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**Department of Defense
Fiscal Year (FY) 2017 Request for Additional Appropriations**

March 2017



Air Force

Justification Book Volume 1 of 1

Research, Development, Test & Evaluation, Air Force

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Air Force • Request for Additional Appropriations FY 2017 • RDT&E Program

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March Budget Amendment to the FY 2017 President's Budget Request for BASE + Overseas Contingency Operations (OCO)
Exhibit R-1 March Budget Amendment to the FY 2017 President's Budget Request for BASE + Overseas Contingency Operations (OCO)
Total Obligational Authority 10 Mar 2017
(Dollars in Thousands)

Appropriation -----	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO
Research, Development, Test & Eval, AF	28,112,251	842,082	28,954,333	32,905
Total Research, Development, Test & Evaluation	28,112,251	842,082	28,954,333	32,905

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R-1AMF: Budget Amendment to the FY 2017 President's Budget Request (Published Version), as of March 10, 2017 at 09:24:38

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Appropriation -----	FY 2017 Nov Amended Request OCO -----	FY 2017 Mar Amended Request OCO -----	FY 2017 Total OCO Request -----	FY 2017 Less Enacted Div.B,P.L. 114-254 OCO -----
Research, Development, Test & Eval, AF		72,800	105,705	
Total Research, Development, Test & Evaluation		72,800	105,705	

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Research, Development, Test & Eval, AF	105,705	28,145,156	914,882	29,060,038
Total Research, Development, Test & Evaluation	105,705	28,145,156	914,882	29,060,038

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 (Dollars in Thousands) 10 Mar 2017

	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO
Summary Recap of Budget Activities -----				
Basic Research	500,024		500,024	
Applied Research	1,260,152		1,260,152	
Advanced Technology Development	725,805		725,805	
Advanced Component Development & Prototypes	2,847,833	200,000	3,047,833	
System Development & Demonstration	4,075,804	59,900	4,135,704	425
Management Support	1,245,577	123,800	1,369,377	
Operational Systems Development	17,457,056	458,382	17,915,438	32,480
Total Research, Development, Test & Evaluation	28,112,251	842,082	28,954,333	32,905
Summary Recap of FYDP Programs -----				
Strategic Forces	636,723	10,000	646,723	
General Purpose Forces	2,203,903	178,700	2,382,603	
Intelligence and Communications	1,850,451	132,846	1,983,297	4,715
Mobility Forces	505,020	12,000	517,020	
Research and Development	9,680,261	356,700	10,036,961	425
Central Supply and Maintenance	105,997		105,997	
Training Medical and Other	3,114		3,114	

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Administration and Associated Activities	30,441	30,441
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Summary Recap of Budget Activities -----				
Basic Research				
Applied Research				
Advanced Technology Development				
Advanced Component Development & Prototypes		4,700	4,700	
System Development & Demonstration		11,000	11,425	
Management Support				
Operational Systems Development		57,100	89,580	
Total Research, Development, Test & Evaluation		72,800	105,705	
Summary Recap of FYDP Programs -----				
Strategic Forces				
General Purpose Forces				
Intelligence and Communications		4,700	9,415	
Mobility Forces				
Research and Development		11,000	11,425	
Central Supply and Maintenance				
Training Medical and Other				

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Administration and Associated Activities

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Summary Recap of Budget Activities -----				
Basic Research		500,024		500,024
Applied Research		1,260,152		1,260,152
Advanced Technology Development		725,805		725,805
Advanced Component Development & Prototypes	4,700	2,847,833	204,700	3,052,533
System Development & Demonstration	11,425	4,076,229	70,900	4,147,129
Management Support		1,245,577	123,800	1,369,377
Operational Systems Development	89,580	17,489,536	515,482	18,005,018
Total Research, Development, Test & Evaluation	105,705	28,145,156	914,882	29,060,038
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Strategic Forces		636,723	10,000	646,723
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Administration and Associated Activities 30,441 30,441

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	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO
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Support of Other Nations	4,784		4,784	
Classified Programs	13,091,557	151,836	13,243,393	27,765
Total Research, Development, Test & Evaluation	28,112,251	842,082	28,954,333	32,905

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(Dollars in Thousands) 10 Mar 2017

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

Line No	Program Element Number	Item	Act	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO	Se
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1	0601102F	Defense Research Sciences	01	340,812		340,812		U
2	0601103F	University Research Initiatives	01	145,044		145,044		U
3	0601108F	High Energy Laser Research Initiatives	01	14,168		14,168		U
		Basic Research		500,024		500,024		
4	0602102F	Materials	02	126,152		126,152		U
5	0602201F	Aerospace Vehicle Technologies	02	122,831		122,831		U
6	0602202F	Human Effectiveness Applied Research	02	111,647		111,647		U
7	0602203F	Aerospace Propulsion	02	185,671		185,671		U
8	0602204F	Aerospace Sensors	02	155,174		155,174		U
9	0602601F	Space Technology	02	117,915		117,915		U
10	0602602F	Conventional Munitions	02	109,649		109,649		U
11	0602605F	Directed Energy Technology	02	127,163		127,163		U
12	0602788F	Dominant Information Sciences and Methods	02	161,650		161,650		U
13	0602890F	High Energy Laser Research	02	42,300		42,300		U
		Applied Research		1,260,152		1,260,152		
14	0603112F	Advanced Materials for Weapon Systems	03	35,137		35,137		U

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15	0603199F	Sustainment Science and Technology (S&T)	03	20,636	20,636	U
16	0603203F	Advanced Aerospace Sensors	03	40,945	40,945	U
17	0603211F	Aerospace Technology Dev/Demo	03	130,950	130,950	U
18	0603216F	Aerospace Propulsion and Power Technology	03	94,594	94,594	U

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1	0601102F	Defense Research Sciences	01					U
2	0601103F	University Research Initiatives	01					U
3	0601108F	High Energy Laser Research Initiatives	01					U
		Basic Research		-----	-----	-----	-----	
4	0602102F	Materials	02					U
5	0602201F	Aerospace Vehicle Technologies	02					U
6	0602202F	Human Effectiveness Applied Research	02					U
7	0602203F	Aerospace Propulsion	02					U
8	0602204F	Aerospace Sensors	02					U
9	0602601F	Space Technology	02					U
10	0602602F	Conventional Munitions	02					U
11	0602605F	Directed Energy Technology	02					U
12	0602788F	Dominant Information Sciences and Methods	02					U
13	0602890F	High Energy Laser Research	02					U
		Applied Research		-----	-----	-----	-----	
14	0603112F	Advanced Materials for Weapon Systems	03					U

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15	0603199F	Sustainment Science and Technology (S&T)	03	U
16	0603203F	Advanced Aerospace Sensors	03	U
17	0603211F	Aerospace Technology Dev/Demo	03	U
18	0603216F	Aerospace Propulsion and Power Technology	03	U

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2	0601103F	University Research Initiatives	01		145,044		145,044	U
3	0601108F	High Energy Laser Research Initiatives	01		14,168		14,168	U
		Basic Research			500,024		500,024	
4	0602102F	Materials	02		126,152		126,152	U
5	0602201F	Aerospace Vehicle Technologies	02		122,831		122,831	U
6	0602202F	Human Effectiveness Applied Research	02		111,647		111,647	U
7	0602203F	Aerospace Propulsion	02		185,671		185,671	U
8	0602204F	Aerospace Sensors	02		155,174		155,174	U
9	0602601F	Space Technology	02		117,915		117,915	U
10	0602602F	Conventional Munitions	02		109,649		109,649	U
11	0602605F	Directed Energy Technology	02		127,163		127,163	U
12	0602788F	Dominant Information Sciences and Methods	02		161,650		161,650	U
13	0602890F	High Energy Laser Research	02		42,300		42,300	U
		Applied Research			1,260,152		1,260,152	
14	0603112F	Advanced Materials for Weapon Systems	03		35,137		35,137	U

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15	0603199F	Sustainment Science and Technology (S&T)	03	20,636	20,636	U
16	0603203F	Advanced Aerospace Sensors	03	40,945	40,945	U
17	0603211F	Aerospace Technology Dev/Demo	03	130,950	130,950	U
18	0603216F	Aerospace Propulsion and Power Technology	03	94,594	94,594	U

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 Exhibit R-1 March Budget Amendment to the FY 2017 President's Budget Request for BASE + Overseas Contingency Operations (OCO)
 Total Obligational Authority 10 Mar 2017
 (Dollars in Thousands)

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

Line No	Program Element Number	Item	Act	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO	Se
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19	0603270F	Electronic Combat Technology	03	58,250		58,250		U
20	0603401F	Advanced Spacecraft Technology	03	61,593		61,593		U
21	0603444F	Maui Space Surveillance System (MSSS)	03	11,681		11,681		U
22	0603456F	Human Effectiveness Advanced Technology Development	03	26,492		26,492		U
23	0603601F	Conventional Weapons Technology	03	102,009		102,009		U
24	0603605F	Advanced Weapons Technology	03	39,064		39,064		U
25	0603680F	Manufacturing Technology Program	03	46,344		46,344		U
26	0603788F	Battlespace Knowledge Development and Demonstration	03	58,110		58,110		U
		Advanced Technology Development		725,805		725,805		
27	0603260F	Intelligence Advanced Development	04	5,598		5,598		U
28	0603438F	Space Control Technology	04	7,534		7,534		U
29	0603742F	Combat Identification Technology	04	24,418		24,418		U
30	0603790F	NATO Research and Development	04	4,333		4,333		U
31	0603830F	Space Security and Defense Program	04	32,399		32,399		U
32	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	108,663		108,663		U
33	0604015F	Long Range Strike - Bomber	04	1,358,309		1,358,309		U

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34	0604257F	Advanced Technology and Sensors	04	34,818	34,818	U
35	0604317F	Technology Transfer	04	3,368	3,368	U
36	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	74,308	74,308	U
37	0604414F	Cyber Resiliency of Weapon Systems-ACS	04	40,000	40,000	U

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(Dollars in Thousands) 10 Mar 2017

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19	0603270F	Electronic Combat Technology	03					U
20	0603401F	Advanced Spacecraft Technology	03					U
21	0603444F	Maui Space Surveillance System (MSSS)	03					U
22	0603456F	Human Effectiveness Advanced Technology Development	03					U
23	0603601F	Conventional Weapons Technology	03					U
24	0603605F	Advanced Weapons Technology	03					U
25	0603680F	Manufacturing Technology Program	03					U
26	0603788F	Battlespace Knowledge Development and Demonstration	03	-----	-----	-----	-----	U
		Advanced Technology Development						
27	0603260F	Intelligence Advanced Development	04					U
28	0603438F	Space Control Technology	04					U
29	0603742F	Combat Identification Technology	04					U
30	0603790F	NATO Research and Development	04					U
31	0603830F	Space Security and Defense Program	04					U
32	0603851F	Intercontinental Ballistic Missile - Dem/Val	04					U
33	0604015F	Long Range Strike - Bomber	04					U

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34	0604257F	Advanced Technology and Sensors	04	U
35	0604317F	Technology Transfer	04	U
36	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	U
37	0604414F	Cyber Resiliency of Weapon Systems-ACS	04	U

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19	0603270F	Electronic Combat Technology	03		58,250		58,250	U
20	0603401F	Advanced Spacecraft Technology	03		61,593		61,593	U
21	0603444F	Mauai Space Surveillance System (MSSS)	03		11,681		11,681	U
22	0603456F	Human Effectiveness Advanced Technology Development	03		26,492		26,492	U
23	0603601F	Conventional Weapons Technology	03		102,009		102,009	U
24	0603605F	Advanced Weapons Technology	03		39,064		39,064	U
25	0603680F	Manufacturing Technology Program	03		46,344		46,344	U
26	0603788F	Battlespace Knowledge Development and Demonstration	03		58,110		58,110	U
		Advanced Technology Development		-----	725,805	-----	725,805	
27	0603260F	Intelligence Advanced Development	04		5,598		5,598	U
28	0603438F	Space Control Technology	04		7,534		7,534	U
29	0603742F	Combat Identification Technology	04		24,418		24,418	U
30	0603790F	NATO Research and Development	04		4,333		4,333	U
31	0603830F	Space Security and Defense Program	04		32,399		32,399	U
32	0603851F	Intercontinental Ballistic Missile - Dem/Val	04		108,663		108,663	U
33	0604015F	Long Range Strike - Bomber	04		1,358,309		1,358,309	U

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34	0604257F	Advanced Technology and Sensors	04	34,818	34,818	U
35	0604317F	Technology Transfer	04	3,368	3,368	U
36	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	74,308	74,308	U
37	0604414F	Cyber Resiliency of Weapon Systems-ACS	04		40,000	40,000 U

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Line No	Program Element Number	Item	Act	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO	Se
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38	0604422F	Weather System Follow-on	04	118,953		118,953		U
39	0604425F	Space Situation Awareness Systems	04	9,901	1,000	10,901		U
40	0604776F	Deployment & Distribution Enterprise R&D	04	25,890		25,890		U
41	0604857F	Operationally Responsive Space	04	7,921	10,000	17,921		U
42	0604858F	Tech Transition Program	04	347,304	2,000	349,304		U
43	0605230F	Ground Based Strategic Deterrent	04	113,919		113,919		U
44	0207110F	Next Generation Air Dominance	04	20,595	147,000	167,595		U
45	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	49,491		49,491		U
46	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04	278,147		278,147		U
47	0305236F	Common Data Link Executive Agent (CDL EA)	04	42,338		42,338		U
48	0306250F	Cyber Operations Technology Development	04	158,002		158,002		U
49	0306415F	Enabled Cyber Activities	04	15,842		15,842		U
50	0901410F	Contracting Information Technology System	04	5,782		5,782		U
		Advanced Component Development & Prototypes		2,847,833	200,000	3,047,833		
51	0604270F	Electronic Warfare Development	05	12,476		12,476		U
52	0604281F	Tactical Data Networks Enterprise	05	82,380		82,380		U

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53	0604287F	Physical Security Equipment	05	8,458	16,000	24,458	U
54	0604329F	Small Diameter Bomb (SDB) - EMD	05	54,838		54,838	U
55	0604421F	Counterspace Systems	05	34,394	7,100	41,494	425 U
56	0604425F	Space Situation Awareness Systems	05	23,945		23,945	U

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38	0604422F	Weather System Follow-on	04					U
39	0604425F	Space Situation Awareness Systems	04					U
40	0604776F	Deployment & Distribution Enterprise R&D	04					U
41	0604857F	Operationally Responsive Space	04					U
42	0604858F	Tech Transition Program	04					U
43	0605230F	Ground Based Strategic Deterrent	04					U
44	0207110F	Next Generation Air Dominance	04					U
45	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04					U
46	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04					U
47	0305236F	Common Data Link Executive Agent (CDL EA)	04					U
48	0306250F	Cyber Operations Technology Development	04		4,700	4,700		U
49	0306415F	Enabled Cyber Activities	04					U
50	0901410F	Contracting Information Technology System	04					U
		Advanced Component Development & Prototypes			4,700	4,700		
51	0604270F	Electronic Warfare Development	05					U
52	0604281F	Tactical Data Networks Enterprise	05					U

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53	0604287F	Physical Security Equipment	05	11,000	11,000	U
54	0604329F	Small Diameter Bomb (SDB) - EMD	05			U
55	0604421F	Counterspace Systems	05		425	U
56	0604425F	Space Situation Awareness Systems	05			U

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38	0604422F	Weather System Follow-on	04		118,953		118,953	U
39	0604425F	Space Situation Awareness Systems	04		9,901	1,000	10,901	U
40	0604776F	Deployment & Distribution Enterprise R&D	04		25,890		25,890	U
41	0604857F	Operationally Responsive Space	04		7,921	10,000	17,921	U
42	0604858F	Tech Transition Program	04		347,304	2,000	349,304	U
43	0605230F	Ground Based Strategic Deterrent	04		113,919		113,919	U
44	0207110F	Next Generation Air Dominance	04		20,595	147,000	167,595	U
45	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04		49,491		49,491	U
46	0305164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04		278,147		278,147	U
47	0305236F	Common Data Link Executive Agent (CDL EA)	04		42,338		42,338	U
48	0306250F	Cyber Operations Technology Development	04	4,700	158,002	4,700	162,702	U
49	0306415F	Enabled Cyber Activities	04		15,842		15,842	U
50	0901410F	Contracting Information Technology System	04		5,782		5,782	U
		Advanced Component Development & Prototypes		4,700	2,847,833	204,700	3,052,533	
51	0604270F	Electronic Warfare Development	05		12,476		12,476	U
52	0604281F	Tactical Data Networks Enterprise	05		82,380		82,380	U

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53	0604287F	Physical Security Equipment	05	11,000	8,458	27,000	35,458	U
54	0604329F	Small Diameter Bomb (SDB) - EMD	05		54,838		54,838	U
55	0604421F	Counterspace Systems	05	425	34,819	7,100	41,919	U
56	0604425F	Space Situation Awareness Systems	05		23,945		23,945	U

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Line No	Program Element Number	Item	Act	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO	Se
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57	0604426F	Space Fence	05	168,364		168,364		U
58	0604429F	Airborne Electronic Attack	05	9,187		9,187		U
59	0604441F	Space Based Infrared System (SBIRS) High EMD	05	181,966	36,800	218,766		U
60	0604602F	Armament/Ordnance Development	05	20,312		20,312		U
61	0604604F	Submunitions	05	2,503		2,503		U
62	0604617F	Agile Combat Support	05	53,680		53,680		U
63	0604618F	Joint Direct Attack Munition	05	9,901		9,901		U
64	0604706F	Life Support Systems	05	7,520		7,520		U
65	0604735F	Combat Training Ranges	05	77,409		77,409		U
66	0604800F	F-35 - EMD	05	450,467		450,467		U
67	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05	296,572		296,572		U
68	0604932F	Long Range Standoff Weapon	05	95,604		95,604		U
69	0604933F	ICBM Fuze Modernization	05	189,751		189,751		U
70	0605030F	Joint Tactical Network Center (JTNC)	05	1,131		1,131		U
71	0605213F	F-22 Modernization Increment 3.2B	05	70,290		70,290		U
72	0605214F	Ground Attack Weapons Fuze Development	05	937		937		U

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73	0605221F	KC-46	05	261,724	261,724	U
74	0605223F	Advanced Pilot Training	05	12,377	12,377	U
75	0605229F	Combat Rescue Helicopter	05	319,331	319,331	U
76	0605431F	Advanced EHF MILSATCOM (SPACE)	05	259,131	259,131	U

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57	0604426F	Space Fence	05					U
58	0604429F	Airborne Electronic Attack	05					U
59	0604441F	Space Based Infrared System (SBIRS) High EMD	05					U
60	0604602F	Armament/Ordnance Development	05					U
61	0604604F	Submunitions	05					U
62	0604617F	Agile Combat Support	05					U
63	0604618F	Joint Direct Attack Munition	05					U
64	0604706F	Life Support Systems	05					U
65	0604735F	Combat Training Ranges	05					U
66	0604800F	F-35 - EMD	05					U
67	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05					U
68	0604932F	Long Range Standoff Weapon	05					U
69	0604933F	ICBM Fuze Modernization	05					U
70	0605030F	Joint Tactical Network Center (JTNC)	05					U
71	0605213F	F-22 Modernization Increment 3.2B	05					U
72	0605214F	Ground Attack Weapons Fuze Development	05					U

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73	0605221F	KC-46	05	U
74	0605223F	Advanced Pilot Training	05	U
75	0605229F	Combat Rescue Helicopter	05	U
76	0605431F	Advanced EHF MILSATCOM (SPACE)	05	U

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57	0604426F	Space Fence	05		168,364		168,364	U
58	0604429F	Airborne Electronic Attack	05		9,187		9,187	U
59	0604441F	Space Based Infrared System (SBIRS) High EMD	05		181,966	36,800	218,766	U
60	0604602F	Armament/Ordnance Development	05		20,312		20,312	U
61	0604604F	Submunitions	05		2,503		2,503	U
62	0604617F	Agile Combat Support	05		53,680		53,680	U
63	0604618F	Joint Direct Attack Munition	05		9,901		9,901	U
64	0604706F	Life Support Systems	05		7,520		7,520	U
65	0604735F	Combat Training Ranges	05		77,409		77,409	U
66	0604800F	F-35 - EMD	05		450,467		450,467	U
67	0604853F	Evolved Expendable Launch Vehicle Program (SPACE) - EMD	05		296,572		296,572	U
68	0604932F	Long Range Standoff Weapon	05		95,604		95,604	U
69	0604933F	ICBM Fuze Modernization	05		189,751		189,751	U
70	0605030F	Joint Tactical Network Center (JTNC)	05		1,131		1,131	U
71	0605213F	F-22 Modernization Increment 3.2B	05		70,290		70,290	U
72	0605214F	Ground Attack Weapons Fuze Development	05		937		937	U

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73	0605221F	KC-46	05	261,724	261,724	U
74	0605223F	Advanced Pilot Training	05	12,377	12,377	U
75	0605229F	Combat Rescue Helicopter	05	319,331	319,331	U
76	0605431F	Advanced EHF MILSATCOM (SPACE)	05	259,131	259,131	U

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77	0605432F	Polar MILSATCOM (SPACE)	05	50,815		50,815		U
78	0605433F	Wideband Global SATCOM (SPACE)	05	41,632		41,632		U
79	0605458F	Air & Space Ops Center 10.2 RDT&E	05	28,911		28,911		U
80	0605931F	B-2 Defensive Management System	05	315,615		315,615		U
81	0101125F	Nuclear Weapons Modernization	05	137,909		137,909		U
82	0207171F	F-15 EPAWSS	05	256,669		256,669		U
83	0207701F	Full Combat Mission Training	05	12,051		12,051		U
84	0305176F	Combat Survivor Evader Locator	05	29,253		29,253		U
85	0307581F	JSTARS Recap	05	128,019		128,019		U
86	0401319F	Presidential Aircraft Recapitalization (PAR)	05	351,220		351,220		U
87	0701212F	Automated Test Systems	05	19,062		19,062		U
		System Development & Demonstration		4,075,804	59,900	4,135,704	425	
88	0604256F	Threat Simulator Development	06	21,630		21,630		U
89	0604759F	Major T&E Investment	06	66,385	5,000	71,385		U
90	0605101F	RAND Project Air Force	06	34,641		34,641		U
91	0605712F	Initial Operational Test & Evaluation	06	11,529		11,529		U

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92	0605807F	Test and Evaluation Support	06	661,417	18,800	680,217	U
93	0605860F	Rocket Systems Launch Program (SPACE)	06	11,198		11,198	U
94	0605864F	Space Test Program (STP)	06	27,070		27,070	U

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77	0605432F	Polar MILSATCOM (SPACE)	05					U
78	0605433F	Wideband Global SATCOM (SPACE)	05					U
79	0605458F	Air & Space Ops Center 10.2 RDT&E	05					U
80	0605931F	B-2 Defensive Management System	05					U
81	0101125F	Nuclear Weapons Modernization	05					U
82	0207171F	F-15 EPAWSS	05					U
83	0207701F	Full Combat Mission Training	05					U
84	0305176F	Combat Survivor Evader Locator	05					U
85	0307581F	JSTARS Recap	05					U
86	0401319F	Presidential Aircraft Recapitalization (PAR)	05					U
87	0701212F	Automated Test Systems	05					U
	System Development & Demonstration			-----	-----	-----	-----	
					11,000	11,425		
88	0604256F	Threat Simulator Development	06					U
89	0604759F	Major T&E Investment	06					U
90	0605101F	RAND Project Air Force	06					U
91	0605712F	Initial Operational Test & Evaluation	06					U

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92 0605807F	Test and Evaluation Support	06	U
93 0605860F	Rocket Systems Launch Program (SPACE)	06	U
94 0605864F	Space Test Program (STP)	06	U

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March Budget Amendment to the FY 2017 President's Budget Request for BASE + Overseas Contingency Operations (OCO)
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 Total Obligational Authority
 (Dollars in Thousands)

10 Mar 2017

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

Line No	Program Element Number	Item	Act	FY 2017 Remaining PB Request OCO	FY 2017 PB Request wNov Amend Less Enacted PL 114-254 Base+OCO	FY 2017 Mar Amended Request Base+OCO	FY 2017 PB Remaining Base+OCO	S e c
77	0605432F	Polar MILSATCOM (SPACE)	05		50,815		50,815	U
78	0605433F	Wideband Global SATCOM (SPACE)	05		41,632		41,632	U
79	0605458F	Air & Space Ops Center 10.2 RDT&E	05		28,911		28,911	U
80	0605931F	B-2 Defensive Management System	05		315,615		315,615	U
81	0101125F	Nuclear Weapons Modernization	05		137,909		137,909	U
82	0207171F	F-15 EPAWSS	05		256,669		256,669	U
83	0207701F	Full Combat Mission Training	05		12,051		12,051	U
84	0305176F	Combat Survivor Evader Locator	05		29,253		29,253	U
85	0307581F	JSTARS Recap	05		128,019		128,019	U
86	0401319F	Presidential Aircraft Recapitalization (PAR)	05		351,220		351,220	U
87	0701212F	Automated Test Systems	05		19,062		19,062	U
		System Development & Demonstration		11,425	4,076,229	70,900	4,147,129	
88	0604256F	Threat Simulator Development	06		21,630		21,630	U
89	0604759F	Major T&E Investment	06		66,385	5,000	71,385	U
90	0605101F	RAND Project Air Force	06		34,641		34,641	U
91	0605712F	Initial Operational Test & Evaluation	06		11,529		11,529	U

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92	0605807F	Test and Evaluation Support	06	661,417	18,800	680,217	U
93	0605860F	Rocket Systems Launch Program (SPACE)	06	11,198		11,198	U
94	0605864F	Space Test Program (STP)	06	27,070		27,070	U

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(Dollars in Thousands) 10 Mar 2017

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Line No	Program Element Number	Item	Act	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO	Se
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95	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	134,111		134,111		U
96	0605978F	Facilities Sustainment - Test and Evaluation Support	06	28,091		28,091		U
97	0606017F	Requirements Analysis and Maturation	06	29,100	100,000	129,100		U
98	0606116F	Space Test and Training Range Development	06	18,528		18,528		U
99	0606392F	Space and Missile Center (SMC) Civilian Workforce	06	176,666		176,666		U
100	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	4,410		4,410		U
101	0702806F	Acquisition and Management Support	06	14,613		14,613		U
102	0804731F	General Skill Training	06	1,404		1,404		U
103	1001004F	International Activities	06	4,784		4,784		U
		Management Support		1,245,577	123,800	1,369,377		
104	0603423F	Global Positioning System III - Operational Control Segment	07	393,268	120,000	513,268		U
105	0604233F	Specialized Undergraduate Flight Training	07	15,427		15,427		U
106	0604445F	Wide Area Surveillance	07	46,695		46,695		U
107	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	10,368		10,368		U
108	0605024F	Anti-Tamper Technology Executive Agency	07	31,952		31,952		U
109	0605117F	Foreign Materiel Acquisition and Exploitation	07	42,960		42,960		U

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110	0605278F	HC/MC-130 Recap RDT&E	07	13,987		13,987	U
111	0101113F	B-52 Squadrons	07	78,267	10,000	88,267	U
112	0101122F	Air-Launched Cruise Missile (ALCM)	07	453		453	U

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95	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06					U
96	0605978F	Facilities Sustainment - Test and Evaluation Support	06					U
97	0606017F	Requirements Analysis and Maturation	06					U
98	0606116F	Space Test and Training Range Development	06					U
99	0606392F	Space and Missile Center (SMC) Civilian Workforce	06					U
100	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06					U
101	0702806F	Acquisition and Management Support	06					U
102	0804731F	General Skill Training	06					U
103	1001004F	International Activities	06					U
	Management Support			-----	-----	-----	-----	
104	0603423F	Global Positioning System III - Operational Control Segment	07					U
105	0604233F	Specialized Undergraduate Flight Training	07					U
106	0604445F	Wide Area Surveillance	07					U
107	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07					U
108	0605024F	Anti-Tamper Technology Executive Agency	07					U
109	0605117F	Foreign Materiel Acquisition and Exploitation	07					U

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110 0605278F	HC/MC-130 Recap RDT&E	07	U
111 0101113F	B-52 Squadrons	07	U
112 0101122F	Air-Launched Cruise Missile (ALCM)	07	U

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95	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06		134,111		134,111	U
96	0605978F	Facilities Sustainment - Test and Evaluation Support	06		28,091		28,091	U
97	0606017F	Requirements Analysis and Maturation	06		29,100	100,000	129,100	U
98	0606116F	Space Test and Training Range Development	06		18,528		18,528	U
99	0606392F	Space and Missile Center (SMC) Civilian Workforce	06		176,666		176,666	U
100	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06		4,410		4,410	U
101	0702806F	Acquisition and Management Support	06		14,613		14,613	U
102	0804731F	General Skill Training	06		1,404		1,404	U
103	1001004F	International Activities	06		4,784		4,784	U
		Management Support		-----	-----	-----	-----	
					1,245,577	123,800	1,369,377	
104	0603423F	Global Positioning System III - Operational Control Segment	07		393,268	120,000	513,268	U
105	0604233F	Specialized Undergraduate Flight Training	07		15,427		15,427	U
106	0604445F	Wide Area Surveillance	07		46,695		46,695	U
107	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07		10,368		10,368	U
108	0605024F	Anti-Tamper Technology Executive Agency	07		31,952		31,952	U
109	0605117F	Foreign Materiel Acquisition and Exploitation	07		42,960		42,960	U

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110 0605278F	HC/MC-130 Recap RDT&E	07	13,987		13,987	U
111 0101113F	B-52 Squadrons	07	78,267	10,000	88,267	U
112 0101122F	Air-Launched Cruise Missile (ALCM)	07	453		453	U

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113	0101126F	B-1B Squadrons	07	5,830		5,830		U
114	0101127F	B-2 Squadrons	07	152,458		152,458		U
115	0101213F	Minuteman Squadrons	07	182,958		182,958		U
116	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07	39,148		39,148		U
117	0101316F	Worldwide Joint Strategic Communications	07	6,042		6,042		U
119	0102110F	UH-1N Replacement Program	07	14,116		14,116		U
120	0102326F	Region/Sector Operation Control Center Modernization Program	07	10,868		10,868		U
121	0105921F	Service Support to STRATCOM - Space Activities	07	8,674		8,674		U
122	0205219F	MQ-9 UAV	07	151,373		151,373		U
123	0207131F	A-10 Squadrons	07	14,853	6,500	21,353		U
124	0207133F	F-16 Squadrons	07	132,795	15,000	147,795		U
125	0207134F	F-15E Squadrons	07	356,717		356,717		U
126	0207136F	Manned Destructive Suppression	07	14,773		14,773		U
127	0207138F	F-22A Squadrons	07	387,564		387,564		U
128	0207142F	F-35 Squadrons	07	153,045		153,045		U
129	0207161F	Tactical AIM Missiles	07	52,898		52,898		U

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130	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	62,470	62,470	U
131	0207227F	Combat Rescue - Pararescue	07	362	362	U
132	0207247F	AF TENCAP	07	28,413	28,413	U

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113	0101126F	B-1B Squadrons	07					U
114	0101127F	B-2 Squadrons	07					U
115	0101213F	Minuteman Squadrons	07					U
116	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07					U
117	0101316F	Worldwide Joint Strategic Communications	07					U
119	0102110F	UH-1N Replacement Program	07					U
120	0102326F	Region/Sector Operation Control Center Modernization Program	07					U
121	0105921F	Service Support to STRATCOM - Space Activities	07					U
122	0205219F	MQ-9 UAV	07					U
123	0207131F	A-10 Squadrons	07					U
124	0207133F	F-16 Squadrons	07					U
125	0207134F	F-15E Squadrons	07					U
126	0207136F	Manned Destructive Suppression	07					U
127	0207138F	F-22A Squadrons	07					U
128	0207142F	F-35 Squadrons	07					U
129	0207161F	Tactical AIM Missiles	07					U

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130 0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	U
131 0207227F	Combat Rescue - Pararescue	07	U
132 0207247F	AF TENCAP	07	U

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113	0101126F	B-1B Squadrons	07		5,830		5,830	U
114	0101127F	B-2 Squadrons	07		152,458		152,458	U
115	0101213F	Minuteman Squadrons	07		182,958		182,958	U
116	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07		39,148		39,148	U
117	0101316F	Worldwide Joint Strategic Communications	07		6,042		6,042	U
119	0102110F	UH-1N Replacement Program	07		14,116		14,116	U
120	0102326F	Region/Sector Operation Control Center Modernization Program	07		10,868		10,868	U
121	0105921F	Service Support to STRATCOM - Space Activities	07		8,674		8,674	U
122	0205219F	MQ-9 UAV	07		151,373		151,373	U
123	0207131F	A-10 Squadrons	07		14,853	6,500	21,353	U
124	0207133F	F-16 Squadrons	07		132,795	15,000	147,795	U
125	0207134F	F-15E Squadrons	07		356,717		356,717	U
126	0207136F	Manned Destructive Suppression	07		14,773		14,773	U
127	0207138F	F-22A Squadrons	07		387,564		387,564	U
128	0207142F	F-35 Squadrons	07		153,045		153,045	U
129	0207161F	Tactical AIM Missiles	07		52,898		52,898	U

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130	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	62,470	62,470	U
131	0207227F	Combat Rescue - Pararescue	07	362	362	U
132	0207247F	AF TENCAP	07	28,413	28,413	U

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133	0207249F	Precision Attack Systems Procurement	07	649		649		U
134	0207253F	Compass Call	07	13,723	10,200	23,923		U
135	0207268F	Aircraft Engine Component Improvement Program	07	109,859		109,859		U
136	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	30,002		30,002		U
137	0207410F	Air & Space Operations Center (AOC)	07	37,621		37,621		U
138	0207412F	Control and Reporting Center (CRC)	07	13,292		13,292		U
139	0207417F	Airborne Warning and Control System (AWACS)	07	86,644		86,644		U
140	0207418F	Tactical Airborne Control Systems	07	2,442		2,442		U
142	0207431F	Combat Air Intelligence System Activities	07	10,911		10,911		U
143	0207444F	Tactical Air Control Party-Mod	07	11,843		11,843		U
144	0207448F	C2ISR Tactical Data Link	07	1,515		1,515		U
145	0207452F	DCAPES	07	14,979		14,979		U
146	0207590F	Seek Eagle	07	25,308		25,308		U
147	0207601F	USAF Modeling and Simulation	07	16,666		16,666		U
148	0207605F	Wargaming and Simulation Centers	07	4,245		4,245		U
149	0207697F	Distributed Training and Exercises	07	3,886		3,886		U

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150	0208006F	Mission Planning Systems	07	71,785	71,785	U
151	0208087F	AF Offensive Cyberspace Operations	07	25,025	25,025	U
152	0208088F	AF Defensive Cyberspace Operations	07	29,439	29,439	U
155	0301017F	Global Sensor Integrated on Network (GSIN)	07	3,470	3,470	U

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133	0207249F	Precision Attack Systems Procurement	07					U
134	0207253F	Compass Call	07					U
135	0207268F	Aircraft Engine Component Improvement Program	07					U
136	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07					U
137	0207410F	Air & Space Operations Center (AOC)	07					U
138	0207412F	Control and Reporting Center (CRC)	07					U
139	0207417F	Airborne Warning and Control System (AWACS)	07					U
140	0207418F	Tactical Airborne Control Systems	07					U
142	0207431F	Combat Air Intelligence System Activities	07					U
143	0207444F	Tactical Air Control Party-Mod	07					U
144	0207448F	C2ISR Tactical Data Link	07					U
145	0207452F	DCAPES	07					U
146	0207590F	Seek Eagle	07					U
147	0207601F	USAF Modeling and Simulation	07					U
148	0207605F	Wargaming and Simulation Centers	07					U
149	0207697F	Distributed Training and Exercises	07					U

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150 0208006F	Mission Planning Systems	07	U
151 0208087F	AF Offensive Cyberspace Operations	07	U
152 0208088F	AF Defensive Cyberspace Operations	07	U
155 0301017F	Global Sensor Integrated on Network (GSIN)	07	U

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133	0207249F	Precision Attack Systems Procurement	07		649		649	U
134	0207253F	Compass Call	07		13,723	10,200	23,923	U
135	0207268F	Aircraft Engine Component Improvement Program	07		109,859		109,859	U
136	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07		30,002		30,002	U
137	0207410F	Air & Space Operations Center (AOC)	07		37,621		37,621	U
138	0207412F	Control and Reporting Center (CRC)	07		13,292		13,292	U
139	0207417F	Airborne Warning and Control System (AWACS)	07		86,644		86,644	U
140	0207418F	Tactical Airborne Control Systems	07		2,442		2,442	U
142	0207431F	Combat Air Intelligence System Activities	07		10,911		10,911	U
143	0207444F	Tactical Air Control Party-Mod	07		11,843		11,843	U
144	0207448F	C2ISR Tactical Data Link	07		1,515		1,515	U
145	0207452F	DCAPES	07		14,979		14,979	U
146	0207590F	Seek Eagle	07		25,308		25,308	U
147	0207601F	USAF Modeling and Simulation	07		16,666		16,666	U
148	0207605F	Wargaming and Simulation Centers	07		4,245		4,245	U
149	0207697F	Distributed Training and Exercises	07		3,886		3,886	U

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150	0208006F	Mission Planning Systems	07	71,785	71,785	U
151	0208087F	AF Offensive Cyberspace Operations	07	25,025	25,025	U
152	0208088F	AF Defensive Cyberspace Operations	07	29,439	29,439	U
155	0301017F	Global Sensor Integrated on Network (GSIN)	07	3,470	3,470	U

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156	0301112F	Nuclear Planning and Execution System (NPES)	07	4,060		4,060		U
163	0301400F	Space Superiority Intelligence	07	13,880		13,880		U
164	0302015F	E-4B National Airborne Operations Center (NAOC)	07	30,948		30,948		U
165	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07	42,378	10,200	52,578		U
166	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	47,471		47,471		U
167	0303140F	Information Systems Security Program	07	46,388		46,388		U
168	0303141F	Global Combat Support System	07	52		52		U
169	0303142F	Global Force Management - Data Initiative	07	2,099		2,099		U
171	0304260F	Airborne SIGINT Enterprise	07	90,762		90,762		U
174	0305099F	Global Air Traffic Management (GATM)	07	4,354		4,354		U
175	0305110F	Satellite Control Network (SPACE)	07	15,624		15,624		U
176	0305111F	Weather Service	07	19,974		19,974		U
177	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07	9,770		9,770		U
178	0305116F	Aerial Targets	07	3,051		3,051		U
181	0305128F	Security and Investigative Activities	07	405		405		U
182	0305145F	Arms Control Implementation	07	4,844		4,844		U

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183	0305146F	Defense Joint Counterintelligence Activities	07	339	339	U
186	0305173F	Space and Missile Test and Evaluation Center	07	3,989	3,989	U
187	0305174F	Space Innovation, Integration and Rapid Technology Development	07	3,070	3,070	4,715 U
188	0305179F	Integrated Broadcast Service (IBS)	07	8,833	8,833	U

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Department of the Air Force
 March Budget Amendment to the FY 2017 President's Budget Request for BASE + Overseas Contingency Operations (OCO)
 Exhibit R-1 March Budget Amendment to the FY 2017 President's Budget Request for BASE + Overseas Contingency Operations (OCO)
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 (Dollars in Thousands)

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

Line	Program Element No Number	Item	Act	FY 2017 Nov Amended Request OCO	FY 2017 Mar Amended Request OCO	FY 2017 Total OCO Request	FY 2017 Less Enacted Div.B,P.L. 114-254 OCO	S e c -
156	0301112F	Nuclear Planning and Execution System (NPES)	07					U
163	0301400F	Space Superiority Intelligence	07					U
164	0302015F	E-4B National Airborne Operations Center (NAOC)	07					U
165	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07					U
166	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07					U
167	0303140F	Information Systems Security Program	07					U
168	0303141F	Global Combat Support System	07					U
169	0303142F	Global Force Management - Data Initiative	07					U
171	0304260F	Airborne SIGINT Enterprise	07					U
174	0305099F	Global Air Traffic Management (GATM)	07					U
175	0305110F	Satellite Control Network (SPACE)	07					U
176	0305111F	Weather Service	07					U
177	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07					U
178	0305116F	Aerial Targets	07					U
181	0305128F	Security and Investigative Activities	07					U
182	0305145F	Arms Control Implementation	07					U

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183	0305146F	Defense Joint Counterintelligence Activities	07		U
186	0305173F	Space and Missile Test and Evaluation Center	07		U
187	0305174F	Space Innovation, Integration and Rapid Technology Development	07	4,715	U
188	0305179F	Integrated Broadcast Service (IBS)	07		U

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Department of the Air Force

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---	-----	----	---	-----	-----	-----	-----	-
156	0301112F	Nuclear Planning and Execution System (NPES)	07		4,060		4,060	U
163	0301400F	Space Superiority Intelligence	07		13,880		13,880	U
164	0302015F	E-4B National Airborne Operations Center (NAOC)	07		30,948		30,948	U
165	0303001F	Family of Advanced BLoS Terminals (FAB-T)	07		42,378	10,200	52,578	U
166	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07		47,471		47,471	U
167	0303140F	Information Systems Security Program	07		46,388		46,388	U
168	0303141F	Global Combat Support System	07		52		52	U
169	0303142F	Global Force Management - Data Initiative	07		2,099		2,099	U
171	0304260F	Airborne SIGINT Enterprise	07		90,762		90,762	U
174	0305099F	Global Air Traffic Management (GATM)	07		4,354		4,354	U
175	0305110F	Satellite Control Network (SPACE)	07		15,624		15,624	U
176	0305111F	Weather Service	07		19,974		19,974	U
177	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07		9,770		9,770	U
178	0305116F	Aerial Targets	07		3,051		3,051	U
181	0305128F	Security and Investigative Activities	07		405		405	U
182	0305145F	Arms Control Implementation	07		4,844		4,844	U

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183	0305146F	Defense Joint Counterintelligence Activities	07		339	339	U
186	0305173F	Space and Missile Test and Evaluation Center	07		3,989	3,989	U
187	0305174F	Space Innovation, Integration and Rapid Technology Development	07	4,715	7,785	7,785	U
188	0305179F	Integrated Broadcast Service (IBS)	07		8,833	8,833	U

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Total Obligational Authority
(Dollars in Thousands) 10 Mar 2017

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

Line No	Program Element Number	Item	Act	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO	Se
--	-----	----	---	-----	-----	-----	-----	-
189	0305182F	Spacelift Range System (SPACE)	07	11,867		11,867		U
190	0305202F	Dragon U-2	07	37,217		37,217		U
191	0305206F	Airborne Reconnaissance Systems	07	3,841		3,841		U
192	0305207F	Manned Reconnaissance Systems	07	20,975		20,975		U
193	0305208F	Distributed Common Ground/Surface Systems	07	18,902	11,546	30,448		U
194	0305220F	RQ-4 UAV	07	256,307		256,307		U
195	0305221F	Network-Centric Collaborative Targeting	07	22,610		22,610		U
196	0305238F	NATO AGS	07	38,904		38,904		U
197	0305240F	Support to DCGS Enterprise	07	23,084		23,084		U
198	0305258F	Advanced Evaluation Program	07	116,143		116,143		U
199	0305265F	GPS III Space Segment	07	141,888	37,300	179,188		U
200	0305600F	International Intelligence Technology and Architectures	07	2,360		2,360		U
201	0305614F	JSPOC Mission System	07	72,889	15,000	87,889		U
202	0305881F	Rapid Cyber Acquisition	07	4,280		4,280		U
203	0305906F	NCMC - TW/AA System	07	4,951		4,951		U
204	0305913F	NUDET Detection System (SPACE)	07	21,093		21,093		U

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205	0305940F	Space Situation Awareness Operations	07	35,002	58,800	93,802	U
206	0308699F	Shared Early Warning (SEW)	07	6,366		6,366	U
207	0401115F	C-130 Airlift Squadron	07	15,599		15,599	U
208	0401119F	C-5 Airlift Squadrons (IF)	07	66,146		66,146	U

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189	0305182F	Spacelift Range System (SPACE)	07					U
190	0305202F	Dragon U-2	07					U
191	0305206F	Airborne Reconnaissance Systems	07					U
192	0305207F	Manned Reconnaissance Systems	07					U
193	0305208F	Distributed Common Ground/Surface Systems	07					U
194	0305220F	RQ-4 UAV	07					U
195	0305221F	Network-Centric Collaborative Targeting	07					U
196	0305238F	NATO AGS	07					U
197	0305240F	Support to DCGS Enterprise	07					U
198	0305258F	Advanced Evaluation Program	07					U
199	0305265F	GPS III Space Segment	07					U
200	0305600F	International Intelligence Technology and Architectures	07					U
201	0305614F	JSPOC Mission System	07					U
202	0305881F	Rapid Cyber Acquisition	07					U
203	0305906F	NCMC - TW/AA System	07					U
204	0305913F	NUDET Detection System (SPACE)	07					U

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205 0305940F	Space Situation Awareness Operations	07	U
206 0308699F	Shared Early Warning (SEW)	07	U
207 0401115F	C-130 Airlift Squadron	07	U
208 0401119F	C-5 Airlift Squadrons (IF)	07	U

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--	-----	----	---	-----	-----	-----	-----	-
189	0305182F	Spacelift Range System (SPACE)	07		11,867		11,867	U
190	0305202F	Dragon U-2	07		37,217		37,217	U
191	0305206F	Airborne Reconnaissance Systems	07		3,841		3,841	U
192	0305207F	Manned Reconnaissance Systems	07		20,975		20,975	U
193	0305208F	Distributed Common Ground/Surface Systems	07		18,902	11,546	30,448	U
194	0305220F	RQ-4 UAV	07		256,307		256,307	U
195	0305221F	Network-Centric Collaborative Targeting	07		22,610		22,610	U
196	0305238F	NATO AGS	07		38,904		38,904	U
197	0305240F	Support to DCGS Enterprise	07		23,084		23,084	U
198	0305258F	Advanced Evaluation Program	07		116,143		116,143	U
199	0305265F	GPS III Space Segment	07		141,888	37,300	179,188	U
200	0305600F	International Intelligence Technology and Architectures	07		2,360		2,360	U
201	0305614F	JSPOC Mission System	07		72,889	15,000	87,889	U
202	0305881F	Rapid Cyber Acquisition	07		4,280		4,280	U
203	0305906F	NCMC - TW/AA System	07		4,951		4,951	U
204	0305913F	NUDET Detection System (SPACE)	07		21,093		21,093	U

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205	0305940F	Space Situation Awareness Operations	07	35,002	58,800	93,802	U
206	0308699F	Shared Early Warning (SEW)	07	6,366		6,366	U
207	0401115F	C-130 Airlift Squadron	07	15,599		15,599	U
208	0401119F	C-5 Airlift Squadrons (IF)	07	66,146		66,146	U

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Line No	Program Element Number	Item	Act	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO	Se
--	-----	----	---	-----	-----	-----	-----	-
209	0401130F	C-17 Aircraft (IF)	07	12,430		12,430		U
210	0401132F	C-130J Program	07	16,776		16,776		U
211	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	5,166		5,166		U
212	0401314F	Operational Support Airlift	07	13,817		13,817		U
213	0401318F	CV-22	07	16,702	12,000	28,702		U
214	0408011F	Special Tactics / Combat Control	07	7,164		7,164		U
215	0702207F	Depot Maintenance (Non-IF)	07	1,518		1,518		U
216	0708610F	Logistics Information Technology (LOGIT)	07	61,676		61,676		U
217	0708611F	Support Systems Development	07	9,128		9,128		U
218	0804743F	Other Flight Training	07	1,653		1,653		U
219	0808716F	Other Personnel Activities	07	57		57		U
220	0901202F	Joint Personnel Recovery Agency	07	3,663		3,663		U
221	0901218F	Civilian Compensation Program	07	3,735		3,735		U
222	0901220F	Personnel Administration	07	5,157		5,157		U
223	0901226F	Air Force Studies and Analysis Agency	07	1,523		1,523		U
224	0901538F	Financial Management Information Systems Development	07	10,581		10,581		U

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9999 9999999999 Classified Programs	13,091,557	151,836	13,243,393	27,765	U
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Operational Systems Development	17,457,056	458,382	17,915,438	32,480	
	-----	-----	-----	-----	
Total Research, Development, Test & Eval, AF	28,112,251	842,082	28,954,333	32,905	

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209	0401130F	C-17 Aircraft (IF)	07					U
210	0401132F	C-130J Program	07					U
211	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07					U
212	0401314F	Operational Support Airlift	07					U
213	0401318F	CV-22	07					U
214	0408011F	Special Tactics / Combat Control	07					U
215	0702207F	Depot Maintenance (Non-IF)	07					U
216	0708610F	Logistics Information Technology (LOGIT)	07					U
217	0708611F	Support Systems Development	07					U
218	0804743F	Other Flight Training	07					U
219	0808716F	Other Personnel Activities	07					U
220	0901202F	Joint Personnel Recovery Agency	07					U
221	0901218F	Civilian Compensation Program	07					U
222	0901220F	Personnel Administration	07					U
223	0901226F	Air Force Studies and Analysis Agency	07					U
224	0901538F	Financial Management Information Systems Development	07					U

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9999 9999999999 Classified Programs	-----	57,100	84,865	-----	U
Operational Systems Development			89,580		
	-----	-----	-----	-----	
Total Research, Development, Test & Eval, AF		72,800	105,705		

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--	-----	----	---	-----	-----	-----	-----	-
209	0401130F	C-17 Aircraft (IF)	07		12,430		12,430	U
210	0401132F	C-130J Program	07		16,776		16,776	U
211	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07		5,166		5,166	U
212	0401314F	Operational Support Airlift	07		13,817		13,817	U
213	0401318F	CV-22	07		16,702	12,000	28,702	U
214	0408011F	Special Tactics / Combat Control	07		7,164		7,164	U
215	0702207F	Depot Maintenance (Non-IF)	07		1,518		1,518	U
216	0708610F	Logistics Information Technology (LOGIT)	07		61,676		61,676	U
217	0708611F	Support Systems Development	07		9,128		9,128	U
218	0804743F	Other Flight Training	07		1,653		1,653	U
219	0808716F	Other Personnel Activities	07		57		57	U
220	0901202F	Joint Personnel Recovery Agency	07		3,663		3,663	U
221	0901218F	Civilian Compensation Program	07		3,735		3,735	U
222	0901220F	Personnel Administration	07		5,157		5,157	U
223	0901226F	Air Force Studies and Analysis Agency	07		1,523		1,523	U
224	0901538F	Financial Management Information Systems Development	07		10,581		10,581	U

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9999 9999999999 Classified Programs	84,865	13,119,322	208,936	13,328,258	U
	-----	-----	-----	-----	
Operational Systems Development	89,580	17,489,536	515,482	18,005,018	
	-----	-----	-----	-----	
Total Research, Development, Test & Eval, AF	105,705	28,145,156	914,882	29,060,038	

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Air Force • Request for Additional Appropriations FY 2017 • RDT&E Program

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41	04	0604857F	Operational Responsive Space.....	Volume 1 - 7
42	04	0604858F	Tech Transition Program.....	Volume 1 - 11
44	04	0207110F	Next Generation Air Dominance.....	Volume 1 - 13
48	04	0306250F	Cyber Operations Technology Development.....	Volume 1 - 15

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97	06	0606017F	Requirements Analysis and Maturation.....	Volume 1 - 29

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111	07	0101113F	B-52 SQUADRONS.....	Volume 1 - 37
123	07	0207131F	A-10 Squadrons.....	Volume 1 - 43
124	07	0207133F	F-16 Squadrons.....	Volume 1 - 45
134	07	0207253F	Compass Call.....	Volume 1 - 47
165	07	0303001F	Family of Advanced BLoS Terminals (FAB-T).....	Volume 1 - 49
193	07	0305208F	Distributed Common Ground/Surface Systems.....	Volume 1 - 51
199	07	0305265F	GPS III Space Segment.....	Volume 1 - 53

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Air Force • Request for Additional Appropriations FY 2017 • RDT&E Program

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213	07	0401318F	CV-22.....	Volume 1 - 61

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Air Force • Request for Additional Appropriations FY 2017 • RDT&E Program

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Compass Call	0207253F	134	07.....	Volume 1 - 47
Counterspace Systems	0604421F	55	05.....	Volume 1 - 19
Cyber Operations Technology Development	0306250F	48	04.....	Volume 1 - 15
Cyber Resiliency of Weapon Systems-ACS	0604414F	37	04.....	Volume 1 - 1
Distributed Common Ground/Surface Systems	0305208F	193	07.....	Volume 1 - 51
F-16 Squadrons	0207133F	124	07.....	Volume 1 - 45
Family of Advanced BLoS Terminals (FAB-T)	0303001F	165	07.....	Volume 1 - 49
GPS III Space Segment	0305265F	199	07.....	Volume 1 - 53
Global Positioning System III - Operational Control Segment	0603423F	104	07.....	Volume 1 - 33
JSpOC Mission System	0305614F	201	07.....	Volume 1 - 57
Major T&E Investment	0604759F	89	06.....	Volume 1 - 23
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Space Situational Awareness Systems	0604425F	39	04.....	Volume 1 - 5
Tech Transition Program	0604858F	42	04.....	Volume 1 - 11
Test and Evaluation Support	0605807F	92	06.....	Volume 1 - 27

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force										Date: March 2017		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604414F I Cyber Resiliency of Weapon Systems-ACS							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	40.000	0.000	40.000	0.000	0.000	0.000	0.000	Continuing	Continuing
642816: Agile/Adaptable Standards	-	0.000	0.000	15.000	0.000	15.000	0.000	0.000	0.000	0.000	Continuing	Continuing
642834: Mission Assurance for fielded Systems	-	0.000	0.000	20.000	0.000	20.000	0.000	0.000	0.000	0.000	Continuing	Continuing
642836: Mission Thread Analysis	-	0.000	0.000	5.000	0.000	5.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): N42												
Note This program, BA 04 PE 0604414F, project 642816, Agile and Adaptable Standards, is a new start. This program, BA 04 PE 0604414F, project 642834, Cyber Vulnerability Evaluations and Mitigation Prototyping, is a new start. This program, BA 04 PE 0604414F, project 642836, Cyber Mission Thread Analysis, is a new start.												
A. Mission Description and Budget Item Justification The Cyber Resiliency of Weapon Systems (CRWS) for Agile Combat Support (ACS) provides funding to increase cyber security and resiliency in all phases and activities of the acquisition life cycle and sustainment of weapon systems by accomplishing two goals: first, to mature technologies and develop prototypes to help avoid the fielding of weapon systems susceptible to cyberattack and second, to enable the modification of fielded systems to protect them from cyberattacks. To meet these goals, this budget activity addresses cyber security and resiliency gaps in: standards for designing new weapon systems by defining a government reference architecture which provides future weapon system designers the opportunity use open system architectures; cyber security/resiliency of fielded weapon systems by designing mitigations strategies and identifying requirements for known vulnerabilities; having a mission focused analysis for identifying critical subsystem and support system needing additional cyber security and resiliency by delivering a systematic approach for looking across weapon systems used to achieve each and every Air Force mission. "Fiscal Year (FY) 2017 Request for Additional Appropriations": \$40 million is required to address emergency warfighting readiness requirements. 1) \$5 million: PE 0604414F, project 642836, Cyber Mission Thread Analysis. Accelerates the prototyping of cyber mission thread analysis (CMTA) methodologies, techniques, and tools; and accelerates the CMTA of a number of Air Force mission threads. Accelerates the prioritization of Air Force mission threads for future analysis.												

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604414F / <i>Cyber Resiliency of Weapon Systems-ACS</i>
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2) \$20 million: PE 0604414F, project 642834, Cyber Vulnerability Evaluations and Mitigation Prototyping. Accelerates the evaluation of fielded weapon systems, subsystems, and support systems for cyber susceptibilities and vulnerabilities; and accelerates prototyping of mitigations for cyber vulnerabilities on fielded weapon systems, subsystems, and support systems in realistic, high fidelity environments.

3) \$15 million: PE 0604414F, project 642816, Agile and Adaptable Standards. Accelerates prototyping of open system architecture components for use in advanced avionics systems and Precision Navigation and Timing (PNT) systems; and accelerates prototyping of techniques to increase cyber security and resiliency acquisition skills, knowledge, and expertise needed for the workforce to facilitate the institutionalizing of government reference architectures enabling adaptive and agile designs for weapon systems.

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

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	40.000	0.000	40.000
Total Adjustments	0.000	0.000	40.000	0.000	40.000
• 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	40.000	0.000	40.000

Change Summary Explanation

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$40 million is required to address emergency warfighting readiness requirements.

1) \$5 million: PE 0604414F, project 642836, Cyber Mission Thread Analysis. Accelerates the prototyping of cyber mission thread analysis (CMTA) methodologies, techniques, and tools; and accelerates the CMTA of a number of Air Force mission threads. Accelerates the prioritization of Air Force mission threads for future analysis.

2) \$20 million: PE 0604414F, project 642834, Cyber Vulnerability Evaluations and Mitigation Prototyping. Accelerates the evaluation of fielded weapon systems, subsystems, and support systems for cyber susceptibilities and vulnerabilities; and accelerates prototyping of mitigations for cyber vulnerabilities on fielded weapon systems, subsystems, and support systems in realistic, high fidelity environments.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	PE 0604414F I Cyber Resiliency of Weapon Systems-ACS	
3) \$15 millon: PE 0604414F, project 642816, Agile and Adaptable Standards. Accelerates prototyping of open system architecture components for use in advanced avionics systems and Precision Navigation and Timing (PNT) systems; and accelerates prototyping of techniques to increase cyber security and resiliency acquisition skills, knowledge, and expertise needed for the workforce to facilitate the institutionalizing of government reference architectures enabling adaptive and agile designs for weapon systems.		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604425F I Space Situational Awareness Systems							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	10.901	0.000	10.901	34.664	39.618	0.000	0.000	Continuing	Continuing
640290: Deep Space Advanced Radar Concept	-	0.000	0.000	10.901	0.000	10.901	34.664	39.618	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Deep Space Advanced Radar Concept (DARC) will leverage ongoing defense science and technology efforts to mature radar concepts and technologies to develop and evaluate prototypes that demonstrate increased sensitivity, capacity, search rates, and scalability to detect, track and maintain custody of objects in deep space orbit. This effort will analyze and select the most promising technologies to move forward into system development and/or operations. The Deep Space Advanced Radar Concept will augment the Space Surveillance Network (SSN) as an additional sensor with increased capacity and capability for deep space object custody at GEO. The Deep Space Advanced Radar Concept effort will coordinate with the JSpOC Mission System (JMS) program to ensure integration with enterprise data fusion and dissemination to support space battle management and command, control and communications (BMC3).

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$1.0 million is required to address growth and improve lethality. Funding will accelerate the Deep Space Radar (DARC) prototype to complete in FY19, demonstrating a cost effective and persistent space surveillance sensor with increased capacity and capability for deep space object custody at GEO.

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

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	10.901	0.000	10.901
Total Adjustments	0.000	0.000	10.901	0.000	10.901
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	10.901	0.000	10.901

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604425F / <i>Space Situational Awareness Systems</i>	
<p><u>Change Summary Explanation</u></p> <p>"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$1.0 million is required to address growth and improve lethality. Funding will accelerate the Deep Space Radar (DARC) prototype to complete in FY19, demonstrating a cost effective and persistent space surveillance sensor with increased capacity and capability for deep space object custody at GEO.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0604857F / <i>Operational Responsive Space</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	20.000	18.437	17.921	0.000	17.921	8.253	8.402	8.559	8.711	Continuing	Continuing
64A020: <i>AF Funded ORSSats</i>	-	20.000	18.437	17.921	0.000	17.921	8.253	8.402	8.559	8.711	Continuing	Continuing

A. Mission Description and Budget Item Justification

The successful integration of space-based capabilities into the core of U.S. national security operations has resulted in dramatically increased demand for and dependence upon space capabilities. As a result, U.S. Strategic Command (USSTRATCOM) identified three needs: 1) to rapidly augment existing space capabilities when needed to expand operational capability; 2) to rapidly reconstitute/replenish critical space capabilities to preserve "continuity of operations" capability; 3) to rapidly exploit and infuse space technological or operational innovations to increase U.S. advantage. Operationally Responsive Space projects were optimized for prioritized theater use and/or surge, augmentation and replenishment of traditional space capabilities. The ORS Concept of Operations (CONOPS) drives the need for satellites featuring high degrees of modularity, standard interface vehicles, and the use of plug and play payloads and buses.

The Air Force will continue to maintain ORS-1, launched 29 Jun 2011 to respond to U.S. Central Command's (USCENTCOM's) urgent need, validated by USSTRATCOM, to provide intelligence, surveillance, and reconnaissance (ISR) for theater warfighters. The additional ORS Office efforts of maturing enabling elements will be transitioned as appropriate to other space programs including Global Positioning System, Advanced EHF Milsatcom, Space Based Infrared System, Space Control Technology, and the rest of the space architecture.

ORS projects provide a broad range of capabilities directly supporting warfighter needs. Potential missions include communications; data exfiltration; blue/friendly force situational awareness; maritime domain awareness; positioning, navigation, and timing; weather; missile warning; and battlefield ISR. The highest priorities of the ORS Office are development and launch of the ORS-5 space situational awareness mission, development and launch of the Compact Ocean Wind Vector Radiometer (COWVR) technology demonstration, the low cost automated manufacturing initiative, and concluding the ORS-4 Super Strypi launch campaign. The remaining priorities for the ORS office are to satisfy the high priority needs for augmentation and reconstitution, such as Missile Warning, Wideband Protected Communication, Narrowband Communication, Space Situational Awareness, and Electro-Optical/Infrared (EO/IR) imagery.

Capabilities are being developed to systematically mature the ORS enabling elements to meet the USSTRATCOM specified responsiveness timelines and the 2007 NDAA cost target (\$40 million satellites/\$20 million launches). This includes authenticating commercial space parts, confirming automated assembly lines, validating digital mission assurance processes, developing a modular open system architecture employing plug and play standards, and providing assembly, integration & test in the Rapid Response Space Works. It also includes integrating with the Multi-Mission Satellite Operations Center (MMSOC) to proliferate common satellite command and control.

ORS is working with the University of Hawaii's (U of H) Hawaii Space Flight Laboratory and Sandia National Laboratory to complete the Super Strypi mission, documenting the results and the mishap investigation.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force			Date: March 2017			
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604857F I Operational Responsive Space				
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10 million is required to address emergency warfighting readiness requirements. Funding is for the ORS-8 solution to the USSTRATCOM validated urgent need for an interim capability addressing weather gap 1 (cloud characterization) and gap 2 (theater weather imagery).						
This program is in Budget Activity 04, Advanced Component Development and Prototypes, because the efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.						
B. Program Change Summary (\$ in Millions)		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget		20.000	6.457	0.000	0.000	0.000
Current President's Budget		20.000	18.437	17.921	0.000	17.921
Total Adjustments		0.000	11.980	17.921	0.000	17.921
• Congressional General Reductions		0.000	-0.020			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		0.000	12.000			
• 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	17.921	0.000	17.921
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 64A020: AF Funded ORSSats						
Congressional Add: Operational Capabilities, Development, and Integration						
Congressional Add: Rapid Assembly, Integration, & Test (Tier-2)						
Congressional Add: ORS Development (1)						
Congressional Add: ORS: Cross Cutting						
Congressional Add Subtotals for Project: 64A020						
Congressional Add Totals for all Projects						
Change Summary Explanation						
FY2016: +\$12.0 million Program increase; -\$0.02 million for FFRDC						
FY2017: +\$7.9 million to continue the ORS program.						

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604857F I Operational Responsive Space	
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10 million is required to address emergency warfighting readiness requirements. Funding is for the ORS-8 solution to the USSTRATCOM validated urgent need for an interim capability addressing weather gap 1 (cloud characterization) and gap 2 (theater weather imagery).		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0604858F / <i>Tech Transition Program</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	79.887	266.514	349.304	0.000	349.304	497.741	606.643	679.961	690.590	Continuing	Continuing
645350: <i>Transition Prioritization</i>	-	79.887	266.514	64.247	0.000	64.247	87.361	87.827	87.376	87.366	Continuing	Continuing
645351: <i>Advanced Engine Development</i>	-	0.000	0.000	285.057	0.000	285.057	410.380	518.816	592.585	603.224	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Technology Transition Program (TTP) provides funding to demonstrate and/or experiment with technologies and concepts to enable or accelerate their transition to acquisition programs of record and operational use. It addresses the gap that exists between when a technology or concept is first developed and demonstrated to when it can be successfully acquired and implemented as an operational capability. TTP bridges that gap by providing funding and enabling integration and demonstration to continue beyond the laboratory. It allows acquisition program managers (the capability developers and providers) and warfighters (the capability recipients and end users) to prototype, integrate, demonstrate, and experiment with candidate technologies and assess them in an operational environment in partnership with PEOs, schoolhouses, simulation facilities, and development planning organizations. TTP includes research and development funds for the following transition activities: (1) experimentation campaigns to support Air Superiority 2030+ promising, high-priority concepts and technologies in an operational environment, (2) prototyping to lower acquisition risk by raising the technology readiness level and assessing implications to CONOPS, tactics, techniques, and procedures; (3) performing pre-acquisition systems engineering to facilitate transition of concepts and technologies from a demonstration program (e.g., Advanced Technology Demonstrations (ATDs), Joint Capability Technology Demonstrations (JCTDs)) into acquisition programs of record; (4) assessing external interface requirements of candidate concepts, technologies, and demonstration projects to better understand true engineering costs resulting from insertion of new technologies into the AF enterprise architecture; and (5) capturing data through information technology tools and databases to help formulate technology transition acquisition strategies and gather proposals for technology and prototype development that have the potential for application to the performance of Department of Defense missions. TTP is specifically designed to deal with technology transition opportunities throughout the fiscal year as they arise, resulting in a prioritized distribution of TTP funding over the course of the entire execution year.

The program provides funding to mature adaptive turbine engine technologies for next generation propulsion systems. The program will leverage adaptive turbine engine science and technology demonstrations to develop a multi-platform common adaptive engine built around a commercially derived core.

Starting in FY 2017 to improve reporting to Congress, Project 645351, Advanced Engine Development was created to capture all engine development activity that was previously performed under Project 645350, Transition Prioritization in this program.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$2 million is required to address emergency warfighting readiness requirements. PE 0604858F, project 645350, Experimentation and Prototyping effort. Develops and builds Air Force Prototypes for Hypersonics.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604858F / <i>Tech Transition Program</i>
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This program is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P) because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	79.004	246.514	288.148	0.000	288.148
Current President's Budget	79.887	266.514	349.304	0.000	349.304
Total Adjustments	0.883	20.000	61.156	0.000	61.156
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	20.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.400	0.000			
• SBIR/STTR Transfer	-1.517	0.000			
• Other Adjustments	0.000	0.000	61.156	0.000	61.156

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

Project: 645350: *Transition Prioritization*

Congressional Add: *Alternative Energy Research*

Congressional Add Subtotals for Project: 645350

Congressional Add Totals for all Projects

FY 2015	FY 2016
20.000	20.000
20.000	20.000
20.000	20.000

Change Summary Explanation

Increase in FY 2015 reflects reprogramming to support Multi-Releasable Intelligence Product (MRIP) Generation.

Increase in FY 2017 due to emphasis on Air Force Experimentation and Prototyping capabilities.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$2 million is required to address emergency warfighting readiness requirements. PE 0604858F, project 645350, Experimentation and Prototyping effort. Develops and builds Air Force Prototypes for Hypersonics.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0207110F I Next Generation Air Dominance							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	18.224	8.830	167.595	0.000	167.595	12.875	12.875	0.000	0.000	0.000	220.399
646007: 2030+ AIR DOMINANCE AOS	-	18.224	8.830	167.595	0.000	167.595	12.875	12.875	0.000	0.000	0.000	220.399

A. Mission Description and Budget Item Justification

Next Generation Air Dominance enables future execution of Air Force air superiority doctrine within the Air Superiority core mission area, as directed in Joint Requirements Oversight Council Memorandum (JROCM) 043-13. Program efforts mitigate critical capability gaps identified in the March 2011 Air Force Next Generation Tactical Air (TACAIR) Capabilities Based Assessment. This program will provide air superiority capability improvements in the areas of persistence, survivability, lethality, connectivity, interoperability, and affordability. Funding provides program management support, operational concept exploration, technology assessments and development, operational and system architecture development, maturation and risk reduction of air superiority related technologies, and integrated system concept development and demonstration.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$147 million is required to address emergency warfighting readiness requirements for Penetrating Counterair (PCA) Risk Reduction. Funds risk reduction to support PCA timelines directed by CSAF-approved Air Superiority 2030 Flight Plan. Risk reduction efforts include work in mission systems, air vehicle, and propulsion technology fields. Supports acceleration of IOC timeline to support the threat profile in the highly contested environment and fulfill needed capability in the Next Generation Air Dominance Family of Capabilities.

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

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	15.722	8.830	0.000	0.000	0.000
Current President's Budget	18.224	8.830	167.595	0.000	167.595
Total Adjustments	2.502	0.000	167.595	0.000	167.595
• 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	3.037	0.000			
• SBIR/STTR Transfer	-0.535	0.000			
• Other Adjustments	0.000	0.000	167.595	0.000	167.595

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0207110F I Next Generation Air Dominance	
<p>Change Summary Explanation</p> <p>FY15 - \$3.037 million reprogramming for NGAD concept development, integration studies & risk reduction activities and -\$0.535 million for Small Business Innovative Research</p> <p>FY17 - \$20.595 million added to expand scope of concept development & integration assessments and technology risk reduction activities addressing family of systems concepts</p> <p>"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$147 million for Penetrating Counterair (PCA) Risk Reduction is required to address emergency warfighting readiness requirements.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0306250F I Cyber Operations Technology Development							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	0.000	81.732	158.002	4.700	162.702	223.636	195.752	198.439	211.977	Continuing	Continuing
646008: US Cyber Command Technology Development	-	0.000	81.732	158.002	4.700	162.702	223.636	195.752	198.439	211.977	Continuing	Continuing

A. Mission Description and Budget Item Justification

US Cyber Command (USCYBERCOM) plans, coordinates, integrates, synchronizes, and conducts activities to: direct the operations and defense of specified Department of Defense information networks, and prepare to, and when directed, conduct full-spectrum military cyberspace operations in order to enable actions in all domains, ensure US/Allied freedom of action in cyberspace and deny the same to our adversaries. Emphasis is on providing component and subsystem maturity prior to integration in major and complex systems and may involve risk reduction initiatives.

USCYBERCOM, in conjunction with the Services and National Agencies, will develop and expand infrastructure architectures to support Cyber Mission Forces.

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

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$4.7 million in OCO funding is required to accelerate the build of Title X Infrastructure and access platforms.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	81.732	94.643	0.000	94.643
Current President's Budget	0.000	81.732	158.002	4.700	162.702
Total Adjustments	0.000	0.000	63.359	4.700	68.059
• 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	63.359	4.700	68.059

Change Summary Explanation

In FY17, funding increased due to growing DOD requirements and priority.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0306250F <i>I Cyber Operations Technology Development</i>	
<p>"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$4.7 million in OCO funding is required to accelerate build of Title X infrastructure and access platforms.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>					R-1 Program Element (Number/Name) PE 0604287F / <i>Physical Security Equipment</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	3.926	5.973	24.458	11.000	35.458	9.212	9.488	9.769	10.141	Continuing	Continuing
655120: <i>Physical Security Equipment - SD ED</i>	-	3.926	5.973	24.458	11.000	35.458	9.212	9.488	9.769	10.141	Continuing	Continuing

A. Mission Description and Budget Item Justification

Integrated Base Defense Security Systems (IBDSS) provides improvements and enhancements, demonstrates, and tests Physical Security Equipment (PSE) systems to include Force Protection. This program supports the protection of tactical, fixed, and nuclear weapons systems, AF personnel and AF facilities. The PSE program is organized to provide PSE RDT&E for Air Force specific needs but as a complement to, and in conjunction with, the PSE RDT&E programs funded by the DOD Physical Security Enterprise and Analysis Group (PSEAG). As such this program will obtain, demonstrate, and test PSE in the same manner and to the same standards and architecture as PSEAG-funded projects to ensure interoperability with PSEAG-developed PSE. In support of PSE, this RDT&E program includes spectrum planning for radio frequency (RF), communication security (cyber), and information assurance requirements. This Program Element also includes funding for Force Protection Commercial Off The Shelf (FP COTS) market research, evaluation and testing. The FP COTS testing applies to all available technologies (delay, denial, detection, assessment, communication display, access control, power, mobility, and defeat effects) which are considered effective for AF physical security use. This program supports the maintenance and test support at Site C 3 and the Cold Weather Test Site (CWTS), as annotated in DoD Directive 3200.11, listing the 46th Test Wing (TW) as a Major Range and Test facility, conducting developmental and operational testing as the primary mission.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$16 million is required to address emergency war fighting readiness requirements. Counter Small Unmanned Aerial System (Cs-UAS) Joint Emergent Operational Need (JEON) - Supports STRATCOM JEON to protect national assets from the evolution of small unmanned aerial systems based on low cost, extensive proliferation and availability in the commercial market place.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$11 million is required to address emergency warfighter readiness requirements. Counter Small Unmanned Aerial System (Cs-UAS) Joint Urgent Operational Need (JUON) - Supports EUCOM JUON to protect specific strategic assets in overseas theaters of operation from the evolution of small unmanned aerial systems based on low cost, extensive proliferation and availability in the commercial market place. This is Overseas Contingency Operations (OCO) funding.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604287F / <i>Physical Security Equipment</i>
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	3.926	5.973	4.122	0.000	4.122
Current President's Budget	3.926	5.973	24.458	11.000	35.458
Total Adjustments	0.000	0.000	20.336	11.000	31.336
• 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	20.336	11.000	31.336

Change Summary Explanation

The FY17 funding increase of \$4.4 million is to support Physical Security Equipment RDT&E.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$16 million is required to address emergency war fighting readiness requirements. Counter Small Unmanned Aerial System (Cs-UAS) Joint Emergent Operational Need (JEON) - Supports STRATCOM JEON to protect national assets from the evolution of small unmanned aerial systems based on low cost, extensive proliferation and availability in the commercial market place.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$11 million is required to address emergency warfighter readiness requirements. Counter Small Unmanned Aerial System (Cs-UAS) Joint Urgent Operational Need (JUON) - Supports EUCOM JUON to protect specific strategic assets in overseas theaters of operation from the evolution of small unmanned aerial systems based on low cost, extensive proliferation and availability in the commercial market place. This is Overseas Contingency Operations (OCO) funding.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604421F I Counterspace Systems							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	22.654	24.134	41.494	0.425	41.919	40.762	22.643	18.909	19.213	Continuing	Continuing
65A001: Counter Satellite Communications System	-	15.618	14.615	35.962	0.000	35.962	32.130	13.884	9.916	10.094	0.000	132.219
65A005: Offensive Counterspace (OCS) C2	-	7.036	7.737	3.961	0.000	3.961	7.032	7.131	7.334	7.431	0.000	47.662
65A013: BOUNTY HUNTER	-	0.000	1.782	1.571	0.425	1.996	1.600	1.628	1.659	1.688	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program conducts critical planning, technology and capability insertion, and system acquisition of Air Force space control systems and associated command and control systems to meet current and future military space control needs in the face of an emerging threat. This funding supports the acquisition process including concept development, risk reduction, design, integration, test, and demonstration. Space control systems include both offensive counterspace (OCS) and defensive counterspace (DCS) systems. OCS systems include the means to disrupt, deny, degrade, or destroy an adversary's space systems, or the information they provide, which may be used for purposes hostile to U.S. national security interests. DCS systems include both active and passive measures to protect U.S. and friendly space related capabilities (satellites, communications links, and supporting ground systems) from enemy attack or interference. This includes development efforts to prevent adversarial ability to use U.S. space systems and services for purposes hostile to U.S. national security interests.

Counterspace Command and Control (C2) includes command and control and mission planning capabilities required for the fielding and employment of counterspace systems. Additional funds in FY2017 and beyond allow the program to continue spiral upgrades of critical battle management command and control (BMC2) functions in concert with the incremental updates to the counterspace systems it supports.

Bounty Hunter supports the Defensive Space Control of US systems in a specific Area of Responsibility and provides the capacity to prevent effective adversary use of Command, Control, Communications, Computers, and Intelligence (C4I). FY2017 OCO funding is for in-theater recapitalization activities to include: R&D and fielding of new capabilities to address evolving threats; hardware and software replacement; and obsolescence issue resolution.

This program is in Budget Activity 5, System Development and Demonstration, because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$7.1 million is required to complete counter communications system (CCs) 10.3 increment. This will double operations capacity to enable responses to COCOM tasking, and replaces obsolete hardware/software to counter emerging threats.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604421F / <i>Counterspace Systems</i>
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	23.424	24.208	30.468	0.000	30.468
Current President's Budget	22.654	24.134	41.494	0.425	41.919
Total Adjustments	-0.770	-0.074	11.026	0.425	11.451
• Congressional General Reductions	-0.770	-0.074			
• 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	11.026	0.425	11.451

Change Summary Explanation

FY2017: +\$3.926 million funds allow the program to add new user capability, to included battle management command and control (BMC2), to coincide with Joint Space Operations Center Mission System (JMS) Increment 3 integration.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$7.1 million is required to complete counter communications system (CCs) 10.3 increment. This will double operations capacity to enable responses to COCOM tasking, and replaces obsolete hardware/software to counter emerging threats.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604441F I Space Based Infrared System (SBIRS) High EMD
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	9,738.188	308.788	291.510	218.766	0.000	218.766	444.177	798.344	650.492	911.263	Continuing	Continuing
653616: SBIRS High Element EMD	9,601.716	229.580	202.929	145.690	0.000	145.690	95.454	0.000	0.000	0.000	0.000	10,275.369
657009: Space Modernization Initiative	136.472	79.208	88.581	73.076	0.000	73.076	116.337	115.022	110.748	112.356	Continuing	Continuing
657106: EVOLVED SBIRS*	0.000	0.000	0.000	0.000	0.000	0.000	232.386	683.322	539.744	798.907	Continuing	Continuing

Program MDAP/MAIS Code: 210

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2017

Note

Prior Years: Total Program Element above includes \$39.831M for BPAC 65A040 Commercially Hosted Payload funded in FY11 and FY12.
 MDAP PNO 210 includes only BPAC 653616 SBIRS High EMD.

A. Mission Description and Budget Item Justification

The SBIRS RDT&E FY17 budget justification exhibits describe three elements of the SBIRS program: 1) the SBIRS Engineering and Manufacturing Development (EMD) program of record PNO 210 MDAP, 2) the Space Modernization Initiative (SMI) (non-MDAP) and the 3) Evolved SBIRS follow-on (pre-MDAP PNO 499).

1. SBIRS EMD: The Space-Based Infrared System (SBIRS) primary mission is to provide initial warning of a ballistic missile attack on the US, its deployed forces, and its allies. SBIRS enhances detection and improves reporting of intercontinental ballistic missile launches, submarine launched ballistic missile launches, and tactical ballistic missile launches. SBIRS supports Missile Defense, Battlespace Awareness, and Technical Intelligence missions by providing reliable, accurate, and timely data to Unified Combatant Commanders, Joint Task Force (JTF) Commanders, the intelligence community, and other users. SBIRS provides increased detection and tracking performance over legacy systems in order to meet requirements in Air Force Space Command's (AFSPC) Operational Requirements Document (ORD). The SBIRS system includes both space and ground elements. The space segment consists of Geosynchronous Earth Orbit (GEO) satellites, payloads hosted on satellites in Highly Elliptical Orbit (HEO), and Defense Support Program (DSP) satellites. The ground segment consists of both fixed and mobile data processing elements, communications infrastructure, and relay ground stations serving all SBIRS space elements. The three HEO payloads and two GEO satellites are on-orbit. Both GEO and two of the three HEO satellites have completed AFSPC and USSTRATCOM operational acceptance and are certified for Integrated Tactical Warning/Attack Assessment (ITW/AA) missile warning operations and technical intelligence operations. HEO-3 is in a storage/residual operational mode. The program of record ground segment development exploits both the new scanner and starer sensor data through software p...

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604441F / <i>Space Based Infrared System (SBIRS) High EMD</i>
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	308.788	292.235	198.779	0.000	198.779
Current President's Budget	308.788	291.510	218.766	0.000	218.766
Total Adjustments	0.000	-0.725	19.987	0.000	19.987
• Congressional General Reductions	0.000	-0.725			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	19.987	0.000	19.987

Change Summary Explanation

FY17 Other Adjustments: -\$15.0 million SMI re-phased to FY18 (+\$9 million) and FY19 (+\$6 million), -\$1.813 million inflation adjustments

"Fiscal Year (FY) 2017 Request for Additional Appropriations": +\$36.8 million to address growth and improve lethality.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	45.985	73.302	71.385	0.000	71.385	65.706	66.001	67.265	68.464	Continuing	Continuing
664597: <i>Air Force Test Investments</i>	-	45.985	73.302	71.385	0.000	71.385	65.706	66.001	67.265	68.464	Continuing	Continuing

A. Mission Description and Budget Item Justification

This PE provides planning, improvements, and modernization for test capabilities at three Air Force Test Center (AFTC) organizations: 96 Test Wing at Eglin AFB FL (to include 96 Test Group at Holloman AFB NM and operating locations at Wright-Patterson AFB OH), Arnold Engineering Development Complex (AEDC) at Arnold AFB TN, and the 412 Test Wing at Edwards AFB CA. The purpose is to help test organizations improve and develop their test infrastructure and capabilities to keep pace with improvements in weapon system technologies.

The improvement and modernization (I&M) requirements are defined through the AF Test Investment Planning & Programming (TIPP) Process. All projects have been reviewed through the Tri-Service Reliance process (to communicate AF efforts to the other Services and avoid unwarranted duplication of effort) and are documented in the Technology Development Acquisition Program (TDAP) database. Each project has its own planning, development, equipment acquisition, equipment installation, and checkout phases which often require significant differences in funding from one year to the next. As such, the changes in category funding from year to year do not necessarily indicate program growth, but rather a planned phasing of improvement and modernization efforts. The test capabilities at these locations enable testing through all phases of weapon system acquisition, from system concept exploration through component and full-scale integrated weapon system testing to operational testing. These test organizations are a part of the Major Range and Test Facility Base (MRTFB), operated and maintained by the Air Force for DoD Test and Evaluation (T&E). These national test assets are available to others requiring their unique capabilities.

The 96 TW, at Eglin AFB FL, conducts and supports developmental test and evaluation (DT&E) of non-nuclear air armaments; Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) systems; target acquisition and weapon delivery systems; navigation systems; provides a climatic simulation capability; determines target/test item spectral signatures; and provides Cyber testing capabilities as part of the Joint Information Operations (IO) Range. The 96 TG at Holloman AFB, NM provides independent test and evaluation of inertial navigation systems, Global Positioning System (GPS) and integrated systems used for aircraft navigation and missile guidance systems, including vulnerability to electronic interference; provides the liaison function for coordinating and scheduling all US Air Force test operations at White Sands Missile Range; provides subsonic through hypersonic ground testing of aircraft and missiles in a flight-representative environment under highly instrumented conditions; and executes flight test and test support for advanced avionics and weapons development of joint, international and commercial test programs. The 96 TG, OL-AC at Wright-Patterson AFB, OH provides independent T&E in support of aircraft survivability and full-scale aircraft landing gear T&E. These T&E activities include the development, T&E of aircraft landing gear components supporting engineering acquisition, design, safety, and performance evaluations. In addition, they provide an independent T&E capability for component qualification.

AEDC, at Arnold AFB TN, provides pre-flight and reliability ground environmental test support for DoD aeropropulsion, flight systems, and space and missile programs. The center has 53 test facilities providing: aerodynamic testing of scale model aircraft, missiles, and space systems; testing of large and full-scale satellites, sensors,

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
3600: Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support	PE 0604759F I Major T&E Investment	
and space vehicles in a simulated space environment; altitude environmental testing for aircraft, missile, and spacecraft propulsion systems; and testing of large-scale models such as space boosters together with their propulsion systems.		
The 412th Test Wing, at Edwards AFB CA, conducts and supports DT&E and Operational Test and Evaluation (OT&E) of aircraft and aircraft systems, aerospace research vehicles, unmanned aerial vehicles, cruise missiles, parachute delivery/recovery/systems, and cargo handling systems.		
I&M efforts within this PE are identified in four mission area categories: Airframe/Propulsion/Avionics (APA); Armament/Munitions (A/M); Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR)/Cyber; and Space. These categories describe general types of effort that will be conducted in this PE. APA provides planning, improvements, and modernization needed for test capabilities to conduct and support DT&E and OT&E of aircraft and aircraft systems, aerospace research vehicles, unmanned aerial vehicles, cruise missiles, parachute delivery/recovery systems, cargo handling systems, and turbine engines. APA focuses on evaluation of the vehicle airframe, propulsion system, and avionics systems, as well as overall systems integration testing. It encompasses both ground test facilities, on-board test aircraft systems, and open-air range infrastructure, including instrumentation and data processing. A/M provides planning, improvements, and modernization to conduct DT&E of air-to-ground and air-to-air armaments and munitions, which include gun, chaff and flare systems, as well as aerial decoy and target systems. The A/M category encompasses the full range of DT&E from digital modeling and simulation, to precision measurement testing, to hardware-in-the-loop and installed systems testing, to open-air range testing. Elements of A/M DT&E include environmental, warhead effectiveness, arena blast/fragmentation, guidance navigation and control, aerodynamics, propulsion, electromagnetic interference and compatibility, mass properties, seeker and signature measurement, survivability, lethality, integration, reliability, net-centric and terminal effects testing. A/M also involves the design and development of systems needed to support A/M DT&E including the design and development of high speed sleds, targets, range support systems and various instrumentation and measurement systems. C4ISR provides planning, improvements and modernization to conduct DT&E of systems that support Command and Control (C2) functions which range from air campaign planning at the theater level to wing level C2 operations, to planning individual missions, to putting weapons on target using concepts such as machine to machine targeting. C4ISR includes ground and flight performance testing of airborne C2 networks and tactical data links, air operation centers, mission planning systems, multi-level security systems, radio and communication systems, ISR systems, information assurance systems, and radar systems such as those used by Joint Surveillance Target Attack Radar Systems (JSTARS) and air traffic control systems. C4ISR conducts DT&E on a full range of systems covering the sensor (detection) to the shooter (weapon), including functional and environmental testing of these systems. C4ISR/Cyber also includes DT&E for offensive and defensive Cyber capabilities. Space provides planning, improvements, and modernization needed for test capabilities to perform developmental and operational testing for space and launch acquisition and sustainment programs. Test capabilities include launch vehicle, satellite, missile, sensor, thermal protection system, signature, hardness, and interface testing. The capabilities reside at Vandenberg, Kirtland, Arnold, Patrick, Schriever, Peterson, Holloman Air Force Bases and others. Infrastructure includes launch sites, mobile control units, thermal vacuum chambers, sled tracks, arc heated wind tunnels, ballistic test ranges, signature collection, and the requisite personnel.		
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$5 million is required to accelerate the development of cyber "System in the Loop" infrastructure for detecting cyber vulnerabilities and increase cyber resiliency of weapon systems.		
This program is in Budget Activity 6, RDT&E Management Support, because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	47.232	68.302	66.845	0.000	66.845
Current President's Budget	45.985	73.302	71.385	0.000	71.385
Total Adjustments	-1.247	5.000	4.540	0.000	4.540
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-1.247	0.000	4.540	0.000	4.540

Change Summary Explanation

FY15: \$1.247 million decrease for SBIRs' tax.

FY16: \$5.0 million add for Airborne Sensor Data Correlation Project

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$5.0 million is required to accelerate the development of cyber "System in the Loop" infrastructure for detecting cyber vulnerabilities and increase cyber resiliency of weapon systems.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605807F / <i>Test and Evaluation Support</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	691.977	683.308	680.217	0.000	680.217	672.180	680.576	693.772	706.945	Continuing	Continuing
6606TG: <i>96th Test Group</i>	-	36.413	35.797	36.680	0.000	36.680	37.442	38.036	38.707	39.438	Continuing	Continuing
6606TS: <i>Test and Evaluation Support</i>	-	655.564	647.511	643.537	0.000	643.537	634.738	642.540	655.065	667.507	Continuing	Continuing

A. Mission Description and Budget Item Justification

Test facilities, capabilities and resources operated through this program include wind tunnels, rocket and jet engine test cells, armament test ranges, hardware-in-the-loop test facilities, climatic test facilities, avionics test facilities, aircraft testbeds, dry lakebed landing sites, instrumented test ranges, civilian payroll, and contractor services. It also provides resources for maintaining and modifying as required Air Force Materiel Command (AFMC) assigned test and test support coded aircraft. No acquisition contracts are funded from this program; test support contracts for services and supplies and equipment are predominantly awarded on the basis of full and open competition.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$18.8 million is required to address emergency war fighting readiness requirements. The funding will provide \$14.4 million of additional F-15 flying hours and contract maintenance labor to support on-going developmental test efforts avoiding critical test delays and \$4.4 million of cyber test infrastructure to support early detection of cyber vulnerabilities.

This program is in Budget Activity 6, RDT&E Management Support, because this budget activity includes research, development, test, and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	689.509	673.908	666.993	0.000	666.993
Current President's Budget	691.977	683.308	680.217	0.000	680.217
Total Adjustments	2.468	9.400	13.224	0.000	13.224
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	9.400			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.468	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	13.224	0.000	13.224

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0605807F / <i>Test and Evaluation Support</i>
<u>Change Summary Explanation</u> FY15: \$2.468 million increase for unscheduled emergency F-15 heavy maintenance. FY16: \$9.400 million congressional increase. FY17: \$5.576 million decrease for pricing adjustments; for non-flying/flying spares, aviation fuel, and civilian pay. "Fiscal Year (FY) 2017 Request for Additional Appropriations": \$18.8 million is required to address emergency readiness war fighting requirements. The funding will provide \$14.4 million of additional F-15 flying hours and contract maintenance labor to support on-going developmental test efforts avoiding critical delays and \$4.4 million for cyber test infrastructure to support early detection of cyber vulnerabilities.		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support					R-1 Program Element (Number/Name) PE 0606017F I Requirements Analysis and Maturation							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	18.673	22.507	129.100	0.000	129.100	35.348	33.565	33.985	34.388	Continuing	Continuing
666157: Development Planning	-	18.673	13.030	38.731	0.000	38.731	12.906	12.020	12.338	12.587	Continuing	Continuing
666158: INTEGRATED SIMULATION AND ANALYSIS	-	0.000	9.477	90.369	0.000	90.369	22.442	21.545	21.647	21.801	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Requirements Analysis and Maturation (RAM) program funds development planning (DP) to include early systems engineering and integrated simulation and analysis. These activities include requirements analysis, capability decomposition and trade space characterization, concept development (system of systems, air, space, and cyber), cost analysis, modeling and simulation of representative or prototype systems, and costs associated with these activities to include analytical tools and travel. Outcomes of these activities are fiscally and technologically informed requirements, mature concepts that are technically feasible, and areas for science and technology (S&T) investment to reduce technology risks. These activities provide the analytic basis for cost and capability trades to inform weapon systems requirements and acquisition milestones, decision points, and phases. A number of Department of Defense (DoD), Government Accountability Office (GAO), and independent studies point to a need for more disciplined, early-phase systems engineering and pre-systems acquisition planning and analysis to produce decision-quality acquisition information that previously did not surface until after the initiation of a program. Early-phase systems engineering and technical planning activities funded by this program provide the foundation for informed investment decisions leading to successful acquisition programs. Specific efforts are determined each year based upon the highest Air Force priorities.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$100 million is required to address emergency warfighting readiness requirements. Project 666157, Pre-systems Acquisition Planning and Concept Development efforts. \$30M for Planning for Development(PFD)activities that support Air Superiority 2030 Enterprise Capability Collaboration Team (ECCT) Flight Plan and other Core Function Lead (CFL) requirements approved by the Capability Development Council (CDC). Project 666158, Integrated Simulation and Analysis. \$70M for Modeling and Simulation Joint Simulation Environment (M&S JSE)to extend existing models and modeling and simulation infrastructure to build a common environment for advanced weapon system operational test, tactics development, and experimentation across all relevant domains.

This program is in Budget Activity 6, RDT&E Management Support, because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0606017F I Requirements Analysis and Maturation
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	16.350	16.507	16.759	0.000	16.759
Current President's Budget	18.673	22.507	129.100	0.000	129.100
Total Adjustments	2.323	6.000	112.341	0.000	112.341
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	6.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.800	0.000			
• SBIR/STTR Transfer	-0.477	0.000			
• Other Adjustments	0.000	0.000	112.341	0.000	112.341

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

Project: 666157: *Development Planning*

Congressional Add: *Program Increase*

Congressional Add Subtotals for Project: 666157

Project: 666158: *INTEGRATED SIMULATION AND ANALYSIS*

Congressional Add: *Program Increase*

Congressional Add Subtotals for Project: 666158

Congressional Add Totals for all Projects

FY 2015	FY 2016
2.500	-
2.500	-
-	6.000
-	6.000
2.500	6.000

Change Summary Explanation

Increase in FY 2015 for Reprogramming due to increased analysis on future airborne battle management and surveillance capability and cyber resiliency needs.

Increase in FY 2017 due to emphasis on integrated modeling and simulation capabilities to support Air Force development planning and experimentation.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$100 million is required to address emergency warfighting readiness requirements. Project 666157, Pre-systems Acquisition Planning and Concept Development efforts. \$30 million for Planning for Development(PFD)activities that support Air Superiority 2030 Enterprise Capability Collaboration Team (ECCT) Flight Plan and other Core Function Lead (CFL) requirements approved by the Capability Development Council (CDC). Project 666158, Integrated Simulation and Analysis. \$70 million for Modeling and Simulation Joint Simulation Environment (M&S JSE)to extend

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0606017F / Requirements Analysis and Maturation	
<p>existing models and modeling and simulation infrastructure to build a common environment for advanced weapon system operational test, tactics development, and experimentation across all relevant domains.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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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 0603423F I <i>Global Positioning System III - Operational Control Segment</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	2,378.898	334.631	392.418	513.268	0.000	513.268	252.530	232.783	124.860	127.073	0.000	4,356.461
67A021: OCX	2,276.545	278.552	331.362	451.362	0.000	451.362	189.417	168.477	74.453	75.772	0.000	3,845.940
67A025: GPS Enterprise Integrator	102.353	56.079	61.056	61.906	0.000	61.906	63.113	64.306	50.407	51.301	0.000	510.521

Program MDAP/MAIS Code: 456

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space based positioning, navigation and timing distribution system which operates through all weather. GPS supports both civil and military users in air, space, sea and land operations. GPS is a satellite-based radio navigation system that serves military and civil users worldwide. GPS users process satellite signals to determine accurate position, velocity and time. GPS must comply with 10 United States Code (USC) sec 2281 which requires that the Secretary of Defense ensures the continued sustainment and operation of GPS for military and civilian purposes and 51 USC sec 50112, which requires that GPS complies with certain standards and facilitates international cooperation.

This Program Element (PE) funds the Research & Development (R&D) for the GPS next generation operational control system (OCX) and the GPS Enterprise Integrator (EI). This includes advanced concept development, systems analysis, modernized control segment development, mission planning development, training simulators, integrated logistics support products, test resources, systems engineering required to meet the government's obligations to the international, military and civil communities, and system requirements verification. OCX acquisition was established to 1) provide command and control of legacy and GPS III satellites, 2) incorporate situational awareness to support Navigation Warfare (NAVWAR) and signal monitoring, 3) enable mission capability upgrades to support a warfighter effects- based approach to operations and 4) integrate DoD information assurance and cyber security controls and capabilities. GPS Enterprise Integrator is responsible for architecture and system definition (the analysis and definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents) as well as for the planning, execution, and fielding of the GPS Enterprise.

OCX funds will support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, test and evaluation efforts and mission operations. These activities support upgrades and product improvements for military and civil applications necessary to enable efforts to protect U.S. military and Allies' use of GPS. Additionally, funds will ensure OCX efforts meet current and future Joint Requirements Oversight Council-approved required capabilities.

The GPS Enterprise consists of Space, Ground Control, Nuclear Detonation (NUDET) Detection System (NDS) and User Equipment Segments. The government is responsible for the integration of the GPS Segments such that they provide worldwide GPS capability to support the warfighter and over a billion national security, civil, Allied, and commercial GPS users.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 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	
<p>The GPS Enterprise Integrator project includes the efforts associated with the Government's prime contract tasks necessary to accomplish this critical integrating function with the entire GPS user community. The Enterprise Integrator maintains the GPS current architecture and system definition, controls and validates interfaces, ensures compatibility of Generation II and III systems, and develops/manages plans for execution and fielding of the GPS Enterprise. Further, the Enterprise Integrator provides modeling, simulation and technical analyses of impacts for Government-directed enterprise-level trades among the GPS segments leading to definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents to build and ensure the integrity of the enterprise technical baseline, and perform system requirements verification.</p> <p>In addition, the GPS Enterprise Integrator project funds the technical evolution, risk reduction, enterprise-level testing and delivery of all GPS Enterprise capabilities. Examples for Generation II include electronic protection and additional civil signals; for Generation III, additional anti-jamming protection. To accomplish this, the GPS Enterprise Integrator delivers Test and Verification capabilities, Requirements and Interface Management, and Systems Integration support across the Space, Control, and User Segments. In this capacity, the Enterprise Integrator is responsible for managing this cross-program work to provide these and other capabilities.</p> <p>GPS Enterprise Integrator's analyses guide government decisions to ensure efficient and effective synchronization and execution across all Generation II and III GPS programs. For Enterprise-wide integration to be successful, the Integrator: works with the GPS and NDS prime contractor teams to develop plans for early risk reduction System Integration Demonstrations to ensure system interfaces and functionality meet user and system requirements; ensures all equipment and documentation is ready when needed; integrates and analyzes enterprise schedules; and conducts formal test and verification, including Requirement Verification Plans and System Test Plans and Procedures. GPS Enterprise Integrator performs all these efforts across all GPS programs in all acquisition phases. The government owns the Enterprise system requirements and integration, and highly leverages the Enterprise Integrator team to eliminate the need to fund a development prime contractor to perform these functions. This enhances government control, oversight and program accountability.</p> <p>"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$120 million is required to address emergency warfighting readiness requirements. RDT&E Project 67A021, OCX Development, implements Information Assurance and Cybersecurity requirements needed to remedy documented operational vulnerabilities. Funds operational fielding of GPS next-gen control system to provide post-launch checkout and anomaly resolution capability and generate PNT messages. Fully funds to the restructured OCX program.</p> <p>This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that were fielded or received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force				Date: March 2017	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development		PE 0603423F I Global Positioning System III - Operational Control Segment			
B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	299.060	350.232	222.288	0.000	222.288
Current President's Budget	334.631	392.418	513.268	0.000	513.268
Total Adjustments	35.571	42.186	290.980	0.000	290.980
• 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	35.571	42.186			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	290.980	0.000	290.980
Change Summary Explanation					
FY15: +\$35.571 million Above Threshold Reprogramming (ATR) for OCX overrun					
FY17: +\$170.980 million to fund OCX to the Service Cost Position (SCP)					
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$120 million is required to address emergency warfighting readiness requirements. RDT&E Project 67A021, OCX Development, implements Information Assurance and Cybersecurity requirements needed to remedy documented operational vulnerabilities. Funds operational fielding of GPS next-gen control system to provide post-launch checkout and anomaly resolution capability and generate PNT messages. Fully funds to the restructured OCX program.					

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 2017
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	PE 0101113F / B-52 SQUADRONS											
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	41.072	74.520	88.267	0.000	88.267	140.285	149.417	148.934	174.635	Continuing	Continuing
675039: <i>B-52 System Improvements</i>	-	0.000	0.050	10.051	0.000	10.051	0.050	0.051	0.050	0.051	Continuing	Continuing
675041: <i>Bomber Tactical Data Link</i>	-	0.000	0.000	7.525	0.000	7.525	5.843	2.179	0.000	0.000	Continuing	Continuing
675048: <i>1760 INTERNAL WEAPONS BAY UPGRADE (IWBU)</i>	-	39.994	60.265	34.634	0.000	34.634	15.128	0.000	0.000	0.000	0.000	150.021
675050: <i>CONNECT</i>	-	1.078	11.225	13.672	0.000	13.672	18.723	10.517	0.815	0.000	Continuing	Continuing
675055: <i>GPS-IU</i>	-	0.000	2.980	6.916	0.000	6.916	17.713	11.785	0.000	0.000	Continuing	Continuing
675056: <i>B-52 Radar Modernization Program (RMP)</i>	-	0.000	0.000	4.653	0.000	4.653	55.067	114.297	145.393	171.909	Continuing	Continuing
675057: <i>B-52 Low Cost Improvement (LCI)*</i>	-	0.000	0.000	0.000	0.000	0.000	2.674	2.674	2.676	2.675	Continuing	Continuing
675058: <i>B-52 Weapon Sys Trainer Air Ref Training Upgrade</i>	-	0.000	0.000	4.875	0.000	4.875	13.202	7.914	0.000	0.000	Continuing	Continuing
675160: <i>B-52 Crypto Modernization</i>	-	0.000	0.000	5.941	0.000	5.941	11.885	0.000	0.000	0.000	Continuing	Continuing

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2017

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

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0101113F / B-52 SQUADRONS	
<p>BOMBER TACTICAL DATA LINK (B-52 LINK 16) (BPAC 675041)</p> <p>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.</p> <p>Trainers and Upgrades for Bomber Tactical Data Link (TDL)</p> <p>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</p> <p>B-52 1760 INTERNAL WEAPONS BAY UPGRADE (IWBU) (BPAC 675048)</p> <p>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.</p> <p>Trainers and Upgrades for 1760 IWBU</p> <p>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</p> <p>B-52 COMBAT NETWORK COMMUNICATIONS TECHNOLOGY (CONECT) (BPAC 675050)</p> <p>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 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</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 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>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) 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</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</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 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	
<p>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 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 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.</p> <p>Trainers and Upgrades for Crypto Modernization 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 CONECT functionality to meet user-training requirements, and update/maintain the SIL for the WSTs</p> <p>The FY2017 funding request was reduced by \$16.462 million to account for the availability of prior year execution balances.</p> <p>"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10 million is required to address emergency warfighting readiness requirements. RDT&E Project 675039, B-52 System Improvements, is a comprehensive project to ensure B-52 viability to perform current and future wartime missions. 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.</p> <p>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.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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 0101113F / B-52 SQUADRONS
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	49.457	74.520	48.849	0.000	48.849
Current President's Budget	41.072	74.520	88.267	0.000	88.267
Total Adjustments	-8.385	0.000	39.418	0.000	39.418
• 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	-6.700	0.000			
• SBIR/STTR Transfer	-1.685	0.000			
• Other Adjustments	0.000	0.000	39.418	0.000	39.418

Change Summary Explanation

FY15: Reduction of -\$8.385 million consists of: -1.685 million SBIR; -\$6.7 million reprogramming for higher AF priorities.

FY17: Increase of +\$39.418 million consists of: +\$7.525 million(Tactical Data Link); +\$4.653 million (Radar Modernization); +\$5.941 million (Crypto Modernization); +\$4.875 million (Weapon System Trainers Air Refueling); +\$0.867 million (CONNECT); +\$8.564 million (1760 IWBW) for JASSM-ER acceleration; +\$10 million for B-52 System Improvements Risk Reduction Studies; -\$3.005 million (GPS-IU) for higher Air Force priorities.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10 million is required to address emergency warfighting readiness requirements. RDT&E Project 675039, B-52 System Improvements, is a comprehensive project to ensure B-52 viability to perform current and future wartime missions. 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.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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 0207131F I A-10 Squadrons							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	0.000	16.200	21.353	0.000	21.353	13.409	13.650	13.810	0.000	Continuing	Continuing
674809: A-10 Squadrons	-	0.000	16.200	21.353	0.000	21.353	13.409	13.650	13.810	0.000	Continuing	Continuing

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.

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 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.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$6.5 million is required to address emergency war-fighting readiness requirements. RDT&E Project 3059, A-10, OFP Development funding will be used to build a High Fidelity Test Stand (HFTS) to support the High Resolution Display System (HRDS). HRDS is currently the number one ranked Operational Flight Program candidate coming out of November 2016 Avionics System Requirements Review Council (ASRRC). The ASRRC is the first step in the requirements definition for OFP. A HRDS Sub System Test Stand (SST) would also be built to support the system.

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

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	16.200	21.353	0.000	21.353
Total Adjustments	0.000	16.200	21.353	0.000	21.353
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	16.200			
• 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	21.353	0.000	21.353

Change Summary Explanation

FY16 Congressional Add of \$16.2 million for OFP restoral
FY17 increase of \$14.853 million for continued OFP sustainment

Fiscal Year (FY) 2017 Request for Additional Appropriations \$6.5 million is required to address emergency war-fighting readiness requirements. RDT&E Project 3059, A-10, OFP Development funding will be used to build a High Fidelity Test Stand (HFTS) to support the High Resolution Display System (HRDS). HRDS is currently the number one ranked Operational Flight Program candidate coming out of November 2016 Avionics System Requirements Review Council (ASRRC). The ASRRC is the first step in the requirements definition for OFP. A HRDS Sub System Test Stand (SST) would also be built to support the system.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0207133F / F-16 Squadrons							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	130.376	166.297	147.795	0.000	147.795	235.894	199.455	140.398	146.203	Continuing	Continuing
672671: F-16 Squadrons	-	130.376	166.297	147.795	0.000	147.795	235.894	199.455	140.398	146.203	Continuing	Continuing

A. Mission Description and Budget Item Justification

The F-16 Fighting Falcon is the world's premier fixed-wing, high performance, single engine multi-mission fighter aircraft that comprises 50% of the AF fighter inventory. Operational since 1980, the F-16 has proven itself in combat in a variety of air-to-air and air-to-surface missions, such as, offensive and defensive counter-air, close air support, forward air control, air interdiction (day/night and all-weather) and Suppression of Enemy Air Defenses (SEAD)/destruction of enemy air defenses (DEAD). The F-16 remains the USAF's primary SEAD/DEAD platform. The aircraft has evolved its capabilities by capitalizing upon advancements made in computers, avionics systems, engines, and structures technologies to meet emerging warfighter requirements and combat current and evolving enemy threats. The F-16 has been selected by more than 20 air forces around the world and Foreign Military Sales (FMS) production continues in the 21st century. The F-16 System Program Office continues to develop, integrate, and qualify systems/subsystems to enhance the overall performance of the F-16 weapon system to meet new mission requirements.

Modernization programs include: Operational Flight Program (OFP) development on Block 40/42/50/52 OFPs required to integrate new precision weapons, advanced targeting pods, improved avionics, hardware (HW) and software (SW) mods to meet DoD mandates and keep the F-16, the respective training simulators, and other hardware subsystems current; Legacy Service Life Extension Program (SLEP), which is a two-phased RDT&E effort, includes a Full Scale Durability Test (FSDT) and Engineering, Manufacturing and Development (EMD) to support structural modifications to Block 40/42/50/52 aircraft 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)/Display Generator Upgrade resolves shortfalls in mission computer memory and throughput brought on by the addition of incremental combat capability 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 Blk 40/42/50/52 aircraft, and includes NRE, test assets, SEEK EAGLE, integration, and flight test; improved satellite communication (SATCOM) radio updates to meet next-gen tactical narrowband SATCOM with better crypto capabilities; and an active electronically scanned array (AESA) radar that offers advanced electronic protection capabilities as well as improved reliability and maintainability on F-16 aircraft that perform the aerospace alert control mission.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$15 million is required to address emergency warfighting readiness requirements. These funds will complete the RDT&E Project 672671, F-16 active electronically scanned array (AESA) Radar Joint Urgent Operational Need (JUON) USNORTHCOM and associated OFP efforts. It 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).

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.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	133.105	148.297	141.118	0.000	141.118
Current President's Budget	130.376	166.297	147.795	0.000	147.795
Total Adjustments	-2.729	18.000	6.677	0.000	6.677
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-22.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	40.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-2.728	0.000			
• Other Adjustments	-0.001	0.000	6.677	0.000	6.677

Change Summary Explanation

FY15: SBIR Reduction: \$2.728 million

FY16: \$40 million Congressional Add for AESA Homeland Defense Radar; \$22M Congressional Reduction for OFP M8+ Early To Need

FY17: \$11 million reduction due to program rephase of RDT&E funds; \$4.0 million RMD add for Comm Suite Radio Upgrade (Post Block); \$1.323 million reduction due to non-pay inflation

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$15 million is required to address emergency warfighting readiness requirements. These funds will complete the RDT&E Project 672671, F-16 active electronically scanned array (AESA) Radar Joint Urgent Operational Need (JUON) USNORTHCOM and associated OFP efforts. It 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).

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	16.480	14.187	23.923	0.000	23.923	13.996	7.824	3.823	14.785	Continuing	Continuing
674804: <i>COMPASS CALL</i>	-	16.480	14.187	23.923	0.000	23.923	13.996	7.824	3.823	14.785	Continuing	Continuing

A. Mission Description and Budget Item Justification

The EC-130H 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). EC-130H 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 the 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, the EC-130H 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 CNS/ATM and RNP enhancements, parameters, and guidance.

The EC-130H 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 2017 RDT&E efforts will concentrate support for Baseline 3(BL3)/platform upgrades to the COMPASS CALL fleet and ground systems/simulators. The programmed BL3 upgrades will advance the primary mission equipment (PME) even further as the 2017 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.

Activities in the FY 2017 RDT&E efforts also include studies and analysis to support both current and future program planning and execution.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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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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.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10.2 million is required to address emergency warfighting readiness requirements. Funding in Project 674804, Compass Call, supports Baseline 3 (BL3) Advanced Radar Countermeasure System (ARCS) software, Environmental Characterization efforts and Baseline 4 (BL4) initial specifications.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	14.315	14.249	13.860	0.000	13.860
Current President's Budget	16.480	14.187	23.923	0.000	23.923
Total Adjustments	2.165	-0.062	10.063	0.000	10.063
• Congressional General Reductions	0.000	-0.062			
• 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	2.165	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	10.063	0.000	10.063

Change Summary Explanation

FY 2015 Below Threshold Reprogramming of +\$2.165 million for Baseline 3 development efforts.

FY17: Other adjustments includes -\$0.137 million inflation adjustment.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10.2 million is required to address emergency warfighting readiness requirements. Funding in Project 674804, Compass Call, supports Baseline 3 (BL3) Advanced Radar Countermeasure System (ARCS) software, Environmental Characterization efforts and Baseline 4 (BL4) initial specifications.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 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 0303001F <i>I Family of Advanced BLoS Terminals (FAB-T)</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	0.000	3.895	52.578	0.000	52.578	0.000	0.000	0.000	0.000	0.000	56.473
672490: <i>Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)</i>	-	0.000	3.895	52.578	0.000	52.578	0.000	0.000	0.000	0.000	0.000	56.473

Note

Prior Years Funding \$180.602 was executed in PE 0303601F

A. Mission Description and Budget Item Justification

The Family of Advanced Beyond Line-of-Sight Terminals (FAB-T) program replaces legacy Milstar terminals and will provide Extremely High Frequency (EHF), protected high data rate communication for nuclear and conventional forces to include Presidential and National Voice Conferencing (PNVC). FAB-T will provide this new, highly secure, state-of-the-art capability for DoD platforms to include strategic platforms and airborne/ground command posts via Milstar, AEHF, and Enhanced Polar System (EPS) satellites. FAB-T terminals will also support the critical command and control (C2) of the Milstar, AEHF and EPS satellite constellations. In FY16, the Air Force continued development of the FAB-T terminal, performing systems engineering, architectures, continuation of test efforts for Initial Operational Test & Evaluation (IOT&E) & other activities to meet current & future emerging SATCOM requirements.

The Presidential and National Voice Conferencing (PNVC) capability is a critical element of the Nuclear Command, Control, and Communications (NC3) System. There are several components being developed that must be synchronized to expeditiously field this capability. In May 2015, the Air Force was designated as the end-to-end PNVC Integrator. The Defense Information Systems Agency will transfer \$15 million RDT&E to the Air Force for PNVC Integration. The Air Force will request a Prior Approval reprogramming for the remaining FY16 requirements. This continuing effort was previously programmed and budgeted in DISA's PE 0303126K/Long-Haul Communications - DCS, PC01: Presidential and National Voice Conferencing Equipment and is not a New Start.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10.2 million is required to address emergency warfighting readiness requirements. Amended funding for Presidential and National Voice Conference (PNVC) Integrator will satisfy the February 2016 Prior Approval Request (FY 16-08 PA) that was deferred past the expiration of sourced funds. The funding enables configuration of system integration test laboratories, development of system-level functional test plans and procedures, as well as execution of system testing essential to execute the integration task. The PNVC replaces the legacy Survivable Emergency Conferencing Network (SECN) which does not meet end user requirements due to poor voice quality latency issues, and is reaching projected end of life. Without this funding, the Air Force will be unable to fulfill its enduring mission to provide worldwide, secure, and survivable command and control of nuclear forces by the President and national senior leaders.

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: Request for Additional Appropriations 2017 Air Force	Date: March 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 0303001F / <i>Family of Advanced BLoS Terminals (FAB-T)</i>
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	3.907	0.000	0.000	0.000
Current President's Budget	0.000	3.895	52.578	0.000	52.578
Total Adjustments	0.000	-0.012	52.578	0.000	52.578
• Congressional General Reductions	0.000	-0.012			
• 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	52.578	0.000	52.578

Change Summary Explanation

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$10.2 million is required to address emergency warfighting readiness requirements. Amended funding for Presidential and National Voice Conference (PNVC) Integrator will satisfy the February 2016 Prior Approval Request (FY 16-08 PA) that was deferred past the expiration of sourced funds. The funding enables configuration of system integration test laboratories, development of system-level functional test plans and procedures, as well as execution of system testing essential to execute the integration task. The PNVC replaces the legacy Survivable Emergency Conferencing Network (SECN) which does not meet end user requirements due to poor voice quality latency issues, and is reaching projected end of life. Without this funding, the Air Force will be unable to fulfill its enduring mission to provide worldwide, secure, and survivable command and control of nuclear forces by the President and national senior leaders.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 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 0305208F <i>I Distributed Common Ground/Surface Systems</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	26.993	22.686	30.448	0.000	30.448	26.422	22.143	22.554	22.954	Continuing	Continuing
674826: <i>Common Imagery Ground / Surface Systems</i>	-	19.482	22.686	30.448	0.000	30.448	26.422	22.143	22.554	22.954	Continuing	Continuing
676025: <i>Data Compression</i>	-	7.511	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.511

A. Mission Description and Budget Item Justification

Air Force Distributed Common Ground System (AF DCGS) is the Combat Air Force (CAF) weapon system architecture for planning and direction, collection, processing and exploitation, analysis and production, and dissemination (PCPAD) of data from Intelligence, Surveillance, and Reconnaissance (ISR) missions. Since AF DCGS is also a major component of the DoD DCGS, the system is designed to complement and interoperate with the DoD, Army, Navy and Marine Corps DCGS. The AF DCGS mission is to provide Joint Task Force (JTF) Commanders, Air Component Commanders, Unified Commands, and other directed organizations with global, time-sensitive ISR PCPAD across the spectrum of military operations. AF DCGS is a multi-INT network linked weapon system (AN/GSQ-272) capable of exploiting intelligence data from manned platforms, remotely piloted aircraft (RPA), non-traditional ISR platforms, national and commercial satellites, and other collection systems. AF DCGS is designed to support joint operational requirements by providing a common PCPAD means to provide time-sensitive intelligence to field commanders and in support of the Air Operations Center (AOC) mission requirements. Currently, the AF DCGS worldwide architecture is composed of two worldwide core sites, three regional core sites, two remote Air Force Forces (AF FOR) sites, four National Mission Partner (NMP) sites, three support sites, and multiple National Guard Bureau (NGB) sites. Currently, AF DCGS is supporting ongoing operations from forward deployed and in-garrison CONUS and OCONUS based locations. The system employs a concept of data distribution, information sharing and collaborative work centers. AF DCGS provides the national leadership and the warfighter with integrated and interoperable national and airborne reconnaissance by providing quality and fused Signals Intelligence (SIGINT), Measurement and Signature Intelligence (MASINT), and Geospatial Intelligence (GEOINT) tailored to the warfighter for all levels of conflict.

AF DCGS is transforming by integrating the necessary technologies and tools to provide increased capabilities and meet emerging and urgent operational needs. These efforts will also integrate commercial-off-the-shelf and government-off-the-shelf upgrades to provide current technologies and achieve necessary application services. The next series of upgrades will meet the operational need to integrate new and/or improved sensor capabilities, as well as enhance interoperability by migrating to an Open Architecture (OA) to improve data sharing ability per DoD direction.

The DCGS Data Compression effort provides the warfighter a capability to efficiently compress and decompress airborne ISR sensor data and transmit near real-time to tactical users through current and future bandwidth limited commercial satellite communications (SATCOM) or military SATCOM. The effort will develop, test and implement new sensor data compression and decompression algorithms for current and emerging airborne ISR sensors. Additionally, the program develops compression and decompression capabilities for manned and unmanned airborne platforms, associated ground stations, and DCGS. Outputs will meet standard certification for use within the DoD GEOINT and MASINT architectures.

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

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force				Date: March 2017		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0305208F I Distributed Common Ground/Surface 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.						
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$11.546 million is required to address emergency warfighting readiness requirements. Funding in RDT&E Project 674826, Common Imagery Ground/ Surface Systems, SIGINT Transformation. AF DCGS is currently air domain centric in nature, technically isolated and unable to seamlessly interface with and access many data sources, tools, and emerging big-data analytics within the Intel Community. This provides RDT&E funds to establish peer-to-peer cryptologic interoperability with NSA architecture, automated ingest of airborne data, improved geolocation timeliness & accuracy for tracking & targeting, greatly enhancing the quality of DCGS analysis.						
B. Program Change Summary (\$ in Millions)		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget		26.994	22.784	21.687	0.000	21.687
Current President's Budget		26.993	22.686	30.448	0.000	30.448
Total Adjustments		-0.001	-0.098	8.761	0.000	8.761
• Congressional General Reductions		0.000	-0.098			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		0.000	0.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		0.000	0.000			
• Other Adjustments		-0.001	0.000	8.761	0.000	8.761
Change Summary Explanation						
The FY 2017 funding request was reduced by \$2.785 million to account for the availability of prior year execution balances.						
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$11.546 million is required to address emergency warfighting readiness requirements. Funding in RDT&E Project 674826, Common Imagery Ground/ Surface Systems, SIGINT Transformation. AF DCGS is currently air domain centric in nature, technically isolated and unable to seamlessly interface with and access many data sources, tools, and emerging big-data analytics within the Intel Community. This provides RDT&E funds to establish peer-to-peer cryptologic interoperability with NSA architecture, automated ingest of airborne data, improved geolocation timeliness & accuracy for tracking & targeting, greatly enhancing the quality of DCGS analysis.						

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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 0305265F / <i>GPS III Space Segment</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	2,172.921	204.864	180.359	179.188	0.000	179.188	110.860	43.561	78.866	80.265	464.191	3,515.075
676007: <i>SAR- GPS</i>	6.521	1.147	1.286	1.295	0.000	1.295	1.320	1.344	1.369	1.393	0.000	15.675
67A019: <i>GPS III</i>	2,166.400	203.717	179.073	177.893	0.000	177.893	109.540	42.217	77.497	78.872	464.191	3,499.400

Program MDAP/MAIS Code: 292

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based navigation system that fills validated Joint Service requirements for worldwide, accurate, common grid three dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures and rapid deployment for all services. GPS must comply with Title 10 United States Code (USC) Sec. 2281 which requires that the Secretary of Defense ensures that continued sustainment and operations of GPS for military and civilian purposes and 51 USC Sec. 50112 which requires that GPS complies with certain standards and facilitates international cooperation.

The system is composed of three segments: User Equipment (funded under PE 0305164F), Space (funded under this PE and PE 0305165F) and a Control Network (funded under PE 0305165F and PE 0603423F). The satellites broadcast high accuracy data using precisely synchronized signals which are received and processed by user equipment installed in military platforms. This equipment computes the platform position and velocity and provides steering vectors to target locations or navigation waypoints. The control segment provides daily updates to the navigation messages broadcast from the satellites to maintain system precision in three dimensions to 16 meters spherical error probable worldwide. Additionally, GPS supports the United States Nuclear Detonation (NUDET) Detection System (NDS) mission and provides strategic and tactical support to the following Department of Defense (DoD) missions: Joint Operations by providing capabilities for Positioning, Navigation, and Timing (PNT); Command, Control, Communications, and Intelligence (C3I); Special Operations; Military Operations in Urban Terrain (MOUT); Defense-Wide Mission Support; Air Mobility; and Space Launch Orbital Support.

GPS III is the next generation Space Vehicle (SV) to join the GPS constellation. GPS III SVs will deliver significant enhancements, including a new civil (L1C) Galileo-compatible signal, and enhanced anti-jam power. Two auxiliary payloads, Search and Rescue/GPS (SAR/GPS) and Laser Retro-reflector Array (LRA) will be added no earlier than SV11. The SAR/GPS payload provided by Canada will fill a validated National Search and Rescue Committee requirement to provide enduring, space-based distress alerting capability to detect, locate, and relay distress alerts to fulfill its responsibilities under international agreements for Search and Rescue. SAR integration costs are split 50%/50% between the Coast Guard and the Air Force (costs presented in this document represent the USAF 50% share). LRA, built by the Naval Research Lab (NRL), is a passive reflector that will improve accuracy and provide better ephemeris data. National Geospatial-Intelligence Agency (NGA) funds the integration costs of the LRA.

This program funds GPS III and supports research, development, test and evaluation (RDT&E) of GPS III SV01-02 and risk-reducing simulators through a systems engineering approach that matures and delivers SVs for launch. This PE includes SV01-02 engineering studies and analyses, trade studies, system development, test

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0305265F I GPS III Space Segment	
and evaluation efforts, integrated logistics support products, on-orbit support, and mission operations support for civil and military applications that protect U.S. military and Allied use of GPS.		
The program also includes Contingency Operations (COPs) as risk mitigation to late Next Generation Operational Control System (OCX) delivery. The current acquisition schedule of OCX Block 1 (capability to operate GPS III satellites) puts GPS constellation sustainment at risk since the current control segment cannot operate GPS III satellites. GPS III COPs is a modification to the current control segment to operate GPS III satellites' PNT and NUDET Detection System (NDS) until OCX Block 1 is delivered.		
On 3 July 2015, USD(AT&L) approved the first phase of a two-phased GPS III SV acquisition strategy starting no earlier than SV11. Phase 1 is a Production Readiness Feasibility Assessment which will provide data and insight into contractors' GPS III Production Design with emphasis on a mature navigation payload to include a regional M-Code capability that is consistent with the GPS Enterprise Analysis of Alternatives (AOA). Phase 1 utilizes FY15-17 RDTE funding for up to three contractors' GPS production designs. Phase 2 has not been approved and options continue to be explored. Notionally, Phase 2 will be a full and open competition for up to 22 GPS III SVs with an expected decision no earlier than SV11. Phase 2 is funded via Space Procurement Air Force (3021) in PE 0305265F, BPAC: 23GPS3.		
Space Modernization Initiative (SMI) focuses on space vehicle affordability and capability, addresses obsolescence, future requirements and resiliency needs, and expands the industrial base to enhance future competition. Phase 1 will address GPS Enterprise AoA recommendations to increase GPS signal strength from space by maturing navigation payload technologies that include a new regional M-Code capability. The Air Force is using its research laboratories to mature an On-Orbit Reprogrammable Digital Waveform Generator which will provide signal flexibility (to change the signal form while the satellite is on-orbit). This effort will be funded with Air Force Research Lab's Science & Technology (S&T) funding and PE 0305265F to increase the number of alternate navigation payload awards.		
In FY17, this Program Element supports Enterprise Ground Services (EGS). EGS is performing tech maturation, experiments and prototyping for increased commonality and resiliency in space program ground systems.		
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$26.3 million is required to address emergency warfighting readiness requirements. RDT&E Project 67A019, GPSIII Space Segment, Funding for the Mission Readiness Campaign (MRC) effort will complete GPSIII Space Vehicle (SV)01-02 activities to include launch preparation, planning, testing, launch vehicle integration, On-Orbit Checkout activities, storage and routine maintenance on the SVs prior to launch.		
"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$11 million is required to address growth and improve lethality requirements. RDT&E Project 67A019, M-Code Early Use is a FY17 New Start effort that fixes current GPS ground control systems for mandatory operational use of Military-code (M-Code) for next-generation encrypted PNT data to all military users with modernized receivers.		
This program is a 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: Request for Additional Appropriations 2017 Air Force	Date: March 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 0305265F I <i>GPS III Space Segment</i>
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	211.907	180.902	154.630	0.000	154.630
Current President's Budget	204.864	180.359	179.188	0.000	179.188
Total Adjustments	-7.043	-0.543	24.558	0.000	24.558
• Congressional General Reductions	0.000	-0.543			
• 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	-7.043	0.000			
• Other Adjustments	0.000	0.000	24.558	0.000	24.558

Change Summary Explanation

FY17: -\$12.742 million for higher Department priorities

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$26.300 million is required to complete GPSIII SV01/02 Mission Readiness Campaign activities to include Launch/planning, testing, space craft launch vehicle integration, on orbit test activities and SV01/02 storage.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$11.000 million is required to fix current GPS ground control systems for mandatory operational use of Military-code (M-Code) for next-generation encrypted PNT data to all military users with modernized receivers.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 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 0305614F / JSpOC Mission System
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	328.110	83.277	80.669	87.889	0.000	87.889	62.799	65.388	66.739	69.408	Continuing	Continuing
67A030: <i>Infrastructure</i>	160.354	39.894	30.018	27.526	0.000	27.526	0.000	0.000	0.000	0.000	0.000	257.792
67A031: <i>Mission Applications</i>	159.164	43.383	38.270	20.496	0.000	20.496	0.000	0.000	0.000	0.000	0.000	261.313
67A032: <i>Command and Control</i>	8.592	0.000	0.000	15.000	0.000	15.000	0.000	0.000	0.000	0.000	0.000	23.592
67A035: <i>INCREMENT 3</i>	0.000	0.000	12.381	24.867	0.000	24.867	62.799	65.388	66.739	69.408	Continuing	Continuing

Program MDAP/MAIS Code: N82

A. Mission Description and Budget Item Justification

The Joint Space Operations Center (JSpOC) Mission System (JMS) Program is a Space Command and Control (C2) capability for the Commander, Joint Functional Component Commander for Space (JFCC SPACE). The JMS program is predominately a software effort that will produce an integrated, net-centric Service Oriented Architecture (SOA) and the necessary software applications to accomplish required missions. The program will provide a collaborative environment that will enhance and modernize space situational awareness (SSA) capabilities; create decision-relevant views of the space environment; rapidly detect, track and characterize objects of interest; identify / exploit traditional and non-traditional sources; perform space threat analysis; and enable efficient distribution of data across the Space Surveillance Network (SSN). Furthermore, it provides a viable migration path from the legacy Space Defense Operations Center (SPADOC) system, which has 75% of its components beyond end of life or end of service, and the majority of its software no longer vendor-supported. JMS Increment 3 will expand upon the Increment 2 architecture and deliver Battle Management Command and Control (BMC2) capabilities for capacity and timeliness to manage major theater engagements of many on many threats; synchronize forces and enable automated courses of action (COA) and C2; expand information architecture to include intelligence community, non-traditional, commercial, and international sources. JMS 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.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$15 million is required to provide deliberate planning & battle management decision support tools enabling timely execution of authorities and C2 JSpOC.

This program is a 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: Request for Additional Appropriations 2017 Air Force	Date: March 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 0305614F / JSpOC Mission System
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	73.779	81.911	65.414	0.000	65.414
Current President's Budget	83.277	80.669	87.889	0.000	87.889
Total Adjustments	9.498	-1.242	22.475	0.000	22.475
• Congressional General Reductions	0.000	-0.242			
• Congressional Directed Reductions	0.000	-1.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.499	0.000			
• SBIR/STTR Transfer	-0.001	0.000			
• Other Adjustments	0.000	0.000	22.475	0.000	22.475

Change Summary Explanation

FY15: +\$9.499 million Below Threshold Reprogramming for equipment and engineering support for development and testing Increment 2 service packs 9-13

FY16: -\$1 million Congressional Mark "Excessive Growth"

FY17: +\$7.475 million Funds Space Control BMC2

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$15 million is required to provide deliberate planning & battle management decision support tools enabling timely execution of authorities and C2 JSpOC.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 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 0305940F / <i>Space Situational Awareness Operations</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	11.017	20.016	93.802	0.000	93.802	22.803	6.619	5.352	5.351	Continuing	Continuing
670004: <i>Joint Interagency Combined Space Operations Center</i>	-	0.000	0.000	73.652	0.000	73.652	6.933	1.981	1.982	1.982	Continuing	Continuing
67A017: <i>Sensor Service Life Extension Program</i>	-	11.017	20.016	20.150	0.000	20.150	15.870	4.638	3.370	3.369	0.000	78.430

A. Mission Description and Budget Item Justification

Space Situational Awareness (SSA) is knowledge of all aspects of space related to operations. As the foundation for space control, SSA encompasses surveillance of all space objects and activities; detailed reconnaissance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering intelligence on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities. This program element fields, upgrades, operationalizes, operates and maintains Air Force sensors and information integration capabilities within the SSA network while companion program element 0604425F, Space Situational Awareness Systems, develops new network sensors and improved information integration capabilities across the network. Activities funded in this program element (0305940F) focus on surveillance of objects in earth orbit to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering.

The Sensor Life Extension Programs (SLEPs) project funds efforts to upgrade, operationalize and extend the life of operational Space Situational Awareness (SSA) sensors, as needed. These SLEPs include, but are not limited to, programs which extend the serviceable life of assets and maintain critical capability by replacing aging and increasingly unsustainable components with modern and sustainable equipment. SLEPs may incorporate equipment which inherently includes technological advances resulting in enhanced or increased capabilities. In addition, the SLEP itself may be designed to increase capabilities not currently realized. The on-going Ground-based Electro Optics Deep Space Surveillance (GEODSS) Phase II is representative of sensor system upgrades in the SLEP project. As the need arises in the execution year, funds in this project may be used to begin sensor life extension programs on additional efforts.

The SSA Ops Demo creates a survivable architecture which provides overlapping, assured, and viable surveillance options for executing simultaneous safety of flight and event response. The demonstration develops software modifications to exploit data from legacy systems.

Beginning in FY17 this program element will begin fielding and sustaining the Joint Interagency Combined Space Operations Center (JICSpOC) infrastructure in response to US Strategic Command Joint Emergent Operational Need (ST-0006). The JICSpOC seeks to improve unity of effort and information sharing across the national security space community to effectively respond to potential future space threat events and will have the capability to develop, test, and integrate new space system tactics, techniques and procedures (TTPs) in support of both DoD and Intelligence Community operations.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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 0305940F / <i>Space Situational Awareness Operations</i>
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Also in FY17 this program element will begin a series of Ground Radar Upgrades designed to improve the sensitivity, search capability and CONOPS of existing SSA sensors to better support fire control timelines.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$58.8 million is required to address emergency warfighting readiness requirements. This effort will focus on the development of the infrastructure to support the buildup of the JICSpOC operations floor and the applications required for an improved integrated battle management, command and control capability. It will also include effort to begin the standup of a Space Operations and Development Center (SpODC) to support BMC2 prototype assessment, wargaming, experimentation, TTP development and advanced training.

These efforts 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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	11.408	20.077	8.583	0.000	8.583
Current President's Budget	11.017	20.016	93.802	0.000	93.802
Total Adjustments	-0.391	-0.061	85.219	0.000	85.219
• Congressional General Reductions	-0.391	-0.061			
• 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	85.219	0.000	85.219

Change Summary Explanation

FY17: +2.8 million for Space Control BMC3; +2.172 million internal realignment of funding; +\$15.0 million to sustain JICSpOC infrastructure; +\$10 million SSA Ground Radar Upgrades; -\$3.6 million to account for availability of prior year balances.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$58.8 million is required to address emergency warfighting readiness requirements. This effort will focus on the development of the infrastructure to support the buildup of the JICSpOC operations floor and the applications required for an improved integrated battle management, command and control capability. It will also include effort to begin the standup of a Space Operations and Development Center (SpODC) to support BMC2 prototype assessment, wargaming, experimentation, TTP development and advanced training.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force **Date:** March 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 0401318F / CV-22
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	37.698	27.776	28.702	0.000	28.702	17.455	16.634	14.724	14.984	74.005	231.978
676033: <i>CV-22 RDT&E POST PRODUCTION</i>	0.000	37.698	27.776	28.702	0.000	28.702	17.455	16.634	14.724	14.984	74.005	231.978

Program MDAP/MAIS Code: 212
Project MDAP/MAIS Code(s): N42

A. Mission Description and Budget Item Justification

The CV-22 is the Air Force Special Operations Forces (SOF) variant of the joint multi-mission V-22 tilt-rotor aircraft. The aircraft provides long-range infiltration, exfiltration, and re-supply of SOF in politically sensitive and hostile/denied areas. The Navy is the lead service for the joint V-22 program and has overall responsibility for managing all V-22 variants, including the Air Force CV-22 variant. CV-22 RDT&E funding provides for the development, integration, and testing of mission critical aircraft modifications to improve operational effectiveness, platform survivability, and aircraft availability.

Block 20: RDT&E funding provides for improved long-range communications, situational awareness capabilities, and aircraft software upgrades needed to address operational requirements specified in the V-22 Block C/20 Capabilities Production Document (CPD).

Enhanced Self-Deployment: RDT&E funding provides for the design, development, and testing of aircraft modifications to improve aircraft self-deployment capabilities (e.g., operating range, global response time), to evaluate emerging threats to the aircraft and mission accomplishment, and to identify and assess emerging air vehicle, propulsion system, avionics, electronic warfare, and weapon system capability requirements and potential solutions to satisfy these requirements.

Improved Inlet Solution (IIS): RDT&E funding provides for design, development, and testing of modifications to the CV-22 propulsion system to reduce ingestion of sand/dust and other particulate matter in austere operating environments. These upgrades will significantly improve Engine Time on Wing (ETOW) and overall aircraft readiness/availability, and reduce platform operating/life cycle costs.

Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM): RDT&E funding provides for upgrades and enhancements to the CV-22 navigation, flight management, and aircraft Identification Friend or Foe (IFF) systems that will bring the aircraft into compliance with Federal Aviation Administration (FAA) and international mandates and other technical guidance for access to, and operations within worldwide airspace.

Other/Future Capabilities: The V-22 Joint Program Office continually assesses user-specified requirements for improved operational safety, suitability, and mission effectiveness. Funding also provides for future modification planning, and for aircraft engineering changes/upgrades to address diminishing manufacturing source (DMS) and component obsolescence issues that adversely affect aircraft readiness and operational availability rates.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force	Date: March 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 0401318F / CV-22
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Unites States Special Operations Command (USSOCOM) and the Air Force (AF) jointly fund many CV-22 development projects. USSOCOM funds the development, integration, and testing of SOF-unique mission equipment and capabilities, while the AF funds service-common/basic air vehicle enhancements, CV-22 implementation, and testing of MV-22 configuration changes, the integration of Air Force and Navy maintenance and information systems used with the CV-22, and support for aircraft qualification and operational testing. USSOCOM and AF jointly fund corrective measures for identified aircraft deficiencies, and for Block 20 development. Block 20 Increments 1 and 3 were developed with AF funds, and Increment 2 was developed with USSOCOM funds.

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.

The FY2017 funding request was reduced by \$0.667 million to account for the availability of prior year execution balances.

"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$12.0 million is required to address emergency warfighting readiness requirements. RDT&E funds the design, development, and test efforts to improve aircraft survivability and availability. Funding supports Improved Inlet Solution (IIS) and accelerates Enhanced Self Deployment capabilities to evaluate emerging threats to the aircraft. The next generation Intelligence Broadcast System (IBS) and the development of a fleet-common Directional Infrared Counter Measures (DIRCM) Advanced Threat Warning (ATW) processor will provide increased capabilities to electronic warfare and weapon system capabilities that improve aircraft survivability and availability within Project 676033/CV-22 RDT&E Post Production.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	38.719	36.576	17.369	0.000	17.369
Current President's Budget	37.698	27.776	28.702	0.000	28.702
Total Adjustments	-1.021	-8.800	11.333	0.000	11.333
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-8.800			
• 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	-1.021	0.000			
• Other Adjustments	0.000	0.000	11.333	0.000	11.333

Change Summary Explanation

FY15: The FY2015 funding was reduced by \$1.021 million for Small Business Innovative Research.

FY16: The FY2016 funding was reduced by \$8.8 million due to a Congressionally directed reduction for Improved inlet solution delay.

FY17: The FY2017 funding request was reduced by \$0.667 million to account for the availability of prior year execution balances.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Air Force		Date: March 2017
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<p>"Fiscal Year (FY) 2017 Request for Additional Appropriations": \$12.0 million is required to address emergency warfighting readiness requirements. RDT&E funds the design, development, and test efforts to improve aircraft survivability and availability. Funding supports Improved Inlet Solution (IIS) and accelerates Enhanced Self Deployment capabilities to evaluate emerging threats to the aircraft. The next generation Intelligence Broadcast System (IBS) and the development of a fleet-common Directional Infrared Counter Measures (DIRCM) Advanced Threat Warning (ATW) processor will provide increased capabilities to electronic warfare and weapon system capabilities that improve aircraft survivability and availability within Project 676033/CV-22 RDT&E Post Production.</p>		

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