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

March 2017



Army

Justification Book of

Research, Development, Test & Evaluation, Army

Budget Activities 3 - 7

(Budget Activities 1 - 2 not impacted by this submission)

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RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

APPROPRIATION LANGUAGE

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$8,118,642 to remain available for obligation until September 30, 2018.

The following Justification Books were prepared at a cost of \$69,900: Aircraft (ACFT), Missile (MSLS), Weapons & Tracked Combat Vehicles (WTCV), Ammunition (AMMO), Other Procurement Army (OPA) 2 – Communications & Electronics, Other Procurement Army (OPA) 3 & 4 - Other Support Equipment & Spares, Research, Development, Test and Evaluation (RDTE) for: Budget Activity 3, Budget Activity 4, Budget Activity 5A, Budget Activity 5B, Budget Activity 6, and Budget Activity 7.

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Department of Defense
 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
 (Dollars in Thousands) 08 Mar 2017

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, Army	7,515,399	349,621	7,865,020	100,522
Total Research, Development, Test & Evaluation	7,515,399	349,621	7,865,020	100,522

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 (Dollars in Thousands)

08 Mar 2017

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, Army	139,200	92,600	332,322	-78,700
Total Research, Development, Test & Evaluation	139,200	92,600	332,322	-78,700

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 (Dollars in Thousands) 08 Mar 2017

Appropriation -----	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
Research, Development, Test & Eval, Army	253,622	7,676,421	442,221	8,118,642
Total Research, Development, Test & Evaluation	253,622	7,676,421	442,221	8,118,642

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Department of Defense
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 (Dollars in Thousands)

08 Mar 2017

Summary Recap of Budget Activities	FY 2017 PB Request Base	FY 2017 Mar Amended Request Base	FY 2017 Revised PB Request Base	FY 2017 PB Request OCO
Basic Research	428,943		428,943	
Applied Research	907,574		907,574	
Advanced Technology Development	930,065	13,300	943,365	
Advanced Component Development & Prototypes	550,635	16,200	566,835	9,375
System Development & Demonstration	2,265,094	128,289	2,393,383	84,043
RDT&E Management Support	1,136,134	25,857	1,161,991	
Operational Systems Development	1,296,954	165,975	1,462,929	7,104
Total Research, Development, Test & Evaluation	7,515,399	349,621	7,865,020	100,522
 Summary Recap of FYDP Programs				
General Purpose Forces	618,038	79,100	697,138	
Intelligence and Communications	238,711	30,044	268,755	7,104
Research and Development	6,591,738	240,477	6,832,215	93,418
Central Supply and Maintenance	62,287		62,287	
Classified Programs	4,625		4,625	
Total Research, Development, Test & Evaluation	7,515,399	349,621	7,865,020	100,522

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<u>Summary Recap of Budget Activities</u>				
Basic Research				
Applied Research				
Advanced Technology Development				
Advanced Component Development & Prototypes		16,020	25,395	
System Development & Demonstration	139,200	65,200	288,443	-78,700
RDT&E Management Support				
Operational Systems Development		11,380	18,484	
Total Research, Development, Test & Evaluation	139,200	92,600	332,322	-78,700
<u>Summary Recap of FYDP Programs</u>				
General Purpose Forces		4,530	4,530	
Intelligence and Communications		1,750	8,854	
Research and Development	139,200	86,320	318,938	-78,700
Central Supply and Maintenance				
Classified Programs				
Total Research, Development, Test & Evaluation	139,200	92,600	332,322	-78,700

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<u>Summary Recap of Budget Activities</u>				
Basic Research		428,943		428,943
Applied Research		907,574		907,574
Advanced Technology Development		930,065	13,300	943,365
Advanced Component Development & Prototypes	25,395	560,010	32,220	592,230
System Development & Demonstration	209,743	2,409,637	193,489	2,603,126
RDT&E Management Support		1,136,134	25,857	1,161,991
Operational Systems Development	18,484	1,304,058	177,355	1,481,413
Total Research, Development, Test & Evaluation	253,622	7,676,421	442,221	8,118,642
<u>Summary Recap of FYDP Programs</u>				
General Purpose Forces	4,530	618,038	83,630	701,668
Intelligence and Communications	8,854	245,815	31,794	277,609
Research and Development	240,238	6,745,656	326,797	7,072,453
Central Supply and Maintenance		62,287		62,287
Classified Programs		4,625		4,625
Total Research, Development, Test & Evaluation	253,622	7,676,421	442,221	8,118,642

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 (Dollars in Thousands) 08 Mar 2017

Appropriation: 2040A Research, Development, Test & Eval, Army

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	St e c
1	0601101A	In-House Laboratory Independent Research	01	12,381		12,381		U
2	0601102A	Defense Research Sciences	01	253,116		253,116		U
3	0601103A	University Research Initiatives	01	69,166		69,166		U
4	0601104A	University and Industry Research Centers	01	94,280		94,280		U
		Basic Research		428,943		428,943		
5	0602105A	Materials Technology	02	31,533		31,533		U
6	0602120A	Sensors and Electronic Survivability	02	36,109		36,109		U
7	0602122A	TRACTOR HIP	02	6,995		6,995		U
8	0602211A	Aviation Technology	02	65,914		65,914		U
9	0602270A	Electronic Warfare Technology	02	25,466		25,466		U
10	0602303A	Missile Technology	02	44,313		44,313		U
11	0602307A	Advanced Weapons Technology	02	28,803		28,803		U
12	0602308A	Advanced Concepts and Simulation	02	27,688		27,688		U
13	0602601A	Combat Vehicle and Automotive Technology	02	67,959		67,959		U
14	0602618A	Ballistics Technology	02	85,436		85,436		U
15	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	3,923		3,923		U
16	0602623A	Joint Service Small Arms Program	02	5,545		5,545		U
17	0602624A	Weapons and Munitions Technology	02	53,581		53,581		U
18	0602705A	Electronics and Electronic Devices	02	56,322		56,322		U
19	0602709A	Night Vision Technology	02	36,079		36,079		U

R-1AMF: Budget Amendment to the FY 2017 President's Budget Request (Published Version), as of March 8, 2017 at 13:54:34

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1	0601101A	In-House Laboratory Independent Research	01					U
2	0601102A	Defense Research Sciences	01					U
3	0601103A	University Research Initiatives	01					U
4	0601104A	University and Industry Research Centers	01					U
		Basic Research						
5	0602105A	Materials Technology	02					U
6	0602120A	Sensors and Electronic Survivability	02					U
7	0602122A	TRACTOR HIP	02					U
8	0602211A	Aviation Technology	02					U
9	0602270A	Electronic Warfare Technology	02					U
10	0602303A	Missile Technology	02					U
11	0602307A	Advanced Weapons Technology	02					U
12	0602308A	Advanced Concepts and Simulation	02					U
13	0602601A	Combat Vehicle and Automotive Technology	02					U
14	0602618A	Ballistics Technology	02					U
15	0602622A	Chemical, Smoke and Equipment Defeating Technology	02					U
16	0602623A	Joint Service Small Arms Program	02					U
17	0602624A	Weapons and Munitions Technology	02					U
18	0602705A	Electronics and Electronic Devices	02					U
19	0602709A	Night Vision Technology	02					U

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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 e Base+OCO	S c
1	0601101A	In-House Laboratory Independent Research	01		12,381		12,381	U
2	0601102A	Defense Research Sciences	01		253,116		253,116	U
3	0601103A	University Research Initiatives	01		69,166		69,166	U
4	0601104A	University and Industry Research Centers	01		94,280		94,280	U
		Basic Research			428,943		428,943	
5	0602105A	Materials Technology	02		31,533		31,533	U
6	0602120A	Sensors and Electronic Survivability	02		36,109		36,109	U
7	0602122A	TRACTOR HIP	02		6,995		6,995	U
8	0602211A	Aviation Technology	02		65,914		65,914	U
9	0602270A	Electronic Warfare Technology	02		25,466		25,466	U
10	0602303A	Missile Technology	02		44,313		44,313	U
11	0602307A	Advanced Weapons Technology	02		28,803		28,803	U
12	0602308A	Advanced Concepts and Simulation	02		27,688		27,688	U
13	0602601A	Combat Vehicle and Automotive Technology	02		67,959		67,959	U
14	0602618A	Ballistics Technology	02		85,436		85,436	U
15	0602622A	Chemical, Smoke and Equipment Defeating Technology	02		3,923		3,923	U
16	0602623A	Joint Service Small Arms Program	02		5,545		5,545	U
17	0602624A	Weapons and Munitions Technology	02		53,581		53,581	U
18	0602705A	Electronics and Electronic Devices	02		56,322		56,322	U
19	0602709A	Night Vision Technology	02		36,079		36,079	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	S e c
20	0602712A	Countermine Systems	02	26,497		26,497		U
21	0602716A	Human Factors Engineering Technology	02	23,671		23,671		U
22	0602720A	Environmental Quality Technology	02	22,151		22,151		U
23	0602782A	Command, Control, Communications Technology	02	37,803		37,803		U
24	0602783A	Computer and Software Technology	02	13,811		13,811		U
25	0602784A	Military Engineering Technology	02	67,416		67,416		U
26	0602785A	Manpower/Personnel/Training Technology	02	26,045		26,045		U
27	0602786A	Warfighter Technology	02	37,403		37,403		U
28	0602787A	Medical Technology	02	77,111		77,111		U
	Applied Research			907,574		907,574		
29	0603001A	Warfighter Advanced Technology	03	38,831		38,831		U
30	0603002A	Medical Advanced Technology	03	68,365		68,365		U
31	0603003A	Aviation Advanced Technology	03	94,280		94,280		U
32	0603004A	Weapons and Munitions Advanced Technology	03	68,714		68,714		U
33	0603005A	Combat Vehicle and Automotive Advanced Technology	03	122,132		122,132		U
34	0603006A	Space Application Advanced Technology	03	3,904		3,904		U
35	0603007A	Manpower, Personnel and Training Advanced Technology	03	14,417		14,417		U
36	0603009A	TRACTOR HIKE	03	8,074	13,300	21,374		U
37	0603015A	Next Generation Training & Simulation Systems	03	18,969		18,969		U
38	0603020A	TRACTOR ROSE	03	11,910		11,910		U

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20	0602712A	Countermine Systems	02					U
21	0602716A	Human Factors Engineering Technology	02					U
22	0602720A	Environmental Quality Technology	02					U
23	0602782A	Command, Control, Communications Technology	02					U
24	0602783A	Computer and Software Technology	02					U
25	0602784A	Military Engineering Technology	02					U
26	0602785A	Manpower/Personnel/Training Technology	02					U
27	0602786A	Warfighter Technology	02					U
28	0602787A	Medical Technology	02					U
Applied Research								
29	0603001A	Warfighter Advanced Technology	03					U
30	0603002A	Medical Advanced Technology	03					U
31	0603003A	Aviation Advanced Technology	03					U
32	0603004A	Weapons and Munitions Advanced Technology	03					U
33	0603005A	Combat Vehicle and Automotive Advanced Technology	03					U
34	0603006A	Space Application Advanced Technology	03					U
35	0603007A	Manpower, Personnel and Training Advanced Technology	03					U
36	0603009A	TRACTOR HIKE	03					U
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29	0603001A	Warfighter Advanced Technology	03		38,831		38,831	U
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31	0603003A	Aviation Advanced Technology	03		94,280		94,280	U
32	0603004A	Weapons and Munitions Advanced Technology	03		68,714		68,714	U
33	0603005A	Combat Vehicle and Automotive Advanced Technology	03		122,132		122,132	U
34	0603006A	Space Application Advanced Technology	03		3,904		3,904	U
35	0603007A	Manpower, Personnel and Training Advanced Technology	03		14,417		14,417	U
36	0603009A	TRACTOR HIKE	03		8,074	13,300	21,374	U
37	0603015A	Next Generation Training & Simulation Systems	03		18,969		18,969	U
38	0603020A	TRACTOR ROSE	03		11,910		11,910	U

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39	0603125A	Combating Terrorism - Technology Development	03	27,686		27,686		U
40	0603130A	TRACTOR NAIL	03	2,340		2,340		U
41	0603131A	TRACTOR EGGS	03	2,470		2,470		U
42	0603270A	Electronic Warfare Technology	03	27,893		27,893		U
43	0603313A	Missile and Rocket Advanced Technology	03	52,190		52,190		U
44	0603322A	TRACTOR CAGE	03	11,107		11,107		U
45	0603461A	High Performance Computing Modernization Program	03	177,190		177,190		U
46	0603606A	Landmine Warfare and Barrier Advanced Technology	03	17,451		17,451		U
47	0603607A	Joint Service Small Arms Program	03	5,839		5,839		U
48	0603710A	Night Vision Advanced Technology	03	44,468		44,468		U
49	0603728A	Environmental Quality Technology Demonstrations	03	11,137		11,137		U
50	0603734A	Military Engineering Advanced Technology	03	20,684		20,684		U
51	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	44,239		44,239		U
52	0603794A	C3 Advanced Technology	03	35,775		35,775		U
		Advanced Technology Development		930,065	13,300	943,365		
53	0603305A	Army Missile Defense Systems Integration	04	9,433		9,433		U
54	0603308A	Army Space Systems Integration	04	23,056		23,056	9,375	U
55	0603327A	Air and Missile Defense Systems Engineering	04		14,200	14,200		U
56	0603619A	Landmine Warfare and Barrier - Adv Dev	04	72,117		72,117		U
57	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	28,244		28,244		U

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 Total Obligational Authority
 (Dollars in Thousands)

08 Mar 2017

Appropriation: 2040A Research, Development, Test & Eval, Army

Line No	Program Element 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
39	0603125A	Combating Terrorism - Technology Development	03					U
40	0603130A	TRACTOR NAIL	03					U
41	0603131A	TRACTOR EGGS	03					U
42	0603270A	Electronic Warfare Technology	03					U
43	0603313A	Missile and Rocket Advanced Technology	03					U
44	0603322A	TRACTOR CAGE	03					U
45	0603461A	High Performance Computing Modernization Program	03					U
46	0603606A	Landmine Warfare and Barrier Advanced Technology	03					U
47	0603607A	Joint Service Small Arms Program	03					U
48	0603710A	Night Vision Advanced Technology	03					U
49	0603728A	Environmental Quality Technology Demonstrations	03					U
50	0603734A	Military Engineering Advanced Technology	03					U
51	0603772A	Advanced Tactical Computer Science and Sensor Technology	03					U
52	0603794A	C3 Advanced Technology	03					U
		Advanced Technology Development						
53	0603305A	Army Missile Defense Systems Integration	04					U
54	0603308A	Army Space Systems Integration	04			9,375		U
55	0603327A	Air and Missile Defense Systems Engineering	04					U
56	0603619A	Landmine Warfare and Barrier - Adv Dev	04					U
57	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04		16,020	16,020		U

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Appropriation: 2040A Research, Development, Test & Eval, Army

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
39	0603125A	Combating Terrorism - Technology Development	03		27,686		27,686	U
40	0603130A	TRACTOR NAIL	03		2,340		2,340	U
41	0603131A	TRACTOR EGGS	03		2,470		2,470	U
42	0603270A	Electronic Warfare Technology	03		27,893		27,893	U
43	0603313A	Missile and Rocket Advanced Technology	03		52,190		52,190	U
44	0603322A	TRACTOR CAGE	03		11,107		11,107	U
45	0603461A	High Performance Computing Modernization Program	03		177,190		177,190	U
46	0603606A	Landmine Warfare and Barrier Advanced Technology	03		17,451		17,451	U
47	0603607A	Joint Service Small Arms Program	03		5,839		5,839	U
48	0603710A	Night Vision Advanced Technology	03		44,468		44,468	U
49	0603728A	Environmental Quality Technology Demonstrations	03		11,137		11,137	U
50	0603734A	Military Engineering Advanced Technology	03		20,684		20,684	U
51	0603772A	Advanced Tactical Computer Science and Sensor Technology	03		44,239		44,239	U
52	0603794A	C3 Advanced Technology	03		35,775		35,775	U
		Advanced Technology Development			930,065	13,300	943,365	
53	0603305A	Army Missile Defense Systems Integration	04		9,433		9,433	U
54	0603308A	Army Space Systems Integration	04	9,375	32,431		32,431	U
55	0603327A	Air and Missile Defense Systems Engineering	04			14,200	14,200	U
56	0603619A	Landmine Warfare and Barrier - Adv Dev	04		72,117		72,117	U
57	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	16,020	28,244	16,020	44,264	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	S e c
58	0603639A	Tank and Medium Caliber Ammunition	04	40,096	2,000	42,096		U
59	0603747A	Soldier Support and Survivability	04	10,506		10,506		U
60	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	15,730		15,730		U
61	0603774A	Night Vision Systems Advanced Development	04	10,321		10,321		U
62	0603779A	Environmental Quality Technology - Dem/Val	04	7,785		7,785		U
63	0603790A	NATO Research and Development	04	2,300		2,300		U
64	0603801A	Aviation - Adv Dev	04	10,014		10,014		U
65	0603804A	Logistics and Engineer Equipment - Adv Dev	04	20,834		20,834		U
66	0603807A	Medical Systems - Adv Dev	04	33,503		33,503		U
67	0603827A	Soldier Systems - Advanced Development	04	31,120		31,120		U
68	0604100A	Analysis Of Alternatives	04	6,608		6,608		U
69	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	35,132		35,132		U
70	0604115A	Technology Maturation Initiatives	04	70,047		70,047		U
71	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	83,279		83,279		U
72	0305251A	Cyberspace Operations Forces and Force Support	04	40,510		40,510		U
	Advanced Component Development & Prototypes			550,635	16,200	566,835	9,375	
73	0604201A	Aircraft Avionics	05	83,248		83,248		U
74	0604270A	Electronic Warfare Development	05	34,642	2,600	37,242		U
75	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05	12,172		12,172		U
76	0604321A	All Source Analysis System	05	3,958		3,958		U

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Line No	Program Element 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
58	0603639A	Tank and Medium Caliber Ammunition	04					U
59	0603747A	Soldier Support and Survivability	04					U
60	0603766A	Tactical Electronic Surveillance System - Adv Dev	04					U
61	0603774A	Night Vision Systems Advanced Development	04					U
62	0603779A	Environmental Quality Technology - Dem/Val	04					U
63	0603790A	NATO Research and Development	04					U
64	0603801A	Aviation - Adv Dev	04					U
65	0603804A	Logistics and Engineer Equipment - Adv Dev	04					U
66	0603807A	Medical Systems - Adv Dev	04					U
67	0603827A	Soldier Systems - Advanced Development	04					U
68	0604100A	Analysis Of Alternatives	04					U
69	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04					U
70	0604115A	Technology Maturation Initiatives	04					U
71	0604120A	Assured Positioning, Navigation and Timing (PNT)	04					U
72	0305251A	Cyberspace Operations Forces and Force Support	04					U
		Advanced Component Development & Prototypes			16,020	25,395		
73	0604201A	Aircraft Avionics	05					U
74	0604270A	Electronic Warfare Development	05					U
75	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05					U
76	0604321A	All Source Analysis System	05					U

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Program Line Element No 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
58 0603639A	Tank and Medium Caliber Ammunition	04		40,096	2,000	42,096	U
59 0603747A	Soldier Support and Survivability	04		10,506		10,506	U
60 0603766A	Tactical Electronic Surveillance System - Adv Dev	04		15,730		15,730	U
61 0603774A	Night Vision Systems Advanced Development	04		10,321		10,321	U
62 0603779A	Environmental Quality Technology - Dem/Val	04		7,785		7,785	U
63 0603790A	NATO Research and Development	04		2,300		2,300	U
64 0603801A	Aviation - Adv Dev	04		10,014		10,014	U
65 0603804A	Logistics and Engineer Equipment - Adv Dev	04		20,834		20,834	U
66 0603807A	Medical Systems - Adv Dev	04		33,503		33,503	U
67 0603827A	Soldier Systems - Advanced Development	04		31,120		31,120	U
68 0604100A	Analysis Of Alternatives	04		6,608		6,608	U
69 0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04		35,132		35,132	U
70 0604115A	Technology Maturation Initiatives	04		70,047		70,047	U
71 0604120A	Assured Positioning, Navigation and Timing (PNT)	04		83,279		83,279	U
72 0305251A	Cyberspace Operations Forces and Force Support	04		40,510		40,510	U
Advanced Component Development & Prototypes			25,395	560,010	32,220	592,230	
73 0604201A	Aircraft Avionics	05		83,248		83,248	U
74 0604270A	Electronic Warfare Development	05		34,642	2,600	37,242	U
75 0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05		12,172		12,172	U
76 0604321A	All Source Analysis System	05		3,958		3,958	U

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Appropriation: 2040A Research, Development, Test & Eval, Army

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	Sec
77	0604328A	TRACTOR CAGE	05	12,525		12,525		U
78	0604601A	Infantry Support Weapons	05	66,943		66,943		U
79	0604611A	JAVELIN	05	20,011		20,011		U
80	0604622A	Family of Heavy Tactical Vehicles	05	11,429		11,429		U
81	0604633A	Air Traffic Control	05	3,421		3,421		U
82	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05	39,282		39,282		U
83	0604642A	Light Tactical Wheeled Vehicles	05	494		494		U
84	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	9,678		9,678		U
85	0604710A	Night Vision Systems - Eng Dev	05	84,519		84,519		U
86	0604713A	Combat Feeding, Clothing, and Equipment	05	2,054		2,054		U
87	0604715A	Non-System Training Devices - Eng Dev	05	30,774	5,000	35,774	33	U
88	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	53,332	8,200	61,532		U
89	0604742A	Constructive Simulation Systems Development	05	17,887		17,887		U
90	0604746A	Automatic Test Equipment Development	05	8,813		8,813		U
91	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	10,487		10,487		U
92	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	15,068		15,068		U
93	0604798A	Brigade Analysis, Integration and Evaluation	05	89,716	56,939	146,655		U
94	0604802A	Weapons and Munitions - Eng Dev	05	80,365	18,800	99,165		U
95	0604804A	Logistics and Engineer Equipment - Eng Dev	05	75,098		75,098		U
96	0604805A	Command, Control, Communications Systems - Eng Dev	05	4,245		4,245		U

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Line No	Program Element 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
77	0604328A	TRACTOR CAGE	05					U
78	0604601A	Infantry Support Weapons	05					U
79	0604611A	JAVELIN	05					U
80	0604622A	Family of Heavy Tactical Vehicles	05					U
81	0604633A	Air Traffic Control	05					U
82	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05					U
83	0604642A	Light Tactical Wheeled Vehicles	05					U
84	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05					U
85	0604710A	Night Vision Systems - Eng Dev	05					U
86	0604713A	Combat Feeding, Clothing, and Equipment	05					U
87	0604715A	Non-System Training Devices - Eng Dev	05			33		U
88	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	78,700	65,200	143,900	-78,700	U
89	0604742A	Constructive Simulation Systems Development	05					U
90	0604746A	Automatic Test Equipment Development	05					U
91	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05					U
92	0604780A	Combined Arms Tactical Trainer (CATT) Core	05					U
93	0604798A	Brigade Analysis, Integration and Evaluation	05					U
94	0604802A	Weapons and Munitions - Eng Dev	05					U
95	0604804A	Logistics and Engineer Equipment - Eng Dev	05					U
96	0604805A	Command, Control, Communications Systems - Eng Dev	05					U

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77	0604328A	TRACTOR CAGE	05		12,525		12,525	U
78	0604601A	Infantry Support Weapons	05		66,943		66,943	U
79	0604611A	JAVELIN	05		20,011		20,011	U
80	0604622A	Family of Heavy Tactical Vehicles	05		11,429		11,429	U
81	0604633A	Air Traffic Control	05		3,421		3,421	U
82	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05		39,282		39,282	U
83	0604642A	Light Tactical Wheeled Vehicles	05		494		494	U
84	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05		9,678		9,678	U
85	0604710A	Night Vision Systems - Eng Dev	05		84,519		84,519	U
86	0604713A	Combat Feeding, Clothing, and Equipment	05		2,054		2,054	U
87	0604715A	Non-System Training Devices - Eng Dev	05	33	30,807	5,000	35,807	U
88	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	65,200	53,332	73,400	126,732	U
89	0604742A	Constructive Simulation Systems Development	05		17,887		17,887	U
90	0604746A	Automatic Test Equipment Development	05		8,813		8,813	U
91	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05		10,487		10,487	U
92	0604780A	Combined Arms Tactical Trainer (CATT) Core	05		15,068		15,068	U
93	0604798A	Brigade Analysis, Integration and Evaluation	05		89,716	56,939	146,655	U
94	0604802A	Weapons and Munitions - Eng Dev	05		80,365	18,800	99,165	U
95	0604804A	Logistics and Engineer Equipment - Eng Dev	05		75,098		75,098	U
96	0604805A	Command, Control, Communications Systems - Eng Dev	05		4,245		4,245	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	S e c
97	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	41,124		41,124		U
98	0604808A	Landmine Warfare/Barrier - Eng Dev	05	39,630		39,630		U
99	0604818A	Army Tactical Command & Control Hardware & Software	05	205,590		205,590		U
100	0604820A	Radar Development	05	15,983		15,983		U
101	0604822A	General Fund Enterprise Business System (GFEBs)	05	6,805		6,805		U
102	0604823A	Firefinder	05	9,235		9,235		U
103	0604827A	Soldier Systems - Warrior Dem/Val	05	12,393		12,393		U
104	0604854A	Artillery Systems - EMD	05	1,756	2,750	4,506		U
105	0605013A	Information Technology Development	05	74,236		74,236		U
106	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	155,584		155,584		U
107	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	184,221		184,221		U
108	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	4,980		4,980		U
109	0605030A	Joint Tactical Network Center (JTNC)	05	15,041		15,041		U
110	0605031A	Joint Tactical Network (JTN)	05	16,014		16,014		U
111	0605032A	TRACTOR TIRE	05	27,254		27,254		U
112	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	5,032		5,032		U
113	0605034A	Tactical Security System (TSS)	05	2,904		2,904		U
114	0605035A	Common Infrared Countermeasures (CIRCM)	05	96,977		96,977	10,900	U
115	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	2,089		2,089		U

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97	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05					U
98	0604808A	Landmine Warfare/Barrier - Eng Dev	05					U
99	0604818A	Army Tactical Command & Control Hardware & Software	05					U
100	0604820A	Radar Development	05					U
101	0604822A	General Fund Enterprise Business System (GFEBs)	05					U
102	0604823A	Firefinder	05					U
103	0604827A	Soldier Systems - Warrior Dem/Val	05					U
104	0604854A	Artillery Systems - EMD	05					U
105	0605013A	Information Technology Development	05					U
106	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05					U
107	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05					U
108	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05					U
109	0605030A	Joint Tactical Network Center (JTNC)	05					U
110	0605031A	Joint Tactical Network (JTN)	05					U
111	0605032A	TRACTOR TIRE	05	10,000		10,000		U
112	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05					U
113	0605034A	Tactical Security System (TSS)	05					U
114	0605035A	Common Infrared Countermeasures (CIRCM)	05			10,900		U
115	0605036A	Combating Weapons of Mass Destruction (CWMD)	05					U

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97	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05		41,124		41,124	U
98	0604808A	Landmine Warfare/Barrier - Eng Dev	05		39,630		39,630	U
99	0604818A	Army Tactical Command & Control Hardware & Software	05		205,590		205,590	U
100	0604820A	Radar Development	05		15,983		15,983	U
101	0604822A	General Fund Enterprise Business System (GFEBS)	05		6,805		6,805	U
102	0604823A	Firefinder	05		9,235		9,235	U
103	0604827A	Soldier Systems - Warrior Dem/Val	05		12,393		12,393	U
104	0604854A	Artillery Systems - EMD	05		1,756	2,750	4,506	U
105	0605013A	Information Technology Development	05		74,236		74,236	U
106	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05		155,584		155,584	U
107	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05		184,221		184,221	U
108	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05		4,980		4,980	U
109	0605030A	Joint Tactical Network Center (JTNC)	05		15,041		15,041	U
110	0605031A	Joint Tactical Network (JTN)	05		16,014		16,014	U
111	0605032A	TRACTOR TIRE	05	10,000	37,254		37,254	U
112	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05		5,032		5,032	U
113	0605034A	Tactical Security System (TSS)	05		2,904		2,904	U
114	0605035A	Common Infrared Countermeasures (CIRCM)	05	10,900	107,877		107,877	U
115	0605036A	Combating Weapons of Mass Destruction (CWMD)	05		2,089		2,089	U

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Appropriation: 2040A Research, Development, Test & Eval, Army

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	Sec
116	0605041A	Defensive CYBER Tool Development	05	33,836		33,836		U
117	0605042A	Tactical Network Radio Systems (Low-Tier)	05	18,824		18,824		U
118	0605047A	Contract Writing System	05	20,663		20,663		U
119	0605051A	Aircraft Survivability Development	05	41,133	10,000	51,133	73,110	U
120	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	83,995		83,995		U
121	0605380A	AMF Joint Tactical Radio System (JTRS)	05	5,028		5,028		U
122	0605450A	Joint Air-to-Ground Missile (JAGM)	05	42,972		42,972		U
123	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	252,811	20,000	272,811		U
124	0605766A	National Capabilities Integration (MIP)	05	4,955		4,955		U
125	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	11,530		11,530		U
126	0605830A	Aviation Ground Support Equipment	05	2,142		2,142		U
127	0210609A	Paladin Integrated Management (PIM)	05	41,498		41,498		U
128	0303032A	TROJAN - RH12	05	4,273		4,273		U
129	0304270A	Electronic Warfare Development	05	14,425	4,000	18,425		U
		System Development & Demonstration		2,265,094	128,289	2,393,383	84,043	
130	0604256A	Threat Simulator Development	06	25,675		25,675		U
131	0604258A	Target Systems Development	06	19,122		19,122		U
132	0604759A	Major T&E Investment	06	84,777		84,777		U
133	0605103A	Rand Arroyo Center	06	20,658		20,658		U

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Line No	Program Element 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
116	0605041A	Defensive CYBER Tool Development	05	50,500		50,500		U
117	0605042A	Tactical Network Radio Systems (Low-Tier)	05					U
118	0605047A	Contract Writing System	05					U
119	0605051A	Aircraft Survivability Development	05			73,110		U
120	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05					U
121	0605380A	AMF Joint Tactical Radio System (JTRS)	05					U
122	0605450A	Joint Air-to-Ground Missile (JAGM)	05					U
123	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05					U
124	0605766A	National Capabilities Integration (MIP)	05					U
125	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05					U
126	0605830A	Aviation Ground Support Equipment	05					U
127	0210609A	Paladin Integrated Management (PIM)	05					U
128	0303032A	TROJAN - RH12	05					U
129	0304270A	Electronic Warfare Development	05					U
		System Development & Demonstration		139,200	65,200	288,443	-78,700	
130	0604256A	Threat Simulator Development	06					U
131	0604258A	Target Systems Development	06					U
132	0604759A	Major T&E Investment	06					U
133	0605103A	Rand Arroyo Center	06					U

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116	0605041A	Defensive CYBER Tool Development	05	50,500	84,336		84,336	U
117	0605042A	Tactical Network Radio Systems (Low-Tier)	05		18,824		18,824	U
118	0605047A	Contract Writing System	05		20,663		20,663	U
119	0605051A	Aircraft Survivability Development	05	73,110	114,243	10,000	124,243	U
120	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05		83,995		83,995	U
121	0605380A	AMF Joint Tactical Radio System (JTRS)	05		5,028		5,028	U
122	0605450A	Joint Air-to-Ground Missile (JAGM)	05		42,972		42,972	U
123	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05		252,811	20,000	272,811	U
124	0605766A	National Capabilities Integration (MIP)	05		4,955		4,955	U
125	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05		11,530		11,530	U
126	0605830A	Aviation Ground Support Equipment	05		2,142		2,142	U
127	0210609A	Paladin Integrated Management (PIM)	05		41,498		41,498	U
128	0303032A	TROJAN - RH12	05		4,273		4,273	U
129	0304270A	Electronic Warfare Development	05		14,425	4,000	18,425	U
		System Development & Demonstration		209,743	2,409,637	193,489	2,603,126	
130	0604256A	Threat Simulator Development	06		25,675		25,675	U
131	0604258A	Target Systems Development	06		19,122		19,122	U
132	0604759A	Major T&E Investment	06		84,777		84,777	U
133	0605103A	Rand Arroyo Center	06		20,658		20,658	U

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134	0605301A	Army Kwajalein Atoll	06	236,648		236,648		U
135	0605326A	Concepts Experimentation Program	06	25,596		25,596		U
136	0605601A	Army Test Ranges and Facilities	06	293,748	14,134	307,882		U
137	0605602A	Army Technical Test Instrumentation and Targets	06	52,404	11,723	64,127		U
138	0605604A	Survivability/Lethality Analysis	06	38,571		38,571		U
139	0605606A	Aircraft Certification	06	4,665		4,665		U
140	0605702A	Meteorological Support to RDT&E Activities	06	6,925		6,925		U
141	0605706A	Materiel Systems Analysis	06	21,677		21,677		U
142	0605709A	Exploitation of Foreign Items	06	12,415		12,415		U
143	0605712A	Support of Operational Testing	06	49,684		49,684		U
144	0605716A	Army Evaluation Center	06	55,905		55,905		U
145	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	7,959		7,959		U
146	0605801A	Programwide Activities	06	51,822		51,822		U
147	0605803A	Technical Information Activities	06	33,323		33,323		U
148	0605805A	Munitions Standardization, Effectiveness and Safety	06	40,545		40,545		U
149	0605857A	Environmental Quality Technology Mgmt Support	06	2,130		2,130		U
150	0605898A	Army Direct Report Headquarters - R&D - MHA	06	49,885		49,885		U
151	0303260A	Defense Military Deception Initiative	06	2,000		2,000		U
		RDT&E Management Support		1,136,134	25,857	1,161,991		
152	0603778A	MLRS Product Improvement Program	07	9,663	25,100	34,763		U

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134	0605301A	Army Kwajalein Atoll	06					U
135	0605326A	Concepts Experimentation Program	06					U
136	0605601A	Army Test Ranges and Facilities	06					U
137	0605602A	Army Technical Test Instrumentation and Targets	06					U
138	0605604A	Survivability/Lethality Analysis	06					U
139	0605606A	Aircraft Certification	06					U
140	0605702A	Meteorological Support to RDT&E Activities	06					U
141	0605706A	Materiel Systems Analysis	06					U
142	0605709A	Exploitation of Foreign Items	06					U
143	0605712A	Support of Operational Testing	06					U
144	0605716A	Army Evaluation Center	06					U
145	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06					U
146	0605801A	Programwide Activities	06					U
147	0605803A	Technical Information Activities	06					U
148	0605805A	Munitions Standardization, Effectiveness and Safety	06					U
149	0605857A	Environmental Quality Technology Mgmt Support	06					U
150	0605898A	Army Direct Report Headquarters - R&D - MHA	06					U
151	0303260A	Defense Military Deception Initiative	06					U
		RDT&E Management Support						
152	0603778A	MLRS Product Improvement Program	07					U

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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 e Base+OCO	S
134	0605301A	Army Kwajalein Atoll	06		236,648		236,648	U
135	0605326A	Concepts Experimentation Program	06		25,596		25,596	U
136	0605601A	Army Test Ranges and Facilities	06		293,748	14,134	307,882	U
137	0605602A	Army Technical Test Instrumentation and Targets	06		52,404	11,723	64,127	U
138	0605604A	Survivability/Lethality Analysis	06		38,571		38,571	U
139	0605606A	Aircraft Certification	06		4,665		4,665	U
140	0605702A	Meteorological Support to RDT&E Activities	06		6,925		6,925	U
141	0605706A	Materiel Systems Analysis	06		21,677		21,677	U
142	0605709A	Exploitation of Foreign Items	06		12,415		12,415	U
143	0605712A	Support of Operational Testing	06		49,684		49,684	U
144	0605716A	Army Evaluation Center	06		55,905		55,905	U
145	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06		7,959		7,959	U
146	0605801A	Programwide Activities	06		51,822		51,822	U
147	0605803A	Technical Information Activities	06		33,323		33,323	U
148	0605805A	Munitions Standardization, Effectiveness and Safety	06		40,545		40,545	U
149	0605857A	Environmental Quality Technology Mgmt Support	06		2,130		2,130	U
150	0605898A	Army Direct Report Headquarters - R&D - MHA	06		49,885		49,885	U
151	0303260A	Defense Military Deception Initiative	06		2,000		2,000	U
		RDT&E Management Support			1,136,134	25,857	1,161,991	
152	0603778A	MLRS Product Improvement Program	07		9,663	25,100	34,763	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 c
153	0603813A	TRACTOR PULL	07	3,960		3,960		U
154	0605024A	Anti-Tamper Technology Support	07	3,638		3,638		U
155	0607131A	Weapons and Munitions Product Improvement Programs	07	14,517		14,517		U
156	0607133A	TRACTOR SMOKE	07	4,479		4,479		U
157	0607134A	Long Range Precision Fires (LRPF)	07	39,275	27,731	67,006		U
158	0607135A	Apache Product Improvement Program	07	66,441		66,441		U
159	0607136A	Blackhawk Product Improvement Program	07	46,765		46,765		U
160	0607137A	Chinook Product Improvement Program	07	91,848		91,848		U
161	0607138A	Fixed Wing Product Improvement Program	07	796		796		U
162	0607139A	Improved Turbine Engine Program	07	126,105		126,105		U
163	0607140A	Emerging Technologies from NIE	07	2,369		2,369		U
164	0607141A	Logistics Automation	07	4,563		4,563		U
165	0607142A	Aviation Rocket System Product Improvement and Development	07		8,000	8,000		U
166	0607665A	Family of Biometrics	07	12,098		12,098		U
167	0607865A	Patriot Product Improvement	07	49,482		49,482		U
168	0202429A	Aerostat Joint Project - COCOM Exercise	07	45,482		45,482		U
169	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	30,455		30,455		U
170	0203735A	Combat Vehicle Improvement Programs	07	316,857	10,500	327,357		U
171	0203740A	Maneuver Control System	07	4,031		4,031		U
172	0203744A	Aircraft Modifications/Product Improvement Programs	07	35,793		35,793		U

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153	0603813A	TRACTOR PULL	07					U
154	0605024A	Anti-Tamper Technology Support	07					U
155	0607131A	Weapons and Munitions Product Improvement Programs	07		5,100	5,100		U
156	0607133A	TRACTOR SMOKE	07					U
157	0607134A	Long Range Precision Fires (LRPF)	07					U
158	0607135A	Apache Product Improvement Program	07					U
159	0607136A	Blackhawk Product Improvement Program	07					U
160	0607137A	Chinook Product Improvement Program	07					U
161	0607138A	Fixed Wing Product Improvement Program	07					U
162	0607139A	Improved Turbine Engine Program	07					U
163	0607140A	Emerging Technologies from NIE	07					U
164	0607141A	Logistics Automation	07					U
165	0607142A	Aviation Rocket System Product Improvement and Development	07					U
166	0607665A	Family of Biometrics	07					U
167	0607865A	Patriot Product Improvement	07					U
168	0202429A	Aerostat Joint Project - COCOM Exercise	07					U
169	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07					U
170	0203735A	Combat Vehicle Improvement Programs	07					U
171	0203740A	Maneuver Control System	07					U
172	0203744A	Aircraft Modifications/Product Improvement Programs	07					U

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153	0603813A	TRACTOR PULL	07		3,960		3,960	U
154	0605024A	Anti-Tamper Technology Support	07		3,638		3,638	U
155	0607131A	Weapons and Munitions Product Improvement Programs	07	5,100	14,517	5,100	19,617	U
156	0607133A	TRACTOR SMOKE	07		4,479		4,479	U
157	0607134A	Long Range Precision Fires (LRPF)	07		39,275	27,731	67,006	U
158	0607135A	Apache Product Improvement Program	07		66,441		66,441	U
159	0607136A	Blackhawk Product Improvement Program	07		46,765		46,765	U
160	0607137A	Chinook Product Improvement Program	07		91,848		91,848	U
161	0607138A	Fixed Wing Product Improvement Program	07		796		796	U
162	0607139A	Improved Turbine Engine Program	07		126,105		126,105	U
163	0607140A	Emerging Technologies from NIE	07		2,369		2,369	U
164	0607141A	Logistics Automation	07		4,563		4,563	U
165	0607142A	Aviation Rocket System Product Improvement and Development	07			8,000	8,000	U
166	0607665A	Family of Biometrics	07		12,098		12,098	U
167	0607865A	Patriot Product Improvement	07		49,482		49,482	U
168	0202429A	Aerostat Joint Project - COCOM Exercise	07		45,482		45,482	U
169	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07		30,455		30,455	U
170	0203735A	Combat Vehicle Improvement Programs	07		316,857	10,500	327,357	U
171	0203740A	Maneuver Control System	07		4,031		4,031	U
172	0203744A	Aircraft Modifications/Product Improvement Programs	07		35,793		35,793	U

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173	0203752A	Aircraft Engine Component Improvement Program	07	259		259		U
174	0203758A	Digitization	07	6,483		6,483		U
175	0203801A	Missile/Air Defense Product Improvement Program	07	5,122	48,600	53,722		U
176	0203802A	Other Missile Product Improvement Programs	07	7,491		7,491		U
177	0203808A	TRACTOR CARD	07	20,333		20,333		U
178	0205402A	Integrated Base Defense - Operational System Dev	07					U
179	0205410A	Materials Handling Equipment	07	124		124		U
180	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	69,417	4,000	73,417		U
181	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	22,044	16,000	38,044		U
182	0208053A	Joint Tactical Ground System	07	12,649		12,649		U
184	0303028A	Security and Intelligence Activities	07	11,619		11,619		U
185	0303140A	Information Systems Security Program	07	38,280		38,280		U
186	0303141A	Global Combat Support System	07	27,223	1,444	28,667		U
187	0303142A	SATCOM Ground Environment (SPACE)	07	18,815		18,815		U
188	0303150A	WWMCCS/Global Command and Control System	07	4,718		4,718		U
190	0305127A	Foreign Counterintelligence Activities	07		4,100	4,100		U
191	0305204A	Tactical Unmanned Aerial Vehicles	07	8,218		8,218		U
192	0305206A	Airborne Reconnaissance Systems	07	11,799		11,799		U
193	0305208A	Distributed Common Ground/Surface Systems	07	32,284		32,284		U
194	0305219A	MQ-1C Gray Eagle UAS	07	13,470	17,500	30,970		U

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Appropriation: 2040A Research, Development, Test & Eval, Army

Line No	Program Element 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
173	0203752A	Aircraft Engine Component Improvement Program	07					U
174	0203758A	Digitization	07					U
175	0203801A	Missile/Air Defense Product Improvement Program	07					U
176	0203802A	Other Missile Product Improvement Programs	07		1,080	1,080		U
177	0203808A	TRACTOR CARD	07					U
178	0205402A	Integrated Base Defense - Operational System Dev	07		3,450	3,450		U
179	0205410A	Materials Handling Equipment	07					U
180	0205456A	Lower Tier Air and Missile Defense (AMD) System	07					U
181	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07					U
182	0208053A	Joint Tactical Ground System	07					U
184	0303028A	Security and Intelligence Activities	07					U
185	0303140A	Information Systems Security Program	07					U
186	0303141A	Global Combat Support System	07					U
187	0303142A	SATCOM Ground Environment (SPACE)	07					U
188	0303150A	WWMCCS/Global Command and Control System	07					U
190	0305127A	Foreign Counterintelligence Activities	07					U
191	0305204A	Tactical Unmanned Aerial Vehicles	07					U
192	0305206A	Airborne Reconnaissance Systems	07					U
193	0305208A	Distributed Common Ground/Surface Systems	07					U
194	0305219A	MQ-1C Gray Eagle UAS	07					U

R-1AMF: Budget Amendment to the FY 2017 President's Budget Request (Published Version), as of March 8, 2017 at 13:54:34

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Department of the Army
 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
 (Dollars in Thousands) 08 Mar 2017

Appropriation: 2040A Research, Development, Test & Eval, Army

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 e Base+OCO	S
173	0203752A	Aircraft Engine Component Improvement Program	07		259		259	U
174	0203758A	Digitization	07		6,483		6,483	U
175	0203801A	Missile/Air Defense Product Improvement Program	07		5,122	48,600	53,722	U
176	0203802A	Other Missile Product Improvement Programs	07	1,080	7,491	1,080	8,571	U
177	0203808A	TRACTOR CARD	07		20,333		20,333	U
178	0205402A	Integrated Base Defense - Operational System Dev	07	3,450		3,450	3,450	U
179	0205410A	Materials Handling Equipment	07		124		124	U
180	0205456A	Lower Tier Air and Missile Defense (AMD) System	07		69,417	4,000	73,417	U
181	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07		22,044	16,000	38,044	U
182	0208053A	Joint Tactical Ground System	07		12,649		12,649	U
184	0303028A	Security and Intelligence Activities	07		11,619		11,619	U
185	0303140A	Information Systems Security Program	07		38,280		38,280	U
186	0303141A	Global Combat Support System	07		27,223	1,444	28,667	U
187	0303142A	SATCOM Ground Environment (SPACE)	07		18,815		18,815	U
188	0303150A	WWMCCS/Global Command and Control System	07		4,718		4,718	U
190	0305127A	Foreign Counterintelligence Activities	07			4,100	4,100	U
191	0305204A	Tactical Unmanned Aerial Vehicles	07		8,218		8,218	U
192	0305206A	Airborne Reconnaissance Systems	07		11,799		11,799	U
193	0305208A	Distributed Common Ground/Surface Systems	07		32,284		32,284	U
194	0305219A	MQ-1C Gray Eagle UAS	07		13,470	17,500	30,970	U

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Department of the Army

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 08 Mar 2017
 (Dollars in Thousands)

Appropriation: 2040A Research, Development, Test & Eval, Army

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 c
195	0305232A	RQ-11 UAV	07	1,613		1,613		U
196	0305233A	RQ-7 UAV	07	4,597	3,000	7,597		U
197	0307665A	Biometrics Enabled Intelligence	07				7,104	U
198	0310349A	Win-T Increment 2 - Initial Networking	07	4,867		4,867		U
199	0708045A	End Item Industrial Preparedness Activities	07	62,287		62,287		U
9999	9999999999	Classified Programs		4,625		4,625		U
		Operational Systems Development		1,296,954	165,975	1,462,929	7,104	
Total Research, Development, Test & Eval, Army				7,515,399	349,621	7,865,020	100,522	

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Appropriation: 2040A Research, Development, Test & Eval, Army

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
195	0305232A	RQ-11 UAV	07					U
196	0305233A	RQ-7 UAV	07					U
197	0307665A	Biometrics Enabled Intelligence	07		1,750	8,854		U
198	0310349A	Win-T Increment 2 - Initial Networking	07					U
199	0708045A	End Item Industrial Preparedness Activities	07					U
9999	9999999999	Classified Programs						U
		Operational Systems Development			11,380	18,484		
Total Research, Development, Test & Eval, Army				139,200	92,600	332,322	-78,700	

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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 08 Mar 2017
 (Dollars in Thousands)

Appropriation: 2040A Research, Development, Test & Eval, Army

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 e Base+OCO	S c
195	0305232A	RQ-11 UAV	07		1,613		1,613	U
196	0305233A	RQ-7 UAV	07		4,597	3,000	7,597	U
197	0307665A	Biometrics Enabled Intelligence	07	8,854	7,104	1,750	8,854	U
198	0310349A	Win-T Increment 2 - Initial Networking	07		4,867		4,867	U
199	0708045A	End Item Industrial Preparedness Activities	07		62,287		62,287	U
9999	9999999999	Classified Programs			4,625		4,625	U
		Operational Systems Development		18,484	1,304,058	177,355	1,481,413	
Total Research, Development, Test & Eval, Army				253,622	7,676,421	442,221	8,118,642	

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

March 2017



Army

Justification Book of

Research, Development, Test & Evaluation, Army

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603009A / <i>TRACTOR HIKE</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	-	7.492	7.502	21.374	-	21.374	8.650	8.686	8.858	9.035	-	-
B18: <i>DB18</i>	-	7.492	7.502	21.374	-	21.374	8.650	8.686	8.858	9.035	-	-

A. Mission Description and Budget Item Justification

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	7.492	7.502	8.074	-	8.074
Current President's Budget	7.492	7.502	21.374	-	21.374
Total Adjustments	0.000	0.000	13.300	-	13.300
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Revised PB17	0.000	0.000	13.300	-	13.300

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

March 2017



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Smoke, Obscurant and Target Defeating Sys-Adv Dev	0603627A	57	04.....	3
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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army **Date:** March 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603327A / <i>Air and Missile Defense Systems Engineering</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	-	0.000	0.000	14.200	-	14.200	0.000	0.000	0.000	0.000	0.000	14.200
FG9: <i>Air and Missile Defense (AMD) Electronic Warfare</i>	-	0.000	0.000	14.200	-	14.200	0.000	0.000	0.000	0.000	0.000	14.200

Note

On 23 December 2009 the Army Integrated Air & Missile Defense (AIAMD) program was approved for entry into the Engineering and Manufacturing Development phase as ACAT ID program. The approved program baseline represents a substantially lower risk approach from the initial program and resulted in a FY 2016 Initial Operational Capability (IOC). As a result of certification required by section 2366b of title 10, United States Code, the Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)) waived three certification elements (Affordability, Full Funding, and Preliminary Design Review (PDR) Completion) for the Army IAMD program. Details on these waivers are provided in the Program Element (PE) Note for PE 0605457A.

A. Mission Description and Budget Item Justification

This system is an integral part of the overall Air and Missile Defense (AMD) architecture and will provide for an incrementally fielded Integrated Air and Missile Defense Fire Control System/capability for the Army Air and Missile Defense Battalions. This program element provides funding for the integration of Army Integrated Air and Missile Defense (AIAMD). On 9 February 2006 the Army Systems Acquisition Review Council (ASARC) designated the IAMD program a Pre-Major Defense Acquisition Program (MDAP) and approved the stand-up of the IAMD Project Office (PO). Program Executive Office Missiles and Space (PEO MS) formally stood up the IAMD PO on 9 May 2006. On 23 December 2009 the Army Integrated Air & Missile Defense (AIAMD) program was approved for entry into the Engineering and Manufacturing Development phase as ACAT ID program.

The mission of the AIAMD PO is twofold; To define, develop, acquire, field and sustain the Army's portion of the Joint IAMD system of systems capability to be deployed as integrated components in Army, Joint, interagency, and multi-national net-centric architectures; and to develop, acquire, field and sustain the AIAMD common battle command component of the architecture (replacing seven weapon system unique Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I) components in an AMD Battalion) and integrate externally developed sensors and shooters to provide an effective AIAMD capability. The Capability Development Document (CDD) was JROC approved on 17 May 2010 via JROCM 073-10. The AIAMD mission is derived from analysis of the Joint Air and Missile Defense (AMD) imperatives and the four mission sets that Army AMD performs. These mission sets are: Provide Air and Missile Defense, Contribute to AMD Situational Awareness/Situational Understanding, Contribute to Airspace Management, and Integrate/contribute to operational protection. The AIAMD PO is responsible for the development of an AIAMD Architecture comprised of components developed within the Project Office as well as by other PEO MS Project Offices (Phased Array Tracking to Intercept of Target (PATRIOT), Improved Sentinel, and Joint Land Attack Cruise Missile Defense Elevated Netted Sensor Systems (JLENS)), PEO Command, Control and Communications - Tactical (C3T) Project Offices (Air and Missile Defense Command and Control Systems (AMDCCS)), Missile Defense Agency (MDA), and Joint organizations. As part of this responsibility, the AIAMD PO has responsibility for performing the overarching AIAMD System of Systems Architecture Systems Engineering. While the AIAMD Architecture is complex, it is itself part of a larger Joint System of Systems architecture. The AIAMD program provides the Army's part of this larger Joint IAMD Architecture.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army	Date: March 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603327A / <i>Air and Missile Defense Systems Engineering</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	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	14.200	-	14.200
Total Adjustments	0.000	0.000	14.200	-	14.200
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Amended FY2017	0.000	0.000	14.200	-	14.200

Change Summary Explanation

Amendment Justification: This increase requests additional \$14.200 million above the PB 2017 Request. Increased funding will accelerate development and integration of Army Low-Cost Portable Surveillance (ALPS) 360-degree surveillance sensor into the Army IAMD (AIAMD) architecture. The Sensor integration effort is required to improve Electronic Protection (EP) posture of the AIAMD architecture. This is a NEW START.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603627A / Smoke, Obscurant and Target Defeating Sys-Adv Dev
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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	13.426	28.244	16.020	44.264	7.137	1.714	0.000	0.000	Continuing	Continuing
E79: SMOKE/OBSCURANT SYSTEM	-	0.000	13.426	28.244	16.020	44.264	7.137	1.714	0.000	0.000	Continuing	Continuing

Note

Nuclear Biological Chemical Radiological Vehicle Sensor Suite (NBCRVSS) funding is expected to move to a separate Program Element during the FY16 President's Budget cycle. It will be reflected under PE 655038, Project Code EQ7.

A. Mission Description and Budget Item Justification

SOM: US Forces must be able to effectively neutralize and degrade energy weapon systems and electro-optical systems/smart weapons that operate in the full range of the electromagnetic spectrum to improve platform survivability and soldier protection levels of maneuver forces on the battlefield. Improvements are sought across the entire multi-spectral range from visual through infrared (IR) and millimeter wavelengths (MMW) radar for incorporation into self-protection using sustained generated obscuration technology. SOM will be man portable and modular to facilitate quick mounting on manned/unmanned platforms and dismounted operations.

NBCRV: This program upgrades the Stryker Nuclear Biological Chemical Radiological Vehicle Sensor Suite (NBCRVSS) for increased sensitivity, chemical detection at increased maneuver speeds, and increased reliability. The NBCRVSS consists of a chemical point detector for solid, liquid, and vapor Chemical Warfare Agents, a biological point detection system, a Chemical Vapor Sampling System, a Training Aids, Devices, and Simulation System, and the Sensor Processing Group. The NBCRVSS provides the Stryker NBCRV the ability to detect, identify, collect, report, and mark NBC hazards. NBCRVSS funding is expected to move to a separate Program Element during the FY16 President's Budget cycle. It will be reflected under PE 655038, Project Code EQ7.

B. Program Change Summary (\$ in Millions)

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>
Previous President's Budget	0.000	13.426	13.400	-	13.400
Current President's Budget	0.000	13.426	28.244	16.020	44.264
Total Adjustments	0.000	0.000	14.844	16.020	30.864
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	14.844	-	14.844
• Amended FY 2017	0.000	0.000	0.000	16.020	16.020

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

Appropriation/Budget Activity
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)

R-1 Program Element (Number/Name)
PE 0603627A / Smoke, Obscurant and Target Defeating Sys-Adv Dev

Change Summary Explanation

The FY 2016 funding request was reduced for \$4.517 million to account for the availability of prior year execution balances.

Amendment Justification: This increase requests an additional \$16.020 million in Overseas Contingency Operations (OCO) funds to develop, test, and study emerging efforts to detect ISIS Chemical, Biological, Radiological and Nuclear (CBRN) agent use and tactical destruction of captured chemical weapons above the PB 2017 Request.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition
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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	-	24.402	46.749	42.096	-	42.096	46.663	50.914	29.886	17.711	Continuing	Continuing
FA5: Assured Precision Weapons and Munitions	-	0.000	0.000	10.171	-	10.171	12.809	14.820	11.828	7.825	0.000	57.453
EB8: OWL for Small Caliber Ammunition	-	2.391	2.500	2.166	-	2.166	4.400	4.400	0.000	0.000	Continuing	Continuing
EB9: Tunable Pyrotechnic Aircraft Countermeasure Flares	-	0.850	3.000	2.368	-	2.368	0.000	0.000	0.000	0.000	0.000	6.218
EC2: Adv Armor-Piercing (ADVAP) for Small Cal Ammo	-	5.280	7.700	0.000	-	0.000	3.800	6.900	0.000	0.000	Continuing	Continuing
EC3: Ammunition Logistics Prototyping	-	1.702	3.571	2.017	-	2.017	2.258	2.825	2.478	1.826	0.000	16.677
656: 120mm Cartridge (Advanced Multipurpose-AMP)	-	14.179	27.578	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.757
694: Medium Caliber Ammunition	-	0.000	0.000	2.170	-	2.170	0.000	0.000	0.000	0.000	Continuing	Continuing
EU1: Enhanced Lethality Cannon Munitions	-	0.000	0.000	9.866	-	9.866	10.000	0.000	0.000	0.000	0.000	19.866
EU2: Improved Multi-Option Fuze (iMOFA/iMOFM)	-	0.000	0.000	7.892	-	7.892	0.000	0.000	0.000	0.000	0.000	7.892
EU3: .50 Caliber All-Purpose Tactical Cartridge (APTC)	-	0.000	0.000	0.000	-	0.000	0.000	0.000	4.600	8.060	0.000	12.660
EL6: Individual Assault Munition (IAM)	-	0.000	0.000	0.000	-	0.000	1.896	8.469	10.980	0.000	0.000	21.345
EL7: Reduced Range Small Caliber Training Ammunition	-	0.000	0.000	2.166	-	2.166	9.000	13.500	0.000	0.000	Continuing	Continuing
EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	-	0.000	2.400	1.280	-	1.280	2.500	0.000	0.000	0.000	Continuing	Continuing

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition							
FG1: Cannon-Delivered Area Effects Munitions (C-DAEM)	-	0.000	0.000	2.000	-	2.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note
In FY 2017, PE 0603639A projects 694, EL7, EU1, EU2 and FA5 are new start programs.

A. Mission Description and Budget Item Justification

Title changed from Tank and Medium Caliber Ammunition to Weapons and Munitions Advanced Development.

The Weapons and Munitions Advanced Development Program Element (PE) encompasses a comprehensive program to develop, rapidly transition to production, and field advanced weapons and munitions. These programs will ensure continued battlefield overmatch and lethality of U.S. maneuver forces against the full range of modern battlefield threats. To achieve this, Weapons and Munitions Engineering Development Program will identify and develop promising technologies through competitive development and streamlined acquisition procedures.

Project 652: The M829E4 cartridge is an Abrams delivered Line of Sight (LOS) munition that will provide capability for the current force Armored Brigade Combat Team's (ABCT) commander to conduct decisive operations and destroy current and future enemy Main Battle Tanks (MBTs) equipped with Explosive Reactive Armor (ERA) and Active Protective System (APS) at ranges from 0-2km (T) and 0-4km (O). The M829E4 equips ABCT commanders with a unique capability which will increase the ABCT's lethality and ability to seize the initiative during unified land operations. After an Engineering and Manufacturing Development (EMD) Phase I competitive shoot off in FY 2011, Alliant Techsystems (ATK) was awarded the option to continue with Phase II until its conclusion in FY 2015. FY 2012 supported the continuation of Phase II of the M829E4 cartridge. FY 2013 funding supported design finalization, design verification, fabrication and initial testing of Developmental Test and Evaluation (DT&E) hardware. The full performance of the M829E4 is obtained with an Abrams equipped with an Ammunition Data Link breech modification. FY 2014 supported hardware and performance testing, mandated Live Fire Test & Evaluation (LFT&E) and completion of Milestone C. FY 2015 supported qualifying a second source for the composite sabot material. The current single source supplier for this material had significantly increased the cost for this material, more than doubled in cost, and expressed intentions of possibly getting out of this business. Qualification of this second source has occurred and has resulted in competitive pricing thus driving down the unit price cost. The aforementioned selection has mitigated the risk of the current supplier exiting as a supplier of this material.

Project 656: The Advanced Multi Purpose (AMP) program is a direct fire line of sight 120mm large caliber munition under development for the Abrams Main Battle Tank. It has three modes of operation including point detonate, point detonate delay and airburst. AMP is the material solution for breaching double reinforced concrete walls and defeating Anti Tank Guided Missile (ATGM) teams from 50m to 2000m (T) and 50m to 4500m (O), a validated gap that cannot currently be met with existing stockpiled ammunition. In addition to added capability, AMP will also consolidate the capabilities of four existing stockpiled 120mm munitions, thereby addressing the users' battlecarry dilemma by allowing them to load a single munition that is capable of defeating multiple targets including ATGM teams, reinforced walls, personnel, light armor, bunkers, and obstacles. The full performance of the AMP is obtained with an Abrams equipped Ammunition Data Link breech modification, the same required by the 120mm M829E4 cartridge that achieved Milestone C in FY 2014. FY 2016 supports multiple contracts with competing prototypes in Phase 1 of 2 for Engineering and Manufacturing Development (EMD).

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army		Date: March 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>Project 694: The 40mm Low Velocity (LV) Increased Range Anti-Personnel (IRAP) tactical cartridge allows the warfighter to effectively engage multiple targets, at increased ranges using the 40mm M203 and M320 Grenade Launchers. The IRAP cartridge provides the grenadier with a higher probability of achieving a first shot kill against enemy personnel, coupled with the ability to defeat personnel targets in defilade positions at increased ranges with greater accuracy and lethality. When deployed against point and area targets, the cartridge inflicts incapacitating effects against personnel or achieve a mobility kill against unarmored vehicles at increased ranges beyond those offered by the current M433 High Explosive Dual Purpose (HEDP) cartridge. IRAP is a new capability identified as a Warfighter requirement in the Capability Development Document, 40mm, Low Velocity Family of Ammunition Annex A1, Increased Range Anti-Personnel Cartridge. The cartridge provides lethal effects against targets with improved accuracy and greater standoff ranges increasing Soldier Survivability. FY 2017 supports Milestone B approval, Request for Proposal (RFP) preparation, Source Selection Planning, Government Technical Development and Cooperative Research and Development Agreement (CRADA) Testing. Engineering, Manufacturing Development will commence in FY 2017.</p> <p>Project EB8: The One Way Luminescence (OWL) program is a critical technology development in response to the 7.62mm, 5.56mm, and .50 Caliber Family of Ammunition Capabilities Development Documents (CDD). Current small caliber ammunition tracer rounds are a pyrotechnic tracer mix allowing enemy forces to see the trace round and track its trajectory back to the shooter. The OWL program objective develops and fields a full day/night tracer round, replace the current pyrotechnic cartridges with trace cartridges that are only visible to the shooter and soldiers in close proximity, increasing soldier survivability. 7.62mm is the immediate focus followed by 5.56mm and .50 caliber OWL cartridges. FY 2017 funding supports maturation and downselect of the 7.62mm OWL technology, procurement of bullet components, "tracer" material and testing evaluation in order to attain a Technology Readiness Level (TRL) of 6. FY 2017 funding further supports EMD contract development necessary for a FY 2018 Milestone B.</p> <p>Project EB9: This project is essential to support the advanced development activities and technology demonstrations of the Aviation Airborne Expendable Countermeasure (AAECM) components and prototype munition decoys necessary to address emerging threat deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. These efforts will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments to help expedite technology transition from the laboratory to operational use to demonstrate component and subsystem maturity prior to integration into major and complex Army aircraft platforms. These expendable countermeasures systems are an essential part of survivability equipment for Army aircraft. Army RDT&E efforts are coordinated with the PEO Aviation and its platform PMs with PM Aircraft Survivability Equipment (ASE) to address emerging JUONS from theatre.</p> <p>Project EC2: The Advanced Armor-Piercing (ADVAP) program is a critical technology development in response to the 7.62mm and 5.56mm Family of Ammunition Capabilities Development Documents (CDD). The nomenclature for the 7.62mm ADVAP is now XM1158 and the companion trace is XM1159. The overall objective of the ADVAP program is to develop and Full Materiel Release (FMR) a 7.62mm XM1158 cartridge linked 4:1 with a trace cartridge (XM1159) followed by a 5.56mm cartridge variant that will provide overmatch capability to defeat advanced light armored threats within typical machine gun ranges. The 7.62mm XM1158 and XM1159 cartridge will be optimized for use in the M240 Machine Gun.</p> <p>Project EC3: The Ammunition Logistics Prototyping project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution,</p>		

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army		Date: March 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter.</p> <p>Project EL7: The Reduced Range Small Caliber Training Ammunition (RRTA) program is a critical technology development in response to the 7.62mm and .50 Caliber Capabilities Development Documents (CDD). The overall objective of the RRTA program is to develop and field 7.62mm RRTA cartridges that will provide a ballistic match to M80A1 and M62A1 cartridges to standard training ranges, while reducing the maximum range of the ammunition. This will allow soldiers to train with 7.62mm weapons on restricted ranges. The RRTA cartridge will be designed to be compatible with all Army 7.62mm weapons, but specifically optimized to work in the M240 Machine Gun. After the 7.62mm cartridge is matured. FY 2017 dollars support Technology Maturation and Risk Reduction in preparation for a TRL 6 demonstration and preparation for Milestone B.</p> <p>Project EL8: The Lightweight Small Caliber Ammunition (LSCA) program is a critical technology development in response to the 7.62mm and .50 Caliber Capabilities Development Documents (CDD). The goal of the LSCA Program is to reduce the Soldier load through reduction in ammunition weight. The LSCA Program will develop and field 7.62mm LSCA cartridges that will provide the same capabilities as the M80A1 and M62A1 cartridges. The LSCA cartridge will be designed to be compatible with all Army 7.62mm weapon systems, but specifically optimized to work in the M240 Machine Gun. After the 7.62mm cartridge is matured a .50 Caliber variant will be developed. FY 2017 funding will support 7.62mm TRL 6 evaluation of the 7.62mm Phase II Defense Ordnance Technology Consortium (DOTC) efforts, solicitation release, preliminary design review, and milestone B preparation for the LSCA Program.</p> <p>Project EU1: The Enhanced Lethality Cannon Munitions program will identify, develop, prototype, and demonstrate new enhanced lethality technologies, components, and subsystems maturity for Cannon munitions to enable fact-based analysis of enhanced lethality alternatives, quantify their effectiveness in mitigating evolving and derived capability gaps, reduce integration risk, and support transition into existing/new Cannon munitions. This program will evaluate and analyze the effectiveness, efficiency, producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in high fidelity simulations and representative realistic performance-related developmental tests.</p> <p>Project EU2: The Improved Multi-Option Fuze will identify, develop, prototype, and demonstrate new improved multi-option fuze technologies, components, and subsystems based on Next Generation Proximity Sensor (NGPS) capabilities with built-in exportability attributes previously matured via OSD-sponsored Science and Technology efforts under the Joint Fuze Technology Program and Defense Exportability Features (DEF) Congressional Pilot Program. This program will evaluate and analyze the effectiveness, efficiency, producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in representative realistic performance-related developmental tests.</p> <p>Project FA5: The objective of this advanced component development and prototyping effort is to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapons and munitions systems to prove component and subsystem maturity in a system-of-systems environment and to reduce subsequent Program of Record (PoR) integration risk. Assured Precision Weapons and Munitions are an integral part of US military strategy and continue to enable combat overmatch and dominance across the Land Component battlespace. Unhindered access to trusted Positioning, Navigation, and Timing (PNT) information under conditions where existing space based PNT (i.e. P(Y)-Code Global Positioning System (GPS)) may be limited or denied has created the need to develop, prototype, and</p>		

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition
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evaluate new/emerging Assured PNT capabilities (including M-Code GPS and Pseudolites) into both PGMs and Weapons operating in a complex system-of-systems environment. This imperative is reinforced by Public Law 111-383 Section 913 which mandates the use of Air Force-developed M-Code GPS capabilities in all systems fielded FY 2018 and beyond unless a waiver is obtained from the Secretary of Defense. As such, both precision weapon and munition PoRs must coordinate with the development and technology delivery activities of the Air Force's Military GPS User Equipment (MGUE) program as well as the Army's Assured PNT program to protect and insure critical precision-based Joint warfighting capabilities as well as maximizing effectiveness and efficiency of US taxpayer investments across multiple Lethality portfolios.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	29.318	46.749	42.240	-	42.240
Current President's Budget	24.402	46.749	42.096	-	42.096
Total Adjustments	-4.916	0.000	-0.144	-	-0.144
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-4.916	0.000	-2.144	-	-2.144
• Amended FY2017	0.000	0.000	2.000	-	2.000

Change Summary Explanation

In FY 2017, PE 0603639A projects 694, EU1, EU2, and FA5 are new start programs.

Amendment Justification: This increase requests an additional \$2.000 million for project FG1 above the PB 2017 Request. Will support the Analysis of Alternatives to down select future Program of Record for the 155mm Cannon-Delivered Area Effects Munitions (C-DAEM). This is a new start project.

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

March 2017



Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E – Volume II, Budget Activity 5

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

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604270A / Electronic Warfare Development
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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	-	5.792	18.843	37.242	-	37.242	61.215	82.223	83.159	49.061	Continuing	Continuing
665: A/C Surv Equip Dev	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
DX5: Electronic Warfare And Management Tool	-	1.913	8.641	19.440	-	19.440	22.408	20.664	20.878	0.330	Continuing	Continuing
DX6: Multi-Function Electronic Warfare (MFEW)	-	0.000	0.000	3.969	-	3.969	24.525	47.194	49.437	36.322	Continuing	Continuing
ET7: Radio Frequency Interference Mitigation	-	0.000	0.000	4.151	-	4.151	4.309	4.220	2.528	1.926	Continuing	Continuing
L12: Signals Warfare Development (MIP)	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
L13: COUNTER-IEDS	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
L15: ARAT-TSS	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
L16: TROJAN DEVELOPMENT (MIP)	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
L20: ATIRCM/CMWS	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000
VS6: Integrated Electronic Warfare Systems	-	3.879	10.202	9.682	-	9.682	9.973	10.145	10.316	10.483	Continuing	Continuing
VU6: Hostile Fire Detection System (HFDS)	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000
VU7: Common Missile Warning System	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000
VU8: Common Infrared Counter Measure	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note
 Projects DX6 and ET7 are new start programs in FY17.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604270A / Electronic Warfare Development
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A. Mission Description and Budget Item Justification

FY 2017 budget request funds Electronic Warfare Development. This program element (PE) encompasses engineering and manufacturing development for tactical electronic warfare (EW). The Integrated Electronic Warfare System (IEWS) is a system of systems capability set that integrates electronic attack, protect and support functions to dramatically improve the ability to seize, retain, and exploit an advantage within the electromagnetic spectrum (EMS). It is based on a modular, scalable and open architecture to allow Army Brigade Combat Team (BCT) and Joint Force Commander's to tailor capability responses against a variety of EW threats/scenarios.

The IEWS capability set is structured along three program lines of effort: 1) Project DX5 is Electronic Warfare Planning and Management Tools (EWPMT), 2) Project DX6 is Multi-Function EW (MFEW), and 3) Project VS6 Counter Radio-Controlled Improvised Explosive Devices (RCIED) Electronic Warfare (CREW) which provides current defensive electronic attack capability. Project ET7 is Radio Frequency Interference Mitigation (RIM) to resolve radio frequency interference and electromagnetic fratricide and enable electronic warfare and communications compatibility.

Project DX5 - EWPMT will provide the Electronic Warfare Officer (EWO) planning capabilities to coordinate, manage, and deconflict the use of the Electromagnetic Spectrum and synchronize spectrum operations within the Cyber Electromagnetic Activities (CEMA) cell. EWPMT will integrate data elements from Mission Command, Intelligence, and Fires to achieve a Common Operating Picture (COP) of the Electromagnetic Operational Environment.

Project DX6 - Multi-Function EW Airborne (MFEW-Air) is a 3 variant system of systems EW payload that will provide Offensive Electronic Attack (OEA) and Electronic Warfare Support (ES) from Tactical to Operational levels. MFEW will provide commanders from BCT to CORPS with an organic EW capability that dramatically improves a land force's ability to seize, retain, and exploit an advantage within the electromagnetic spectrum (EMS) in order to execute successful unified land operations. These capabilities give the commander a competitive advantage by denying, degrading or modifying the enemy's ability to conduct command and control, ISR, and targeting, and allows the commander to optimize effects within the EMS at the time and place of their choosing.

Project ET7 – RIM will provide a cross cutting capability to centrally manage and provide oversight to identify, define, test, and coordinate development of Radio Frequency (RF) interference mitigation material solutions to resolve mutual RF interference and electromagnetic fratricide for SDS.

Project VS6 - Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) provides for protection for ground forces operating in vehicle convoys, single vehicle operations and fixed locations in all theatres of operations. It is programmable to migrate with the evolving threat and provides non-lethal capabilities which enable freedom of movement across depth/breadth of the operational environment.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army	Date: March 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</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	5.999	18.843	16.413	-	16.413
Current President's Budget	5.792	18.843	37.242	-	37.242
Total Adjustments	-0.207	0.000	20.829	-	20.829
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 1	-0.207	0.000	18.229	-	18.229
• Amended FY2017	0.000	0.000	2.600	-	2.600

Change Summary Explanation

Amendment Justification: This increase requests an additional \$2.600 million above the PB 2017 Request. Increased funding will accelerate establishment of the Electronic Warfare Program Office and conduct pre-Milestone B documentation for Multi-Function Electronic Warfare (MFEW) air capabilities.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</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	-	8.775	27.155	35.774	0.033	35.807	31.084	28.360	24.978	26.341	Continuing	Continuing
241: <i>Nstd Combined Arms</i>	-	5.700	24.214	32.769	-	32.769	27.984	25.191	21.742	22.956	Continuing	Continuing
573: <i>Program Executive Office Simulation, Training Spt</i>	-	3.075	2.941	3.005	0.033	3.038	3.100	3.169	3.236	3.385	Continuing	Continuing

A. Mission Description and Budget Item Justification

Program Element funds development of Non-System Training Devices to support force-on-force training at the Combat Training Centers (CTC), general military training, and training on more than one item/system, as compared with system devices which are developed in support of a specific item/weapon system. Army training devices and training simulations contribute to the modernization of the forces by enabling readiness and strengthening combat effectiveness through realistic training solutions for the Warfighter. Training devices maximize the transfer of knowledge, skills, and experience from the training situation to a combat situation. Force-on-force training at the National Training Center (NTC), Ft. Irwin, CA; Joint Readiness Training Center (JRTC), Ft. Polk, LA, and Joint Multinational Readiness Center (JMRC), formerly the Combat Maneuver Training Center (CMTTC), Hohenfels, Germany; and battle staff training in Battle Command Training Program (BCTP) provide increased combat readiness through realistic collective training in low, mid, and high intensity scenarios. Project 241, Non-System Training Devices-Combined Arms, develops simulation training devices for Army-wide use, including the CTCs. Project 573 funds key organizational support to Army/DoD Transformation via innovative simulation and training device efforts. Program Executive Office (PEO) Simulation, Training and Instrumentation (STRI's) unique geographic co-location with other services facilitates joint training solutions in a common environment.

FY 2017 Project 241 funds significant development efforts in support of U.S. Army Training and Readiness on the Combat Training Center Instrumentation Systems (CTC-IS), Instrumentable-Multiple Integrated Laser Engagement System (I-MILES), Home Station Instrumentation Training System (HITS), Common Training Instrumentation Architecture (CTIA), Target Modernization, Call for Fire Trainer (CFFT), Medical Simulation Training Center (MSTC), Engagement Skills Trainer (EST), Live, Virtual, Constructive Integrating Architecture (LVC-IA) and Comprehensive Soldier & Family Fitness (CSF2).

FY 2017 Project 573 will provide for minimum PEO STRI core operations supporting development of training devices and simulations by PEO STRI's three Project Management Offices.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</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	8.943	27.155	41.087	-	41.087
Current President's Budget	8.775	27.155	35.774	0.033	35.807
Total Adjustments	-0.168	0.000	-5.313	0.033	-5.280
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.168	-			
• Adjustments to Budget Years	0.000	0.000	-10.313	0.033	-10.280
• FY 17 Amendment	0.000	0.000	5.000	-	5.000

Change Summary Explanation

FY 2017 Funds were realigned to higher priority requirements.

Non-System Training Devices - Eng Dev 654715A / 241 - \$5.000M

Amendment Justification: This increase requests additional \$5.000 million above the PB 2017 Request to obtain funding to meet urgent requirements to develop, produce, procure, and integrate critical Combat Training Center (CTC) Opposing Forces (OPFOR) Integrated Air Defense System (IADS) capabilities to replicate threats in accordance with the Army Operating Concept (AOC). This is a NEW START.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev
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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	-	15.294	34.569	61.532	143.900	205.432	25.950	41.477	23.566	33.477	Continuing	Continuing
146: Air & Msl Defense Planning Control Sys	-	13.018	15.757	23.761	-	23.761	15.914	16.108	14.294	8.325	Continuing	Continuing
149: Counter-Rockets, Artillery & Mortar	-	2.276	18.812	20.695	-	20.695	4.227	3.550	3.444	3.326	Continuing	Continuing
FG5: Counter Unmanned Aerial Systems (CUAS)	-	0.000	0.000	0.000	143.900	143.900	0.000	0.000	0.000	0.000	0.000	143.900
126: FAAD C2 ED	-	0.000	0.000	17.076	-	17.076	5.809	21.819	5.828	21.826	Continuing	Continuing

Note
FY 2017 funding increase of \$26.201 million includes \$17.076 million of AEPE funds transitioned from APE 655457 DU4 to APE 0604741A, project 126, to respond to an OSD directive. The remainder of the increase supports completion of an LPWS cruise missile capability study and modification development effort.

FY 2017 Overseas Contingency Operations (OCO) Amendment in the amount of \$78.700 million supports Joint Urgent Operational Needs Statement (JUONS) CC-0558 addressing Counter Unmanned Aerial Systems (CUAS) emerging threats in the operational environment posed by enemy UAS.

A. Mission Description and Budget Item Justification

The Advanced Electronic Protection Enhancement (AEPE) Program funds efforts to assess and initiate development of solutions to Army Air and Missile Defense (AMD) vulnerabilities from Advanced Electronic Attack (AEA). Army AMD sensors, Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) Command and Control (C2), and Radio Frequency (RF) data and voice networks will be assessed against current and postulated AEA systems and techniques. Potential Electronic Protection (EP) solutions developed by the Army will be demonstrated and assessed in live and simulated AEA environments. Similarly, EP solutions developed by the Joint services and other Agencies (e.g., the Missile Defense Agency) will also be assessed for potential incorporation into Army AMD systems.

Note: AEPE funds transitioned from APE 655457 DU4 to APE 0604741A, Proj. 126, to respond to an OSD directive. AEPE is a new start in FY 2017. The last funding associated with AEPE was in FY 2013. The AEPE effort crosses all AMD System efforts of which only a portion is Air Defense Command and Control.

The Air and Missile Defense Planning and Control System (AMDPCS) is an Army Objective Force System that provides integration of Air and Missile Defense (AMD) operations at all echelons. AMDPCS systems are deployed with Air Defense Artillery (ADA) brigades, Army Air and Missile Defense Commands (AAMDCs), and Air Defense and Airspace Management (ADAM) Cells at the Brigade Combat Teams (BCT's), Multi Functional Support Brigades and Divisions/Corps. AMDPCS systems also provide air defense capabilities to Homeland Defense systems. ADAM Cells provide the Commander at BCTs, Brigades and Divisions with air defense situational awareness and airspace management capabilities. They also provide the interoperability link with Joint, multinational and coalition forces. AMDPCS components are vital in the transformation of ADA units and the activation of the Air & Missile Defense (AMD) Battalions. AMDPCS has three major components: (1) The Air and

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<p>Missile Defense Workstation (AMDWS) is an automated defense and staff planning tool that displays the common tactical and operational 3-dimensional air picture. AMDWS is the air picture provider for the Army, producing an integrated and correlated air picture at all tactical levels and locations. AMDWS is also an integral component of Integrated Base Defense. AMDWS provides an interoperability link to multinational air defense forces; (2) The Air Defense System Integrator (ADSI) is a communications data link processor and display system that provides near-real time, 3-dimensional, joint airspace situational awareness and fire direction command and control for AMD forces; (3) The Army Air Defense shelter configurations use automated data processing equipment, tactical communications, Common Hardware Systems, standard vehicles and tactical power to provide AMD unit commanders and staffs with the capabilities to plan missions, direct forces, and control the airspace.</p> <p>The Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems (SoS) is an evolutionary, non-developmental program that detects RAM launches; provides localized warning to the defended area, with sufficient time for personnel to take appropriate action; intercepts rounds in flight, thus preventing damage to ground forces or facilities; and enhances response to and defeat of enemy forces. The C-RAM capability is comprised of a combination of multi-service fielded and non-developmental item (NDI) sensors, command and control (C2) equipment, warning systems, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System (LPWS)), with a commercial off-the-shelf (COTS) wireless local area network. The Forward Area Air Defense Command and Control (FAAD C2) system, also under the management of the C-RAM Program Directorate, has been enhanced to integrate the sensors, weapons, and warning systems to provide C2 for the C-RAM SoS. The C-RAM SoS capability is currently deployed at multiple sites in Afghanistan, Iraq, and Egypt, providing correlated air and ground pictures, linking units to the Army Mission Command and the Joint Defense Network, and using various forms of communications to provide situational awareness and exchange of timely and accurate information to synchronize and optimize automated Shape, Sense, Warn, Intercept, Respond, and Protect decisions.</p> <p>Multiple acquisition efforts are associated with the C-RAM program, including C-RAM Intercept, which fields existing LPWS guns to two Indirect Fire Protection Capability (IFPC)/Avenger composite Battalions, and RAM Warn, a horizontal technology insertion, using current C-RAM warning capability to provide early, localized warning to all Maneuver Brigade Combat Teams (BCT).</p> <p>FY 2017 Overseas Contingency Operations (OCO) Amendment in the amount of \$78.700 million supports Joint Urgent Operational Needs Statement (JUONS) CC-0558 addressing Counter Unmanned Aerial Systems (CUAS) emerging threats in the operational environment posed by enemy UAS.</p> <p>The total estimated cost of the CUAS Baseline effort is \$278.000 million. Rapid Acquisition Authority (RAA) was approved for the first quarter FY 2017 research and development efforts in the amount of \$65.500 million and was sourced by FY 2017 OCO Operations and Maintenance, Army (OMA) funds. Funding for FY2017 Procurement efforts are requested in the Indirect Fire Protection Family of Systems Line 080 in Other Procurement, Army (OPA) (SSN BZ0501A).</p> <p>An additional RAA package in the amount of \$76.000 million will be provided to support the CUAS Acceleration plan which fields existing capability and provides immediate protection to the most at risk sites in the shortest time frame and in accordance with Office of the Secretary of Defense (OSD) direction.</p> <p>For transparency and in support of the Counter Unmanned Aerial System (UAS) Joint Operational Needs For Statement (JUONS) CC-0558, Project FG5 was created to support the identification, development, testing, evaluation and integration of technologies to provide an overall evolutionary capability to defeat small Unmanned Aerial systems (UAS) threats. The CUAS effort will provide the capability for the warfighter to comprehensively detect, identify and defeat enemy Group 1 and 2 light weight, low altitude UAS.</p>		

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The CUAS effort involves a four phased development and testing approach of Counter UAS systems:

- Phase 0: Deploys available/interim capabilities to three high priority sites, conducts Operational Assessment in Theater. Systems will be stand-alone with full system characterization, operational and spectrum impacts evaluated in Phase 1. Phase 0 efforts have been funded by Joint Improvised-Threat Defeat Agency (JIDA).
- Phase 1: Limited Test at Yuma Proving Ground (YPG) takes an initial look at available systems on the network, development for sensors and other mature systems, experimental segment for emerging technology and initial fielding of selected sites.
- Phase 1a: Test multiple systems on the network, tests mature solutions and down selects the best solutions that will participate in Phase 2 (full JUON capability) and fielding to identified locations.
- Phase 2: Test fully networked, fixed/mobile capability, sustainable solution and deploy full JUON capability to all locations.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	15.898	24.569	27.131	-	27.131
Current President's Budget	15.294	34.569	61.532	143.900	205.432
Total Adjustments	-0.604	10.000	34.401	143.900	178.301
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-0.604	0.000	0.000	-	0.000
• Other Adjustments	0.000	0.000	26.201	-	26.201
• FY 2017 Overseas Contingency Operations Amendment	0.000	0.000	0.000	78.700	78.700
• Amended FY2017	0.000	0.000	8.200	65.200	73.400

Change Summary Explanation

FY 2016 funding increase of \$10.000 million is a Congressional add to increase the overall effectiveness of the C-RAM system-of-systems through the integration of sensor communications and legacy systems and the development and integration of C-RAM network security enhancements.

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<p>FY 2017 funding increase of \$26.201 million includes \$17.076 million of AEPE funds transitioned from APE 655457 DU4 to APE 0604741A, project 126, to respond to an OSD directive. The remainder of the increase supports completion of an LPWS cruise missile capability study and modification development effort.</p> <p>FY 2017 Overseas Contingency Operations (OCO) Amendment in the amount of \$78.700 million supports Joint Urgent Operational Needs Statement (JUONS) CC-0558 addressing Counter Unmanned Aerial Systems (CUAS) emerging threats in the operational environment posed by enemy UAS. Project FG5 was created to support JUONS CC-0558 and provide transparency of this effort.</p> <p>Amendment Justification: This increase requests an additional \$8.200 million above the PB 2017 Request. The increased funding will accelerate the development, testing and integration of a kinetic or hard kill, defeat solutions into the Low-Slow-Small Unmanned Aerial System (UAS) Integrated Defeat System (LIDS). The kinetic kill development effort: 1) integrates the Compact Laser Weapon System with C-RAM Command and Control, increases the Directed Energy power solutions from 2kW to 5kW of the laser subsystem and supports Phase 1a testing; 2) integrates the Coyote warhead, proximity fuze, and midcourse guidance for Block 1 and Block 2, and supports Phase 1a and Phase 2 testing; and 3) develops the Vehicle Mounted Gun System fire control solution capability for UAS targets, and supports Engineering, Fire Control, and Phase 2 testing.</p> <p>Amendment Justification: This increase requests an additional \$65.200 million in Overseas Contingency Operations (OCO) funds above the PB 2017 Request. This funding will integrate the Compact Laser Weapon System with Counter Rocket, Artillery, and Mortar (C-RAM) Command and Control Systems. It also funds the integration of the warhead, proximity fuse, and midcourse guidance for Block 1 and Block 2 as well as development of fire control solution capability for Unmanned Aerial Systems (UAS) targets, and Engineering, Fire Control.</p>		

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</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	-	82.957	99.242	146.655	-	146.655	101.538	102.831	104.105	107.950	Continuing	Continuing
DY3: <i>NIE Test & Evaluation</i>	-	4.440	12.215	65.844	-	65.844	67.311	67.899	68.478	71.719	Continuing	Continuing
DY4: <i>Network Integration Support</i>	-	16.382	14.131	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	30.513
DY5: <i>Production/Field Coordination for Capability Sets</i>	-	2.802	4.601	3.960	-	3.960	4.099	4.194	4.286	4.374	Continuing	Continuing
DY6: <i>Brigade and Platform Integration Support</i>	-	33.629	45.504	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	79.133
DY7: <i>Army Systems Engineering, Architecture & Analysis</i>	-	16.988	16.416	14.166	-	14.166	24.176	24.651	25.123	25.505	Continuing	Continuing
DZ6: <i>Army Integration Management & Coordination</i>	-	8.716	6.375	5.746	-	5.746	5.952	6.087	6.218	6.352	Continuing	Continuing
FG7: <i>Emerging Technology Initiatives</i>	-	0.000	0.000	56.939	-	56.939	0.000	0.000	0.000	0.000	0.000	56.939

A. Mission Description and Budget Item Justification

The FY 2017 funding supports the Army conducting Network Integration Evaluation (NIE) and Army Warfighting Assessment (AWA) events, System of Systems Engineering and Architecture , Common Operating Environment (COE), Cyber Focal, Capability Set Synchronized Fielding, Integration and Management support. The specific evaluation requirements will support Mission Command Network 2020 and Force 2025 objectives and planned Focused End States.

Project DY3; NIE Test & Evaluation, in FY 2017, provides for the planning and conduct of detailed experiments (NIE and AWAs), tests and evaluation of potential Network, Software and Hardware systems for procurement and integration into the Army's Warfighter system. It includes all test support activities such as Blade time for Helicopters, Satellite time for the network, medical evacuation, and protection for the soldier.

Project DY4; Network Integration Support, in FY 2017 the mission requirements and the funding to support those requirements have been moved to DY3; NIE Test & Evaluation to increase transparency.

Project DY5; Production/Fielding Coordination for Capability Sets, in FY 2017, provides for the development and coordination of Programs to produce, integrate, and field the NIE evaluated Brigade improvements to the Brigade Combat Teams (BCTs). This effort does not fund the production, or integration, or fielding of the Capability

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>
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Sets, but it does fund the coordination of requirements and integration along with scheduling of all activities for the Army through the supporting Program Executive Offices (PEOs), Program Managers (PMs) and Research, Development and Engineering Centers (RDECs).

Project DY6; Brigade and Platform Integration Support, in FY 2017 the mission requirements and the funding to support those requirements have been moved to DY3; NIE Test & Evaluation to increase transparency.

Project DY7; Army System Engineering, Architecture & Analysis, in FY 2017, provides System of System (SOS) engineering and analysis, Basis of Issue Plans (BOIP), and designs that feed planned Capability Sets and NIE plans. These efforts support Army Modernization Processes, the Common Operating Environment (COE), and Cyber planning and implementation.

Project DZ6; Army Integration Management & Coordination, in FY 2017, provides for all "shared" functions (Human resources, Budget development and executions, Acquisition, Operations, Program Coordination, Facilities management) and headquarters functions that supports the technical aspects of the Network integration, Platform integration, Brigade Integration and the Production Integration and coordination and synchronized fielding teams.

Execution of the above projects is in accordance with the Army Acquisition Executive's NIE and CS Business Execution Ground Rules dated August, 1, 2012

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	85.246	99.242	122.407	-	122.407
Current President's Budget	82.957	99.242	146.655	-	146.655
Total Adjustments	-2.289	0.000	24.248	-	24.248
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.289	-			
• Adjustments to Budget Years	0.000	0.000	-32.691	-	-32.691
• Amended FY2017	0.000	0.000	56.939	-	56.939

Change Summary Explanation

The Army has determined the funding for this Program Element should remain at approximately \$100M. The adjustment to FY 2017 aligns the funding requirements to execute two events (NIE & AWA).

Amendment Justification: This increase requests an additional \$56.939 million above the PB 2017 Request. The increased funding will accelerate the Army's Rapid Capabilities Office (RCO) efforts in the Ground/Air Electronic Support/Electronic Attack and Electronic Protect capabilities against a near-peer adversary

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Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0604798A / *Brigade Analysis, Integration and Evaluation*

and Operational Needs Statement (ONS) 16-21509. The efforts will modify the existing program of record capabilities and deploy urgent Electronic Warfare (EW) capabilities to USAREUR within 12 months. Funding will also address EW risk reduction, Air Prototype Payload, Risk Reduction of Payload on Unmanned Aerial System Platform, as well as Acceleration of Radio Frequency (RF) Interference Mitigation (RIM) solution to operate EW networks in a congested/contested environment and completion of the Electronic Warfare Planning and Management Tool (EWPMT) thick client development. Funding also supports prototype and early integration Assured Positioning, Navigation and Timing of the Defense Advanced Global Positioning System Receiver (DAGR) Distributed Device Enhanced with Anti-Jam Antenna System (D3E w/AJAS) on select platforms and Navigational Warfare (NavWar) Situational Awareness Sensor Fixed Site (strategic/tactical) and Ground Mobile.

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Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev							
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	-	17.312	21.379	99.165	-	99.165	130.596	131.880	109.712	80.952	Continuing	Continuing
S36: Precision Guidance Kit	-	6.881	9.530	15.957	-	15.957	14.772	5.860	8.081	8.297	0.000	69.378
EP2: Individual Assault Munition (IAM)	-	0.000	0.000	4.000	-	4.000	0.000	0.000	4.140	10.430	Continuing	Continuing
EP3: Reduced Range Small Caliber Training Ammunition	-	0.000	0.000	0.000	-	0.000	6.000	5.000	20.900	10.500	0.000	42.400
EP4: One-Way Lumiscence (OWL) for Small Caliber Ammo	-	0.000	0.000	0.000	-	0.000	3.200	2.900	8.600	11.500	0.000	26.200
EP5: Adv Armor-Piercing (ADVAP) for Small Caliber Ammo	-	0.000	0.000	10.270	-	10.270	11.309	7.820	8.428	5.826	Continuing	Continuing
EP6: Lightweight Cartridge Case for Small Caliber Ammo	-	0.000	0.000	1.290	-	1.290	3.808	3.820	7.829	4.826	Continuing	Continuing
EP7: Tunable Pyrotechnic Aircraft Countermeasure Flares	-	0.000	1.000	1.431	-	1.431	4.400	2.500	0.000	0.000	0.000	9.331
EC1: 40mm Hi Vel and Low Vel Thermal Training Cartridge	-	9.580	7.257	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.837
EC4: Non-Standard Simulator Munitions	-	0.851	0.993	1.092	-	1.092	2.676	3.035	2.529	1.993	0.000	13.169
ED7: 120mm Advanced Multipurpose (AMP) Cartridge	-	0.000	0.000	31.215	-	31.215	31.655	28.018	0.000	0.000	0.000	90.888
613: MORTAR SYSTEMS	-	0.000	0.000	25.148	-	25.148	36.200	32.730	9.600	0.000	0.000	103.678
EU4: 40mm High Velocity High Explosive Airburst (HEDP)	-	0.000	0.000	0.303	-	0.303	2.809	6.820	6.828	6.825	0.000	23.585
EW1: 40mm Inc Range Anti-Pers Ammo(IRAP)HEAB f/M203	-	0.000	0.000	0.353	-	0.353	5.308	9.732	9.023	7.205	0.000	31.621
EL9: Ammunitions Logistics Prototyping	-	0.000	2.599	0.106	-	0.106	0.459	0.645	0.754	0.550	0.000	5.113

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>											
EU5: <i>.50 Caliber All-Purpose Tactical cartridge (APTC)</i>	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	2.000	0.000	2.000
EU7: <i>Enhanced Lethality Cannon Munitions</i>	-	0.000	0.000	8.000	-	8.000	0.000	8.000	8.000	8.000	Continuing	Continuing
EU8: <i>Improved Multi-Option Fuze</i>	-	0.000	0.000	0.000	-	0.000	8.000	8.000	10.000	0.000	0.000	26.000
EU6: <i>155mm High Explosive Extended Range Artillery</i>	-	0.000	0.000	0.000	-	0.000	0.000	7.000	5.000	3.000	0.000	15.000

Note
In FY 2017, PE 0604802A Projects 613, EP5, EP6, EU4 and EW1 are new start programs.

A. Mission Description and Budget Item Justification

This program element funds multiple efforts for engineering development of weapons and munitions systems.

Project 613: The High Explosive Guided Mortar (HEGM) program funds engineering development of precision guidance systems applicable to Indirect Fire mortar weapon systems. HEGM provides a precision capability to support the close fight in urban and complex terrain, while at the same time, reducing collateral damage. HEGM provides precision accuracy and effectiveness for 120mm mortar systems using precision guidance systems that will effectively reduce target delivery error and reducing the number of rounds required to conduct a fire mission. The HEGM capability will be developed through the use of improved guidance and control components and advanced airframe design that allow sufficient maneuver of the cartridge in flight to correct for induced error providing the ability to engage targets without the need to adjust fire. The Weaponized Universal Lightweight Fire-control (WULF) program funds engineering development of fire-control systems applicable to Indirect Fire mortar weapon systems. WULF is a digital sight integrated with digital fire-control that is designed for aiming of the M252 81mm mortar system and other man portable mortar systems (60mm and 120mm). The digital sight unit and Fire Control will allow the Soldier to emplace the mortar systems faster and fire more accurately. WULF will replace the current M67 optical sight unit that currently cannot meet the threshold accuracy requirement in the M252 mortar Capability Production Document.

Project EC1: The Target Practice Day Night Thermal (TP-DNT) cartridges are 40mm grenade training cartridges. The Low Velocity (LV) variant is for training with the M203/M320 grenade launchers; the High Velocity (HV) variant is for training with the Mk19 grenade machine gun. Both cartridges will provide the Warfighter with a non-dud producing, environmentally friendly training cartridge that provides a visual impact signature seen day or night, by the naked eye, through night vision devices, and thermal weapon sights. These cartridges will replace the 40mm LV Target Practice, M781 cartridges and the 40mm HV Target Practice, M918/M385A1 (Mixed Belt) cartridges. It is expected that the unit price for high velocity cartridges will be lower than the Mixed Belt cartridges.

Project EC4: This project will standardize various pyrotechnic that simulate battlefield effects. The Army's Combat Training Centers (CTCs) are currently using non-standard munitions to replicate both conventional and asymmetric warfare battlefield effects. These modified commercial-off-the-shelf products have not been type classified, material released, and are not safe or sustainable for use by Soldiers. This effort will develop and demonstrate various pyrotechnics/simulators to replicate both conventional and asymmetric warfare battlefield affects such as: Black smoke signature (burning vehicles, buildings, and equipment); Yellow smoke signature

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(chemical, biological or nuclear effects); Macro pyrotechnics to simulate hostile fire and small Improvised Explosive Devices (IEDs) during mounted operations in urban terrain; Micro pyrotechnics to simulate indoor hostile fire and IED effects that are capable of being integrated into existing facilities; Rocket Propelled Grenade (RPG) on a wire to replicate the flight of a Rocket Propelled Grenade; High Order Blast Effect (HOBE) used to replicate a Vehicle Borne Improvised Explosive Device (VBIED), building explosions, and other significant explosive events; Artillery airburst (LA45) simulator to replicate indirect fire; simulator to replicate a STINGER (LA47) firing; Tracer Fire-back simulator to replicate enemy small arms fire and anti-aircraft fire. Standardization will reduce training costs, eliminate redundancies between systems, and mitigate safety risks associated with realistic scenario based training.

Project ED7: The Advanced Multi Purpose (AMP) program is a direct fire line of sight 120mm large caliber munition under development for the Abrams Main Battle Tank. It has three modes of operation including point detonate, point detonate delay and airburst. AMP is the material solution for breaching double reinforced concrete walls and defeating Anti Tank Guided Missile (ATGM) teams from 50m to 2000m (T) and 50m to 4500m (O), a validated gap that cannot currently be met with existing stockpiled ammunition. In addition to added capability, AMP will also consolidate the capabilities of four existing stockpiled 120mm munitions, thereby addressing the users' battlecarry dilemma by allowing them to load a single munition that is capable of defeating multiple targets including ATGM teams, reinforced walls, personnel, light armor, bunkers, and obstacles. The full performance of the AMP is obtained with an Abrams equipped Ammunition Data Link breech modification, the same required by the 120mm M829E4 cartridge that achieved Milestone C in FY 2014. FY 2016 supports multiple contracts with competing prototypes in Phase 1 of 2 for Engineering and Manufacturing Development (EMD). FY 2017 supports completion of Engineering and Manufacturing Development (EMD) Phase 1 and Engineering and Manufacturing Development (EMD) Phase 2 commences.

Project EL9: The Ammunitions Logistics Prototyping project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter.

Project EP5: The Advanced Armor-Piercing (ADVAP) program is a critical technology development in response to the 7.62mm and 5.56mm Family of Ammunition Capabilities Development Documents (CDD). The nomenclature for the 7.62mm ADVAP is now XM1158 and the companion trace is XM1159. The overall objective of the ADVAP program is to develop and Full Materiel Release (FMR) a 7.62mm XM1158 cartridge linked 4:1 with a trace cartridge (XM1159) followed by a 5.56mm cartridge variant that will provide overmatch capability to defeat advanced light armored threats within typical machine gun ranges. The 7.62mm XM1158 and XM1159 cartridges will be optimized for use in the M240 Machine Gun. FY 2017 funding will support EMD efforts to include maturing manufacturing as well as optimization of the XM1158 and XM1159 cartridge designs.

Project EP6: The Lightweight Small Caliber Ammunition (LSCA) program is a critical technology development in response to the 7.62mm and .50 Caliber Family of Ammunition Capabilities Development Documents (CDD). The goal of the LSCA Program is to reduce the Soldier load through reduction in ammunition weight. The LSCA Program will develop and field 7.62mm LSCA cartridges that will provide the same capabilities as the M80A1 and M62A1 cartridges. The LSCA cartridge will be designed to be compatible with all Army 7.62mm weapon systems, but specifically optimized to work in the M240 Machine Gun. After the 7.62mm cartridge is matured

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a .50 Caliber variant will be developed. FY 2017 funding will support the source selection evaluation process and the development of entrance and exit criteria for the Engineering and Manufacturing Development (EMD) Phase I efforts.

Project EP7: This project will support Integrated System Design (ISD), System Capability (SC) and Manufacturing Process Demonstrations (MPD) on current pyrotechnic munitions and tunable pyrotechnic aircraft counter measures and decoys. The project will also support ISD, SC and MPD on new expendable countermeasure munitions that will protect Army aircraft from advanced and current guided missile threats. Activities include modeling and simulation, flight testing, qualification testing, engineering to reduce size and weight, environmental considerations, safety enhancements, manufacturing enhancements, qualification of other service and foreign munitions that could meet current requirements, product improvements, insertion of new technologies to increase performance, and enhancement of current flare solutions for new and existing aircraft. Systems include impulse cartridges, pen flares, hand held signals, trip flares, simulators, marine markers, smoke pots, smoke grenades, rail road flares and other type of emergency/distress devices, aircraft expendables (to include Radio Frequency (RF) expendables), and primers used in munitions systems.

Project EU4: The Army has identified a capability gap to defeat enemy personnel in defilade using the MK19 weapons system. The draft Capability Development Document (CDD) has been prepared and is expected to be approved in FY 2017. The improved 40mm High Velocity HEAB cartridge, with airburst fuze, allows the warfighter to effectively engage multiple targets and provide the grenadier with a higher probability of defeating personnel targets in defilade positions, increasing Soldier Survivability. FY 2017 dollars support the development of the Acquisition Strategy, Milestone B, and procurement support documents.

Project EW1: The 40mm Low Velocity (LV) Increased Range Anti-Personnel (IRAP) tactical cartridge allows the warfighter to effectively engage multiple targets, at increased ranges using the 40mm M203 and M320 Grenade Launchers. The IRAP cartridge provides the grenadier with a higher probability of achieving a first shot kill against enemy personnel, coupled with the ability to defeat personnel targets in defilade positions at increased ranges with greater accuracy and lethality. When deployed against point and area targets, the cartridge inflicts incapacitating effects against personnel or achieve a mobility kill against unarmored vehicles at increased ranges beyond those offered by the current M433 High Explosive Dual Purpose (HEDP) cartridge. IRAP is a new capability identified as a Warfighter requirement in the Capability Development Document, 40mm, Low Velocity Family of Ammunition Annex A1, Increased Range Anti-Personnel Cartridge. The cartridge provides lethal effects against targets with improved accuracy and greater standoff ranges increasing Soldier Survivability. FY 2017 supports Milestone B approval, Request for Proposal (RFP) preparation, Source Selection Planning, Government Technical Development and Cooperative Research and Development Agreement (CRADA) Testing. Engineering, Manufacturing Development will commence in FY 2017.

Project S36: This program funds engineering development of precision guidance systems applicable to Indirect Fire artillery weapon systems. The Precision Guidance Kit (PGK) is a Global Positioning System guidance kit with fuzing functions. PGK provides near precision accuracy and effectiveness for 155mm High Explosive artillery projectiles. PGK improves the accuracy of existing artillery ammunition by correcting the trajectory of projectiles to their designated target location. Precision guidance systems effectively reduce target delivery error reducing the number of rounds required to conduct a fire mission. On-going development addresses performance in jammed environments as well as the implementation of an M-Code capable GPS receiver.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army	Date: March 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</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	14.998	21.379	27.816	-	27.816
Current President's Budget	17.312	21.379	99.165	-	99.165
Total Adjustments	2.314	0.000	71.349	-	71.349
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	2.314	0.000	52.549	-	52.549
• Amended FY2017	0.000	0.000	18.800	-	18.800

Change Summary Explanation

In FY 2017, PE 0604802A Projects 613, ED7, EP5, EP6, EU4, and EW1 are new start programs.

Amendment Justification: This increase requests an additional \$18.8M in support of the following efforts: \$8.000 million for project EU7 above the PB 2017 Request. Provides testing and assessment of munitions as a "bridging strategy" to provide a capability prior to delivery of 155mm Cannon-Delivered Area Effects Munitions (C-DAEM) program of record projectiles that is scheduled to begin fielding in 2026.

This increase requests an additional \$6.800 million for project 613 above the PB 2017 Request. Supports addition of vendor to the Engineering and Manufacturing Development (EMD) phase to reduce project risk.

This increase requests an additional \$4.000 million for project EP2 above the PB 2017 Request. Supports development of a Shoulder Launched Munition as an interim Individual Assault Munition solution. This is a new start project.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</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	-	1.838	1.953	4.506	-	4.506	1.800	2.155	6.998	8.754	Continuing	Continuing
509: <i>LIGHTWEIGHT 155M HOWITZER</i>	-	1.838	1.953	4.506	-	4.506	1.800	2.155	6.998	8.754	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Lightweight 155mm Howitzer (LW155), also known as the M777A2, provides direct, reinforcing, general support fires to maneuver forces and direct support artillery. It replaces all howitzers in all missions in the USMC and replaces the M198 howitzer as the general support artillery for light forces in the Army. The LW155 fires unassisted projectiles to a range of 15 miles and assisted projectiles to 19 miles. The addition of the digital fire control system enables the weapon to program and fire the improved Excalibur precision-guided munitions to ranges in excess of 25 miles with better than 10-meter Circular Error Probable (CEP) accuracy. The LW155 is the first ground combat system whose major structures are made of high strength titanium alloy and the system makes extensive use of hydraulics to operate the breech, load tray, recoil and wheel arms. The combination of titanium structures and the use of hydraulic systems resulted in a significant weight savings of 7000 lbs over the M198 system. Compared to the M198, the LW155 emplaces three-times faster and displaces four-times faster. It traverses 32 percent more terrain worldwide and is 70 percent more survivable than the M198. It is a successful joint service program between the Marine Corps and Army working together to develop, produce, field, and sustain the howitzer. The LW155 was first introduced into the Marine Corps in April 2005 and the Marines have now fielded the howitzer to all active units. The Army has fielded the howitzer to its Stryker Brigade Combat teams (SBCT), Fires Brigades and National Guard. Fielding of the Infantry Brigade Combat Teams (IBCT) commenced in FY14 and will continue through 2018. The LW155 saw extensive action in Afghanistan, receiving high marks for its performance. Having now been in the field for almost 10 years, the howitzer will be going through obsolescent replacement of electronic components in its digital fire control system.

Funding supports engineering studies for capabilities identified in the Joint U.S. Army, U.S. Marine Corps Operational Requirements Document (JORD) for the Advanced Towed Cannon System but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule as well as government sustainment activities requiring RDTE. This includes a digital direct fire sight for the Digital Fire Control System; low temperature, high density power solutions; and electric elevation drives and auto loader to achieve full operational requirements. Efforts in FY2015-FY2018 center on researching technical solutions while efforts in FY2019-FY2021 will involve developing technology demonstrator prototypes.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army	Date: March 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - 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	1.911	1.953	1.973	-	1.973
Current President's Budget	1.838	1.953	4.506	-	4.506
Total Adjustments	-0.073	0.000	2.533	-	2.533
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.073	-			
• Adjustments to Budget Years	0.000	0.000	-0.217	-	-0.217
• FY17 Amendment	0.000	0.000	2.750	-	2.750

Change Summary Explanation

Amendment Justification: This increase requests an additional \$2.750 million above the PB 2017 Request. Funding supports engineering studies for extending the range of the M777A2 Howitzers.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</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	-	0.000	78.112	51.133	73.110	124.243	98.447	41.768	141.917	114.451	Continuing	Continuing
ER7: <i>Aircraft Survivability Equipment Development</i>	-	0.000	15.115	26.815	-	26.815	20.227	5.675	5.820	9.545	Continuing	Continuing
ER8: <i>Common Missile Warning System (CMWS)</i>	-	0.000	62.997	24.318	73.110	97.428	78.220	36.093	136.097	104.906	418.718	934.459

Note

Funds from projects EE3 (A/C Surv Equip Dev) and EE4 (Common Missile Warning System (CMWS)), Program Element (PE) 0605035A (Common Infrared Countermeasures (CIRCM)) are restructured to projects ER7 (Aircraft Survivability Equipment Development) and ER8 (Common Missile Warning System (CMWS)) respectively, PE 0605051A (Aircraft Survivability Development) for Fiscal Year (FY) 2016 and beyond for more efficient and effective program management.

A. Mission Description and Budget Item Justification

The Aircraft Survivability Development budget line includes Aircraft Survivability Development (ER7) and Common Missile Warning System (ER8). This budget line also includes funding for Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a, Headquarters Department of the Army (HQDA) Directed Requirement for the Advanced Threat Warner and Common Infrared Countermeasures Quick Reaction Capability (ATW & CIRCM QRC), and the next generation missile warning system.

ER7: Aircraft Survivability Development.

The objective of the Aircraft Survivability Equipment (ASE) Development project is to improve Radio Frequency (RF) ASE for Army aviation. The APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1 serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of the AN/APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until an affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2, RWR Modernization, adopts the ongoing United States Navy Class I RWR Engineering Change Proposal (ECP), commonly referred to as the APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Under Phase 2, the Army will develop enhancements to the APR-39D(V)2 as hardware upgrades needed to keep the APR-39D(V)2 technically relevant and address emerging Low Probability Intercept (LPI) and frequency agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) jamming capability for selected aircraft; Materiel Development Decision (MDD) for this ECM jamming capability phase is not expected until later in the Future Years Defense Program (FYDP).

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army		Date: March 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>	
<p>ER8: Common Missile Warning System (CMWS).</p> <p>The US Army operational requirements concept for Aviation Infrared (IR) countermeasure systems is known as the Suite of Integrated Infrared Countermeasures (SIIRCM). SIIRCM is an integrated warning and countermeasure system to enhance aircraft survivability against IR-guided threat missile systems. The CMWS is a core element of the SIIRCM concept. CMWS is an integrated ultraviolet (UV) missile warning system, with an Improved Countermeasure Dispenser (ICMD) serving as a subsystem to a host aircraft.</p> <p>The CMWS program is a UV missile warning system that cues both flare and laser-based countermeasures to defeat incoming IR-seeking missiles and will alert aircrews to the presence of certain incoming unguided munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, unguided munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives UV missile detection data from Electro-Optic Missile Sensors (EOMS) and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by the CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition, the CMWS ECU receives from the EOMS unguided munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. The CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding material release conditions to achieve a Full Material Release (FMR) for CMWS and ensure protection against emerging IR-guided missile threats.</p> <p>The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.</p> <p>JUONS SO-0010 will integrate the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system on a select number of Army and SOCOM aircraft in the threat area of responsibility. The purpose of this JUONS is to detect and defeat proliferate Surface-to-Air Missiles (SAM) threats. HQDA has provided a follow up Directed Requirement to this JUONS to reduce Space, Weight and Power (SWaP) and accelerate delivery of Common Infrared Countermeasures (CIRCMs).</p> <p>FY 2017 Overseas Contingency Operations (OCO) Research, Development, Test, and Evaluation (RDTE) dollars in the amount of \$11.510 million are required to complete final development and testing of A-kits and integration of the Phase 2a solution in support of JUONS SO-0010 for the Operation Inherent Resolve (OIR) theater of operations.</p> <p>FY 2017 OCO RDTE dollars in the amount of \$61.600 million are required for integration efforts to support the ATW & CIRCM QRC solution in support of JUONS SO-0010 for the OIR theater of operations. The intent of the ATW & CIRCM QRC program is to reduce the SWaP that require operational tradeoffs that are associated with the Phase 2a solution.</p> <p>Joint Staff, J-8 Deputy Director for Requirements (DDR) memorandum, April 24, 2015 SOCOM JUONs SO-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015</p>		

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>
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Directed Requirement for the Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) to Support Joint Urgent Operational Need (JUON) SO-0010, CIRCM Critical Intelligence Parameters Breach, 18 December 2015

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	18.112	31.015	-	31.015
Current President's Budget	0.000	78.112	51.133	73.110	124.243
Total Adjustments	0.000	60.000	20.118	73.110	93.228
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	60.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	10.118	73.110	83.228
• Amended 2017	0.000	0.000	10.000	-	10.000

Change Summary Explanation

Funds were added due to emerging Man Portable Air Defense System (MANPADS) threat and Senior Leader and congressional interest in closing the gap between JUONS efforts and next Program of Record (PoR).

Amendment Justification: This increase requests an additional \$10.0M above the PB 2017 Request. The increased funding will accelerate development and testing of Improved Radio Frequency Radar Warning receiver to improve lethality by allowing platforms to penetrate A2AD environments.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</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	-	147.250	222.075	272.811	-	272.811	169.070	152.942	32.914	34.447	Continuing	Continuing
S40: <i>Army Integrated Air and Missile Defense</i>	-	147.250	222.075	272.811	-	272.811	169.070	152.942	32.914	34.447	Continuing	Continuing
DJ4: <i>Advanced Electronic Protection Enhancements AEPE</i>	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000

A. Mission Description and Budget Item Justification

The Army Integrated Air and Missile Defense (AIAMD) program is a designated Major Defense Acquisition Program (MDAP).

The AIAMD program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational (O&O) Plan for the Future Force, the AIAMD System of Systems (SoS) Capabilities Development Document (CDD) and the new Air and Missile Defense Task Force Concept of Operations (CONOPS). The AIAMD Program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD program achieves this objective by establishing the AIAMD architecture and developing (1) the IAMD Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common Mission Command capability, (2) the Integrated Fire Control Network (IFCN) capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC.

The AIAMD Program will provide advanced capabilities to the Army and the soldier by allowing transformation to a network-centric system-of-systems capability (also referred to as "Plug and Fight") that integrates AMD sensors and weapons with the IBCS EOC. The AIAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that have plagued AMD defense design in the past. The AIAMD program will provide the user with the ability to train on a single command and control (C2) system that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will build to established interfaces allowing them to "connect" to the IFCN alleviating the cost of procuring total system capabilities in the future.

Funding in FY17 will provide for Low Rate Initial Production (LRIP) Developmental Test phase activities, to include preparation and conduct of flight tests, and First Unit Equipped (FUE).

Fielding of the IBCS is the Army Air Defense Artillery User's number one priority. The AIAMD Program is on track to deliver the Initial Operational Capability (IOC) in FY18. The FY18 IOC will be delivered through fielding of the IBCS EOC-based AIAMD architecture including the IBCS EOC, Sentinel, and Patriot components connected via an IFCN, working in an integrated manner. Additional capabilities include the incorporation of IBCS functionality into Air Defense Airspace Management

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>
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(ADAM) Cells, ADA Brigade Headquarters and Army Air and Missile Defense Command (AAMDC) Headquarters. Future additional capabilities include incorporation of Terminal High Altitude Air Defense (THAAD) batteries and Indirect Fire Protection Capability (IFPC) components into the AIAMD architecture.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	152.516	214.099	227.103	-	227.103
Current President's Budget	147.250	222.075	272.811	-	272.811
Total Adjustments	-5.266	7.976	45.708	-	45.708
• Congressional General Reductions	-	-0.024			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.266	-			
• Adjustments to Budget Years	0.000	0.000	25.708	-	25.708
• Amended FY2017	0.000	0.000	20.000	-	20.000

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

Project: S40: *Army Integrated Air and Missile Defense*

Congressional Add: *Product Development - Cyber Security*

	FY 2015	FY 2016
Congressional Add Subtotals for Project: S40	10.000	8.000
Congressional Add Totals for all Projects	10.000	8.000

Change Summary Explanation

FY17 Base funding increase in the amount of \$25.708M provides necessary resources for the testing and integration program.

Amendment Justification: This increase requests an additional \$20.000 million above the PB 2017 Request. The increased funding will provide hardware upgrades and system refresh improvements for Air and Missile Defense. It initiates requirements development to merge the Patriot PDB-8 software capabilities with IAMD A-kit and B-kit software. Completes development of the Sentinel Digital Simulation (SDS). It will develop and test an Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) interface for the integration of a unique 360-degree surveillance sensor into the Army IAMD (AIAMD) architecture.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development</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	-	8.961	12.686	18.425	-	18.425	13.677	13.533	13.809	41.380	Continuing	Continuing
EW5: <i>Electronic Warfare Development - MIP</i>	-	4.426	6.660	6.758	-	6.758	5.512	4.842	4.942	32.275	Continuing	Continuing
EW6: <i>ARAT-TSS - MIP</i>	-	4.535	6.026	11.667	-	11.667	8.165	8.691	8.867	9.105	Continuing	Continuing

A. Mission Description and Budget Item Justification

Fiscal Year (FY) 2017 budget request funds Electronic Warfare (EW) Development. This Program Element encompasses engineering and manufacturing development for tactical EW. EW encompasses the development of tactical EW equipment and systems mounted in both ground and air vehicles. The systems under this program provides the Army with the capability to degrade or deny hostile forces the effective use of their communications, counter mortar/counterbattery radars, surveillance radars, infrared/optical battlefield surveillance systems and electronically fused munitions. Existing Army EW systems must be replaced or upgraded to maintain their capability in the face of threats. Prophet Enhanced is the current system under the Prophet Ground acquisition program. Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade to enable the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture-based system solution optimized for ease of use in a variety of configurations (Stationary-Fixed, Mobile and Manpack). The Army Reprogramming Analysis Team (ARAT) is a Department of the Army established project to develop techniques, methods, tools and architecture to reprogram mission software embedded in Army EW systems, Force Protection Systems (FPS), and Target Sensing Systems (TSS) in response to changes in threat signatures. ARAT Research and Development enables continuous development of: 1) automated threat analysis tools to rapidly detect (flag) threat changes within intelligence systems, 2) tools to minimize the time to develop EW Mission Software and Products (MSP) for both air and ground EW systems, 3) tools and technology to minimize the time required to test and validate MSPs, 4) improved communications conduits to transmit mission software changes to field users, and 5) enhanced mission-software uploading tools. These efforts allow for rapid threat analysis, simulation, mission software development, distribution and uploading of mission software changes directly to the supported Soldier in the field. The ARAT project will develop, test and equip an Army-wide infrastructure capable of rapidly reprogramming electronic combat software embedded in offensive and defensive weapon system.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army	Date: March 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development</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	8.961	12.686	15.598	-	15.598
Current President's Budget	8.961	12.686	18.425	-	18.425
Total Adjustments	0.000	0.000	2.827	-	2.827
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	-1.173	-	-1.173
• Amended FY2017	0.000	0.000	4.000	-	4.000

Change Summary Explanation

Amendment Justification: This increase requests an additional \$4.000 million above the PB 2017 Request. The increase funding will accelerate developments to rapidly detect and defeat future Electronic Warfare (EW) Ground and Air threats through software reprogramming to counter the threat and keep pace with the enemy and technology specifically in the EUCOM Theater.

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

March 2017



Army

Justification Book of

Research, Development, Test & Evaluation, Army

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Army • Request for Additional Appropriations FY 2017 • RDT&E Program

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605601A / <i>Army Test Ranges and Facilities</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	-	271.377	279.896	307.882	-	307.882	295.388	296.602	293.180	300.977	-	-
F30: <i>Army Test Ranges & Facilities</i>	-	271.377	279.896	307.882	-	307.882	295.388	296.602	293.180	300.977	-	-

Note

Beginning in FY17, this project will fund labor for physical security civilian guards and equipment as well as the UH-60 helicopters.

A. Mission Description and Budget Item Justification

This project provides the institutional funding required to operate test activities, in accordance with Section 232 of the FY2003 National Defense Authorization Act (NDAA FY03), required by Department of Defense (DOD) Program Executive Officers, Program and Product Managers, and Research, Development, and Engineering Centers. Resources provided by this project operate seven elements of the DOD Major Range and Test Facility Base (MRTFB): White Sands Test Center (WSTC), White Sands Missile Range, New Mexico; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; and Yuma Test Center (YTC), Yuma Proving Ground, Arizona, Cold Regions Test Center (CRTC) Fort Greely, Alaska and Tropic Regions Test Center (TRTC) at various locations. This project also funds the Army's test capability at Redstone Test Center (RTC), Redstone Arsenal, Alabama.

This project finances the overhead (institutional) test operating costs not billable to DOD test customers per DODI 3200.18 and DODFMR 7000.14-R, which include recurring test infrastructure/capability sustainment requirements, replacement of test equipment, test operating procedures, and test revitalization/upgrade projects to maintain current testing capabilities and improvements to safety, environmental protection, efficiency of test operations, and technological advances. The test capabilities at these ranges have been uniquely established, are in place to support test and evaluation (T&E) requirements of funded weapons programs, and are required to assure technical performance, adherence to safety requirements, reliability, logistics supportability, Title 10 Live Fire Test and Evaluation, transportability, environmental effects, electromagnetic effects, and quality of materiel in development and in production.

Beginning in FY17, this project will fund labor for physical security civilian guards and equipment, as well as the UH-60 helicopters. The UH-60 is part of the Aviation Restructure Initiative endorsed by the SECDEF.

This project sustains the T&E capability required to support Army as well as Joint Service or Other Service systems, materiel, and technologies. Types of systems scheduled for testing include: Aircraft, Air Delivery, Unmanned Aerial Systems, Unmanned Ground Vehicles, Air and Missile Defense Systems, Engineering Equipment, Direct fire, Indirect fire, Nonlethal weapons, Ammunition, Automotive Systems, Intelligence Surveillance and Reconnaissance, Ground Soldier System, Missiles, Rockets, Mission Command Network, and Tactical Command, Control, and Communication.

Specific systems supported in FY16 with continued support in FY17 include: Network Integration Evaluation (NIE), Joint Light Tactical Vehicle (JLTV), Rifleman Radio, Joint Assault Bridge, Warfighter Information Network Tactical (WIN-T Inc 2/3), AN/TPQ53 Radar, Distributed Common Ground Sensor - Army (DCGS-A), missile

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605601A / <i>Army Test Ranges and Facilities</i>
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defense (PAC-3), Army Integrated Air and Missile Defense (AIAMD), Nett Warrior, XM25 Counter Defilade Target Engagement (CDTE), Gray Eagle, Joint Tactical Radio System (JTRS), Soldier Protective System M829E4, 120MM Advanced Kinetic Energy, Precision Guidance Kit (PGK), Mid-tier Networking Vehicular Radios (MNVR).

Direct costs are borne by materiel developers in accordance with DoD Directive 3200.11 and DOD Financial Management Regulation 7000.14R.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	274.980	277.646	258.464	-	258.464
Current President's Budget	271.377	279.896	307.882	-	307.882
Total Adjustments	-3.603	2.250	49.418	-	49.418
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.603	-			
• Adjustments to Budget Years	0.000	2.250	35.284	-	35.284
• Amended FY2017	0.000	0.000	14.134	-	14.134

Change Summary Explanation

FY2017 increase in funding to support labor for physical security civilian guards and equipment, UH60 aircraft, the UH-60 is part of the Aviation Restructure Initiative endorsed by the SECDEF and for test capability capacity at the developmental test ranges.

Amendment Justification: This increase requests an additional \$14.134 million for RDTE Project F30 (Army Test Ranges & Facilities) from the PB 2017 Request. The increased funding will provide for Major Range and Test Facility Base (MRTFB) sustainment and maintenance for Army Test and Evaluation Command facilities and equipment test capabilities supporting Soldier Systems, Engineering and General Equipment, Ground Vehicles, C4ISR Systems, Aircraft, and Air and Missile Defense Systems.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605602A / <i>Army Technical Test Instrumentation and Targets</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	-	43.961	51.550	64.127	-	64.127	49.354	54.270	56.753	58.238	-	-
628: <i>Developmental Test Technology & Sustainment</i>	-	31.858	41.688	52.782	-	52.782	34.092	35.755	37.874	38.865	-	-
62C: <i>Modeling and Simulation Instrumentation</i>	-	12.103	9.862	11.345	-	11.345	15.262	18.515	18.879	19.373	-	-

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This Program Element provides critical front-end investments for development of new test methodologies; test standards; advanced test technology concepts for long range requirements; future test capabilities; advanced development of modeling and simulation (M&S) and instrumentation prototypes; and the full development of test instrumentation for the United States Army Test and Evaluation Command (ATEC), which includes the Operational Test Command (OTC) at Ft Hood, Texas; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; Yuma Test Center (YTC) at Yuma Proving Grounds (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropics Regions Test Center (TRTC), at various locations); and Redstone Test Center (RTC), Redstone Arsenal, Alabama. OTC consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Integrated Test and Evaluation Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas. These activities support the development and fielding cycle of all Army acquisition programs including rapid fielding initiatives. Sustainment funding maintains existing testing capabilities at all locations by replacing unreliable, uneconomical, and irreparable instrumentation, as well as incremental upgrades of hardware and software for modeling and simulation (M&S) and instrumentation systems to assure adequate test data collection capabilities. This data supports acquisition milestone decisions for all commodity areas throughout the Army including programs such as the Joint Light Tactical Vehicle (JLTV), Advanced Multi-Purpose Vehicle (AMPV), Network Integration Evaluation (NIE), Patriot Advance Capability Phase 3 (PAC-3), Warfighter Information Network - Tactical (WIN-T), Stryker, Bradley, Abrams, Guided Multiple Launch Rocket System (GMLRS), Joint Tactical Radio System (JTRS), and the Distributed Common Ground System - Army (DCGS-A).

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605602A / <i>Army Technical Test Instrumentation and Targets</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	45.573	51.550	52.773	-	52.773
Current President's Budget	43.961	51.550	64.127	-	64.127
Total Adjustments	-1.612	0.000	11.354	-	11.354
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.612	-			
• Adjustments to Budget Years	0.000	0.000	-0.369	-	-0.369
• Amended FY2017	0.000	0.000	11.723	-	11.723

Change Summary Explanation

Decrease to programs due to adjustments in inflation rates.

Amendment Justification: This increase requests an additional \$11.723 million for RDTE Projects 628 (Developmental Test Technology & Sustainment) and 62C (Modeling and Simulation Instrumentation) from the PB 2017 Request. The increased funds will provide for upgrade/replacement of instrumentation and equipment, develop new test technologies, develop and procure new instrumentation systems, and develop modeling and simulation (M&S) for developmental and operational test activities.

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

March 2017



Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E – Volume III, Budget Activity 7

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0603778A / <i>MLRS Product Improvement Program</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	-	17.852	18.397	34.763	-	34.763	3.778	3.840	3.848	5.066	Continuing	Continuing
093: <i>Multi-Launch Rocket System (MLRS)</i>	-	14.974	0.000	25.100	-	25.100	0.000	0.000	0.000	0.000	0.000	40.074
DX8: <i>HIMARS Product Improvement Program</i>	-	2.878	1.355	9.663	-	9.663	3.778	3.840	3.848	5.066	Continuing	Continuing
DZ8: <i>Long Range Precision Fires</i>	-	0.000	17.042	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.042

Note

FY2017 funding for Long Range Precision Fires (LRPF) has been realigned to a new OSD-directed PE 0607134A, Project ES1.

A. Mission Description and Budget Item Justification

Project 093. The Multiple Launch Rocket System (MLRS) is a full spectrum, combat proven, all weather, 24/7, tracked weapon system. These precision strike weapon systems are organic/assigned to Field Artillery Brigades (FABs). The MLRS launcher provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. In FY16 a third battalion of MLRS launchers will be added to United States Forces Korea (USFK). Army Prepositioned Stock requirements have increased to eight M270A1s in FY16. The launcher is complemented by the MLRS Family of Munitions (MFOM) to include the Guided Multiple Launch Rocket System (GMLRS), and the Army Tactical Missile System (ATACMS) Family of Munitions (AFOM), capable of engaging targets up to a range of 300 kilometers. The MLRS product improvement program provides funding for research, development, test, and integration efforts necessary for incorporation of advanced automotive, armament, and system hardware and software technologies, including Common Operating Environment (COE) and Network Integrated Evaluation (NIE), obsolescence mitigation, reliability improvements, and decreasing the logistics footprint. This effort includes performing technical assessments, concept studies, and risk reduction efforts for incorporation of future requirements. The MLRS product improvement program maintains compliance with intra-army interoperability and digital communications via joint variable message format.

Project DX8. The M142 High Mobility Artillery Rocket System (HIMARS) is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system that fully supports more deployable, affordable and lethal, Brigade Combat Teams (BCT), Fires Brigades, Modular Forces, and Joint Expeditionary Forces. The HIMARS launcher is a C-130 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing all rockets and missiles in the current and future Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM) and Army Tactical Missile System (ATACMS) Family of Munitions (AFOM) engaging targets with precision out to ranges of 300 kilometers. The HIMARS satisfies the Army's digitization requirements by interfacing with the Advanced Field Artillery Tactical Data System (AFATDS) fire support command and control system. The HIMARS product improvement program provides funding for research, development test, and integration efforts necessary for incorporation of advanced automotive, armor, armament, life cycle enhancements, system hardware and software technologies, including Common Operating Environment (COE) and Network Integrated Evaluation (NIE), obsolescence mitigation, reliability improvements and decreasing the logistics footprint. This effort includes performing technical assessments, concept studies, and risk reduction efforts for incorporation of future requirements. The

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program
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HIMARS product improvement program maintains compliance with Intra-Army Interoperability and Digital Communications. Army prepositioned stock requirement has increased to twenty-four HIMARS in FY16. The HIMARS was deployed to Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) with great success by both US Army and Marine Corps units.

Project DZ8. LRPF is being developed as a non-cluster munition to provide Joint Force Command with a 24/7 all weather long-range fires capability without placing aircraft and crews at risk. FY2017 funding for Long Range Precision Fires (LRPF) has been realigned to a new OSD-directed PE 0607134A, Project ES1.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	17.103	18.397	49.986	-	49.986
Current President's Budget	17.852	18.397	34.763	-	34.763
Total Adjustments	0.749	0.000	-15.223	-	-15.223
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.400	-			
• SBIR/STTR Transfer	-0.651	-			
• Adjustments to Budget Years	0.000	0.000	-40.323	-	-40.323
• Amended FY2017	0.000	0.000	25.100	-	25.100

Change Summary Explanation

FY2015 Below Threshold Reprogramming (BTR) in the amount of \$1.400 million was received from Program Element 0205778A Project EG2 into Project 093 to support Improved Armor Cab (IAB).

FY2017 funding for Long Range Precision Fires (LRPF) has been realigned to a new OSD-directed PE 0607134A, Project ES1, funding adjustment reflects this change.

Amendment Justification: This increase requests an additional \$25.100 million above the PB 17 request. This increased funding (Project 093) will accelerate the MLRS Launcher Fleet expansion. This effort is fourfold, it will: build one M270A1 carrier hull from an excess M270A0 hull, establish tooling and processes to enable efficient execution of the follow-on fleet expansion, redesign of the current fire control system, and identifying, quoting and making first item purchases for parts no longer manufactured for the MLRS fleet expansion.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</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	4.945	14.517	5.100	19.617	7.001	5.753	5.835	6.716	Continuing	Continuing
ER2: <i>Indirect Fire and Fuze Technology</i>	-	0.000	0.870	4.300	-	4.300	1.183	0.832	0.956	1.083	0.000	9.224
ER5: <i>Life Cycle Pilot Processes</i>	-	0.000	1.771	0.883	-	0.883	2.159	2.320	2.328	2.816	0.000	12.277
ER6: <i>Munitions Survivability and Logistics</i>	-	0.000	2.304	9.334	5.100	14.434	3.659	2.601	2.551	2.817	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project ER2: The Close Combat Technology program includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, countermeasure flares, non-lethal ammunition/systems, networked munitions and mines, that have been fielded or have received approval for full rate production. This program will identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

FY 2017 funds will be used to support the following efforts: MK3A2 Offensive Hand Grenade, improve Claymore Force-on-Force Training Aids, Device, Simulator and Simulation (TADSS) Trainer, Countermeasure Flare Decoy Formulations, AN-M82A Obscuration Grenade, and Non-Lethal Ammunition Obsolescence.

Project ER5: The Indirect Fire and Fuze Technology program supports product improvement development efforts to upgrade indirect fire weapon systems and munitions that have already been fielded and/or are in production. Indirect Fire Weapons and Munitions Product Improvement Programs include improved target engagement; increased reliability, availability, maintainability, and safety; standardization and interoperability with weapons and munitions of Allied Nations; defense exportability features under the auspices of Better Buying Power; reduced taxpayer life-cycle costs; reduction of failure mechanisms and supply chain risk through introduction of new and alternative technology and materiel solutions; materiel and technology obsolescence mitigation; improvement of manufacturing methods and their associated production and life cycle support processes; new capabilities in response the evolving and emerging threats and countermeasures; and reduction/elimination of potential environmental and health risks associated with these products and their underlying components, materials, and production processes.

This program supports the standardization and interoperability of legacy and new production U.S. weapons and ammunition with Allied Nations to maximize battlefield interchangeability/compatibility under the auspices of the international Joint Ballistics Memorandum Of Understanding (JBMOU). Maximizing standardization, interchangeability, and exportability will also potentially increase Foreign Military Sales (FMS) of U.S. indirect fire Weapon and Munition products to maintain critical mass domestic production and affordable taxpayer costs through increased economies of scale.

This program also supports the identification, study, analysis and development of fuzing technologies and safe and arm devices in production and in the field. This program will implement these technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The program addresses two major areas: (1) analysis and (2) block upgrades. Analysis efforts will identify second sources

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>
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for fuzing systems that may reduce cost by providing competition, and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect and identify latent defects. The second major area is block upgrades, which will identify and perform studies on improvements to fuzes; increase commonality of fuze components and requirements. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues, and add capabilities.

Project ER6: The Munitions, Survivability and Logistics program funding will be used to support direct fire ammunition from small caliber ammunition, 40mm grenade, medium caliber cannon ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. In FY 2016, this program assures complete interchangeability of direct fire ammunition and weapons among all the North Atlantic Treaty Organization (NATO) countries with all of the associated logistic, strategic and tactical advantages of the alliance. The program involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the North American Regional Test Center (NARTC). In FY 2017, the NATO Standardization mission transfers to PE 0605805A - Munitions Standardization, Effectiveness and Safety, Project F21 - Direct Fire Technology and NATO Ammo Evaluation.

FY 2017 funds are used for a more lethal and safer design for 40mm grenades that will be built and tested. An improved 30mm training round for the Apache helicopter will allow pilots to see where the rounds strike. Warhead improvements for the 30mm Apache ammunition are also under development. A number of studies on potential improvements for training ammunition and better primers will be conducted.

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	4.945	4.322	-	4.322
Current President's Budget	0.000	4.945	14.517	5.100	19.617
Total Adjustments	0.000	0.000	10.195	5.100	15.295
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	10.195	-	10.195
• Amended FY2017	0.000	0.000	0.000	5.100	5.100

Change Summary Explanation

Amendment Justification: This increase requests an additional \$5.100 million for project ER6 above the PB 2017 Request. Supports phase I and phase II testing for M940 in support of JUONS CC-0562. THIS AMENDMENT IS AN OCO REQUIREMENT.

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Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607134A / Long Range Precision Fires (LRPF)							
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	67.006	-	67.006	64.808	79.697	59.177	62.775	Continuing	Continuing
ES1: Long Range Precision Fires (LRPF)	-	0.000	0.000	67.006	-	67.006	64.808	79.697	59.177	62.775	Continuing	Continuing

Note

In FY 2017 LRPF continues under new PE 0607134A, Project ES1. Funding was realigned from PE 0603778A, Project DZ8.

A. Mission Description and Budget Item Justification

The Long Range Precision Fires (LRPF) program is being developed as a cluster and insensitive munition compliant system that replaces and improves upon Army Tactical Missile System (ATACMS) capabilities to provide Joint Force Commanders with a 24/7, all-weather, area target, long-range fires capability without placing aircraft and crews at risk. The mission of the LRPF System will be to attack/neutralize/suppress/destroy targets using missile delivered indirect precision fires. The LRPF will counter the enemy's ability to conduct combat maneuver and air defense operations. Targets include counter-fire, air defense, command and control, and other high payoff targets at all depths of the tactical battlefield. LRPF requirements include 300km range; specified lethality against the designated target set, a Launch Pod Missile Container (LPMC) that holds a minimum of two missiles; and compatibility with the existing launcher platforms (M270A1 and High Mobility Artillery Rocket System (HIMARS)). An Analysis of Alternatives (AoA) was directed in the Material Development Decision (MDD) on 6 November 2013. The AoA was completed on 30 April 2015 and a letter of sufficiency issued by OSD in August 2015.

AMENDED BUDGET JUSTIFICATION: This increase requests an additional \$27.731 million from the PB 17 request. Accelerates the reduction of development risk during the Technology Maturation and Risk Reduction (TMRR) phase with the intent of generating initial production one year earlier.

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
Current President's Budget	0.000	0.000	67.006	-	67.006
Total Adjustments	0.000	0.000	67.006	-	67.006
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	39.275	-	39.275
• Amended FY2017	0.000	0.000	27.731	-	27.731

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607134A / <i>Long Range Precision Fires (LRPF)</i>
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Change Summary Explanation

FY 2017 funding reflects the movement of the program from PE 0603778A, Project DZ8.

Amendment Justification: This increase requests an additional \$27.731 million from the PB 17 request. Accelerates the reduction of development risk during the Technology Maturation and Risk Reduction (TMRR) phase with the intent of generating initial production one year earlier.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev							
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	8.000	-	8.000	0.000	0.000	0.000	0.000	Continuing	Continuing
EW9: Aviation Rocket System Product Improvement and Dev	-	0.000	0.000	8.000	-	8.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

This is a new start in FY2017.

A. Mission Description and Budget Item Justification

This is a new start. The Aviation Rockets Product Improvement and Development line will fund a range of improvement initiatives to include the integration and test of new munitions and modernize the Hydra-70 2.75 Inch rocket and launcher system to include improvements to performance, safety, reliability, transportability, producibility, affordability, and Insensitive Munitions (IM) compliance. The current Hydra-70 2.75 inch rocket system is more than 50 years old and is in need of performance improvements to comply with 1) USC – Title 10, Chapter 141, Section 2389, 2) DoD Directive 5000.1, CJCS Instruction 3170.01C, USD (AT&L) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to IM Requirements", and 3) existing/emerging HQDA G-3/5/7 and TRADOC aviation weapon requirements for guided and unguided rocket systems. Improvements will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced war fighter workload, and reduced environmental impact for both manned and unmanned applications.

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
Current President's Budget	0.000	0.000	8.000	-	8.000
Total Adjustments	0.000	0.000	8.000	-	8.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Amended FY2017	0.000	0.000	8.000	-	8.000

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607142A / <i>Aviation Rocket System Product Improvement & Dev</i>
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Change Summary Explanation

The Aviation Rockets Product Improvement and Development line was established to fund a range of improvement initiatives to modernize the Hydra-70 2.75 Inch rocket and launcher system to include improvements to performance, safety, reliability, transportability, producibility, affordability and Insensitive Munitions (IM) compliance.

Amendment Justification: This increase requests an additional \$8.000 million for project EW9 above the PB 2017 Request. Supports the integration and testing of Lightweight Precision Munitions to Army Aviation platforms and launchers. This is a new start project.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</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	-	297.423	354.667	327.357	-	327.357	249.464	259.410	235.824	151.345	Continuing	Continuing
330: <i>Abrams Tank Improve Prog</i>	-	98.596	77.603	88.452	-	88.452	95.679	108.621	57.829	45.036	Continuing	Continuing
371: <i>Bradley Improve Prog</i>	-	73.294	73.775	102.382	-	102.382	73.514	89.118	118.893	67.738	Continuing	Continuing
EE2: <i>Stryker Improvement</i>	-	125.533	203.289	136.523	-	136.523	80.271	61.671	59.102	38.571	Continuing	Continuing

Note

PE Number 0203735A/Project EE2 funds the Stryker Engineering Change Proposal (ECP) 1, Stryker Operational Needs Statement (ONS) Lethality and Stryker ECP 2 efforts.

A. Mission Description and Budget Item Justification

The Army has approved engineering change proposals for the Abrams, Bradley and Stryker programs to restore lost platform capability and host inbound technologies.

This Program Element (PE) corrects vehicle deficiencies identified during Army operations; continues technical system upgrades to include the integration of applicable technologies on ground systems; addresses needed evolutionary enhancements to tracked combat vehicles; and develops technology improvements which have application to or insertion opportunities across multiple Ground Combat Systems vehicles. This PE provides combat effectiveness and Operating and Support (O&S) cost reduction enhancements for the Abrams tanks, Bradley Fighting Vehicles and Stryker Family of Vehicles (FOVs) through a series of product improvements.

The strategy for Abrams and Bradley will focus on incrementally delivering capability to the warfighter to meet both near-term limitations as well as mitigating gaps and maintaining combat overmatch in the future. This effort was approved by the Army Acquisition Executive in 3Q FY 2011.

The Abrams M1A2 SEP V2 and M2/M3A3 Bradley Fighting Vehicles are at or exceed Space, Weight, and Power-Cooling (SWaP-C) limitations. In order to host and restore lost platform capability, the Abrams Tank and Bradley Fighting Vehicle programs will execute a series of Engineering Change Proposals (ECPs) to support the current embedded systems and to facilitate integration of technologies currently in development under other existing Programs of Record. The ECPs are not intended to exceed the operational capability outlined in current system requirements documents, but rather to ensure that the existing system performance is not further degraded and that Army mission equipment packages can be integrated on the Abrams and Bradley Platforms.

Stryker Improvement will address the development of Lethality, Survivability, Mobility, and Communication, Command and Control (C3) improvements within the Stryker Family of Vehicles (FoV). Principal development efforts include upgrades associated with the ECP 1, Operational Needs Statement Lethality (ONS), and ECP 2 efforts. ECP 1 power generation, suspension, and network upgrades will both restore Stryker Double-V Hull (DVH) Space, Weight, and Power-Cooling (SWaP-C) lost as a result of incorporating vehicle changes to counter threats encountered during deployment operations while allowing the future network to be hosted without further degradation in vehicle protection and mobility. The Stryker ONS Lethality effort will address an Urgent Operational Need to increase the firepower of Stryker Infantry Carrier Vehicles (ICV) within the US Army European Command (USAREUR). The ONS Lethality effort will integrate a 30mm-equipped weapon station that will provide USAREUR with

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs
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precision direct firepower to overwhelm the enemy in encounter actions and suppressive fire to preserve mounted and dismounted freedom of movement. The ECP 2 effort will focus on the integration of lethality upgrades such as a medium caliber weapon, under armor Javelin, and other capabilities that will improve suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs).

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	297.850	257.167	292.401	-	292.401
Current President's Budget	297.423	354.667	327.357	-	327.357
Total Adjustments	-0.427	97.500	34.956	-	34.956
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	97.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-0.427	0.000	24.456	-	24.456
• Amended 2017	0.000	0.000	10.500	-	10.500

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

Project: EE2: Stryker Improvement

Congressional Add: Stryker ECP 1 Development (Engineering/Prototypes) Congressional Add

Congressional Add: Stryker ECP 1 Testing Congressional Add

Congressional Add: Stryker ECP 1 Contractor Support to Test Congressional Add

Congressional Add: Stryker Operational Needs Statement Lethality Development (Engineering/Prototypes) Congressional Add

Congressional Add: Stryker Operational Needs Statement Lethality Testing Congressional Add

Congressional Add: Stryker Operational Needs Statement Lethality Contractor Support to Test Congressional Add

Congressional Add: Stryker Operational Needs Statement Lethality Government Engineering and Project Management Congressional Add

Congressional Add Subtotals for Project: EE2

Congressional Add Totals for all Projects

	FY 2015	FY 2016
	21.755	-
	3.918	-
	3.327	-
	9.217	60.587
	0.238	14.150
	-	16.370
	0.345	6.393
Congressional Add Subtotals for Project: EE2	38.800	97.500
Congressional Add Totals for all Projects	38.800	97.500

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

Appropriation/Budget Activity <i>2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) <i>PE 0203735A / Combat Vehicle Improvement Programs</i>
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Change Summary Explanation

Amendment Justification: This increase requests an additional \$10.500 million above the PB 2017 Request. Will complete the FY17 Trophy System Characterization efforts for the Abrams Tank and supports the remaining ECP2 software drop efforts for the Bradley Fighting Vehicles.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</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	-	4.917	3.154	53.722	-	53.722	2.209	1.351	0.828	0.826	Continuing	Continuing
DT5: <i>Stinger Product Improvement</i>	-	0.000	0.000	46.000	-	46.000	0.000	0.000	0.000	0.000	0.000	46.000
038: <i>Avenger PIP</i>	-	4.917	3.154	7.722	-	7.722	2.209	1.351	0.828	0.826	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Avenger Air Defense System is a lightweight, highly mobile surface-to-air missile and gun weapon system mounted on a High Mobility Multi-purpose Wheeled Vehicle (HMMWV). The system employs a canopied turret consisting of a gunner position, two gyro-stabilized missile launcher pods containing four STINGER missiles each, a Forward Looking Infrared Receiver (FLIR), a Laser Range Finder (LRF), an Identification Friend or Foe (IFF) system, and a very high rate of fire .50 caliber machine gun. The gun system is used against ground targets and to cover the Stinger missile dead-zone. Avenger is capable of day, night and adverse weather operations; can be transported by UH-60L Blackhawk helicopter or C-130 aircraft; is air-droppable and can shoot on the move. The Avenger system is operated by a two-man crew to counter Unmanned Aerial Systems (UASs), cruise missiles, attack helicopters, and high performance fixed wing/rotary wing aircraft. The system can also be operated by remote control from a protected position up to 50 meters away from the fire unit. The system fills the line-of-sight rear component of the Forward Area Air Defense (FAAD) system.

These funds are provided to modify the Avenger to ensure viability and sustainability through the end of the useful life. Avenger is planned to remain in the force through the Fiscal Year (FY) 31. Avenger fills a capability gap which will be permanently filled by the Indirect Fire Protection Capability Increment 2 Intercept (IFPC Inc 2-I) which will be fully fielded in FY31. The Avenger Fire Control Computer (AFCC) will undergo software and hardware upgrades that will enable the system to handle increased targeting capability realized with the latest version of the Forward Area Air Defense (FAAD) early warning system and ensures the system meets the latest Information Assurance (IA) requirements, upgraded analog to digital vehicle internal communication (VIC) system and Mode 5 cooperative target identification functions.

Amendment Justification: This increase requests an additional \$48.600 million to procure Training Aids, Devices, Simulators, and Simulations (TADSS), interrogators, and other equipment from the PB 2017 Request. Will provide Avenger PIP (Project 038) Mode 5 Identify Friend or Foe (IFF) fratricide risk reduction improvement for Short Range Air Defense (SHORAD) and Stinger Product Improvement (Project DT5) improved capability of Stinger Man-Portable Air Defense System (MANPADS) for two-man teams in the Maneuver Force for SHORAD.

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army	Date: March 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</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	5.112	3.154	3.945	-	3.945
Current President's Budget	4.917	3.154	53.722	-	53.722
Total Adjustments	-0.195	0.000	49.777	-	49.777
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.195	-			
• Adjustments to Budget Years	0.000	0.000	1.177	-	1.177
• Amended FY2017	0.000	0.000	48.600	-	48.600

Change Summary Explanation

Amendment Justification: This increase requests an additional \$48.600 million to procure Training Aids, Devices, Simulators, and Simulations (TADSS), interrogators, and other equipment from the PB 2017 Request. Will provide Avenger PIP (Project 038) Mode 5 Identify Friend or Foe (IFF) fratricide risk reduction improvement for Short Range Air Defense (SHORAD) and Stinger Product Improvement (Project DT5) improved capability of Stinger Man-Portable Air Defense System (MANPADS) for two-man teams in the Maneuver Force for SHORAD.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0205402A / <i>Integrated Base Defense - Operational System Dev</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	-	4.196	10.750	0.000	3.450	3.450	0.000	0.000	0.000	0.000	Continuing	Continuing
EF2: <i>Integrated Base Defense</i>	-	4.196	10.750	0.000	3.450	3.450	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

No FY 2017 funding request. Beginning in FY 2017 Ground-Based Operational Surveillance System (Expeditionary) (G-BOSS(E)) funding is now under PE0605033A Project EQ3. Beginning in FY 2017 Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) funding is now under PE0605029A Project EQ2.

A. Mission Description and Budget Item Justification

G-BOSS(E): Ground-Based Operational Surveillance System (Expeditionary) (G-BOSS(E)) will replace the interim Persistent Surveillance System-Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities and will provide network integration and better mobility utilizing modular configurations. G-BOSS(E) will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Light (man-transportable) for extra small base camps or small outpost/company, Medium (mid sensor height) for small to medium size base, and Heavy (high level sensor height) for large contingency base camps. G-BOSS(E) will operate in a stand-alone mode or as part of an integrated network utilizing government owned software, be easily operated and maintained, and be rugged enough to support employment in expeditionary operations worldwide.

IGSSR-C: The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) is an Automated Information System (AIS) program. IGSSR-C has a requirement to provide a layered approach to integrate sensors, sensor systems and unmanned systems with automated fusion capabilities. The system will provide a Force Protection (FP) Common Operational Picture (COP) capability for CONUS fixed, OCONUS semi-fixed or expeditionary elements in all Operating Environments (OE). This capability will enable rapid decision analysis, speed the response process as well as increase information dissemination horizontally and vertically along the chain of command and with outside supporting organizations. IGSSR-C is a software centric fusion engine that connects legacy and emerging FP systems, legacy Chemical, Biological, Radiological, and Nuclear (CBRN), unmanned systems, biometric identification and forensic data systems. The desired end state is to achieve interoperability and COP with current and emerging FP systems used by Joint Forces, Department of Defense (DoD) agencies and multi-national forces.

Integrated Base Defense (IBD): The purpose of IBD Kitting is to harvest and refurbish physical security and Force Protection (FP) Non-Standard Equipment (NS-E) and package them into integrated and interoperable IBD Capabilities. IBD provides integration of software and analytical capability to support the integration of systems in the field. IBD employs an enterprise approach to enable IBD capabilities across the operational spectrum by leveraging interoperability efforts in support of the Integrated Unit, Base and Installation Protection (IUBIP) framework.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0205402A / Integrated Base Defense - Operational System Dev
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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	4.362	10.750	11.108	-	11.108
Current President's Budget	4.196	10.750	0.000	3.450	3.450
Total Adjustments	-0.166	0.000	-11.108	3.450	-7.658
• Congressional General Reductions	-0.166	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	-11.108	-	-11.108
• FY 17 Amendments	0.000	0.000	0.000	3.450	3.450

Change Summary Explanation

Decrease in FY 2017 funding is due to a realignment of funds to PE0605033A Project EQ3 for Ground-Based Operational Surveillance System (Expeditionary) (G-BOSS(E)) and PE0605029A Project EQ2 for Integrated Ground Security, Surveillance and Response Capability (IGSSR-C).

 Integrated Base Defense (PE 205402) (\$3,450K)
 Amendment Justification: This increase requests an additional \$3.450 million in Overseas Contingency Operations (OCO) funds to procure and integrate existing Vehicle-Borne Improvised Explosive Device (VBIED) detection capabilities into an Integrated Base Defense Kit above the PB 2017 Request. Supports JUONS CC-0540.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0205456A / <i>Lower Tier Air and Missile Defense (AMD) System</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	-	78.720	64.159	73.417	-	73.417	79.562	80.962	96.042	113.641	Continuing	Continuing
EF9: <i>System Integration and Test</i>	-	78.720	64.159	73.417	-	73.417	79.562	80.962	96.042	113.641	Continuing	Continuing

Note

Funds in this program were a realignment of funds from PE 0605456A PA3.

A. Mission Description and Budget Item Justification

The PATRIOT system includes a family of hardware, software, interceptors (GEM, PAC-2, PAC-3/MSE) and Ground Support Equipment. As software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation allow for performance assessment against all threats that would not be possible in flight tests due to cost, target and range constraints. Flight testing is periodically required for validation of the Modeling and Simulation as well as satisfying Army Test and Evaluation Command/Director, Operational Test and Evaluation (ATEC/DOTE) requirements of segment improvements.

PATRIOT is an integral part of the overall Air and Missile Defense (AMD) Architecture and enables the incremental fielding of the system capability for Army Air and Missile Defense Battalions.

FY2017 base dollars in the amount of \$69.417 million continues program development with the integration of missile and ground system software and hardware to complete Post Deployment Build-8 (PDB-8) and continue with PDB-8.05 activities. Continues the testing program to support the Test and Evaluation Master Plan (TEMP) and system testing/analysis for PDB-8/8.05 Development Test and Evaluation (DTE) and Initial Operational Test & Evaluation (IOT&E).

AMENDED BUDGET JUSTIFICATION: This increase requests an additional \$4.000 million from the PB 17 request. The increased funding will modify PATRIOT operational test target trajectory to better replicate advanced and evolving threats.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0205456A / <i>Lower Tier Air and Missile Defense (AMD) System</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	78.720	64.159	60.214	-	60.214
Current President's Budget	78.720	64.159	73.417	-	73.417
Total Adjustments	0.000	0.000	13.203	-	13.203
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	9.203	-	9.203
• Amended FY2017	0.000	0.000	4.000	-	4.000

Change Summary Explanation

Adjustment to Budget Years was to fully fund PDB-8 testing, which supports a Full Rate Production decision.

Amendment Justification: This increase requests an additional \$4.000 million from the PB 17 request. The increased funding will modify PATRIOT operational test target trajectory to better replicate advanced and evolving threats.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0205778A / Guided Multiple-Launch Rocket System (GMLRS)
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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	-	43.791	36.727	38.044	-	38.044	30.177	29.726	27.959	27.015	Continuing	Continuing
EG2: GMLRS Alternative Warheads	-	32.754	0.319	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	33.073
EG3: Guided MLRS	-	11.037	36.408	38.044	-	38.044	30.177	29.726	27.959	27.015	Continuing	Continuing

Note

Beginning in FY2015, Guided Multiple Launch Rocket System (GMLRS) has its own separate Program Element, 0205778A, to include Projects EG2 (GMLRS Alternative Warhead) and EG3 (Guided MLRS), previously under Program Element 0603778A Project Codes 78G and 784, respectively.

A. Mission Description and Budget Item Justification

Projects EG2/EG3. GMLRS rockets are surface-to-surface artillery rockets fired from the Multiple Launch Rocket System (MLRS) and High Mobility Artillery Rocket System (HIMARS) launchers. GMLRS rockets provide 24/7, all-weather precision fires to engage both area and point targets at short, medium, and long ranges.

The GMLRS Program consists of three separate increments: GMLRS Dual Purpose Improved Conventional Munition (DPICM) cluster munition to engage area or imprecisely located targets; GMLRS Unitary utilizes a 200 lbs. high explosive warhead to engage point targets with limited collateral damage; and GMLRS Alternative Warhead (AW) which has been developed as a non-cluster munition to replace GMLRS DPICM. GMLRS DPICM Production was terminated in response to the June 2008 Department of Defense (DoD) Cluster Munitions Policy. GMLRS Unitary is currently in full rate production. GMLRS AW completed Engineering and Manufacturing Development (EMD) and entered full rate production in FY2015. The GMLRS AW rocket is 90% common with the Unitary variant.

B. Program Change Summary (\$ in Millions)

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>
Previous President's Budget	45.353	17.527	27.829	-	27.829
Current President's Budget	43.791	36.727	38.044	-	38.044
Total Adjustments	-1.562	19.200	10.215	-	10.215
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	19.200			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.562	-			
• Adjustments to Budget Years	0.000	0.000	-5.785	-	-5.785
• Amended FY2017	0.000	0.000	16.000	-	16.000

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Exhibit R-2, RDT&E Budget Item Justification: Request for Additional Appropriations 2017 Army		Date: March 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0205778A / <i>Guided Multiple-Launch Rocket System (GMLRS)</i>	
<u>Change Summary Explanation</u> The FY 2017 funding request was reduced by \$1.200 million (Project EG3) to account for the availability of prior year execution balances. Amendment Justification: This increase requests an additional \$16.0M from the PB 2017 request. This increase will fund research, development, testing, and integration efforts to design a "drop-in" M-Code GPS receiver for the GMLRS rocket guidance set. This technology improves anti-jamming and secure access of military GPS signals and will be leveraged against the entire Multiple Launch Rocket System Family of Munitions.		

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

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					PE 0303141A / Global Combat Support System							
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	-	5.225	21.574	28.667	-	28.667	60.063	67.576	32.519	34.711	Continuing	Continuing
08A: Army Enterprise System Integration Program	-	3.267	1.685	2.340	-	2.340	0.000	0.000	0.000	0.000	0.000	7.292
EK2: GCSS-A Increment 2	-	0.000	18.234	25.199	-	25.199	59.752	67.259	32.519	34.711	0.000	237.674
083: Global Combat Support Sys - Army	-	1.958	1.655	1.128	-	1.128	0.311	0.317	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Global Combat Support System-Army (GCSS-Army) program has two components: a functional component titled GCSS-Army and a technology enabler component titled Army Enterprise Systems Integration Program (AESIP). GCSS-Army coupled with AESIP are information and communications technology investments that will provide key enabling support to the transformation of the Army into a network-centric, knowledge-based future force. The GCSS-Army approved Capability Description Document (CDD) and Capability Production Document (CPD) require an enterprise approach to replace current logistics and maintenance Standard Army Management Information Systems (STAMIS). GCSS-Army will provide the Army's Sustainment Support for the warfighter with a seamless flow of timely, accurate, accessible and secure information management that gives combat forces a decisive edge. AESIP will provide the system's enterprise hub services, centralized master data management and cross-functional business intelligence/analytics. GCSS-Army will implement best business practices to streamline supply, accountability, maintenance, distribution, and reporting procedures in support of the future force transition path of the Army Campaign Plan.

B. Program Change Summary (\$ in Millions)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	4.525	12.274	11.368	-	11.368
Current President's Budget	5.225	21.574	28.667	-	28.667
Total Adjustments	0.700	9.300	17.299	-	17.299
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	9.300			
• Reprogrammings	0.870	-			
• SBIR/STTR Transfer	-0.170	-			
• Adjustments to Budget Years	0.000	0.000	15.855	-	15.855
• Amended FY2017	0.000	0.000	1.444	-	1.444

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>
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Change Summary Explanation

FY 2017 RDTE increased to progress GCSS-Army Increment II functionality. Funding will be for technology maturation, requirements analysis and initial prototyping.

Amendment Justification: This increase requests an additional \$1.444 million above the PB 2017 Request. The increased funds will procure a HANA Appliance for business solution analysis and functional prototyping of the Enterprise Universe of Transactions (EUOT) effort. The EUOT effort will provide a single source of truth for all Army financial transactions and will have the ability to scan billions of transactions and perform audit analyses across all Army feeder and legacy systems as well as all Army Enterprise Resource Programs (GFEBs, LMP, GCSS-ARMY, etc.) critical to the Army achieving Audit Readiness.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305219A / MQ-1 Gray Eagle UAV							
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	-	46.472	0.000	30.907	-	30.907	0.000	0.000	0.000	0.000	Continuing	Continuing
MQ1: MQ-1 Gray Eagle - Army UAV (MIP)	-	46.472	0.000	30.907	-	30.907	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The MQ-1C Gray Eagle provides Reconnaissance, Surveillance, Target Acquisition (RSTA), Command and Control, Communications Relay, Signals Intelligence (SIGINT), Battle Damage Assessment, and Manned-Unmanned Teaming Capability. MQ-1C Gray Eagle is a dedicated, assured, multi-mission Unmanned Aircraft System (UAS) fielded to all Army Divisions, Intelligence and Security Command and Army Special Operations Command in support of the commander's warfighting priorities.

The Fiscal Year (FY) 2017 MQ-1 Gray Eagle funding of \$13.470 million will support Test and Evaluation efforts associated with the Improved Gray Eagle (IGE) Engineering Change Proposal (ECP). The test effort will evaluate the changes materiel. The types of effort required include Environmental Testing, Electromagnetic Environmental Effects (E3) testing, and Follow-On Operational Test and Evaluation II (FOTE II).

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	46.472	0.000	0.000	-	0.000
Current President's Budget	46.472	0.000	30.907	-	30.907
Total Adjustments	0.000	0.000	30.907	-	30.907
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 2	0.000	0.000	13.407	-	13.407
• amended 2017	0.000	0.000	17.500	-	17.500

Change Summary Explanation

Amendment Justification: This increase requests an additional \$17.5M from the PB 2017 Request. The increased funding supports integration and qualification of M-Code GPS (MGUE) into Gray Eagle.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV
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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	-	16.389	11.797	7.597	-	7.597	10.389	10.087	13.789	0.096	Continuing	Continuing
RQ7: RQ-7 Shadow UAV	-	16.389	11.797	7.597	-	7.597	10.389	10.087	13.789	0.096	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Tactical Unmanned Aerial System (TUAS) RQ-7 provides the Army Brigade Commander with dedicated Reconnaissance, Surveillance and Target Acquisition (RSTA), Intelligence, Battle Damage Assessment (BDA), and Force Protection. In line with the Army's Aviation Restructure Initiative (ARI) three Shadow Platoons are being integrated into the Combat Aviation Brigade's (CAB) Apache Reconnaissance Battalion. This will provide Aviation Brigades with Manned-Unmanned-Teaming (MUM-T) and enhanced Aerial Scout capabilities. The RQ-7B Shadow has logged over 945,600 flight hours, most of which were flown in support of Overseas Contingency Operations (OCO).

The full Shadow system consists of four air vehicles with payload, two Universal Ground Control stations, two Universal Ground Data Terminals, one Portable Ground Control Station with Portable Ground Data Terminal, Ground Support Equipment, two launchers, ten High Mobility Multipurpose Wheeled Vehicles (HMMWVs) with trailer(s), and a Light Medium Tactical Vehicle. Each system is equipped with one Maintenance Section Multifunctional (MSM) and is supported at the division level by a Mobile Maintenance Facility (MMF). The baseline fielded payload was the electro-optic infrared (EO/IR), but half of those were replaced with a Laser Designator (LD) payload. All 104 systems required by the Army Procurement Objective (APO) have been procured. In 2010 the Army G8 established an RQ-7B Unmanned Aerial Vehicle (UAV) MODs program. This budget line procures modifications including the Shadow v2, System Modifications, Mission Simulators, and One System Remote Video Terminal upgrades (OSRVT).

Implements Shadow v2: Tactical Common Data Link with Type 1 Encryption and North Atlantic Treaty Organization (NATO) interoperability; solves obsolescence associated with legacy computer hardware and the SOLARIS operating system. Government Furnished Equipment (GFE) and spares are also included.

Justification: Fiscal Year (FY) 2017 RQ-7 UAV Base funding of \$4.597 million will be used for capability and reliability improvements, specifically: Air Vehicle modifications development of the ability to operate in Global Positioning System (GPS) denied environment. Additionally, funds will be for system engineering and system test and evaluation support. Base funding will also be used to incorporate enhanced performance and interoperability into the OSRVT.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 UAV
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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	16.389	7.297	7.928	-	7.928
Current President's Budget	16.389	11.797	7.597	-	7.597
Total Adjustments	0.000	4.500	-0.331	-	-0.331
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 1	0.000	0.000	-3.331	-	-3.331
• Amended 2017	0.000	0.000	3.000	-	3.000

Change Summary Explanation

Amendment Justification: This increase requests an additional \$3.0M from the PB 2017 Request. The increased funding will accelerate development of visual based navigation which enables operations in a GPS denied environment.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0307665A / Biometrics Enabled Intelligence							
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	-	1.973	0.000	0.000	8.854	8.854	0.000	0.000	0.000	0.000	76.260	87.087
B17: BIOMETRICS ENABLED INTELLIGENCE - MIP	-	1.973	0.000	0.000	8.854	8.854	0.000	0.000	0.000	0.000	76.260	87.087

A. Mission Description and Budget Item Justification

The Army has two biometric tactical collection devices, the Biometric Automated Toolset-Army (BAT-A) Kit and BAT-A Handheld (HH). These two devices support the Army Force Protection Mission and Identity Dominance Mission. Product Manager (PM) Joint Personnel Identification (JPI) supports the Biometric Enterprise database system which delivers these innovative and emergent biometric solutions. The BAT-A system is the Army's biometric tactical collection devices which collect, match, store and share biometric and contextual information on Known & Suspected Terrorists, potential adversaries, host nation personnel, and third country nationals. Recipients of collected information include DoD organizations, other U.S. government agencies, and Coalition Partners. The BAT-A devices are also used by non-Military Intelligence personnel (Infantry and Military Police). The capability was originally deployed as a Quick Reaction Capability (QRC) and has been deployed in a combat zone and other OCONUS contingency operations for the past decade. The original acquisition strategy for JPIv2 was to incorporate lessons learned through the QRC program; however, the Army refined the program acquisition strategy. In accordance with the current guidance from the Vice Chief of Staff of the Army, the current BAT-A systems will serve as the Army biometrics enduring capability through FY22. The Army Acquisition Executive approved the BAT-A Materiel Development Decision. All research and development efforts are now concluded for JPIv2. PM JPI will continue to serve as the Office of Primary Responsibility as the BAT-A is now a program of record in sustainment.

The additional FY17 RDT&E OCO funding supports developmental activities to create vehicle-independent and tailorable Multi-INT Collection, Processing, Exploitation, and Dissemination capability packages that can be installed and removed in a matter of minutes on any vehicle type to meet specific mission needs. In addition, the funds will enable development and testing of software code integrating new voice matching algorithms to deliver improved technical capabilities of stand-off voice biometric collection and speaker identification within the Voice Identity Biometrics Exploitation System (VIBES) QRC in order counter ever-changing threats facing deployed operational forces. Lastly, the funds affords the development of new software code and associated testing necessary to deliver an instance of the Biometric Intelligence Information Repository (BI2R-the unique software-based analytic production system used by NGIC specifically to create the Biometric Enabled Watchlist for OFS and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) C2S cloud.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0307665A / Biometrics Enabled Intelligence
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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	1.973	0.000	0.000	-	0.000
Current President's Budget	1.973	0.000	0.000	8.854	8.854
Total Adjustments	0.000	0.000	0.000	8.854	8.854
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 1	0.000	0.000	0.000	7.104	7.104
• Amended FY2017	0.000	0.000	0.000	1.750	1.750

Change Summary Explanation

FY17 RDTE OCO for \$7.104M provided to support the Five Vigilant Pursuit System Sets (10 vehicles total plus equipment) which are currently deployed in support of OFS and OIR. The Vigilant Pursuit System currently consists of 2 vehicles with integrated Multi-INT Collection, Processing, Exploitation, and Dissemination capability packages installed on MATVs. Funding (\$3.744M) supports developmental activities to create vehicle-independent and tailorable Multi-INT Collection, Processing, Exploitation, and Dissemination capability packages that can be installed and removed in a matter of minutes on any vehicle type to meet specific mission needs. Specific activities include hardware development for several small but critical hardware components that cannot be commercially procured necessary to refactor the Multi-INT capability packages to work on any vehicle platform and software development necessary to replace/upgrade open source code that is no longer current/viable and is therefore more difficult and expensive to maintain or completely unusable.

In addition, FY17 RDT&E OCO Funding (\$1,210K) supports development & testing of software code integrating new voice matching algorithms to deliver improved technical capabilities of stand-off voice biometric collection & speaker identification within the Voice Identity Biometrics Exploitation System (VIBES) QRC to counter ever-changing threats facing deployed operational forces. The VIBES software program provides a stand-off speaker identification capability that supports operations in OFS and OIR. Software development is necessary for the program to remain current & compliant with enterprise standards; will improve the data flow & efficiency of the system enabling faster response times, increased automation, & tighter integration with existing biometrics and intelligence systems.

Lastly, the FY17 RDT&E OCO Funding (\$2,150K) supports the development of new software code & associated testing necessary to deliver an instance of the Biometric Intelligence Information Repository (BI2R-the unique software-based analytic production system used by NGIC specifically to create the Biometric Enabled Watchlist.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0307665A / <i>Biometrics Enabled Intelligence</i>
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Amendment Justification: This increase requests an additional \$1.750 million in Overseas Contingency Operations (OCO) funds above the PB 2017 Request. The funding supports the development and completion of a rapid DNA solution and procures critical Force Protection capabilities in the identification and verification of individuals supporting enhanced entry points, base access, personnel accountability, and screening of personnel required by commanders in support of JUONS CC-0548.