.768	0.000	6.768
• 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	-0.216	0.000			
• Other Adjustments	0.000	0.000	6.768	0.000	6.768

Change Summary Explanation

In FY 2018, PE 020605F, Wargaming and Simulation Centers, Project 672888, Distributed Mission Operations Center (DMOC) was increased \$6.768M to fund the Air, Space, and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS).

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Title: Distributed Mission Operations (DMO) Capability / Battlespace Systems Development</p> <p>Description: Simulation software/hardware development in support of users conducting RDT&E, mission rehearsal, and concepts of operation development.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Continued Next Generation Threat System (NGTS) development; enhanced source code to implement Air Force Distributed Mission Operations (DMO) requirements; upgraded versions 3.1.0-3.1.3 - Enhanced system automation and model database to increase training for intel community - Continued DMO tool development (Distributed Interactive Simulation (DIS) Tools, DMOC Replay Tool, Dr. J, etc) -- Completed transition to web based user interface -- Improved filtering, routing, and entity management to ensure seamless connectivity between disparate Live, Virtual and Constructive systems - Upgraded capabilities of DMOC-Space (DMOC-S) Global Positioning System Environment Generator to implement features to improve realism of space aspects in DMO events <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Continue NGTS development; enhance NGTS source code to implement future Air Force DMO requirements; enhance versions 3.1.4 - 3.2.0 as future requirements are identified 	4.359	3.180	4.570

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Continue DMO tool development (DIS Tools, DMOC Replay Tool, Dr. J etc.) as modifications/improvements are identified after completion of DMO events to support changing M&S technology and emerging AF and CCDR requirements - Support DMOC-S by upgrading systems that incorporate space aspects into DMO events - Commence design on a dedicated network to allow design and testing of new/updated systems without impacting operational battlespace <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will continue NGTS development; enhance source code to implement future Air Force DMO requirements; enhance NGTS version 3.2.0 as future requirements are identified - Will continue DMO tool development (DIS Tools, DMOC Replay Tool, Dr. J etc.) as improvements are identified after completion of each DMO event to support changing M&S technology and emerging AF and Combatant Commander requirements - Will support DMOC-S by upgrading systems that incorporate space aspects into DMO events 				
<p>Title: Certification & Accreditation (C&A) and Networthiness</p> <p>Description: Support requirements definition, integration test support, scenario development, analysis, systems engineering support, and Certification & Accreditation (C&A) and Networthiness of core systems. Implement requirements of Cybersecurity, Risk Management Framework (RMF), and Continuous Monitoring.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed DoD Information Assurance Certification and Accreditation Process (DIACAP) to acquire DMOC Battlespace Authority to Operate (ATO) from HAF/A3, expires January 2018 - Commenced DIACAP's transition to RMF - Registered DMOC Battlespace in enterprise Mission Assurance Support Service (eMASS) for Risk Management Framework (RMF) - Conducted C&A activities to accredit DMO Tools, systems, and battlespace modifications after upgrades were completed - Supported Coalition Virtual Flag (CVF) and RED KITE with Cross-Domain Information Sharing (CDIS) ruleset development, testing, and implementation based on FY16 requirements <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Begin accreditation of the Jumper Room enclave to conduct high-side / 5th Generation operations - Commence RMF activities to accredit battlespace by January 2018 - Continue C&A activities to re-accredit DMO Tools, systems, and battlespace modifications - Commence certification of DMOC - Develop software within the Air Force Network Integration Center (AFNIC) Enterprise Product Listing (EPL) standards 		0.484	0.353	0.486

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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)		FY 2016	FY 2017	FY 2018
<p>- Continue support of CVF and RED KITE with Cross Domain Information Sharing (CDIS) ruleset development, testing, and implementation</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will continue NGTS development; enhance source code to implement future Air Force DMO requirements; enhance NGTS version 3.2.0 as future requirements are identified - Will continue DMO tool development (DIS Tools, DMOC Replay Tool, Dr. J etc.) as improvements are identified after completion of each DMO event to support changing M&S technology and emerging AF and Combatant Commander requirements - Will support DMOC-S by upgrading systems that incorporate space aspects into DMO events 				
<p>Title: Distributed Training Sites & Systems Integration</p> <p>Description: Establish distributed training site system integration and interoperability between DMOC, operational units, and modeling & simulation facilities.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Explored options for integration of 5th Gen fighters and advanced systems into FY16 Virtual Flags (VFs)/Coalition Virtual Flag (CVF) - Completed NORTHCOM scenario in VF 16-2 that discovered efficiencies for Homeland Defense Command & Control (C2) and enabled informed North American Aerospace Defense Command (NORAD) Weapons Tactics (WEPTAC) discussions - Completed Joint IO Range connected Cyber participants into VF 16-3 - Completed MQ-9 Medium Altitude Long Endurance Tactical - Joint Systems Integration Lab (MALET-JSIL) Aircrew Trainer (MJAT) at Ellsworth AFB enabling Remotely Piloted Aircraft (RPA) crews to count VF training towards Ready Aircrew Program (RAP) requirements - Completed Marine Air Control Squadrons (MACS) 1 and 2 in VFs 16-1 and 16-3 - Completed new British Rivet Joint (Airseeker) into CVF 16-4 <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Continue development of Live, Virtual, and Constructive (LVC) concepts in support of VF/CVF/RED FLAG (RF) integration - Continue 5th Generation and future Distributed Mission Operations Network (DMON) infrastructure integration into DMOC Jumper Room -- Commence support of VF 17-2, NORTHCOM defense in depth of the CONUS from near peer systems, 1st planned use of advanced systems integration (4th/5th gen fighters, AEGIS, and Patriot) -- Support/leverage/collaborate DMOC efforts with Virtual Warfare Center-Nellis (VWC-N), to enable a high end testing and tactics development capability - Support emerging higher headquarters/Combatant Commander (CCDR) requirements 		0.976	0.712	1.032

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Commence Virtual-into-Live integration and testing with RF to include virtual Rivet Joint, virtual JSTARS, etc. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will continue development of LVC concepts in support of VF/CVF/RF integration - Will continue to support/leverage/collaborate DMOC efforts with Virtual Warfare Center-Nellis to enable a high end testing and tactics development capability - Will support emerging higher headquarters/CCDR requirements - Will continue Virtual-into-Live integration and testing with RF 				
<p>Title: Air, Space and Cyberspace Collaborative Environment – Information Operations Suite (ACE-IOS)</p> <p>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 Command battle staffs during Joint and Service exercises and experimentations. In Fiscal Year 2018, these efforts transferred in from Program Element 0207601F, USAF Modeling & Simulation.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will complete ACE-IOS version 5.0.19 as open systems architecture version evolving from 5.0.18 - Will complete development of license-free replacements for two commercial licensed applications - Will complete product agnostic database interface allowing future replacement and upgrades with minimal software and configuration modifications - Will complete control Graphical User Interfaces (GUIs) and run-time scripts for map displays, control and monitoring of the system - Will complete development of Supervisory Control and Data Acquisition (SCADA) and cascading battlefield effects - Will develop Joint LVC (JLVC) 2020 database Application Program Interface (API) - Will maintain Certification & Accreditation 		-	-	6.751
Accomplishments/Planned Programs Subtotals		5.819	4.245	12.839
D. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
E. Acquisition Strategy				
Distributed Mission Operations Center (DMOC):				

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force Date: May 2017

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

R-1 Program Element (Number/Name)
PE 0207605F / *Wargaming and Simulation Centers*

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.

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.

Air, Space and Cyberspace Collaborative Environment – Information Operations Suite (ACE-IOS):

Acquisition goals 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.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	2.704	Mar 2016	0.865	Dec 2016	0.000		0.000		0.000	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	-	0.000		2.333	Jul 2017	3.451	Mar 2018	0.000		3.451	Continuing	Continuing	75.000
ACE-IOS	C/Various	90th COS : Lackland AFB, TX	-	0.000		0.000		5.977	Jan 2018	0.000		5.977	Continuing	Continuing	47.000
Subtotal			-	2.704		3.198		9.428		0.000		9.428	-	-	216.000

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Change Engineering, Inc. : Kirtland AFB, NM	-	1.602	Sep 2016	0.437	Sep 2017	2.017	Sep 2018	0.000		2.017	Continuing	Continuing	30.000
Subtotal			-	1.602		0.437		2.017		0.000		2.017	-	-	30.000

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Capability / Battlespace Systems Development (Design)																												
DMO Capability / Battlespace Systems Development (Development)																												
DMO Capability / Battlespace Systems Development (Integration/Test)																												
Certification & Accreditation (C&A) and Networthiness (Concept Activities)																												
Certification & Accreditation (C&A) and Networthiness (Design)																												
Certification & Accreditation (C&A) and Networthiness (Development)																												
Distributed Training Sites & Systems Integration (Design)																												
Distributed Training Sites & Systems Integration (Development)																												
Distributed Training Sites & Systems Integration (Integration/Test)																												
VIRTUAL FLAG 16-1 (VF 16-1) (Dec 2016)																												
VF 16-2 (Mar 2016)																												
VF 16-3 (May 2016)																												
CVF 16-4 (Aug 2016)																												
VF 17-1 (Dec 2016)																												
VF 17-2 (Mar 2017)																												
VF 17-3 (May 2017)																												
CVF 17-4 (Aug 2017)																												
VF 18-1 (Dec 2017)																												

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
VF 18-2 (Mar 2018)										■																		
VF 18-3 (May 2018)											■																	
CVF 18-4 (Aug 2018)												■																
VF 19-1 (Dec 2018)													■															
VF 19-2 (Mar 2019)														■														
VF 19-3 (May 2019)															■													
CVF 19-4 (Aug 2019)																■												
VF 20-1 (Dec 2019)																	■											
VF 20-2 (Mar 2020)																		■										
VF 20-3 (May 2020)																			■									
CVF 20-4 (Aug 2020)																				■								
VF 21-1 (Dec 2020)																					■							
VF 21-2 (Mar 2021)																						■						
VF 21-3 (May 2021)																							■					
CVF 21-4 (Aug 2021)																								■				
VF 22-1 (Dec 2021)																									■			
VF 22-2 (Mar 2022)																										■		
VF 22-3 (May 2022)																										■		
CVF 22-4 (Aug 2022)																											■	
ACE-IOS v5.0.19																												
ACE-IOS v5.0.20																												
ACE-IOS v5.0.21																												
ACE-IOS v5.0.22																												
ACE-IOS v5.0.23																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
DMO Capability / Battlespace Systems Development (Design)	1	2016	4	2022
DMO Capability / Battlespace Systems Development (Development)	2	2016	4	2022
DMO Capability / Battlespace Systems Development (Integration/Test)	3	2016	4	2022
Certification & Accreditation (C&A) and Networthiness (Concept Activities)	1	2016	4	2022
Certification & Accreditation (C&A) and Networthiness (Design)	2	2016	4	2022
Certification & Accreditation (C&A) and Networthiness (Development)	3	2016	4	2022
Distributed Training Sites & Systems Integration (Design)	2	2016	4	2022
Distributed Training Sites & Systems Integration (Development)	3	2016	4	2022
Distributed Training Sites & Systems Integration (Integration/Test)	4	2016	4	2022
VIRTUAL FLAG 16-1 (VF 16-1) (Dec 2016)	1	2016	1	2016
VF 16-2 (Mar 2016)	2	2016	2	2016
VF 16-3 (May 2016)	3	2016	3	2016
CVF 16-4 (Aug 2016)	4	2016	4	2016
VF 17-1 (Dec 2016)	1	2017	1	2017
VF 17-2 (Mar 2017)	2	2017	2	2017
VF 17-3 (May 2017)	3	2017	3	2017
CVF 17-4 (Aug 2017)	4	2017	4	2017
VF 18-1 (Dec 2017)	1	2018	1	2018
VF 18-2 (Mar 2018)	2	2018	2	2018
VF 18-3 (May 2018)	3	2018	3	2018
CVF 18-4 (Aug 2018)	4	2018	4	2018
VF 19-1 (Dec 2018)	1	2019	1	2019

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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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Events	Start		End	
	Quarter	Year	Quarter	Year
VF 19-2 (Mar 2019)	2	2019	2	2019
VF 19-3 (May 2019)	3	2019	3	2019
CVF 19-4 (Aug 2019)	4	2019	4	2019
VF 20-1 (Dec 2019)	1	2020	1	2020
VF 20-2 (Mar 2020)	2	2020	2	2020
VF 20-3 (May 2020)	3	2020	3	2020
CVF 20-4 (Aug 2020)	4	2020	4	2020
VF 21-1 (Dec 2020)	1	2021	1	2021
VF 21-2 (Mar 2021)	2	2021	2	2021
VF 21-3 (May 2021)	3	2021	3	2021
CVF 21-4 (Aug 2021)	4	2021	4	2021
VF 22-1 (Dec 2021)	1	2022	1	2022
VF 22-2 (Mar 2022)	2	2022	2	2022
VF 22-3 (May 2022)	3	2022	3	2022
CVF 22-4 (Aug 2022)	4	2022	4	2022
ACE-IOS v5.0.19	1	2018	4	2018
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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	4.202	3.886	4.190	0.000	4.190	4.257	4.336	4.410	4.500	Continuing	Continuing
675190: <i>JFCOM Wargaming</i>	-	4.202	3.886	4.190	0.000	4.190	4.257	4.336	4.410	4.500	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 pressure 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 is charting a new course to better integrate and synergize the wargaming 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, as well as, a wargame series, Plan Blue, 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 with regard to 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 post-game analysis. These findings inform portfolio rebalancing exercises, concept and strategy development, and very senior leader decision making. Having concluded Global Engagement 16, the current wargaming cycle, the current version of the WIE is being given a major overall to match the new charter and SP3 process along with supporting greater number and more diverse wargames.

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: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	4.358	3.886	4.178	0.000	4.178
Current President's Budget	4.202	3.886	4.190	0.000	4.190
Total Adjustments	-0.156	0.000	0.012	0.000	0.012
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.156	0.000	0.012	0.000	0.012

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Title: Develop/ Upgrade M&S Tools for WIE</p> <p>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</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Expanded the WIE from the current construct to support Air Force Materiel Command, Air Mobility Command and Air Force Space Command wargames. This required reprogramming of some hard coded, CONOPS-specifics to into broader, more generic, wargame support. Additional models and analytical tools used by other wargames and organizations required the creation of custom interfaces to allow interaction within the WIE. Examples include analytic tools being tested for agile combat support and operational energy management. Additionally, registration and IT permissions process were templated and partially automated in order to better service a more diverse user pool and mission set. - Developed and deployed the Force Tracker Request For Forces (RFF) Tool. RFF Tool permits wargame participants to nominate, vet, and authorize the movement of forces through player selected processes reflecting experimental command and control constructs tested in Flexible Engagement and Global Engagement 16. Its integration into the previously developed Force Tracker suite makes the process transparent in a universally accessible database, eliminating errors in transposition. It also serves as a record of participant decisions suitable for subsequent analysis. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Develop the WIE as a standard platform for Air Force wargaming, permitting integration with other Air Force Wargaming systems, such as BubbleNet at Lemay Center Wargaming Institute and the nascent Schriever Wargame System, currently being tested and evaluated. 	1.918	1.360	1.463

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>- 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 will require analysis of utility and functionality of additional models and analytical tools used by other wargames, as well as creation of custom interfaces to allow interaction within the WIE. Given the sharp increase in the number and frequency of diverse wargames, additional capacity is being acquired to manage a greater number of server instantiations that serve as the informational architecture for each effort. as creation of custom interfaces to allow interaction within the WIE.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Recertify the "GameNet", component of the WIE as a RDT&E Local Area Network. - 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 budgeting and programming. - 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 will require analysis of utility and functionality of additional models and analytical tools used by other wargames, as well as creation of custom interfaces to allow interaction within the WIE. 				
<p>Title: Joint Concept Development & Experimentation (JCD&E) Tools</p> <p>Description: Develop scenarios and data for future synthetic environment that grounded in truth to support several wargames and mini-wargames.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Designed and implemented novel wargaming support plan in accord with Strategy, Planning and Programming (SP3). This plan will include flexible and agile, quick-turn efforts to provide analytic support as required by HAF and SAF efforts. - Designed and executed a midterm, theater-baseline wargame hosted by USAFE. This baseline wargame directly services HAF objectives and provides high fidelity data for subsequent quick-turn efforts supporting dynamic SP3 requirements. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Refine wargame support plan to SP3 process, with respect to timing, sequence and focus to ensure greatest utility of wargaming efforts in the provision of analytic support; to include dynamic, quick-turn wargaming efforts in support of HAF and SAF initiatives as required. - Maintain, direct, and mature the Air Force Wargaming Enterprise to better coordinate, integrate, and leverage efforts, resources, and expertise across Air Force organizations. - Develop Scenarios, plan and execute materiel-focused, theater baseline wargame involving Air Force, Sister Services, Pacific Command, functional commands, and multinational coalition. 		2.284	2.526	2.727

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
-Add organic capability to manage and provide analysis of Special Access Programs and Requirements data.				
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.				
- Maintain, direct, and mature the Air Force Wargaming Enterprise to better coordinate, integrate, and leverage efforts, resources, and expertise across Air Force organizations.				
- Develop Scenarios, plan and execute materiel-focused, theater baseline wargame involving Air Force, Sister Services, Pacific Command, functional commands, and multinational coalition.				
Accomplishments/Planned Programs Subtotals		4.202	3.886	4.190
D. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
E. Acquisition Strategy				
In order to achieve an innovative strategy, avoid operational and technical surprise and make best use of limited resources, the newly revamped wargame approach will require an evolutionary acquisition approach and continued senior-leadership engagement in setting the objectives and strategy for every wargame. Contract support will be required because that is where wargame specialized expertise resides. The requirements are constantly evolving and cannot be accurately defined at the outset of the contract; therefore, a cost plus fixed fee (CPFF) contract will be used. There is currently an adequate accounting system and government monitoring in place. The Air Force is aware of the increased risk but Air Force will continue to monitor the performance and cost to ensure the contractor has efficient methods and effective cost controls.				
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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	338.582	54.176	71.785	85.531	0.000	85.531	75.318	87.028	88.540	90.352	Continuing	Continuing
675302: <i>Precision Aerial Delivery Systems (PADS)</i>	30.048	7.390	7.245	8.397	0.000	8.397	8.912	7.074	3.113	5.212	Continuing	Continuing
675380: <i>Mission Planning Systems (MPS) Modernization</i>	308.534	46.786	60.788	76.316	0.000	76.316	66.406	79.954	85.427	85.140	Continuing	Continuing
675385: <i>MPS Increment 5</i>	0.000	0.000	3.752	0.818	0.000	0.818	0.000	0.000	0.000	0.000	0.000	4.570

Program MDAP/MAIS Code: 509

Note

MPS Increment 5 Prior Years funding of \$46.121M and FY16 funding of \$13.762 was executed in BPAC 675380

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.

MPS Increment 5 will complete the initial migration of Air Force platforms from their legacy planning systems to the new Mission Planning System (aka the Joint Mission Planning Systems (JMPS)). It will complete development 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 MPS Major

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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Automated Information Systems (MAIS) program as MPS Increment 5 to improve transparency and oversight. As such, MPS Increment 5 is a continuation of efforts previously started under the development umbrella of the MPS Modernization project.

FY18 funding will continue the MPS software development program. 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, 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, 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)etc.) 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.

FY18 funding will also continue the development of the Mobility Air Force Automated Flight Planning Service (MAFPS) to realize fuel savings and other efficiencies.

Joint Precision Airdrop System- Mission Planning (JPADS-MP) will be utilized to continue development of elements of Mission Planning Systems in conjunction with the Army. This program will continue the development of 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. The JPADS product 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. 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, etc... to accurately deliver payloads to keep the warfighter supplied and in the fight.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	55.835	71.785	76.183	0.000	76.183
Current President's Budget	54.176	71.785	85.531	0.000	85.531
Total Adjustments	-1.659	0.000	9.348	0.000	9.348
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.659	0.000			
• Other Adjustments	0.000	0.000	9.348	0.000	9.348

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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>	

Change Summary Explanation

Increase of \$9.348M to accelerate delivery of Mobility Air Force Automated Flight Planning Service (MAFPS) Release 2.0

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675302: <i>Precision Aerial Delivery Systems (PADS)</i>	30.048	7.390	7.245	8.397	0.000	8.397	8.912	7.074	3.113	5.212	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, etc., to accurately deliver payloads to combat and other friendly forces.

The 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).

In addition the Air Force Research Laboratories (AFRL) led Precision Airdrop (PAD) Flagship Capability Concept (FCC) effort will transition technology for new capabilities into various CAT software release/deliverables. The PAD FCC is also charged with updating airdrop platforms and airdrop related systems to improve accuracy across all airdrop mission types.

FY18 funding continues CAT v6.x and 7.x development and testing to provide precision and conventional airdrop capabilities including, but not limited to, Airdrop Damage Estimate (ADE), Combination Airdrop, Personnel Airdrop, Unified Mission Configuration Editor, Falconview Overlays and Advanced Launch Acceptance Regions (LAR) and Failure Footprints, Kalman Filter Implementation and calculation optimization, Humanitarian airdrop, and bundle tracking for AF and other services (e.g. the Army) aircraft platforms.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

This program is in Budget Activity 7, Operational System Development, which 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 2016	FY 2017	FY 2018
<p>Title: JPADS-MP Phase I</p> <p>Description: Continues development of a JPADS capability for precise, high altitude delivery of material to forward ground forces.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Delivered (Consolidated Air Drop Tool) CAT v3.2 and associated quick turn patches on Portable Flight Planning System (PFPS) - Completed development and began testing of CAT v4.1.2 which migrates CAT v3.2 to a JMPS Framework - Completed development and initial testing of CAT v4.2 on a JMPS Framework, which expands precision airdrop capabilities for accurate calculation of established operational requirements. - Began backwards compatibility of CAT v4.2 and PFPS - CAT v4.2 capabilities include, but are not limited to: Support for advanced failure to footprints for guided delivery systems, assessment of airdrop damage estimates based on in-flight constraints identified by the aircrew during improved container delivery system (CDS) airdrops, new 45 foot parachute for High Speed CDS airdrops, Launch Acceptable Range calculation for Ultra- Lightweight guided delivery systems, 2K Halo, Mass CDS, and improved user workflows, Enhanced Forecast-Sonde (NON-LAPS Solution), Initial Applications for Touch Screen (Tablet) User Interface, Marine Helos and Dropsonde footprint updates - Began CAT v5.0 (High Altitude Low Opening) HALO, Automation Enhancements, Network Automation, Humanitarian Airdrop, Calculation Optimizations and Guided Airdrop Damage Estimation (ADE) <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Complete work to allow backward compatibility of CAT with PFPS - Complete operational testing of CAT v4.2 on PFPS for fielding in FY17 - Complete development of CAT v5.0 and begin testing - Award contracts and initiate development of CAT v6.x to continue evolution of CAT S/W into an automated suite of airdrop mission tools <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will complete testing and field CAT v5.0 - Will 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 	7.390	7.245	8.397

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Will begin 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, Ensemble Weather and Kalman Filter implementation.			
Accomplishments/Planned Programs Subtotals	7.390	7.245	8.397

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA03: Line Item # 833170: <i>Mission Planning Systems</i>	5.944	6.329	6.083	0.000	6.083	6.407	6.520	6.640	6.760	Continuing	Continuing

Remarks

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). As an example, a portion of funding is transferred via MIPR to the Defense Information Systems Agency's Defense Information Technology Contracting Organization (DISA/DITCO) who contracts for AFLCMC/HBM at a fee.

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: FY 2018 Air Force **Date:** May 2017

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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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 Development	MIPR	Various : Various	17.117	5.742	Nov 2015	5.725	Nov 2016	6.651	Nov 2017	0.000		6.651	Continuing	Continuing	-
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	4.839	1.221	Nov 2015	1.350	Nov 2016	1.377	Nov 2017	0.000		1.377	Continuing	Continuing	-
Subtotal			21.956	6.963		7.075		8.028		0.000		8.028	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.082	0.015	Nov 2015	0.039	Nov 2016	0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			0.082	0.015		0.039		0.000		0.000		0.000	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Type I Training	C/FP	Spiral Solutions & Technologies : Bellevue, NE	2.096	0.076	Nov 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			2.096	0.076		0.000		0.000		0.000		0.000	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	5.914	0.336	Nov 2015	0.131	Nov 2016	0.369	Nov 2017	0.000		0.369	Continuing	Continuing	-
Subtotal			5.914	0.336		0.131		0.369		0.000		0.369	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Delivered (Consolidated Air Drop Tool) CAT v3.2	██████																											
Development and Testing of CAT v4.1	██████████████																											
Development and Testing of CAT v4.2					██████████████																							
Development 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 Fielding													██████															
JPADS-MP CAT v7.x Fielding																	██████											
JPADS - MP CAT v8.x Fielding																					██████							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Delivered (Consolidated Air Drop Tool) CAT v3.2	1	2016	2	2016
Development and Testing of CAT v4.1	2	2016	1	2017
Development and Testing of CAT v4.2	3	2016	3	2017
Development of CAT v5.0	4	2016	1	2018
JPADS-MP CAT v4.1 Fielding (C-17)	4	2017	1	2018
JPADS-MP CAT v4.2 Fielding	4	2017	1	2018
JPADS-MP CAT v5.0 Fielding	4	2018	1	2019
JPADS-MP CAT v6.x Fielding	3	2019	4	2019
JPADS-MP CAT v7.x Fielding	3	2020	4	2020
JPADS - MP CAT v8.x Fielding	3	2021	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675380: <i>Mission Planning Systems (MPS) Modernization</i>	308.534	46.786	60.788	76.316	0.000	76.316	66.406	79.954	85.427	85.140	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), F-16 Block 30 (System Capability Upgrade [SCU] 9, F-16 Block 40/50 (M6.1, M6.5, M7.1, and M7.2) 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 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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>b. F-16 Block 30 Modernization Phase I: The F-16 Block 30 Mod Phase 1 completed fielding and transitioned to full sustainment the 4QFY16.</p> <p>c. F-16 Block 40/50 Modernization Phases I&II: The F-16 Block 40/50 modernization efforts will provide the capability to plan/utilize a number of OFP-driven capabilities in the platform. The modernization efforts will support new aircraft capabilities established in OFPs for M7.1 and M7.2. These capabilities include, but are not limited to, integrating the Universal Armament Interface (UAI) with the most recent version of Weapons Planning Software (WPS) to give the platform the ability to plan missions for any type of Network Enabled Weapon. It will also provide for UAI compliance with the Small Diameter Bomb (SDB; GBU-39) and the Laser Joint Direct Attack Munition (LJDAM; GBU-54). The modernization effort will also provide for the use of the Advanced Identification Friend or Foe (AIFF) Mode 5 capability in the F-16 Blk 40/50. AIFF will allow use of enhanced authentication and verification of friendly signals through the incorporation of cryptographically secured signals. It will also introduce Automatic Dependent Surveillance-Broadcast Out (ADS-B Out) technology and facilitate compliance with standards for the Next Generation Air Transportation System (NextGen), JASSM-Extended Range (JASSM-ER), and Multifunctional Information Distribution System (MIDS) upgrades. M7.2 will also migrate the F-16 Block 40/50 MPE to the Windows 10 operating environment. A follow on effort to F-16 Mod Phase III will be planned in FY19.</p> <p>d. F-22 Modernization Phase I: The F-22 Modernization program includes OFP-driven software updates v13 and v14. 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, 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>e. 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. 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.</p>		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>
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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.

Test, Training, and Certification: Continues all MPS-related integration, test, and certification activities for all CAF and MAF platforms.

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.

FY18 funding continues the development and modernization of Mission Planning Environments (MPEs) 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).

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 2016	FY 2017	FY 2018
<p>Title: F-15 Modernization Phase II&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 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed Developmental Testing (DT)of v4.0 in Q3 - Completed Operational Testing (OT)and fielding of MPE v4.0 in Q4 - Initiated v6.0 in Q4, enabling mission planning support for OFP Suite 9.1 and EPAWSS - Released two v4.0 mid-DT to address risks with SDB-II implementation - Development efforts for v4.0 included, but were not limited to: Integration of B61 Life Extension Program (LEP), feature updates for several weapons, and the expansion of Link-16 messages sets - Continued MPE v5.0 development that includes Digital Transfer Device/Modules (DTD/DTM) modernization, MIDS-JTRS, and Radar library updates <p>FY 2017 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 in FY18, deficiencies found in v4.0 and Suite 8E and Suite 7 requirements. - Continue development of MPE v5.0 which includes: 	9.730	13.387	13.271

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Digital Transfer Device/Modules (DTD/DTM) modernization - Radar library updates - MIDS-JTRS upgrade - Transition to WIN10 - Continue to work requirements and begin development for F-15 v6.0 with focus on systems interfacing with aircraft program and EPAWSS <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will complete FQT and DT on MPE v5.0 - Will continue requirements definition and development of v6.0 				
<p>Title: F-16 Block 30 Modernization Phase I</p> <p>Description: Continues the modernization of previously fielded F-16 Block 30 MPEs to enable efficient use of new and improved capabilities being developed in the OFPs.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed SCU9 development, full qualification testing, Development Testing, Operational Testing & fielding <p>FY 2017 Plans:</p> <p>No RDT&E funding requested in FY17.</p> <p>FY 2018 Plans:</p> <p>No RDT&E funding requested in FY18</p>		0.000	0.000	0.000
<p>Title: F-16 Block 40/50 Modernization Phases I and II</p> <p>Description: Continues the modernization of previously fielded F-16 Block 40/50 MPEs to enable efficient use of new and improved capabilities being developed in the OFPs.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed development testing and started operational testing of M7.1+ - Completed design and began coding MPS M7.2 for first Operational Flight Plan (OFP) ground testing - Capabilities for M7.2+ included Automatic Dependent Surveillance-Broadcast (ADS-B) Out, JASSM-ER, UAI Compliance for SDB II, and MIDS upgrades <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Field M7.1+ 		0.372	0.486	3.263

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>- Complete coding and two software development builds for MPS M7.2 for first and second OFP ground and flight test (FTR1 and FTR2)</p> <p>FY 2018 Plans:</p> <p>- Complete development of M7.2 and begin developmental testing in preparation for operational testing and fielding in FY19</p>				
<p>Title: F-22 Modernization Phase I</p> <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 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed MPE v13.0 FQT - Completed Developmental Test for v13.0 - Released mid-DT v13.0 to resolve GEO-2 immaturity issues - Capabilities for v13.0 included, but were not limited to: Addition of AIM-9X and AIM-120D, incorporation of additional Electronic Protection Tasks, Combat Identification improvements, and the Synthetic Aperture Radar Planning Tool - Began MPE v14.0 requirements definition interfacing with the aircraft program - Awarded delivery order for v14.0 - Awarded v13.1 Update 6 - development for Crypto Modernization, Threat Rings and EW Tools <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Enter and complete Operational Testing (OT) for v13.0 - Field MPE v13.0 - Continue development of Update 6 - Complete FQT or v13.1 Update 6 - Continue development for MPE v14.0 - MPE v14.0 will be built from the v13.1 baseline and integrated with requirements established through OFP Inc 3.2M <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will continue development of v14.0 - Will continue development of F-22 Helmet Display Mounted Cueing System (HDMCS) - Will complete Developmental Testing (DT) and Operational Testing (OT) for v13.1 update 6 Field v13.1 Update 6 		4.901	10.822	9.832
<p>Title: B-1 Modernization Phase I&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>		5.779	11.256	13.026

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i></p> <ul style="list-style-type: none"> - Fielded Release 8.0 - Incorporated Draw File into Release 8.0 - Continued development of Release 9.0 that will update the migration to Framework v. 1.5.3xx, SDC 5.x and operation in WoW64 environment - Accomplished Release 9.0 Initial Design Reviews (IDR) 1 & 2 - Released Release 9.0 Beta 1 & 2 - Completed the transition to Universal Armament Interface (UAI) Mission Planner 2 version with Fully Integrated Data Link (FIDL) updates, Integrated Battle Station (IBS) replacement, Long Range Air to Surface (LRASM), and replacement of Redundant Power Supply (RPS) Super microcomputer for SB-17 - Continued development of LRASM - Accomplished System Integration Lab (SIL) test - Released Release 9.0 Beta 2 and finalized detailed design - Released Release 9.0 Beta 3 and finalized MPE integration prior to FQT for SB-17 - Prepared Delivery Order (DO) for Release 11.0 - Accomplished Release 11.0 Configuration Control Board (CCB) - Released Release 11.0 Request for Proposal (RFP) <p><i>FY 2017 Plans:</i></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 - Accomplish Technical Requirements Review (TRR) - Perform Final Quality Test (FQT) - Complete a 63-119 review - Formalize Developmental Test (DT) and scenario testing <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> - Will continue development of LRASM - Will field Release 9 - Will start Development Release 11 				
Title: MAF Modernization		9.468	8.388	18.326

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>Description: Migrates Airlift (C-5), Tanker (KC-135 and KC-10), and Air Drop (C-17, C-130) platforms from their legacy mission planning systems to the Joint Mission Planning Systems (JMPS). Develops KC-46 JMPS Mission Planning Environment (MPE). Also, once fielded, the program will keep MPEs current via modernization upgrades to account for changes in aircraft operational flight profiles (OFPs) and Global Command and Control Changes.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed GM 1.3.100 (C-17) Formal Qualification Testing (FQT) and began formal Government developmental testing - Continued development for GM release 1.3.300 (C-5, KC-10, KC-135, C-130) and prepared for Formal Qualification Testing (FQT) and entry into for Government developmental testing - Began development for GM release 1.4 (KC-46 aircraft) <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Complete GM 1.4 (KC-46) development, formal qualification testing, and initiate formal Government developmental testing (not including the Increment 5 products which are discussed in the MPS Inc 5 section of this submittal). <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will complete both operational testing and fielding for the GM 1.4 (KC-46) MPE - Will complete the operational testing of the AMC MPE (C-17) MPE (FW, UPC, and CC) and complete testing for the AMC GM (C-130, C-5, KC-10 and KC-135) MPE - Will begin development of GM Sustainment ECP 			
<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.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Continued development of EC-130 Version 2.0 MPE and RC-135 Version 3.1.1 - Continued development of the MPE for HH-60 and HC/MC-130s within the SMACC CSAR program <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Continue development of E-3/E-8 v2.1.1. Complete development and testing of EC-130H v2.0 - Complete development of the E-3 DRAGON, enter formal government developmental test and field - Continue development and enter formal government testing of the SMACC CSAR MPE - Complete and integrate Survivor Broadcast Overlay Tool (SBOT) and Search pattern Tool (SPT) into the SMACC CSAR MPE <p>FY 2018 Plans:</p>	10.976	14.270	15.743

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Will develop follow-on MPE's for E-3 DRAGON v3.2 and EC-130 v2.1 - Continue development, testing, and CSAR fielding 			
<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 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed FQT parts 1 & 2 - Installed MAFPS software into AMC's Command and Control Support Environment (C2SE) - Awarded ECP 4 to address new requirements to address associated system obsolescence and user feedback must fixes - MAPFS Release 1 (FY17 program) will be reported as part of Increment 5. <p>FY 2017 Plans:</p> <p>Note: Activities for Release 1, previously described in FY16 Accomplishments and FY18 Plans, are not included in this FY 2017 plan description. These efforts will be continued in MPS Increment 5, Project 675385.</p> <ul style="list-style-type: none"> - Begin initial development activities for Release 2 to include a System Requirements Review and Integrated Baseline Review for completion of the second spiral capabilities. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Will continue IOT&E and Field Release 1 - Will continue Release 2 development 	5.560	2.179	2.855
Accomplishments/Planned Programs Subtotals	46.786	60.788	76.316

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item # 833170: <i>Mission Planning Systems</i>	8.512	9.539	9.403	0.000	9.403	9.345	9.511	9.681	9.857	Continuing	Continuing

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	116.277	14.796	Nov 2015	24.261	Nov 2016	28.925	Nov 2017	0.000		28.925	Continuing	Continuing	-
A-10 Modernization	PO	Organic : Hill AFB, UT	1.917	0.000		0.000		0.000		0.000		0.000	0.000	1.917	1.917
F-16 Modernization	PO	Organic : Hill AFB, UT	17.961	0.000	Nov 2015	0.000		0.000		0.000		0.000	0.000	17.961	17.961
EC-130H Modernization	PO	Organic : Robins AFB, GA	3.694	1.010	Jan 2016	1.011	Jan 2017	2.360	Jan 2018	0.000		2.360	Continuing	Continuing	-
HH-60G/HC-130	PO	Organic : Robins AFB, GA	2.208	1.789	Nov 2015	0.322	Nov 2016	2.170	Nov 2017	0.000		2.170	Continuing	Continuing	-
F-22 MilCloud SIL	MIPR	GSA : Washington, DC	0.062	0.043	Dec 2015	0.000		0.000		0.000		0.000	0.000	0.105	0.062
MAF AMC Transition Tools	MIPR	AMCOM : Redstone Arsenal, AL	4.632	0.000		0.000		0.000		0.000		0.000	0.000	4.632	2.082
SMACC CSAR Tools	MIPR	Various : Various	1.088	0.536	Jan 2016	0.908	Jan 2017	2.132	Jan 2018	0.000		2.132	Continuing	Continuing	-
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	43.862	7.579	Nov 2015	8.205	Nov 2016	9.701	Nov 2017	0.000		9.701	Continuing	Continuing	-
Framework	C/FPIF	Northrop Grumman : Herndon, VA	5.040	3.708	Jan 2016	6.231	Jan 2017	6.751	Jan 2018	0.000		6.751	Continuing	Continuing	-
Common Components	C/Various	Various : Various	33.552	4.648	Nov 2015	5.996	Nov 2016	7.948	Nov 2017	0.000		7.948	Continuing	Continuing	-
Subtotal			230.293	34.109		46.934		59.987		0.000		59.987	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	0.080	Nov 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Cost Estimating	C/T&M	Tecolote Inc : Goleta, CA	1.083	0.167	Nov 2015	0.090	Nov 2016	0.020	Nov 2017	0.000		0.020	Continuing	Continuing	-
Subtotal			1.083	0.247		0.090		0.020		0.000		0.020	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	26.470	2.860	Dec 2015	3.882	Dec 2016	4.246	Dec 2017	0.000		4.246	Continuing	Continuing	-
Certification and Accreditation	MIPR	JITC : Fort Huachuca, AZ	0.124	0.040	Feb 2016	0.111	Feb 2017	0.113	Feb 2018	0.000		0.113	Continuing	Continuing	-
Type I Training	C/FP	Spiral Solutions & Technologies, Inc. : Bellevue, NE	4.037	0.530	Jul 2016	0.985	Jul 2017	1.223	Jul 2018	0.000		1.223	Continuing	Continuing	-
Field Representative Hardware	C/Various	Various : Various	0.179	0.410	Nov 2015	0.312	Nov 2016	0.421	Nov 2017	0.000		0.421	Continuing	Continuing	-
Subtotal			30.810	3.840		5.290		6.003		0.000		6.003	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	14.371	2.753	Oct 2015	3.482	Oct 2016	0.393	Oct 2017	0.000		0.393	Continuing	Continuing	-
Program Management Administration	Various	Various : Various	31.977	5.837	Nov 2015	4.992	Nov 2016	9.913	Nov 2017	0.000		9.913	Continuing	Continuing	-
Subtotal			46.348	8.590		8.474		10.306		0.000		10.306	-	-	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		308.534	46.786	60.788	76.316	0.000	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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>

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 v4.0 Fielding					■																							
F-15 v5.0 Fielding													■															
F-15 v6.0 Fielding																											■	
F-16 Blk 30 SCU 9 Fielding				■																								
F-16 Blk 40/50 M7.1 Fielding					■	■																						
F-16 Blk 40/50 M7.2 First					■																							
F-16 Blk 40/50 M7.2 Fielding														■														
F-22 v13.0 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																											■	
SMACC RC-135 Release 3.4 Fielding																											■	

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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 RC-135 Release 3.5 Fielding																																
SMACC RC-135 Release 3.6 Fielding																																
MAFPS Release 2 Fielding																																
GM 1.4 (KC-46) Release 1 Fielding																																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
F-15 v4.0 Fielding	2	2017	2	2017
F-15 v5.0 Fielding	2	2019	2	2019
F-15 v6.0 Fielding	4	2020	4	2020
F-16 Blk 30 SCU 9 Fielding	4	2016	4	2016
F-16 Blk 40/50 M7.1 Fielding	1	2017	2	2017
F-16 Blk 40/50 M7.2 First	2	2017	2	2017
F-16 Blk 40/50 M7.2 Fielding	3	2019	3	2019
F-22 v13.0 Fielding	4	2017	4	2017
F-22 v14.0 Fielding	1	2021	1	2021
B-1 Release 9 Fielding	1	2018	1	2018
B-1 Release 11 Fielding	3	2020	3	2020
SMACC E-3/ E-8 Release 2.1 Fielding	4	2019	4	2019
SMACC E-3/E8 Release 2.4 Fielding	4	2020	4	2020
SMACC E-3/E8 Release 2.5 Fielding	4	2021	4	2021
SMACC EC-130H Release 2.0	4	2017	4	2017
SMACC EC-130H Release 2.1 Fielding	1	2019	1	2019
SMACC EC-130H Release 2.2 Fielding	4	2019	4	2019
SMACC EC-130H Release 2.3 Fielding	4	2020	4	2020
SMACC EC-130H Release 2.4 Fielding	4	2021	4	2021
SMACC E-3 DRAGON Release 3 Fielding	3	2018	3	2018
SMACC E-3 DRAGON Release 3.1 Fielding	3	2019	3	2019
SMACC E-3 DRAGON Release 3.2 Fielding	1	2021	1	2021

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
SMACC E-3 DRAGON Release 3.3 Fielding	2	2022	2	2022
SMACC RC-135 Release 3.4 Fielding	4	2020	4	2020
SMACC RC-135 Release 3.5 Fielding	4	2021	4	2021
SMACC RC-135 Release 3.6 Fielding	4	2022	4	2022
MAFPS Release 2 Fielding	2	2019	2	2019
GM 1.4 (KC-46) Release 1 Fielding	4	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675385: <i>MPS Increment 5</i>	0.000	0.000	3.752	0.818	0.000	0.818	0.000	0.000	0.000	0.000	0.000	4.570
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MPS Increment 5 will complete the initial migration of Air Force platforms from their legacy planning systems to the new Mission Planning System (aka the Joint Mission Planning Systems (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, are now included in the overarching MPS Major Automated Information Systems (MAIS) program as MPS Increment 5 to provide improved transparency and oversight. As such, MPS Increment 5 is a continuation of efforts previously started under the development umbrella of the MPS Modernization project. The overall purpose of MPS is to provide a suite of mission planning systems that can be integrated with USAF Command, Control, Communications, Computers and Intelligence (C4I) systems for the operational management of Combat Air Force (CAF) and Mobility Air Force (MAF) aerial assets and the support of USAF training requirements. MPS allows aircrews to electronically receive tasking orders, intelligence information, target coordinates, imagery and other information. This information is then used to organize and prepare flight (including cargo airdrop) and weapons delivery planning data (e.g., maps, charts, imagery, flight logs, radar predications, and navigation databases) this is electronically transferred to aircraft and weapons.

Specific capabilities include but are not limited to the following:

A. Mobility Air Forces Automated Flight Planning Service (MAFPS): The MAFPS component to MPS Increment 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-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 in August 2018. Additional warfighter benefits include:

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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- Color moving map (Digimap) Common Component
- Enhanced Air Refueling Common Component
- 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 2016	FY 2017	FY 2018
<p>Title: MPS Increment 5</p> <p>Description: MPS Increment 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 2016 Accomplishments: FY16 accomplishments are included in the MAF Modernization (overarching MPS project 675380) section of this document.</p> <p>FY 2017 Plans: MAFPS: - Complete the development of MAFPS Release 1 operational Testing in the AMC enclaves and field.</p> <p>AMC Transition: - Complete the development of the Air Mobility Command (AMC) Mission Planning Environment (MPE) and begin testing the C-17 Global Mobility (GM) MPE Framework, Unique Planning Component, and Common Component - Complete (GM) developmental testing for the for C-130, C-5, KC-10 and KC-135 MPE - Develop and reuse Navy Air Refueling Tool</p> <p>SMACC CSAR: - Complete the development and integration of the CSAR tools and of the MPE and begin developmental testing for the HH-60 and HC/MC-130.</p> <p>FY 2018 Plans:</p>	0.000	3.752	0.818

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
MAF Modernization: - Will complete both operational testing and fielding for the GM 1.4 (KC-46) MPE - Will complete the operational testing of the AMC MPE (C-17) MPE (FW, UPC, and CC) and complete testing for the AMC GM (C-130, C-5, KC-10 and KC-135) MPE - Will begin development of GM Sustainment ECP Special Mission ACC (SMACC): - Will develop follow-on MPE's for E-3 DRAGON v3.2 and EC-130 v2.1 - Continue development, testing, and CSAR fielding MAF Automated Flight Planning Service (MAFPS): - Will continue IOT&E and Field Release 1 - Will continue Release 2 development			
Accomplishments/Planned Programs Subtotals	0.000	3.752	0.818

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Remarks

D. Acquisition Strategy

MPS Increment 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.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
3600 / 7	PE 0208006F / <i>Mission Planning Systems</i>	675385 / <i>MPS Increment 5</i>

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000		0.254	Nov 2016	0.000		0.000		0.000	0.000	0.254	-
HH-60/HC-130J/N/P Release 1	PO	Organic : Robins AFB, GA	0.000	0.000		0.272	Nov 2016	0.068	Nov 2017	0.000		0.068	0.000	0.340	-
SM-ACC CSAR Tools	MIPR	Various : Various	0.000	0.000		0.432	Dec 2016	0.000		0.000		0.000	0.000	0.432	-
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	0.000	0.000		0.931	Nov 2016	0.274	Nov 2017	0.000		0.274	0.000	1.205	-
Air Refueling Tool	C/FFP	Navy Mission Planning Systems : Point Mugu, CA	0.000	0.000		0.358	Feb 2017	0.000		0.000		0.000	0.000	0.358	-
Subtotal			0.000	0.000		2.247		0.342		0.000		0.342	0.000	2.589	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000		0.028	Nov 2016	0.000		0.000		0.000	0.000	0.028	-
Subtotal			0.000	0.000		0.028		0.000		0.000		0.000	0.000	0.028	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	0.000		0.301	Dec 2016	0.104	Dec 2017	0.000		0.104	0.000	0.405	-
Type I Training	C/FP	Spiral solutions & Technologies, Inc. : Bellevue, NE	0.000	0.000		0.301	Jan 2017	0.104	Jan 2018	0.000		0.104	0.000	0.405	-
Subtotal			0.000	0.000		0.602		0.208		0.000		0.208	0.000	0.810	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force **Date:** May 2017

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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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

MAFPS Release 1 Fielding	█																															
AMC Transition C-17 Release 1 Fielding	█																															
AMC Transition C-130 Release 1 Fielding	█																															
AMC Transition Airdrop Release 1 Fielding	█																															
SMACC CSAR MPS v1 Release 1 Fielding	█																															
Delivered (Consolidated Air Drop Tool) CAT v4.1	█																															
Development of CAT v5.0	█																															

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force **Date:** May 2017

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	Start		End	
	Quarter	Year	Quarter	Year
MAFPS Release 1 Fielding	1	2018	1	2018
AMC Transition C-17 Release 1 Fielding	3	2017	4	2017
AMC Transition C-130 Release 1 Fielding	2	2018	2	2018
AMC Transition Airdrop Release 1 Fielding	2	2018	2	2018
SMACC CSAR MPS v1 Release 1 Fielding	4	2017	1	2018
Delivered (Consolidated Air Drop Tool) CAT v4.1	1	2016	2	2016
Development of CAT v5.0	4	2016	2	2018

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	3.761	0.000	3.761	3.001	3.502	3.500	0.501	Continuing	Continuing
674550: <i>Air Base Resiliency</i>	-	0.000	0.000	3.761	0.000	3.761	3.001	3.502	3.500	0.501	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 This program, BA 07 PE 0208007F, project 674550, Non-Kinetic Air Base Defense, is a new start.

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 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	3.761	0.000	3.761
Total Adjustments	0.000	0.000	3.761	0.000	3.761
• 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	3.761	0.000	3.761

C. Accomplishments/Planned Programs (\$ in Millions)	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>
Title: Non-Kinetic Air Base Defense	-	-	3.761
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.			

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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 2016	FY 2017	FY 2018
<i>FY 2018 Plans:</i> Provide trained, capable MILDEC planners to combatant commands.			
Accomplishments/Planned Programs Subtotals	-	-	3.761

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-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	14.939	25.025	35.693	4.000	39.693	40.333	35.443	33.873	33.922	Continuing	Continuing
670375: <i>Network Warfare Systems and Support</i>	-	14.939	25.025	35.693	4.000	39.693	40.333	35.443	33.873	33.922	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AF Offensive Cyberspace Operations (OCO) 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 into three capability areas required for effective operations: 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 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 (SA) Programs.

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: FY 2018 Air Force **Date:** May 2017

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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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	12.874	25.025	26.092	0.000	26.092
Current President's Budget	14.939	25.025	35.693	4.000	39.693
Total Adjustments	2.065	0.000	9.601	4.000	13.601
• 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	2.489	0.000			
• SBIR/STTR Transfer	-0.424	0.000			
• Other Adjustments	0.000	0.000	9.601	4.000	13.601

Change Summary Explanation

PB18 Funding increased \$9.601M to provide for the development of Air Force unique access modifications and capability to include Electronic Magnetic Spectrum (EMS) requirements.

PB18 Funding (OCO \$4.0M) for Joint Task Force ARES.

FY16 Below Threshold Reprogramming (BTR) increase of \$2.489M for modifications to the AF Cyber Mission Platform (CMP) special access platform.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Cyber SA - Platforms	12.025	17.078	16.791	3.400	20.191
Description: The Cyber Mission Platform (CMP) provides the hardware/software host for offensive cyber operations, i.e., architecture that enables mission execution through both internet protocol and the electromagnetic spectrum.					
- CMP integrates the Offensive Cyber Production Line (OCPL) developed capabilities into a common framework					
- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCY, 210-925-6653					
FY 2016 Accomplishments:					
- Developed platforms via necessary upgrades, modifications, equipment modernization, and integration					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> - Refined the CMP Version 1 design to meet CRASH HEADER and Risk Management Framework (RMF) approval requirements - Prepared for development and operational testing <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Develop platforms via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications - Completed fielding of CMP Spiral 3 - Award CMP follow-on contract - Develop additional services (Version 2) for CMP framework required to execute and enhance the Offensive Cyberspace Operation mission - Develop additional Planning, Generation, Execution, Assessment, Reporting, and Visualization (PGEARV) services integration into the CMP framework required to execute and enhance the Offensive Cyberspace Operation mission - Deliver capability releases addressing highest priority user requirements <p>FY 2018 Base Plans:</p> <ul style="list-style-type: none"> - Will continue to develop platforms via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications - Will update CMP system accreditation as needed <p>FY 2018 OCO Plans:</p> <ul style="list-style-type: none"> - Will support Joint Task Force ARES requirements. 					

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force			Date: May 2017		
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)					
- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCY,210-925-6653					
Title: Cyber Tech Projects - Access					
Description: Access provides operators with the means to enable offensive cyberspace operations.					
- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCY,210-925-6653					
FY 2016 Accomplishments: - Provided access programs via necessary upgrades, modifications, equipment modernization and integration					
FY 2017 Plans: - Provide access programs via necessary upgrades, modifications, equipment modernization and integration					
FY 2018 Base Plans: - Will continue to develop access and infrastructure programs via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications					
- Funding increase provides for the development and delivery of access releases addressing highest priority user requirements to include Electronic Magnetic Spectrum (EMS)requirements					
Title: Cyber Tech Projects - Capabilities					
Description: The cyber capability area delivers desired effects to the target.					
- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCY,210-925-6653					
FY 2016 Accomplishments: - Developed solutions as required to support Combatant Commanders, Weapon System modernization and MAJCOM Cyber Needs in the area of Offensive Cyberspace Operation's capabilities.					
FY 2017 Plans:					
	0.517	2.000	9.769	-	9.769
	2.034	4.907	7.837	-	7.837

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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<p>- Develop solutions as required to support Combatant Commanders, Weapons System modernization, and MAJCOM Cyber needs in the area of Offensive Cyberspace Operation's capabilities</p> <p>FY 2018 Base Plans:</p> <p>- Will continue to develop access and infrastructure programs via necessary upgrades, modifications, equipment modernization, and integration leveraging industry and AFRL-developed applications</p> <p>- Funding increase provides for the development and delivery of access releases addressing highest priority user requirements to include Electronic Magnetic Spectrum (EMS) requirements</p>					
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<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> <p>- Some aspects of the effort are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCY,210-925-6653</p> <p>FY 2016 Accomplishments:</p> <p>- Provided the required developmental testing for new platform, access, and capability products prior to fielding</p> <p>- Provided the secure network environment for all tests</p> <p>FY 2017 Plans:</p> <p>- Provide the required developmental testing for new platform, access, and capability products prior to fielding</p> <p>- Provide the secure network environment for all tests</p> <p>FY 2018 Base Plans:</p> <p>- Will provide the required developmental testing for new platform, access, and capability products prior to fielding</p> <p>- Will provide the secure network environment for all tests</p> <p>FY 2018 OCO Plans:</p>	0.363	1.040	1.296	0.600	1.896
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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Will support testing for Joint Task Force ARES requirements.					
- Will provide the secure network environment for all tests					
Accomplishments/Planned Programs Subtotals	14.939	25.025	35.693	4.000	39.693

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA03: Line Item # 834320: <i>C3 Countermeasures</i>	0.000	0.000	4.933	0.000	4.933	15.361	11.658	10.333	8.865	Continuing	Continuing
• OPAF: BA03: Line Item # 834010: <i>General Information Technology</i>	1.329	1.554	8.764	0.000	8.764	2.678	2.709	2.739	1.770	Continuing	Continuing
• OPAF: BA03: Line Item# 831010: <i>COMSEC Equipment</i>	0.000	0.000	0.000	8.348	8.348	2.783	0.000	0.000	0.000	11.131	11.131

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 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 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.

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 SA (Platforms)	C/Various	Various : Various	-	8.431	Jan 2016	11.431	Nov 2016	10.916	Apr 2018	3.400		14.316	Continuing	Continuing	-
Cyber Tech Projects (Access)	Various	Army : Ft Belvoir, VA	-	0.517	Oct 2015	2.000	Dec 2016	9.769	Jan 2018	0.000		9.769	Continuing	Continuing	-
Cyber Tech Projects (Capabilities)	C/Various	Various : Various	-	2.034	Oct 2015	4.907	Dec 2016	7.837	Jan 2018	0.000		7.837	Continuing	Continuing	-
Subtotal			-	10.982		18.338		28.522		3.400		31.922	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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 SA (Test & Evaluation)	MIPR	TASC : San Antonio, TX	-	0.363	Dec 2015	1.040	Dec 2016	1.296	Dec 2017	0.600		1.896	Continuing	Continuing	-
Subtotal			-	0.363		1.040		1.296		0.600		1.896	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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) (Cyber SA)	C/FFP	Various : San Antonio, TX	-	2.015	Oct 2015	2.940	Oct 2016	3.018	Oct 2017	0.000		3.018	Continuing	Continuing	-
PMA - Acquisition Support (Cyber SA)	C/Various	Various : San Antonio, TX	-	1.579	Oct 2015	2.707	Oct 2016	2.857	Oct 2017	0.000		2.857	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Platforms CMP Version 1 Development	██████████																											
Platforms CMP Version 1 DT and OT Events					██████████																							
Platforms CMP Version 1 OA/Fielding (CRASH HEADER)									██████████																			
Platforms CMP Follow-on Contract Award (APR 2017)					████																							
Platforms CMP Version 2 Development									██████████																			
Platforms CMP Version 3 Development													██████████															
Platforms CMP Version 4 Development													██████████															
Platforms CMP Version 5 Development													██████████															
Platforms CMP Version 6 Development																	██████████											
Platforms CMP Version 7 Development																	██████████											
Platforms CMP Version 8 Development																					██████████							
Platforms CMP Version 9 Development																					██████████							
Platforms CMP Version 10 Development																					██████████							
Platforms CMP Version 11 Development																					██████████							
Platforms CMP PGEARV Services					██████████				██████████				██████████				██████████				██████████							
Access	██████████				██████████				██████████				██████████				██████████				██████████							
Capabilities	██████████				██████████				██████████				██████████				██████████				██████████							
Saber Chime Development									██████████				██████████				██████████				██████████							
AF Unique Access									██████████				██████████				██████████				██████████							
Cyber Effects Via EMS									██████████				██████████				██████████				██████████							
Test & Evaluation - 46TS Det 2	██████████				██████████				██████████				██████████				██████████				██████████							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Platforms CMP Version 1 Development	1	2016	1	2017
Platforms CMP Version 1 DT and OT Events	2	2017	4	2017
Platforms CMP Version 1 OA/Fielding (CRASH HEADER)	4	2017	1	2018
Platforms CMP Follow-on Contract Award (APR 2017)	3	2017	3	2017
Platforms CMP Version 2 Development	1	2018	3	2018
Platforms CMP Version 3 Development	4	2018	1	2019
Platforms CMP Version 4 Development	2	2019	3	2019
Platforms CMP Version 5 Development	4	2019	1	2020
Platforms CMP Version 6 Development	2	2020	3	2020
Platforms CMP Version 7 Development	4	2020	1	2021
Platforms CMP Version 8 Development	2	2021	3	2021
Platforms CMP Version 9 Development	4	2021	1	2022
Platforms CMP Version 10 Development	2	2022	3	2022
Platforms CMP Version 11 Development	4	2022	4	2022
Platforms CMP PGEARV Services	3	2017	4	2022
Access	1	2016	4	2022
Capabilities	1	2016	4	2022
Saber Chime Development	2	2018	4	2022
AF Unique Access	2	2018	4	2022
Cyber Effects Via EMS	3	2018	4	2022
Test & Evaluation - 46TS Det 2	1	2016	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	7.414	29.439	20.964	0.000	20.964	26.888	23.718	14.404	14.700	Continuing	Continuing
677820: <i>Computer Security RDTE: Firestarter</i>	-	5.797	5.555	6.491	0.000	6.491	6.355	6.472	6.585	6.721	Continuing	Continuing
677821: <i>Cyberspace Vulnerability Assessment</i>	-	0.143	22.378	13.176	0.000	13.176	18.956	15.634	6.179	6.306	Continuing	Continuing
677822: <i>Cyber Defense Analysis</i>	-	0.252	0.258	0.026	0.000	0.026	0.270	0.276	0.281	0.287	Continuing	Continuing
677823: <i>AFCERT</i>	-	1.222	1.248	1.271	0.000	1.271	1.307	1.336	1.359	1.386	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 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

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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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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.

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.

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.

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

These programs are 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	7.681	29.439	35.094	0.000	35.094
Current President's Budget	7.414	29.439	20.964	0.000	20.964
Total Adjustments	-0.267	0.000	-14.130	0.000	-14.130
• 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	-0.267	0.000			
• Other Adjustments	0.000	0.000	-14.130	0.000	-14.130

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force		Date: May 2017
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>	
<u>Change Summary Explanation</u> FY18 reduction of \$14.130M for higher AF priorities.		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
677820: Computer Security RDTE: Firestarter	-	5.797	5.555	6.491	0.000	6.491	6.355	6.472	6.585	6.721	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 2016	FY 2017	FY 2018
Title: Cyber Forensic Tools & Methodologies	1.475	1.427	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 2016 Accomplishments: - Continued development of technologies to detect and attribute distributed computer network attacks over time and distance to specific adversaries			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
<p>- Integrate memory forensics analysis techniques with real time network forensic capabilities and transition to appropriate Air Force cyber weapon systems</p> <p>FY 2018 Plans:</p> <p>- Will continue the development, enhancement, and transition of incident response data gathering and attack attribution technologies</p>				
<p>Title: Cyber Threat Recognition</p> <p>Description: Enhancing cyber platform technology to identify zero-day threats in real time.</p> <p>FY 2016 Accomplishments:</p> <p>- Continued development of technologies to detect and attribute distributed computer network attacks over time and distance to specific adversaries</p> <p>FY 2017 Plans:</p> <p>- Implement advanced techniques to correlate cyber intelligence data with real time network feeds to detect potential cyber intrusion and data exfiltration</p> <p>FY 2018 Plans:</p> <p>- Will normalize and automate methods and procedures to identify zero day cyber threats prior to system compromise</p>		1.508	1.313	1.847
<p>Title: Cyber Threat Attribution & Mitigation</p> <p>Description: Includes risk mitigation techniques for wireless networks and systems; active response, dynamic policy enforcement and computer/net attack attribution efforts.</p> <p>FY 2016 Accomplishments:</p> <p>- Continued development of technologies to detect and attribute distributed computer network attacks over time and distance to specific adversaries</p> <p>FY 2017 Plans:</p> <p>- Integrate technologies to detect and attribute distributed computer network attacks with appropriate USAF cyber weapon systems and pursue certification, accreditation, and authority to operate on USAF data networks</p> <p>FY 2018 Plans:</p> <p>- Will mature, enhance, and integrate developmental concepts to attribute cyber patterns, techniques, behaviors, and signatures to specific threat actors and identify mitigation strategies for each</p>		1.615	1.710	1.733
<p>Title: Transition of Cyber and Information Assurance Technologies</p>		1.199	1.105	1.299

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018
<p>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.</p> <p>FY 2016 Accomplishments: - Enhanced and transitioned customer funded cyber and IA technology to operational USAF components in accordance with rapid requirements documentation provided by AFSPC</p> <p>FY 2017 Plans: - 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>FY 2018 Plans: - 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>			
Accomplishments/Planned Programs Subtotals	5.797	5.555	6.491

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

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-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
677821: <i>Cyberspace Vulnerability Assessment</i>	-	0.143	22.378	13.176	0.000	13.176	18.956	15.634	6.179	6.306	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY17, BA07 PE 0208088F, project 677821, Cyber Threat Mitigation, was a new start.
 In FY17, BA07 PE 0208088F, project 677821, Defensive Next Generation Development, was a new start.

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 2016	FY 2017	FY 2018
Title: Cyber Threat Mitigation	0.000	7.239	2.203
Description: Cyber Threat Mitigation includes vulnerability, compliance, defense and non-technical assessments, best practice reviews, penetration testing and supports Cyberspace Vulnerability Assessment/Hunter (CVH/H) missions in support of Air Force Cyber Command and Combatant Commanders.			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: - Modernize CVA/H weapon system with emerging technologies to keep pace with an evolving cyber threat - Develop 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 2018 Plans: - Will continue modernization of CVA/H weapon system with emerging technologies to keep pace with an evolving cyber threat			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017		
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 2016	FY 2017	FY 2018
- Will 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)				
<p>Title: Defensive Next Generation Development</p> <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 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: - Develop new 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 2018 Plans: Will deliver 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>		0.000	14.719	9.973
<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 2016 Accomplishments: - Continued developmental testing support for new defensive capabilities and provided network environment for such testing</p> <p>FY 2017 Plans: - Continue developmental testing support for new defensive capabilities and provide for network environment for such testing</p> <p>FY 2018 Plans: - Will provide the required developmental testing for new platform, access, and capability products prior to fielding</p>		0.143	0.420	1.000
Accomplishments/Planned Programs Subtotals		0.143	22.378	13.176

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item # 831010: COMSEC Equipment	8.698	19.878	20.703	0.000	20.703	25.498	21.382	21.770	25.192	0.00	0.000

Remarks

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: FY 2018 Air Force **Date:** May 2017

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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.000		3.200	Jun 2017	0.000	Jun 2018	0.000		0.000	Continuing	Continuing	-
Cyber Threat Mitigation - Forensic Analysis	C/FFP	Various : Various	-	0.000		1.617	Jun 2017	0.000	Jun 2018	0.000		0.000	Continuing	Continuing	-
Cyber Threat Mitigation - Visual Analysis Environment	C/FFP	Various : Various	-	0.000		0.120	Mar 2017	0.000	Mar 2018	0.000		0.000	Continuing	Continuing	-
Cyber Threat Mitigation - Distributed Source Code Control Vault	C/FFP	Various : Various	-	0.000		0.177	May 2017	0.000	May 2018	0.000		0.000	Continuing	Continuing	-
Cyber Threat Mitigation - Mission Oriented Mapping	C/CPFF	Various : Various	-	0.000		2.125	Jan 2017	2.203	Jan 2018	0.000		2.203	Continuing	Continuing	-
Defensive Next Gen - Data & Analysis	C/CPFF	Various : Various	-	0.000		8.105	Mar 2017	2.143	Mar 2018	0.000		2.143	Continuing	Continuing	-
Defensive Next Gen - Training Simulator	C/FFP	Various : Various	-	0.000		5.440	Apr 2017	2.230	Apr 2018	0.000		2.230	Continuing	Continuing	-
Defensive Next Gen - Disc Forensics Solution	C/FFP	Various : Various	-	0.000		0.000		1.500	Mar 2018	0.000		1.500	Continuing	Continuing	-
Defensive Next Gen - Data Collection and Correlation	C/FFP	Various : Various	-	0.000		0.000		1.726	Mar 2018	0.000		1.726	Continuing	Continuing	-
Defensive Next Gen - Cloudshield Capabilities	C/FFP	Various : Various	-	0.000		0.000		1.200	Aug 2018	0.000		1.200	Continuing	Continuing	-
Subtotal			-	0.000		20.784		11.002		0.000		11.002	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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			-	-		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

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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Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.143		0.420	Oct 2016	1.000	Oct 2017	0.000		1.000	Continuing	Continuing	-
Subtotal			-	0.143		0.420		1.000		0.000		1.000	-	-	-

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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	-	0.000	Jan 2016	1.174	Jan 2017	1.174	Jan 2018	0.000		1.174	Continuing	Continuing	-
Subtotal			-	0.000		1.174		1.174		0.000		1.174	-	-	-

Remarks
Provides program engineering continuity, technical maturation and expertise, and access to an extensive professional network for future capabilities.

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.143	22.378	13.176	0.000	13.176	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 Threat Mitigation (Malware Analysis)																												
Cyber Threat Mitigation (Forensic Analysis)																												
Cyber Threat (Visual Analysis Environment)																												
Cyber Threat Mitigation (Distributed Source Code Control Vault)																												
Cyber Threat Mitigation (Mission Oriented Mapping)																												
Defensive Next Generation Development (Data & Analysis)																												
Defensive Next Generation (Training Simulator)																												
Defensive Next Generation (Disc Forensics Solution)																												
Defensive Next Generation (Data Collection and Correlation)																												
Defensive Next Generation (Cloudshield Capabilities)																												
Test & Evaluation																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
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	2022
Defensive Next Generation (Training Simulator)	3	2017	4	2022
Defensive Next Generation (Disc Forensics Solution)	2	2018	4	2022
Defensive Next Generation (Data Collection and Correlation)	2	2018	4	2022
Defensive Next Generation (Cloudshield Capabilities)	4	2018	4	2022
Test & Evaluation	2	2016	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force **Date:** May 2017

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
677822: Cyber Defense Analysis	-	0.252	0.258	0.026	0.000	0.026	0.270	0.276	0.281	0.287	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 2016	FY 2017	FY 2018
Title: Cyber Defense Analysis - Assessments	0.252	0.258	0.026
Description: Engineering support to conduct Cyberspace Defense Analysis (CDA) assessment of non-secure telecommunications during peace time and contingency operations.			
FY 2016 Accomplishments: - Supported CDA technical maturation and development of technologies to prevent disclosure of sensitive and/or classified information to adversaries			
FY 2017 Plans: - Continue support of 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 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			
Accomplishments/Planned Programs Subtotals	0.252	0.258	0.026

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF: BA03: Line Item#	2.136	0.244	3.940	0.000	3.940	1.268	1.279	1.284	7.349	0.000	0.000
831010: COMSEC Equipment											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force	Date: May 2017
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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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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</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-2A, RDT&E Project Justification: FY 2018 Air Force **Date: May 2017**

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
677823: AFCERT	-	1.222	1.248	1.271	0.000	1.271	1.307	1.336	1.359	1.386	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.

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

	FY 2016	FY 2017	FY 2018
Title: Cyberspace Defense Development	1.222	1.248	1.271
Description: Air Force Computer Emergency Response Team (AFCERT) prevention, detection, and response to adversarial penetration into AF unclassified and classified networks.			
FY 2016 Accomplishments: -Funding was not executed as part of the AFCERT BPAC 677823 for ACD requirements. Funding was reallocated to the FIRESTARTER BPAC 677820.			
FY 2017 Plans: -Funding was not executed as part of the AFCERT BPAC 677823 for ACD requirements. Funding was reallocated to the FIRESTARTER BPAC 677820.			
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			
Accomplishments/Planned Programs Subtotals	1.222	1.248	1.271

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To		
			Base	OCO	Total					Complete	Total Cost	
• OPAF: BA03: Line Item # 831010: COMSEC Equipment	0.238	0.242	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• OPAF: BA03: Line Item # 835080: AFNET	0.000	7.736	31.206	0.000	31.206	31.850	23.023	23.436	33.041		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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