

UNCLASSIFIED

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

February 2018



Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E – Volume III, Budget Activity 7

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

Table of Contents

Introduction and Explanation of Contents..... ii

Comptroller Exhibit R-1..... iii

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

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

Summary.....Ixiii

Exhibit R-2's..... 1

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, \$10,484,483,000.00 to remain available for obligation until September 30, 2020.

The following Justification Books were prepared at a cost of \$226,413: Aircraft (ACFT), Missile (MSLS), Weapons & Tracked Combat Vehicles (WTCV), Ammunition (AMMO), Other Procurement Army (OPA) 1 - Tactical & Support Vehicles, 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 1, Budget Activity 2, Budget Activity 3, Budget Activity 4, Budget Activity 5A, Budget Activity 5B, Budget Activity 6, and Budget Activity 7.

UNCLASSIFIED

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

18 Jan 2018

Appropriation	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Research, Development, Test & Eval, Army	8,852,507	8,273,447	8,273,447	342,356	342,356
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356

UNCLASSIFIED

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

18 Jan 2018

	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
Appropriation						
Research, Development, Test & Eval, Army	20,700	-20,700		8,636,503	-20,700	8,615,803
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803

UNCLASSIFIED

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

18 Jan 2018

Appropriation -----	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Research, Development, Test & Eval, Army	10,159,379	325,104	10,484,483
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483

UNCLASSIFIED

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

18 Jan 2018

Summary Recap of Budget Activities	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests* with CR Adj OCO
Basic Research	473,216	430,022	430,022		
Applied Research	1,196,132	889,182	889,182		
Advanced Technology Development	1,351,035	1,070,977	1,070,977		
Advanced Component Development & Prototypes	619,976	890,889	890,889	18,000	18,000
System Development & Demonstration	2,502,560	3,012,840	3,012,840	57,840	57,840
RDT&E Management Support	1,413,481	1,253,845	1,253,845		
Operational Systems Development	1,296,107	1,877,685	1,877,685	43,528	43,528
Undistributed		-1,151,993	-1,151,993	222,988	222,988
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356
Summary Recap of FYDP Programs					
General Purpose Forces	611,072	710,401	710,401	15,000	15,000
Intelligence and Communications	342,648	370,519	370,519	29,728	29,728
Research and Development	7,826,372	8,215,942	8,215,942	74,640	74,640
Central Supply and Maintenance	59,891	60,877	60,877		
Administration and Associated Activities	7,899	-1,151,993	-1,151,993	222,988	222,988
Space		60,547	60,547		
Classified Programs	4,625	7,154	7,154		
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
<u>Summary Recap of Budget Activities</u>						
Basic Research				430,022		430,022
Applied Research				889,182		889,182
Advanced Technology Development	12,000	-12,000		1,082,977	-12,000	1,070,977
Advanced Component Development & Prototypes	8,700	-8,700		917,589	-8,700	908,889
System Development & Demonstration				3,070,680		3,070,680
RDT&E Management Support				1,253,845		1,253,845
Operational Systems Development				1,921,213		1,921,213
Undistributed				-929,005		-929,005
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803
<u>Summary Recap of FYDP Programs</u>						
General Purpose Forces				725,401		725,401
Intelligence and Communications				400,247		400,247
Research and Development	20,700	-20,700		8,311,282	-20,700	8,290,582
Central Supply and Maintenance				60,877		60,877
Administration and Associated Activities				-929,005		-929,005
Space				60,547		60,547
Classified Programs				7,154		7,154
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page IIIA

vii

UNCLASSIFIED

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

18 Jan 2018

Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Basic Research	445,895		445,895
Applied Research	919,609		919,609
Advanced Technology Development	1,026,698		1,026,698
Advanced Component Development & Prototypes	1,329,393	28,500	1,357,893
System Development & Demonstration	3,192,689	236,863	3,429,552
RDT&E Management Support	1,322,481		1,322,481
Operational Systems Development	1,922,614	59,741	1,982,355
Undistributed			
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483
Summary Recap of FYDP Programs			
General Purpose Forces	783,464	10,000	793,464
Intelligence and Communications	313,112	40,613	353,725
Research and Development	8,775,582	274,491	9,050,073
Central Supply and Maintenance	53,958		53,958
Administration and Associated Activities			
Space	227,308		227,308
Classified Programs	5,955		5,955
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
<u>Summary Recap of Budget Activities</u>					
Basic Research	473,216	430,022	430,022		
Applied Research	1,196,132	889,182	889,182		
Advanced Technology Development	1,351,035	1,070,977	1,070,977		
Advanced Component Development & Prototypes	619,976	890,889	890,889	18,000	18,000
System Development & Demonstration	2,502,560	3,012,840	3,012,840	57,840	57,840
RDT&E Management Support	1,413,481	1,253,845	1,253,845		
Operational Systems Development	1,296,107	1,877,685	1,877,685	43,528	43,528
Undistributed		-1,151,993	-1,151,993	222,988	222,988
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356
<u>Summary Recap of FYDP Programs</u>					
General Purpose Forces	611,072	710,401	710,401	15,000	15,000
Intelligence and Communications	342,648	370,519	370,519	29,728	29,728
Research and Development	7,826,372	8,215,942	8,215,942	74,640	74,640
Central Supply and Maintenance	59,891	60,877	60,877		
Administration and Associated Activities	7,899	-1,151,993	-1,151,993	222,988	222,988
Space		60,547	60,547		
Classified Programs	4,625	7,154	7,154		
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-1

ix

UNCLASSIFIED

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

18 Jan 2018

	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
<u>Summary Recap of Budget Activities</u>						
Basic Research				430,022		430,022
Applied Research				889,182		889,182
Advanced Technology Development	12,000	-12,000		1,082,977	-12,000	1,070,977
Advanced Component Development & Prototypes	8,700	-8,700		917,589	-8,700	908,889
System Development & Demonstration				3,070,680		3,070,680
RDT&E Management Support				1,253,845		1,253,845
Operational Systems Development				1,921,213		1,921,213
Undistributed				-929,005		-929,005
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803
<u>Summary Recap of FYDP Programs</u>						
General Purpose Forces				725,401		725,401
Intelligence and Communications				400,247		400,247
Research and Development	20,700	-20,700		8,311,282	-20,700	8,290,582
Central Supply and Maintenance				60,877		60,877
Administration and Associated Activities				-929,005		-929,005
Space				60,547		60,547
Classified Programs				7,154		7,154
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803

UNCLASSIFIED

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

18 Jan 2018

Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-----	-----	-----	-----
Basic Research	445,895		445,895
Applied Research	919,609		919,609
Advanced Technology Development	1,026,698		1,026,698
Advanced Component Development & Prototypes	1,329,393	28,500	1,357,893
System Development & Demonstration	3,192,689	236,863	3,429,552
RDT&E Management Support	1,322,481		1,322,481
Operational Systems Development	1,922,614	59,741	1,982,355
Undistributed			
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483
Summary Recap of FYDP Programs			

General Purpose Forces	783,464	10,000	793,464
Intelligence and Communications	313,112	40,613	353,725
Research and Development	8,775,582	274,491	9,050,073
Central Supply and Maintenance	53,958		53,958
Administration and Associated Activities			
Space	227,308		227,308
Classified Programs	5,955		5,955
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-1B

xi

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S
1	0601101A	In-House Laboratory Independent Research	01	11,936	12,010	12,010			U
2	0601102A	Defense Research Sciences	01	286,086	263,590	263,590			U
3	0601103A	University Research Initiatives	01	66,506	67,027	67,027			U
4	0601104A	University and Industry Research Centers	01	108,688	87,395	87,395			U
		Basic Research		473,216	430,022	430,022			
5	0602105A	Materials Technology	02	81,950	29,640	29,640			U
6	0602120A	Sensors and Electronic Survivability	02	50,574	35,730	35,730			U
7	0602122A	TRACTOR HIP	02	6,995	8,627	8,627			U
8	0602126A	TRACTOR JACK	02						U
9	0602211A	Aviation Technology	02	67,593	66,086	66,086			U
10	0602270A	Electronic Warfare Technology	02	34,528	27,144	27,144			U
11	0602303A	Missile Technology	02	66,173	43,742	43,742			U
12	0602307A	Advanced Weapons Technology	02	52,766	22,785	22,785			U
13	0602308A	Advanced Concepts and Simulation	02	29,767	28,650	28,650			U
14	0602601A	Combat Vehicle and Automotive Technology	02	89,852	67,232	67,232			U
15	0602618A	Ballistics Technology	02	103,484	85,309	85,309			U
16	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	3,772	4,004	4,004			U
17	0602623A	Joint Service Small Arms Program	02	5,331	5,615	5,615			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
1	0601101A	In-House Laboratory Independent Research	01				12,010		12,010	U
2	0601102A	Defense Research Sciences	01				263,590		263,590	U
3	0601103A	University Research Initiatives	01				67,027		67,027	U
4	0601104A	University and Industry Research Centers	01				87,395		87,395	U
		Basic Research					430,022		430,022	
5	0602105A	Materials Technology	02				29,640		29,640	U
6	0602120A	Sensors and Electronic Survivability	02				35,730		35,730	U
7	0602122A	TRACTOR HIP	02				8,627		8,627	U
8	0602126A	TRACTOR JACK	02							U
9	0602211A	Aviation Technology	02				66,086		66,086	U
10	0602270A	Electronic Warfare Technology	02				27,144		27,144	U
11	0602303A	Missile Technology	02				43,742		43,742	U
12	0602307A	Advanced Weapons Technology	02				22,785		22,785	U
13	0602308A	Advanced Concepts and Simulation	02				28,650		28,650	U
14	0602601A	Combat Vehicle and Automotive Technology	02				67,232		67,232	U
15	0602618A	Ballistics Technology	02				85,309		85,309	U
16	0602622A	Chemical, Smoke and Equipment Defeating Technology	02				4,004		4,004	U
17	0602623A	Joint Service Small Arms Program	02				5,615		5,615	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-2A

xiii

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
1	0601101A	In-House Laboratory Independent Research	01	11,585		11,585	U
2	0601102A	Defense Research Sciences	01	276,912		276,912	U
3	0601103A	University Research Initiatives	01	65,283		65,283	U
4	0601104A	University and Industry Research Centers	01	92,115		92,115	U
		Basic Research		445,895		445,895	
5	0602105A	Materials Technology	02	28,600		28,600	U
6	0602120A	Sensors and Electronic Survivability	02	32,366		32,366	U
7	0602122A	TRACTOR HIP	02	8,674		8,674	U
8	0602126A	TRACTOR JACK	02	400		400	U
9	0602211A	Aviation Technology	02	64,847		64,847	U
10	0602270A	Electronic Warfare Technology	02	25,571		25,571	U
11	0602303A	Missile Technology	02	50,183		50,183	U
12	0602307A	Advanced Weapons Technology	02	29,502		29,502	U
13	0602308A	Advanced Concepts and Simulation	02	28,500		28,500	U
14	0602601A	Combat Vehicle and Automotive Technology	02	70,450		70,450	U
15	0602618A	Ballistics Technology	02	75,541		75,541	U
16	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	5,032		5,032	U
17	0602623A	Joint Service Small Arms Program	02	12,394		12,394	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
18	0602624A	Weapons and Munitions Technology	02	118,068	41,455	41,455			U
19	0602705A	Electronics and Electronic Devices	02	72,979	58,352	58,352			U
20	0602709A	Night Vision Technology	02	34,762	34,723	34,723			U
21	0602712A	Countermines Systems	02	29,495	26,190	26,190			U
22	0602716A	Human Factors Engineering Technology	02	23,359	24,127	24,127			U
23	0602720A	Environmental Quality Technology	02	21,553	21,678	21,678			U
24	0602782A	Command, Control, Communications Technology	02	36,396	33,123	33,123			U
25	0602783A	Computer and Software Technology	02	13,452	14,041	14,041			U
26	0602784A	Military Engineering Technology	02	92,140	67,720	67,720			U
27	0602785A	Manpower/Personnel/Training Technology	02	23,475	20,216	20,216			U
28	0602786A	Warfighter Technology	02	59,327	39,559	39,559			U
29	0602787A	Medical Technology	02	78,341	83,434	83,434			U
		Applied Research		1,196,132	889,182	889,182			
30	0603001A	Warfighter Advanced Technology	03	50,004	44,863	44,863			U
31	0603002A	Medical Advanced Technology	03	106,040	67,780	67,780			U
32	0603003A	Aviation Advanced Technology	03	111,654	160,746	160,746			U
33	0603004A	Weapons and Munitions Advanced Technology	03	198,245	84,079	84,079			U
34	0603005A	Combat Vehicle and Automotive Advanced Technology	03	163,501	125,537	125,537			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-3

XV

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
18	0602624A	Weapons and Munitions Technology	02				41,455		41,455	U
19	0602705A	Electronics and Electronic Devices	02				58,352		58,352	U
20	0602709A	Night Vision Technology	02				34,723		34,723	U
21	0602712A	Countermines Systems	02				26,190		26,190	U
22	0602716A	Human Factors Engineering Technology	02				24,127		24,127	U
23	0602720A	Environmental Quality Technology	02				21,678		21,678	U
24	0602782A	Command, Control, Communications Technology	02				33,123		33,123	U
25	0602783A	Computer and Software Technology	02				14,041		14,041	U
26	0602784A	Military Engineering Technology	02				67,720		67,720	U
27	0602785A	Manpower/Personnel/Training Technology	02				20,216		20,216	U
28	0602786A	Warfighter Technology	02				39,559		39,559	U
29	0602787A	Medical Technology	02				83,434		83,434	U
	Applied Research						889,182		889,182	
30	0603001A	Warfighter Advanced Technology	03				44,863		44,863	U
31	0603002A	Medical Advanced Technology	03				67,780		67,780	U
32	0603003A	Aviation Advanced Technology	03				160,746		160,746	U
33	0603004A	Weapons and Munitions Advanced Technology	03				84,079		84,079	U
34	0603005A	Combat Vehicle and Automotive Advanced Technology	03				125,537		125,537	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
18	0602624A	Weapons and Munitions Technology	02	40,444		40,444	U
19	0602705A	Electronics and Electronic Devices	02	58,283		58,283	U
20	0602709A	Night Vision Technology	02	29,582		29,582	U
21	0602712A	Countermines Systems	02	21,244		21,244	U
22	0602716A	Human Factors Engineering Technology	02	24,131		24,131	U
23	0602720A	Environmental Quality Technology	02	13,242		13,242	U
24	0602782A	Command, Control, Communications Technology	02	55,003		55,003	U
25	0602783A	Computer and Software Technology	02	14,958		14,958	U
26	0602784A	Military Engineering Technology	02	78,159		78,159	U
27	0602785A	Manpower/Personnel/Training Technology	02	21,862		21,862	U
28	0602786A	Warfighter Technology	02	40,566		40,566	U
29	0602787A	Medical Technology	02	90,075		90,075	U
	Applied Research			919,609		919,609	
30	0603001A	Warfighter Advanced Technology	03	39,338		39,338	U
31	0603002A	Medical Advanced Technology	03	62,496		62,496	U
32	0603003A	Aviation Advanced Technology	03	124,958		124,958	U
33	0603004A	Weapons and Munitions Advanced Technology	03	102,686		102,686	U
34	0603005A	Combat Vehicle and Automotive Advanced Technology	03	119,739		119,739	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-3B

xvii

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
35	0603006A	Space Application Advanced Technology	03	3,787	12,231	12,231			U
36	0603007A	Manpower, Personnel and Training Advanced Technology	03	12,110	6,466	6,466			U
37	0603009A	TRACTOR HIKE	03	21,374	28,552	28,552			U
38	0603015A	Next Generation Training & Simulation Systems	03	18,238	16,434	16,434			U
39	0603020A	TRACTOR ROSE	03	11,910					U
40	0603125A	Combating Terrorism - Technology Development	03	33,553	26,903	26,903			U
41	0603130A	TRACTOR NAIL	03	2,340	4,880	4,880			U
42	0603131A	TRACTOR EGGS	03	2,470	4,326	4,326			U
43	0603270A	Electronic Warfare Technology	03	40,819	31,296	31,296			U
44	0603313A	Missile and Rocket Advanced Technology	03	113,683	62,850	62,850			U
45	0603322A	TRACTOR CAGE	03	11,107	12,323	12,323			U
46	0603461A	High Performance Computing Modernization Program	03	215,462	182,331	182,331			U
47	0603606A	Landmine Warfare and Barrier Advanced Technology	03	16,798	17,948	17,948			U
48	0603607A	Joint Service Small Arms Program	03	5,615	5,796	5,796			U
49	0603710A	Night Vision Advanced Technology	03	42,798	47,135	47,135			U
50	0603728A	Environmental Quality Technology Demonstrations	03	21,415	10,421	10,421			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
35	0603006A	Space Application Advanced Technology	03				12,231		12,231	U
36	0603007A	Manpower, Personnel and Training Advanced Technology	03				6,466		6,466	U
37	0603009A	TRACTOR HIKE	03	12,000	-12,000		40,552	-12,000	28,552	U
38	0603015A	Next Generation Training & Simulation Systems	03				16,434		16,434	U
39	0603020A	TRACTOR ROSE	03							U
40	0603125A	Combating Terrorism - Technology Development	03				26,903		26,903	U
41	0603130A	TRACTOR NAIL	03				4,880		4,880	U
42	0603131A	TRACTOR EGGS	03				4,326		4,326	U
43	0603270A	Electronic Warfare Technology	03				31,296		31,296	U
44	0603313A	Missile and Rocket Advanced Technology	03				62,850		62,850	U
45	0603322A	TRACTOR CAGE	03				12,323		12,323	U
46	0603461A	High Performance Computing Modernization Program	03				182,331		182,331	U
47	0603606A	Landmine Warfare and Barrier Advanced Technology	03				17,948		17,948	U
48	0603607A	Joint Service Small Arms Program	03				5,796		5,796	U
49	0603710A	Night Vision Advanced Technology	03				47,135		47,135	U
50	0603728A	Environmental Quality Technology Demonstrations	03				10,421		10,421	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-4A

xix

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
35	0603006A	Space Application Advanced Technology	03	13,000		13,000	U
36	0603007A	Manpower, Personnel and Training Advanced Technology	03	8,044		8,044	U
37	0603009A	TRACTOR HIKE	03	22,631		22,631	U
38	0603015A	Next Generation Training & Simulation Systems	03	25,682		25,682	U
39	0603020A	TRACTOR ROSE	03				U
40	0603125A	Combating Terrorism - Technology Development	03	3,762		3,762	U
41	0603130A	TRACTOR NAIL	03	4,896		4,896	U
42	0603131A	TRACTOR EGGS	03	6,041		6,041	U
43	0603270A	Electronic Warfare Technology	03	31,491		31,491	U
44	0603313A	Missile and Rocket Advanced Technology	03	61,132		61,132	U
45	0603322A	TRACTOR CAGE	03	16,845		16,845	U
46	0603461A	High Performance Computing Modernization Program	03	183,322		183,322	U
47	0603606A	Landmine Warfare and Barrier Advanced Technology	03	11,104		11,104	U
48	0603607A	Joint Service Small Arms Program	03	5,885		5,885	U
49	0603710A	Night Vision Advanced Technology	03	61,376		61,376	U
50	0603728A	Environmental Quality Technology Demonstrations	03	9,136		9,136	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
51	0603734A	Military Engineering Advanced Technology	03	59,101	32,448	32,448			U
52	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	52,572	52,206	52,206			U
53	0603794A	C3 Advanced Technology	03	36,439	33,426	33,426			U
		Advanced Technology Development		1,351,035	1,070,977	1,070,977			
54	0603305A	Army Missile Defense Systems Integration	04	39,395	9,634	9,634			U
55	0603308A	Army Space Systems Integration	04	32,278					U
56	0603327A	Air and Missile Defense Systems Engineering	04	6,100	33,949	33,949	15,000	15,000	U
57	0603619A	Landmine Warfare and Barrier - Adv Dev	04	65,062	72,909	72,909			U
58	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	43,177	7,135	7,135			U
59	0603639A	Tank and Medium Caliber Ammunition	04	47,745	41,452	41,452			U
60	0603645A	Armored System Modernization - Adv Dev	04		32,739	32,739			U
61	0603747A	Soldier Support and Survivability	04	13,607	10,157	10,157	3,000	3,000	U
62	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	15,730	27,733	27,733			U
63	0603774A	Night Vision Systems Advanced Development	04	9,930	12,347	12,347			U
64	0603779A	Environmental Quality Technology - Dem/Val	04	7,480	10,456	10,456			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-5

xxi

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
51	0603734A	Military Engineering Advanced Technology	03				32,448		32,448	U
52	0603772A	Advanced Tactical Computer Science and Sensor Technology	03				52,206		52,206	U
53	0603794A	C3 Advanced Technology	03				33,426		33,426	U
		Advanced Technology Development		12,000	-12,000		1,082,977	-12,000	1,070,977	
54	0603305A	Army Missile Defense Systems Integration	04				9,634		9,634	U
55	0603308A	Army Space Systems Integration	04							U
56	0603327A	Air and Missile Defense Systems Engineering	04	8,700	-8,700		57,649	-8,700	48,949	U
57	0603619A	Landmine Warfare and Barrier - Adv Dev	04				72,909		72,909	U
58	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04				7,135		7,135	U
59	0603639A	Tank and Medium Caliber Ammunition	04				41,452		41,452	U
60	0603645A	Armored System Modernization - Adv Dev	04				32,739		32,739	U
61	0603747A	Soldier Support and Survivability	04				13,157		13,157	U
62	0603766A	Tactical Electronic Surveillance System - Adv Dev	04				27,733		27,733	U
63	0603774A	Night Vision Systems Advanced Development	04				12,347		12,347	U
64	0603779A	Environmental Quality Technology - Dem/Val	04				10,456		10,456	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
51	0603734A	Military Engineering Advanced Technology	03	25,864		25,864	U
52	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	34,883		34,883	U
53	0603794A	C3 Advanced Technology	03	52,387		52,387	U
		Advanced Technology Development		1,026,698		1,026,698	
54	0603305A	Army Missile Defense Systems Integration	04	10,777		10,777	U
55	0603308A	Army Space Systems Integration	04				U
56	0603327A	Air and Missile Defense Systems Engineering	04	42,802	1,000	43,802	U
57	0603619A	Landmine Warfare and Barrier - Adv Dev	04	45,254		45,254	U
58	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	22,700	1,500	24,200	U
59	0603639A	Tank and Medium Caliber Ammunition	04	41,974		41,974	U
60	0603645A	Armored System Modernization - Adv Dev	04	119,395		119,395	U
61	0603747A	Soldier Support and Survivability	04	8,746	3,000	11,746	U
62	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	35,667		35,667	U
63	0603774A	Night Vision Systems Advanced Development	04	7,350		7,350	U
64	0603779A	Environmental Quality Technology - Dem/Val	04	14,749		14,749	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-5B

xxiii

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
65	0603790A	NATO Research and Development	04	2,211	2,588	2,588			U
66	0603801A	Aviation - Adv Dev	04	7,702	14,055	14,055			U
67	0603804A	Logistics and Engineer Equipment - Adv Dev	04	17,445	35,333	35,333			U
68	0603807A	Medical Systems - Adv Dev	04	47,336	33,491	33,491			U
69	0603827A	Soldier Systems - Advanced Development	04	54,497	20,239	20,239			U
70	0604017A	Robotics Development	04		39,608	39,608			U
71	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04						U
72	0604100A	Analysis Of Alternatives	04	6,354	9,921	9,921			U
73	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04						U
74	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	33,780	76,728	76,728			U
75	0604115A	Technology Maturation Initiatives	04	57,737	115,221	115,221			U
76	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04		20,000	20,000			U
77	0604118A	TRACTOR BEAM	04		10,400	10,400			U
78	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	83,074	164,967	164,967			U
79	0604121A	Synthetic Training Environment Refinement & Prototyping	04		1,600	1,600			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
65	0603790A	NATO Research and Development	04				2,588		2,588	U
66	0603801A	Aviation - Adv Dev	04				14,055		14,055	U
67	0603804A	Logistics and Engineer Equipment - Adv Dev	04				35,333		35,333	U
68	0603807A	Medical Systems - Adv Dev	04				33,491		33,491	U
69	0603827A	Soldier Systems - Advanced Development	04				20,239		20,239	U
70	0604017A	Robotics Development	04				39,608		39,608	U
71	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04							U
72	0604100A	Analysis Of Alternatives	04				9,921		9,921	U
73	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04							U
74	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04				76,728		76,728	U
75	0604115A	Technology Maturation Initiatives	04				115,221		115,221	U
76	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04				20,000		20,000	U
77	0604118A	TRACTOR BEAM	04				10,400		10,400	U
78	0604120A	Assured Positioning, Navigation and Timing (PNT)	04				164,967		164,967	U
79	0604121A	Synthetic Training Environment Refinement & Prototyping	04				1,600		1,600	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-6A

XXV

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
65	0603790A	NATO Research and Development	04	3,687		3,687	U
66	0603801A	Aviation - Adv Dev	04	10,793		10,793	U
67	0603804A	Logistics and Engineer Equipment - Adv Dev	04	14,248		14,248	U
68	0603807A	Medical Systems - Adv Dev	04	34,284		34,284	U
69	0603827A	Soldier Systems - Advanced Development	04	18,044		18,044	U
70	0604017A	Robotics Development	04	95,660		95,660	U
71	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04	38,000		38,000	U
72	0604100A	Analysis Of Alternatives	04	9,765		9,765	U
73	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	12,393		12,393	U
74	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	120,374		120,374	U
75	0604115A	Technology Maturation Initiatives	04	95,347		95,347	U
76	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	95,085	23,000	118,085	U
77	0604118A	TRACTOR BEAM	04	52,894		52,894	U
78	0604120A	Assured Positioning, Navigation and Timing (PNT)	04				U
79	0604121A	Synthetic Training Environment Refinement & Prototyping	04	77,939		77,939	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-6B

xxvi

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
80	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04		11,303	11,303			U
81	0305251A	Cyberspace Operations Forces and Force Support	04	29,336	56,492	56,492			U
82	1206120A	Assured Positioning, Navigation and Timing (PNT)	04						U
83	1206308A	Army Space Systems Integration	04		20,432	20,432			U
		Advanced Component Development & Prototypes		619,976	890,889	890,889	18,000	18,000	
84	0604201A	Aircraft Avionics	05	54,915	30,153	30,153			U
85	0604270A	Electronic Warfare Development	05	33,419	71,671	71,671			U
86	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05	9,363	10,589	10,589			U
87	0604321A	All Source Analysis System	05	11,958	4,774	4,774			U
88	0604328A	TRACTOR CAGE	05	12,525	17,252	17,252			U
89	0604601A	Infantry Support Weapons	05	63,842	87,643	87,643			U
90	0604604A	Medium Tactical Vehicles	05		6,039	6,039			U
91	0604611A	JAVELIN	05	19,241	21,095	21,095			U
92	0604622A	Family of Heavy Tactical Vehicles	05	10,989	10,507	10,507			U
93	0604633A	Air Traffic Control	05	3,326	3,536	3,536			U
94	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05	32,315					U
95	0604642A	Light Tactical Wheeled Vehicles	05	476	7,000	7,000			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-7

xxvii

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
80	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04				11,303		11,303	U
81	0305251A	Cyberspace Operations Forces and Force Support	04				56,492		56,492	U
82	1206120A	Assured Positioning, Navigation and Timing (PNT)	04							U
83	1206308A	Army Space Systems Integration	04				20,432		20,432	U
	Advanced Component Development & Prototypes			8,700	-8,700		917,589	-8,700	908,889	
84	0604201A	Aircraft Avionics	05				30,153		30,153	U
85	0604270A	Electronic Warfare Development	05				71,671		71,671	U
86	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05				10,589		10,589	U
87	0604321A	All Source Analysis System	05				4,774		4,774	U
88	0604328A	TRACTOR CAGE	05				17,252		17,252	U
89	0604601A	Infantry Support Weapons	05				87,643		87,643	U
90	0604604A	Medium Tactical Vehicles	05				6,039		6,039	U
91	0604611A	JAVELIN	05				21,095		21,095	U
92	0604622A	Family of Heavy Tactical Vehicles	05				10,507		10,507	U
93	0604633A	Air Traffic Control	05				3,536		3,536	U
94	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05							U
95	0604642A	Light Tactical Wheeled Vehicles	05				7,000		7,000	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
80	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04	51,030		51,030	U
81	0305251A	Cyberspace Operations Forces and Force Support	04	65,817		65,817	U
82	1206120A	Assured Positioning, Navigation and Timing (PNT)	04	146,300		146,300	U
83	1206308A	Army Space Systems Integration	04	38,319		38,319	U
		Advanced Component Development & Prototypes		1,329,393	28,500	1,357,893	
84	0604201A	Aircraft Avionics	05	32,293		32,293	U
85	0604270A	Electronic Warfare Development	05	78,699		78,699	U
86	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05				U
87	0604321A	All Source Analysis System	05				U
88	0604328A	TRACTOR CAGE	05	17,050	12,000	29,050	U
89	0604601A	Infantry Support Weapons	05	83,155		83,155	U
90	0604604A	Medium Tactical Vehicles	05	3,704		3,704	U
91	0604611A	JAVELIN	05	10,623		10,623	U
92	0604622A	Family of Heavy Tactical Vehicles	05	11,950		11,950	U
93	0604633A	Air Traffic Control	05	12,347		12,347	U
94	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05				U
95	0604642A	Light Tactical Wheeled Vehicles	05	8,212		8,212	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-7B

xxix

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
96	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	9,306	36,242	36,242			U
97	0604710A	Night Vision Systems - Eng Dev	05	76,491	108,504	108,504			U
98	0604713A	Combat Feeding, Clothing, and Equipment	05	1,975	3,702	3,702			U
99	0604715A	Non-System Training Devices - Eng Dev	05	33,888	43,575	43,575			U
100	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	200,205	28,726	28,726			U
101	0604742A	Constructive Simulation Systems Development	05	17,363	18,562	18,562			U
102	0604746A	Automatic Test Equipment Development	05	8,503	8,344	8,344			U
103	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	10,150	11,270	11,270			U
104	0604768A	Brilliant Anti-Armor Submunition (BAT)	05		10,000	10,000			U
105	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	14,538	18,566	18,566			U
106	0604798A	Brigade Analysis, Integration and Evaluation	05	101,927	145,360	145,360			U
107	0604802A	Weapons and Munitions - Eng Dev	05	75,845	145,232	145,232			U
108	0604804A	Logistics and Engineer Equipment - Eng Dev	05	76,374	90,965	90,965			U
109	0604805A	Command, Control, Communications Systems - Eng Dev	05	4,166	9,910	9,910			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-8

XXX

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + e Emergency c	S
96	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05				36,242		36,242	U
97	0604710A	Night Vision Systems - Eng Dev	05				108,504		108,504	U
98	0604713A	Combat Feeding, Clothing, and Equipment	05				3,702		3,702	U
99	0604715A	Non-System Training Devices - Eng Dev	05				43,575		43,575	U
100	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05				28,726		28,726	U
101	0604742A	Constructive Simulation Systems Development	05				18,562		18,562	U
102	0604746A	Automatic Test Equipment Development	05				8,344		8,344	U
103	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05				11,270		11,270	U
104	0604768A	Brilliant Anti-Armor Submunition (BAT)	05				10,000		10,000	U
105	0604780A	Combined Arms Tactical Trainer (CATT) Core	05				18,566		18,566	U
106	0604798A	Brigade Analysis, Integration and Evaluation	05				145,360		145,360	U
107	0604802A	Weapons and Munitions - Eng Dev	05				145,232		145,232	U
108	0604804A	Logistics and Engineer Equipment - Eng Dev	05				90,965		90,965	U
109	0604805A	Command, Control, Communications Systems - Eng Dev	05				9,910		9,910	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-8A

xxxi

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
96	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	393,613		393,613	U
97	0604710A	Night Vision Systems - Eng Dev	05	139,614		139,614	U
98	0604713A	Combat Feeding, Clothing, and Equipment	05	4,507		4,507	U
99	0604715A	Non-System Training Devices - Eng Dev	05	49,436		49,436	U
100	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	95,172	119,300	214,472	U
101	0604742A	Constructive Simulation Systems Development	05	22,628		22,628	U
102	0604746A	Automatic Test Equipment Development	05	13,297		13,297	U
103	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	9,145		9,145	U
104	0604768A	Brilliant Anti-Armor Submunition (BAT)	05	9,894		9,894	U
105	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	21,964		21,964	U
106	0604798A	Brigade Analysis, Integration and Evaluation	05	49,288		49,288	U
107	0604802A	Weapons and Munitions - Eng Dev	05	183,100		183,100	U
108	0604804A	Logistics and Engineer Equipment - Eng Dev	05	79,706		79,706	U
109	0604805A	Command, Control, Communications Systems - Eng Dev	05	15,970		15,970	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
110	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	36,237	39,238	39,238			U
111	0604808A	Landmine Warfare/Barrier - Eng Dev	05	32,069	34,684	34,684			U
112	0604818A	Army Tactical Command & Control Hardware & Software	05	169,375	164,409	164,409			U
113	0604820A	Radar Development	05	15,368	32,968	32,968			U
114	0604822A	General Fund Enterprise Business System (GFEBs)	05	11,044	49,554	49,554			U
115	0604823A	Firefinder	05	6,177	45,605	45,605			U
116	0604827A	Soldier Systems - Warrior Dem/Val	05	11,929	16,127	16,127			U
117	0604852A	Suite of Survivability Enhancement Systems - EMD	05		98,600	98,600			U
118	0604854A	Artillery Systems - EMD	05	1,689	1,972	1,972			U
119	0605013A	Information Technology Development	05	70,104	81,776	81,776			U
120	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	149,597	172,361	172,361			U
121	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	177,133	199,778	199,778			U
122	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	4,789	4,418	4,418			U
123	0605030A	Joint Tactical Network Center (JTNC)	05	14,463	15,877	15,877			U
124	0605031A	Joint Tactical Network (JTN)	05	16,430	44,150	44,150			U
125	0605032A	TRACTOR TIRE	05	27,254	34,670	34,670	5,000	5,000	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-9

xxxiii

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
110	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05				39,238		39,238	U
111	0604808A	Landmine Warfare/Barrier - Eng Dev	05				34,684		34,684	U
112	0604818A	Army Tactical Command & Control Hardware & Software	05				164,409		164,409	U
113	0604820A	Radar Development	05				32,968		32,968	U
114	0604822A	General Fund Enterprise Business System (GFEBS)	05				49,554		49,554	U
115	0604823A	Firefinder	05				45,605		45,605	U
116	0604827A	Soldier Systems - Warrior Dem/Val	05				16,127		16,127	U
117	0604852A	Suite of Survivability Enhancement Systems - EMD	05				98,600		98,600	U
118	0604854A	Artillery Systems - EMD	05				1,972		1,972	U
119	0605013A	Information Technology Development	05				81,776		81,776	U
120	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05				172,361		172,361	U
121	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05				199,778		199,778	U
122	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05				4,418		4,418	U
123	0605030A	Joint Tactical Network Center (JTNC)	05				15,877		15,877	U
124	0605031A	Joint Tactical Network (JTN)	05				44,150		44,150	U
125	0605032A	TRACTOR TIRE	05				39,670		39,670	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
110	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	44,542		44,542	U
111	0604808A	Landmine Warfare/Barrier - Eng Dev	05	50,817		50,817	U
112	0604818A	Army Tactical Command & Control Hardware & Software	05	178,693		178,693	U
113	0604820A	Radar Development	05	39,338		39,338	U
114	0604822A	General Fund Enterprise Business System (GFEBS)	05	37,851		37,851	U
115	0604823A	Firefinder	05	45,473		45,473	U
116	0604827A	Soldier Systems - Warrior Dem/Val	05	10,395		10,395	U
117	0604852A	Suite of Survivability Enhancement Systems - EMD	05	69,204		69,204	U
118	0604854A	Artillery Systems - EMD	05	1,781		1,781	U
119	0605013A	Information Technology Development	05	113,758		113,758	U
120	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	166,603		166,603	U
121	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	118,239		118,239	U
122	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	3,211		3,211	U
123	0605030A	Joint Tactical Network Center (JTNC)	05	15,889		15,889	U
124	0605031A	Joint Tactical Network (JTN)	05	41,972		41,972	U
125	0605032A	TRACTOR TIRE	05	41,166	66,760	107,926	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-9B

XXXV

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
126	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	4,838	5,207	5,207			U
127	0605034A	Tactical Security System (TSS)	05	2,792	4,727	4,727			U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05	90,685	105,778	105,778	21,540	21,540	U
129	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	2,008	6,927	6,927			U
130	0605037A	Evidence Collection and Detainee Processing	05		214	214			U
131	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05		16,125	16,125			U
132	0605041A	Defensive CYBER Tool Development	05	32,535	55,165	55,165			U
133	0605042A	Tactical Network Radio Systems (Low-Tier)	05	14,198	20,076	20,076			U
134	0605047A	Contract Writing System	05	19,868	20,322	20,322			U
135	0605049A	Missile Warning System Modernization (MWSM)	05		55,810	55,810			U
136	0605051A	Aircraft Survivability Development	05	121,530	30,879	30,879	30,100	30,100	U
137	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	80,781	175,069	175,069			U
138	0605053A	Ground Robotics	05		70,760	70,760			U
139	0605054A	Emerging Technology Initiatives	05						U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + e Emergency	S c
126	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05				5,207		5,207	U
127	0605034A	Tactical Security System (TSS)	05				4,727		4,727	U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05				127,318		127,318	U
129	0605036A	Combating Weapons of Mass Destruction (CWMD)	05				6,927		6,927	U
130	0605037A	Evidence Collection and Detainee Processing	05				214		214	U
131	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05				16,125		16,125	U
132	0605041A	Defensive CYBER Tool Development	05				55,165		55,165	U
133	0605042A	Tactical Network Radio Systems (Low-Tier)	05				20,076		20,076	U
134	0605047A	Contract Writing System	05				20,322		20,322	U
135	0605049A	Missile Warning System Modernization (MWSM)	05				55,810		55,810	U
136	0605051A	Aircraft Survivability Development	05				60,979		60,979	U
137	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05				175,069		175,069	U
138	0605053A	Ground Robotics	05				70,760		70,760	U
139	0605054A	Emerging Technology Initiatives	05							U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-10A

xxxvii

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	S e c
126	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	5,175		5,175	U
127	0605034A	Tactical Security System (TSS)	05	4,496		4,496	U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05	51,178	2,670	53,848	U
129	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	11,311		11,311	U
130	0605037A	Evidence Collection and Detainee Processing	05				U
131	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05	17,154		17,154	U
132	0605041A	Defensive CYBER Tool Development	05	36,626		36,626	U
133	0605042A	Tactical Network Radio Systems (Low-Tier)	05	3,829		3,829	U
134	0605047A	Contract Writing System	05	41,928		41,928	U
135	0605049A	Missile Warning System Modernization (MWSM)	05	28,276		28,276	U
136	0605051A	Aircraft Survivability Development	05	21,965	34,933	56,898	U
137	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	157,710		157,710	U
138	0605053A	Ground Robotics	05	86,167		86,167	U
139	0605054A	Emerging Technology Initiatives	05	42,866		42,866	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
140	0605380A	AMF Joint Tactical Radio System (JTRS)	05	4,088	8,965	8,965			U
141	0605450A	Joint Air-to-Ground Missile (JAGM)	05	47,446	34,626	34,626			U
142	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	273,240	336,420	336,420			U
143	0605766A	National Capabilities Integration (MIP)	05	4,955	6,882	6,882			U
144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	11,086	23,467	23,467			U
145	0605830A	Aviation Ground Support Equipment	05	2,060	6,930	6,930			U
146	0210609A	Paladin Integrated Management (PIM)	05	39,902	6,112	6,112			U
147	0303032A	TROJAN - RH12	05	4,273	4,431	4,431	1,200	1,200	U
148	0303267A	Auctioned Spectrum Relocation Fund	05	34,967					U
149	0303367A	Spectrum Access Research and Development	05	66,125					U
150	0304270A	Electronic Warfare Development	05	18,425	14,616	14,616			U
151	1205117A	Tractor Bears	05		17,928	17,928			U
		System Development & Demonstration		2,502,560	3,012,840	3,012,840	57,840	57,840	
152	0604256A	Threat Simulator Development	06	28,883	22,862	22,862			U
153	0604258A	Target Systems Development	06	18,518	13,902	13,902			U
154	0604759A	Major T&E Investment	06	93,668	102,901	102,901			U
155	0605103A	Rand Arroyo Center	06	19,863	20,140	20,140			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-11

xxxix

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
140	0605380A	AMF Joint Tactical Radio System (JTRS)	05				8,965		8,965	U
141	0605450A	Joint Air-to-Ground Missile (JAGM)	05				34,626		34,626	U
142	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05				336,420		336,420	U
143	0605766A	National Capabilities Integration (MIP)	05				6,882		6,882	U
144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05				23,467		23,467	U
145	0605830A	Aviation Ground Support Equipment	05				6,930		6,930	U
146	0210609A	Paladin Integrated Management (PIM)	05				6,112		6,112	U
147	0303032A	TROJAN - RH12	05				5,631		5,631	U
148	0303267A	Auctioned Spectrum Relocation Fund	05							U
149	0303367A	Spectrum Access Research and Development	05							U
150	0304270A	Electronic Warfare Development	05				14,616		14,616	U
151	1205117A	Tractor Bears	05				17,928		17,928	U
		System Development & Demonstration					3,070,680		3,070,680	
152	0604256A	Threat Simulator Development	06				22,862		22,862	U
153	0604258A	Target Systems Development	06				13,902		13,902	U
154	0604759A	Major T&E Investment	06				102,901		102,901	U
155	0605103A	Rand Arroyo Center	06				20,140		20,140	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
140	0605380A	AMF Joint Tactical Radio System (JTRS)	05	15,984		15,984	U
141	0605450A	Joint Air-to-Ground Missile (JAGM)	05	11,773		11,773	U
142	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	277,607		277,607	U
143	0605766A	National Capabilities Integration (MIP)	05	12,340		12,340	U
144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	2,686		2,686	U
145	0605830A	Aviation Ground Support Equipment	05	2,706		2,706	U
146	0210609A	Paladin Integrated Management (PIM)	05				U
147	0303032A	TROJAN - RH12	05	4,521	1,200	5,721	U
148	0303267A	Auctioned Spectrum Relocation Fund	05				U
149	0303367A	Spectrum Access Research and Development	05				U
150	0304270A	Electronic Warfare Development	05	8,922		8,922	U
151	1205117A	Tractor Bears	05	23,170		23,170	U
		System Development & Demonstration		3,192,689	236,863	3,429,552	
152	0604256A	Threat Simulator Development	06	12,835		12,835	U
153	0604258A	Target Systems Development	06	12,135		12,135	U
154	0604759A	Major T&E Investment	06	82,996		82,996	U
155	0605103A	Rand Arroyo Center	06	19,821		19,821	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-11B

xli

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
156	0605301A	Army Kwajalein Atoll	06	219,271	246,663	246,663			U
157	0605326A	Concepts Experimentation Program	06	24,668	29,820	29,820			U
158	0605502A	Small Business Innovative Research	06	230,691					U
159	0605601A	Army Test Ranges and Facilities	06	305,238	307,588	307,588			U
160	0605602A	Army Technical Test Instrumentation and Targets	06	70,523	49,242	49,242			U
161	0605604A	Survivability/Lethality Analysis	06	38,245	41,843	41,843			U
162	0605606A	Aircraft Certification	06	4,486	4,804	4,804			U
163	0605702A	Meteorological Support to RDT&E Activities	06	6,793	7,238	7,238			U
164	0605706A	Materiel Systems Analysis	06	21,510	21,890	21,890			U
165	0605709A	Exploitation of Foreign Items	06	12,415	12,684	12,684			U
166	0605712A	Support of Operational Testing	06	49,580	51,040	51,040			U
167	0605716A	Army Evaluation Center	06	55,460	56,246	56,246			U
168	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	7,653	1,829	1,829			U
169	0605801A	Programwide Activities	06	50,971	55,060	55,060			U
170	0605803A	Technical Information Activities	06	29,905	33,934	33,934			U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06	63,983	43,444	43,444			U
172	0605857A	Environmental Quality Technology Mgmt Support	06	2,048	5,087	5,087			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
156	0605301A	Army Kwajalein Atoll	06				246,663		246,663	U
157	0605326A	Concepts Experimentation Program	06				29,820		29,820	U
158	0605502A	Small Business Innovative Research	06							U
159	0605601A	Army Test Ranges and Facilities	06				307,588		307,588	U
160	0605602A	Army Technical Test Instrumentation and Targets	06				49,242		49,242	U
161	0605604A	Survivability/Lethality Analysis	06				41,843		41,843	U
162	0605606A	Aircraft Certification	06				4,804		4,804	U
163	0605702A	Meteorological Support to RDT&E Activities	06				7,238		7,238	U
164	0605706A	Materiel Systems Analysis	06				21,890		21,890	U
165	0605709A	Exploitation of Foreign Items	06				12,684		12,684	U
166	0605712A	Support of Operational Testing	06				51,040		51,040	U
167	0605716A	Army Evaluation Center	06				56,246		56,246	U
168	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06				1,829		1,829	U
169	0605801A	Programwide Activities	06				55,060		55,060	U
170	0605803A	Technical Information Activities	06				33,934		33,934	U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06				43,444		43,444	U
172	0605857A	Environmental Quality Technology Mgmt Support	06				5,087		5,087	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-12A

xlili

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
156	0605301A	Army Kwajalein Atoll	06	246,574		246,574	U
157	0605326A	Concepts Experimentation Program	06	30,430		30,430	U
158	0605502A	Small Business Innovative Research	06				U
159	0605601A	Army Test Ranges and Facilities	06	305,759		305,759	U
160	0605602A	Army Technical Test Instrumentation and Targets	06	62,379		62,379	U
161	0605604A	Survivability/Lethality Analysis	06	40,496		40,496	U
162	0605606A	Aircraft Certification	06	3,941		3,941	U
163	0605702A	Meteorological Support to RDT&E Activities	06	9,767		9,767	U
164	0605706A	Materiel Systems Analysis	06	21,226		21,226	U
165	0605709A	Exploitation of Foreign Items	06	13,026		13,026	U
166	0605712A	Support of Operational Testing	06	52,718		52,718	U
167	0605716A	Army Evaluation Center	06	57,049		57,049	U
168	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	2,801		2,801	U
169	0605801A	Programwide Activities	06	60,942		60,942	U
170	0605803A	Technical Information Activities	06	29,050		29,050	U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06	42,332		42,332	U
172	0605857A	Environmental Quality Technology Mgmt Support	06	3,216		3,216	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06	49,287	54,679	54,679			U
174	0606001A	Military Ground-Based CREW Technology	06		7,916	7,916			U
175	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06		61,254	61,254			U
176	0606003A	CounterIntel and Human Intel Modernization	06						U
177	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06						U
178	0303260A	Defense Military Deception Initiative	06	1,923	1,779	1,779			U
179	0909980A	Judgment Fund Reimbursement	06	7,893					U
180	0909999A	Financing for Cancelled Account Adjustments	06	6					U
		RDT&E Management Support		1,413,481	1,253,845	1,253,845			
181	0603778A	MLRS Product Improvement Program	07	34,391	8,929	8,929			U
182	0603813A	TRACTOR PULL	07	3,960	4,014	4,014			U
183	0605024A	Anti-Tamper Technology Support	07	3,498	4,094	4,094			U
184	0607131A	Weapons and Munitions Product Improvement Programs	07	19,969	15,738	15,738			U
185	0607133A	TRACTOR SMOKE	07	4,479	4,513	4,513			U
186	0607134A	Long Range Precision Fires (LRPF)	07	36,322	102,014	102,014			U
187	0607135A	Apache Product Improvement Program	07	60,995	59,977	59,977			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-13

xiv

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06				54,679		54,679	U
174	0606001A	Military Ground-Based CREW Technology	06				7,916		7,916	U
175	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06				61,254		61,254	U
176	0606003A	CounterIntel and Human Intel Modernization	06							U
177	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06							U
178	0303260A	Defense Military Deception Initiative	06				1,779		1,779	U
179	0909980A	Judgment Fund Reimbursement	06							U
180	0909999A	Financing for Cancelled Account Adjustments	06							U
		RDT&E Management Support					1,253,845		1,253,845	
181	0603778A	MLRS Product Improvement Program	07				8,929		8,929	U
182	0603813A	TRACTOR PULL	07				4,014		4,014	U
183	0605024A	Anti-Tamper Technology Support	07				4,094		4,094	U
184	0607131A	Weapons and Munitions Product Improvement Programs	07				15,738		15,738	U
185	0607133A	TRACTOR SMOKE	07				4,513		4,513	U
186	0607134A	Long Range Precision Fires (LRPF)	07				102,014		102,014	U
187	0607135A	Apache Product Improvement Program	07				59,977		59,977	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06	54,145		54,145	U
174	0606001A	Military Ground-Based CREW Technology	06	4,896		4,896	U
175	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	63,011		63,011	U
176	0606003A	CounterIntel and Human Intel Modernization	06	2,636		2,636	U
177	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06	88,300		88,300	U
178	0303260A	Defense Military Deception Initiative	06				U
179	0909980A	Judgment Fund Reimbursement	06				U
180	0909999A	Financing for Cancelled Account Adjustments	06				U
		RDT&E Management Support		1,322,481		1,322,481	
181	0603778A	MLRS Product Improvement Program	07	8,886		8,886	U
182	0603813A	TRACTOR PULL	07	4,067		4,067	U
183	0605024A	Anti-Tamper Technology Support	07	4,254		4,254	U
184	0607131A	Weapons and Munitions Product Improvement Programs	07	16,022	2,548	18,570	U
185	0607133A	TRACTOR SMOKE	07	4,577	7,780	12,357	U
186	0607134A	Long Range Precision Fires (LRPF)	07	186,475		186,475	U
187	0607135A	Apache Product Improvement Program	07	31,049		31,049	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-13B

xlvi

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
188	0607136A	Blackhawk Product Improvement Program	07	44,966	34,416	34,416			U
189	0607137A	Chinook Product Improvement Program	07	88,314	194,567	194,567			U
190	0607138A	Fixed Wing Product Improvement Program	07	765	9,981	9,981			U
191	0607139A	Improved Turbine Engine Program	07	111,638	204,304	204,304			U
192	0607140A	Emerging Technologies from NIE	07	2,278	1,023	1,023			U
193	0607141A	Logistics Automation	07	1,542	1,504	1,504			U
194	0607142A	Aviation Rocket System Product Improvement and Development	07		10,064	10,064			U
195	0607143A	Unmanned Aircraft System Universal Products	07		38,463	38,463			U
196	0607665A	Family of Biometrics	07	11,632	6,159	6,159			U
197	0607865A	Patriot Product Improvement	07	48,073	90,217	90,217			U
198	0202429A	Aerostat Joint Project - COCOM Exercise	07	6,178	6,749	6,749			U
199	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	29,412	33,520	33,520			U
200	0203735A	Combat Vehicle Improvement Programs	07	340,353	343,175	343,175			U
201	0203740A	Maneuver Control System	07	3,943	6,639	6,639			U
202	0203743A	155mm Self-Propelled Howitzer Improvements	07		40,784	40,784			U
203	0203744A	Aircraft Modifications/Product Improvement Programs	07	32,397	39,358	39,358			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + e Emergency c	S
188	0607136A	Blackhawk Product Improvement Program	07				34,416		34,416	U
189	0607137A	Chinook Product Improvement Program	07				194,567		194,567	U
190	0607138A	Fixed Wing Product Improvement Program	07				9,981		9,981	U
191	0607139A	Improved Turbine Engine Program	07				204,304		204,304	U
192	0607140A	Emerging Technologies from NIE	07				1,023		1,023	U
193	0607141A	Logistics Automation	07				1,504		1,504	U
194	0607142A	Aviation Rocket System Product Improvement and Development	07				10,064		10,064	U
195	0607143A	Unmanned Aircraft System Universal Products	07				38,463		38,463	U
196	0607665A	Family of Biometrics	07				6,159		6,159	U
197	0607865A	Patriot Product Improvement	07				90,217		90,217	U
198	0202429A	Aerostat Joint Project - COCOM Exercise	07				6,749		6,749	U
199	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07				33,520		33,520	U
200	0203735A	Combat Vehicle Improvement Programs	07				343,175		343,175	U
201	0203740A	Maneuver Control System	07				6,639		6,639	U
202	0203743A	155mm Self-Propelled Howitzer Improvements	07				40,784		40,784	U
203	0203744A	Aircraft Modifications/Product Improvement Programs	07				39,358		39,358	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-14A

xlix

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
188	0607136A	Blackhawk Product Improvement Program	07	35,240		35,240	U
189	0607137A	Chinook Product Improvement Program	07	157,822		157,822	U
190	0607138A	Fixed Wing Product Improvement Program	07	4,189		4,189	U
191	0607139A	Improved Turbine Engine Program	07	192,637		192,637	U
192	0607140A	Emerging Technologies from NIE	07				U
193	0607141A	Logistics Automation	07				U
194	0607142A	Aviation Rocket System Product Improvement and Development	07	60,860		60,860	U
195	0607143A	Unmanned Aircraft System Universal Products	07	52,019		52,019	U
196	0607665A	Family of Biometrics	07	2,400		2,400	U
197	0607865A	Patriot Product Improvement	07	65,369		65,369	U
198	0202429A	Aerostat Joint Project - COCOM Exercise	07	1		1	U
199	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	30,954		30,954	U
200	0203735A	Combat Vehicle Improvement Programs	07	411,927		411,927	U
201	0203740A	Maneuver Control System	07				U
202	0203743A	155mm Self-Propelled Howitzer Improvements	07	40,676		40,676	U
203	0203744A	Aircraft Modifications/Product Improvement Programs	07	17,706		17,706	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
204	0203752A	Aircraft Engine Component Improvement Program	07	249	145	145			U
205	0203758A	Digitization	07	6,234	4,803	4,803			U
206	0203801A	Missile/Air Defense Product Improvement Program	07	24,925	2,723	2,723	15,000	15,000	U
207	0203802A	Other Missile Product Improvement Programs	07	8,283	5,000	5,000			U
208	0203808A	TRACTOR CARD	07	20,333	37,883	37,883			U
209	0205402A	Integrated Base Defense - Operational System Dev	07	3,450					U
210	0205410A	Materials Handling Equipment	07	119	1,582	1,582			U
211	0205412A	Environmental Quality Technology - Operational System Dev	07		195	195			U
212	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	61,449	78,926	78,926			U
213	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	21,196	102,807	102,807			U
214	0208053A	Joint Tactical Ground System	07	12,649					U
216	0303028A	Security and Intelligence Activities	07	15,719	13,807	13,807			U
217	0303140A	Information Systems Security Program	07	36,892	132,438	132,438			U
218	0303141A	Global Combat Support System	07	26,176	64,370	64,370			U
219	0303142A	SATCOM Ground Environment (SPACE)	07	18,761					U
220	0303150A	WWMCCS/Global Command and Control System	07	4,536	10,475	10,475			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-15

li

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
204	0203752A	Aircraft Engine Component Improvement Program	07				145		145	U
205	0203758A	Digitization	07				4,803		4,803	U
206	0203801A	Missile/Air Defense Product Improvement Program	07				17,723		17,723	U
207	0203802A	Other Missile Product Improvement Programs	07				5,000		5,000	U
208	0203808A	TRACTOR CARD	07				37,883		37,883	U
209	0205402A	Integrated Base Defense - Operational System Dev	07							U
210	0205410A	Materials Handling Equipment	07				1,582		1,582	U
211	0205412A	Environmental Quality Technology - Operational System Dev	07				195		195	U
212	0205456A	Lower Tier Air and Missile Defense (AMD) System	07				78,926		78,926	U
213	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07				102,807		102,807	U
214	0208053A	Joint Tactical Ground System	07							U
216	0303028A	Security and Intelligence Activities	07				13,807		13,807	U
217	0303140A	Information Systems Security Program	07				132,438		132,438	U
218	0303141A	Global Combat Support System	07				64,370		64,370	U
219	0303142A	SATCOM Ground Environment (SPACE)	07							U
220	0303150A	WWMCCS/Global Command and Control System	07				10,475		10,475	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
204	0203752A	Aircraft Engine Component Improvement Program	07	146		146	U
205	0203758A	Digitization	07	6,316		6,316	U
206	0203801A	Missile/Air Defense Product Improvement Program	07	1,643	2,000	3,643	U
207	0203802A	Other Missile Product Improvement Programs	07	4,947		4,947	U
208	0203808A	TRACTOR CARD	07	34,050		34,050	U
209	0205402A	Integrated Base Defense - Operational System Dev	07		8,000	8,000	U
210	0205410A	Materials Handling Equipment	07	1,464		1,464	U
211	0205412A	Environmental Quality Technology - Operational System Dev	07	249		249	U
212	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	79,283		79,283	U
213	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	154,102		154,102	U
214	0208053A	Joint Tactical Ground System	07				U
216	0303028A	Security and Intelligence Activities	07	12,280	23,199	35,479	U
217	0303140A	Information Systems Security Program	07	68,533		68,533	U
218	0303141A	Global Combat Support System	07	68,619		68,619	U
219	0303142A	SATCOM Ground Environment (SPACE)	07				U
220	0303150A	WWMCCS/Global Command and Control System	07	2,034		2,034	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-15B

iii

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
223	0305172A	Combined Advanced Applications	07		1,100	1,100			U
224	0305179A	Integrated Broadcast Service (IBS)	07						U
225	0305204A	Tactical Unmanned Aerial Vehicles	07	8,218	9,433	9,433	7,492	7,492	U
226	0305206A	Airborne Reconnaissance Systems	07	11,799	5,080	5,080	15,000	15,000	U
227	0305208A	Distributed Common Ground/Surface Systems	07	32,284	24,700	24,700			U
228	0305219A	MQ-1C Gray Eagle UAS	07	13,470	9,574	9,574			U
229	0305232A	RQ-11 UAV	07	1,613	2,191	2,191			U
230	0305233A	RQ-7 UAV	07	4,597	12,773	12,773			U
231	0307665A	Biometrics Enabled Intelligence	07	8,854	2,537	2,537	6,036	6,036	U
232	0310349A	Win-T Increment 2 - Initial Networking	07	4,680	4,723	4,723			U
233	0708045A	End Item Industrial Preparedness Activities	07	59,891	60,877	60,877			U
234	1203142A	SATCOM Ground Environment (SPACE)	07		11,959	11,959			U
235	1208053A	Joint Tactical Ground System	07		10,228	10,228			U
9999	9999999999	Classified Programs		4,625	7,154	7,154			U
		Operational Systems Development		1,296,107	1,877,685	1,877,685	43,528	43,528	
236	0901560A	Continuing Resolution Programs	20		-1,151,993	-1,151,993	222,988	222,988	U
		Undistributed			-1,151,993	-1,151,993	222,988	222,988	
		Total Research, Development, Test & Eval, Army		8,852,507	8,273,447	8,273,447	342,356	342,356	

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

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

18 Jan 2018

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

Line	Program Element No Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + e Emergency c	S
223	0305172A	Combined Advanced Applications	07				1,100		1,100	U
224	0305179A	Integrated Broadcast Service (IBS)	07							U
225	0305204A	Tactical Unmanned Aerial Vehicles	07				16,925		16,925	U
226	0305206A	Airborne Reconnaissance Systems	07				20,080		20,080	U
227	0305208A	Distributed Common Ground/Surface Systems	07				24,700		24,700	U
228	0305219A	MQ-1C Gray Eagle UAS	07				9,574		9,574	U
229	0305232A	RQ-11 UAV	07				2,191		2,191	U
230	0305233A	RQ-7 UAV	07				12,773		12,773	U
231	0307665A	Biometrics Enabled Intelligence	07				8,573		8,573	U
232	0310349A	Win-T Increment 2 - Initial Networking	07				4,723		4,723	U
233	0708045A	End Item Industrial Preparedness Activities	07				60,877		60,877	U
234	1203142A	SATCOM Ground Environment (SPACE)	07				11,959		11,959	U
235	1208053A	Joint Tactical Ground System	07				10,228		10,228	U
9999	9999999999	Classified Programs					7,154		7,154	U
		Operational Systems Development					1,921,213		1,921,213	
236	0901560A	Continuing Resolution Programs	20				-929,005		-929,005	U
		Undistributed					-929,005		-929,005	
		Total Research, Development, Test & Eval, Army		20,700	-20,700		8,636,503	-20,700	8,615,803	

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-16A

iv

UNCLASSIFIED

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

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
223	0305172A	Combined Advanced Applications	07	1,500		1,500	U
224	0305179A	Integrated Broadcast Service (IBS)	07	450		450	U
225	0305204A	Tactical Unmanned Aerial Vehicles	07	6,000		6,000	U
226	0305206A	Airborne Reconnaissance Systems	07	12,416	14,000	26,416	U
227	0305208A	Distributed Common Ground/Surface Systems	07	38,667		38,667	U
228	0305219A	MQ-1C Gray Eagle UAS	07				U
229	0305232A	RQ-11 UAV	07	6,180		6,180	U
230	0305233A	RQ-7 UAV	07	12,863		12,863	U
231	0307665A	Biometrics Enabled Intelligence	07	4,310	2,214	6,524	U
232	0310349A	Win-T Increment 2 - Initial Networking	07				U
233	0708045A	End Item Industrial Preparedness Activities	07	53,958		53,958	U
234	1203142A	SATCOM Ground Environment (SPACE)	07	12,119		12,119	U
235	1208053A	Joint Tactical Ground System	07	7,400		7,400	U
9999	9999999999	Classified Programs		5,955		5,955	U
		Operational Systems Development		1,922,614	59,741	1,982,355	
236	0901560A	Continuing Resolution Programs	20				U
		Undistributed					
		Total Research, Development, Test & Eval, Army		10,159,379	325,104	10,484,483	

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

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

Appropriation 2040: Research, Development, Test & Evaluation, Army

Line #	Budget Activity	Program Element Number	Program Element Title	Page
181	07	0603778A	MLRS Product Improvement Program.....	1
182	07	0603813A	TRACTOR PULL.....	15
183	07	0605024A	Anti-Tamper Technology Support.....	16
184	07	0607131A	Weapons and Munitions Product Improvement Programs.....	22
185	07	0607133A	TRACTOR SMOKE.....	61
186	07	0607134A	Long Range Precision Fires (LRPF).....	62
187	07	0607135A	Apache Product Improvement Program.....	71
188	07	0607136A	Blackhawk Product Improvement Program.....	79
189	07	0607137A	Chinook Product Improvement Program.....	90
190	07	0607138A	Fixed Wing Product Improvement Program.....	101
191	07	0607139A	Improved Turbine Engine Program.....	108
192	07	0607140A	Emerging Technologies from NIE.....	118
193	07	0607141A	Logistics Automation.....	123
194	07	0607142A	Aviation Rocket System Product Improvement & Dev.....	134
195	07	0607143A	Unmanned Aircraft System Universal Products.....	143
196	07	0607665A	Family of Biometrics.....	151

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

Appropriation 2040: Research, Development, Test & Evaluation, Army

Line #	Budget Activity	Program Element Number	Program Element Title	Page
197	07	0607865A	Patriot Product Improvement.....	164
198	07	0202429A	Aerostat Joint Project - COCOM Exercise.....	173
199	07	0203728A	Joint Automated Deep Operation Coordination System (JADOCS).....	181
200	07	0203735A	Combat Vehicle Improvement Programs.....	202
201	07	0203740A	Maneuver Control System.....	252
202	07	0203743A	155MM Self-Propelled Howitzer Improvements.....	261
203	07	0203744A	Aircraft Modifications/Product Improvement Programs.....	268
204	07	0203752A	Aircraft Engine Component Improvement Program.....	277
205	07	0203758A	Digitization.....	284
206	07	0203801A	Missile/Air Defense Product Improvement Program.....	293
207	07	0203802A	Other Missile Product Improvement Programs.....	307
208	07	0203808A	TRACTOR CARD.....	323
209	07	0205402A	Integrated Base Defense - Operational System Dev.....	327
210	07	0205410A	Materials Handling Equipment.....	337
211	07	0205412A	Environmental Quality Technology - Operational System Dev.....	344
212	07	0205456A	Lower Tier Air and Missile Defense (AMD) System.....	350
213	07	0205778A	Guided Multiple Launch Rocket System (GMLRS).....	360
214	07	0208053A	Joint Tactical Ground System.....	370

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

Appropriation 2040: Research, Development, Test & Evaluation, Army

Line #	Budget Activity	Program Element Number	Program Element Title	Page
216	07	0303028A	INTEL SPT TO FORCE XXI.....	378
217	07	0303140A	Communications Security (COMSEC) Equipment.....	393
218	07	0303141A	Global Combat Support System.....	428
219	07	0303142A	SATCOM Ground Environment (SPACE).....	451
220	07	0303150A	Army Global Command & Control System.....	475
223	07	0305172A	Combined Advanced Applications.....	490
224	07	0305179A	Integrated Broadcast Service (IBS).....	491
225	07	0305204A	Tactical Unmanned Aerial Vehicles.....	497
226	07	0305206A	Airborne Reconnaissance Systems.....	519
227	07	0305208A	Distributed Common Ground/Surface Systems.....	545
228	07	0305219A	MQ-1 Gray Eagle UAV.....	556
229	07	0305232A	RQ-11 UAV.....	563
230	07	0305233A	RQ-7 Shadow UAV.....	571
231	07	0307665A	Biometrics Enabled Intelligence.....	581
232	07	0310349A	Win-T Increment 2 - Initial Networking.....	591
233	07	0708045A	INDUSTRIAL PREPAREDNESS.....	599
234	07	1203142A	SATCOM Ground Environment (SPACE).....	610
235	07	1208053A	Joint Tactical Ground System.....	629

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

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

Program Element Title	Program Element Number	Line #	BA	Page
155MM Self-Propelled Howitzer Improvements	0203743A	202	07.....	261
Aerostat Joint Project - COCOM Exercise	0202429A	198	07.....	173
Airborne Reconnaissance Systems	0305206A	226	07.....	519
Aircraft Engine Component Improvement Program	0203752A	204	07.....	277
Aircraft Modifications/Product Improvement Programs	0203744A	203	07.....	268
Anti-Tamper Technology Support	0605024A	183	07.....	16
Apache Product Improvement Program	0607135A	187	07.....	71
Army Global Command & Control System	0303150A	220	07.....	475
Aviation Rocket System Product Improvement & Dev	0607142A	194	07.....	134
Biometrics Enabled Intelligence	0307665A	231	07.....	581
Blackhawk Product Improvement Program	0607136A	188	07.....	79
Chinook Product Improvement Program	0607137A	189	07.....	90
Combat Vehicle Improvement Programs	0203735A	200	07.....	202
Combined Advanced Applications	0305172A	223	07.....	490
Communications Security (COMSEC) Equipment	0303140A	217	07.....	393
Digitization	0203758A	205	07.....	284
Distributed Common Ground/Surface Systems	0305208A	227	07.....	545

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Emerging Technologies from NIE	0607140A	192	07.....	118
Environmental Quality Technology - Operational System Dev	0205412A	211	07.....	344
Family of Biometrics	0607665A	196	07.....	151
Fixed Wing Product Improvement Program	0607138A	190	07.....	101
Global Combat Support System	0303141A	218	07.....	428
Guided Multiple Launch Rocket System (GMLRS)	0205778A	213	07.....	360
INDUSTRIAL PREPAREDNESS	0708045A	233	07.....	599
INTEL SPT TO FORCE XXI	0303028A	216	07.....	378
Improved Turbine Engine Program	0607139A	191	07.....	108
Integrated Base Defense - Operational System Dev	0205402A	209	07.....	327
Integrated Broadcast Service (IBS)	0305179A	224	07.....	491
Joint Automated Deep Operation Coordination System (JADOCS)	0203728A	199	07.....	181
Joint Tactical Ground System	0208053A	214	07.....	370
Joint Tactical Ground System	1208053A	235	07.....	629
Logistics Automation	0607141A	193	07.....	123
Long Range Precision Fires (LRPF)	0607134A	186	07.....	62
Lower Tier Air and Missile Defense (AMD) System	0205456A	212	07.....	350
MLRS Product Improvement Program	0603778A	181	07.....	1
MQ-1 Gray Eagle UAV	0305219A	228	07.....	556

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Maneuver Control System	0203740A	201	07.....	252
Materials Handling Equipment	0205410A	210	07.....	337
Missile/Air Defense Product Improvement Program	0203801A	206	07.....	293
Other Missile Product Improvement Programs	0203802A	207	07.....	307
Patriot Product Improvement	0607865A	197	07.....	164
RQ-11 UAV	0305232A	229	07.....	563
RQ-7 Shadow UAV	0305233A	230	07.....	571
SATCOM Ground Environment (SPACE)	0303142A	219	07.....	451
SATCOM Ground Environment (SPACE)	1203142A	234	07.....	610
TRACTOR CARD	0203808A	208	07.....	323
TRACTOR PULL	0603813A	182	07.....	15
TRACTOR SMOKE	0607133A	185	07.....	61
Tactical Unmanned Aerial Vehicles	0305204A	225	07.....	497
Unmanned Aircraft System Universal Products	0607143A	195	07.....	143
Weapons and Munitions Product Improvement Programs	0607131A	184	07.....	22
Win-T Increment 2 - Initial Networking	0310349A	232	07.....	591

UNCLASSIFIED

UNCLASSIFIED
FY 2019 RDT&E, ARMY PROGRAM ELEMENT
DESCRIPTIVE SUMMARIES

Introduction and Explanation of Contents

1. **General.** The purpose of this document is to provide summary information concerning the Research, Development, Test and Evaluation, Army program. The descriptive summaries are comprised of R-2 (Army RDT&E Budget Item Justification – program element level), R-2A (Army RDT&E Budget Item Justification – project level), R-3 (Army RDT&E Cost Analysis), R-4 (Schedule Profile Detail) and R-5 (Termination Liability Funding for MDAPs) Exhibits, which provide narrative information on all RDT&E program elements and projects through FY 2019.
2. **Relationship of the FY 2019 Budget Submitted to Congress to the FY 2018 Budget Submitted to Congress.** This paragraph provides a list of program elements/projects that are major new starts, restructures, developmental transitions, and terminated programs. Explanations for these changes can be found in the narrative sections of the Program Element R-2A Exhibits.

A. New Start Programs:

<u>Budget Activity</u>	<u>OSDPE / Project</u>	<u>Project Title</u>
02	0602126A / XW8	TRACTOR JACK
02	0602787A / XV5	Medical Capabilities to Support Dispersed Ops
04	0604020A / CF1	CFT Advanced Development & Prototyping
04	0604113A / EX8	Future Tactical Unmanned Aircraft System (FTUAS)
06	0605898A / FJ2	Army SHARP RDTE
06	0606942A / FL2	Cyber Vulnerabilities Assessments and Evaluations
07	0305179A / EF4	Integrated Broadcast System
07	0305206A / EH7	Guardrail Common Sensor (GRCS) Payloads (MIP)
07	0305206A / EH2	EMARSS ADV DEV (MIP)

B. Program Element/Project Restructures:

Budget Activity	Old OSDPE / Project: Title	New OSDPE / Project: Title
02	0602105A / H84: Materials	0602105A / XW4: Manufacturing Science
02	0602270A / 906: Tactical Electronic Warfare Applied Research	0602270A / CYB: Applied Offensive Cyber
02	0602782A / 779: Command, Control And Platform Electronics Tech	0602782A / CY2: Applied Defensive Cyber
02	0602782A / H92: Communications Technology	0602782A / CY2: Applied Defensive Cyber
02	0602786A / 283: Airdrop Adv Tech	0602786A / XW5: Small Unit Expeditionary Maneuver Technology
02	0602786A / H99: Joint Service Combat Feeding Technology	0602786A / XW5: Small Unit Expeditionary Maneuver Technology
02	0602786A / VT4: Expeditionary Mobile Base Camp Technology	0602786A / XW5: Small Unit Expeditionary Maneuver Technology
03	0603001A / C07: Joint Service Combat Feeding Tech Demo	0603001A / XW6: Small Unit Expeditionary Maneuver
03	0603001A / VT5: Expeditionary Mobile Base Camp Demonstration	0603001A / XW6: Small Unit Expeditionary Maneuver
03	0603001A / 242: Airdrop Equipment	0603001A / XW6: Small Unit Expeditionary Maneuver
03	0603270A / K15: Advanced Comm Ecm Demo	0603270A / CY3: Offensive Cyber Demonstration
03	0603270A / K16: Non-Commo Ecm Tech Dem	0603270A / CY3: Offensive Cyber Demonstration
04	0603639A / EL7: Reduced Range Ammunition	0604802A / EP3: Reduced Range Ammunition - Small Caliber
04	0603639A / EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	0607131A / ER6: Direct Fire Technology
04	0603639A / EU1: Enhanced Lethality Cannon Munitions	0604802A / EU7: Enhanced Lethality Cannon Munitions
04	0603639A / EU1: Enhanced Lethality Cannon Munitions	0604802A / EU6: 155mm HE Rocket Assist Project Extended Range
04	0604120A / ED5: Assured Positioning, Navigation and Timing (PNT)	1206120A / FJ8: Assured Positioning, Navigation and Timing (PNT)
04	0604120A / EH8: DISMOUNTED	1206120A / FJ9: Dismounted A-PNT
04	0604120A / EH9: PSEUDOLITES	1206120A / FK1: Pseudolites
04	0604120A / EJ2: MOUNTED	1206120A / FK2: Mounted A-PNT
04	0604120A / EJ3: ANTI-JAM ANTENNA	1206120A / FK3: Anti-Jam Antenna
05	0210609A / ED8: Paladin Integrated Management (PIM)	0203743A / FF9: PIM Improvement Program
05	0604798A / FG7: Emerging Technology Initiatives	0604798A / FI3: Rapid Capability Development and Maturation
05	0604827A / S65: Platoon Power Generator	0604827A / EY3: Soldier Power Generator
05	0605053A / FB4: Common Robotic Systems	0605053A / FG8: Common Robotic Controller
07	0303028A / FG2: Counterintelligence & Human Intel Modernization	0606003A / FI9: Counterl Intel and Human Intel Modernization
07	0205402A / EF2: Integrated Base Defense	0605029A / EQ2: IntegGrdSecSurvRespC(IGSSR-C)
07	0205402A / EF2: Integrated Base Defense	0605033A / EQ3: Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)
07	0303142A / 253: Dscs-Dcs (Phase II)	1203142A / FE1: Dscs-Dcs (Phase II)
07	0303142A / 456: MILSATCOM System Engineering	1203142A / FE2: MILSATCOM System Engineering
07	0303142A / EK8: Enroute Mission Command	1203142A / FE4: Enroute Mission Command

C. Program Terminations:

<u>Budget Activity</u>	<u>OSDPE / Project</u>	<u>OSDPE Title / Project Title</u>
01	0601103A / V72	University Research Initiatives / Minerva; project ends
01	0601104A / H50	University and Industry Research Centers / Network Sciences Cta; project ends
01	0601104A / H53	University and Industry Research Centers / Army High Performance Computing Research Center; project ends
01	0601104A / H54	University and Industry Research Centers / Micro-Autonomous Systems Technology (MAST) CTA; project ends
02	0602105A / H7G	Materials Technology / Nanomaterials Applied Research; project ends
02	0602120A / SA2	Sensors and Electronic Survivability / Biotechnology Applied Research; project ends
02	0602705A / H17	Electronics and Electronic Devices / Flexible Display Center; project ends
02	0602720A / 895	Environmental Quality Technology / Pollution Prevention; project ends
03	0603001A / 543	Warfighter Advanced Technology / Ammunition Logistics; project ends
03	0603015A / S28	Next Generation Training & Simulation Systems / Immersive Learning Environments; project ends
03	0603020A / DB1	TRACTOR ROSE / DDB1; project ends
03	0603606A / 683	Landmine Warfare and Barrier Advanced Technology / Area Denial Sensors; project ends
03	0603728A / 025	Environmental Quality Technology Demonstrations / Pollution Prevention Technology; project ends
04	0604115A / EX3	Technology Maturation Initiatives / Ground Vehicle Prototyping; project ends
05	0604290A / DW1	Mid-tier Networking Vehicular Radio (MNVR) / Mid-Tier Wideband Networking Vehicular Radio Mnv; project ends
05	0604321A / B41	All Source Analysis System / CI/HUMINT Software Products (MIP); project ends
05	0604321A / B51	All Source Analysis System / Machine - Foreign Language Translation System; project ends
05	0604818A / 334	Army Tactical Command & Control Hardware & Software / Common Software; project ends
06	0303260A / FA9	Defense Military Deception Initiative / Security Initiatives; project ends
06	0604759A / FA4	Major T&E Investment / Warrior Injury Assessment Manikin (WIAMan); transitions to procurement
07	0202429A / EP8	Aerostat Joint Project - COCOM Exercise / COCOM Exercise; project ends
07	0203740A / 484	Maneuver Control System / Maneuver Control System; project ends
07	0303142A / EA3	SATCOM Ground Environment (SPACE) / Transportable Tactical Cmd Comms (T2C2); transitions to procurement
07	0303150A / EA5	WWMCCS/Global Command and Control System / Strategic and Joint Mission Command; transitions to procurement
07	0305219A / MQ1	MQ-1 Gray Eagle UAV / MQ-1 Gray Eagle - Army UAV (MIP); project ends
07	0607140A / ES7	Emerging Technologies from NIE / Emerging Technologies from NIE; project ends
07	0607141A / DY1	Logistics Automation / Logistics Information Warehouse (LIW); project ends

3. **Classification:** This document contains no classified data. Appropriately cleared individuals can obtain further information on Classified/Special Access Programs by contacting the Department of the Army (ASA(ALT)) Special Programs Office.

UNCLASSIFIED

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

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							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	34.391	8.929	8.886	-	8.886	8.877	10.167	12.479	53.296	0.000	137.025
093: Multi-Launch Rocket System (MLRS)	-	25.100	5.000	4.947	-	4.947	4.943	5.041	5.040	31.506	0.000	81.577
789: Guided MLRS (GMLRS) Rocket P3I*	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	17.748	0.000	17.748
DX8: HIMARS Product Improvement Program	-	9.291	3.929	3.939	-	3.939	3.934	5.126	7.439	4.042	0.000	37.700

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

A. Mission Description and Budget Item Justification

Project 093. The Multiple Launch Rocket System (MLRS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the MLRS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems.

FY2019 Base funding in the amount of \$4.947 million for project 093 supports the continued software development of an organic tactical software build in support of the Fire Control System (FCS) hardware supporting both the current MLRS Fleet (upon upgrade with a modern hardware FCS) and the Army's MLRS Fleet Expansion effort. This software development leverages the program's completed software transition from the prime contractor to the government in FY2016. This FCS solution will be ready to field in FY2021. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and will be the first release of organic software common to both the MLRS and HIMARS launcher in FY2021.

Project 789. The Multiple Launch Rocket System (MLRS) Low Cost Reduced Range Practice Rocket (LCRRPR) is the only live training rocket for High Mobility Artillery Rocket System (HIMARS) and M270/M270A1 MLRS Launcher units/crews. LCRRPR meets a critical validated requirement for Active and National Guard HIMARS and M270A1 launcher units to achieve and maintain combat readiness. HIMARS and M270A1 Battalions are organic and attached to modular Fires Brigades supporting Brigade Combat Teams (BCTs), Joint Expeditionary Force, and Joint Special Operations Force combatant commanders. The training rocket has an inert payload section and blunt nose for inducing reduced range for use at multiple facilities in the United States and foreign countries. LCRRPRs are manufactured by Lockheed Martin in Camden, Arkansas and Letterkenny Munitions Center (LEMC) in Chambersburg, Pennsylvania. LEMC provides an organic dual source. The LCRRPR is currently produced by reusing the M26 pod and rocket motor, however, the US Government will soon experience inventory depletion of M26 rocket motors and Launch Pod Containers that feed the LCRRPR production line.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army			Date: February 2018			
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				
Project DX8. The M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the HIMARS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems. FY2019 Base funding in the amount of \$3.939 million for project DX8 supports HIMARS-unique software build, version 8.2. The Product Manager will field this software to the M142 fleet in FY2019. In addition to addressing software maintenance, software version 8.2 enables portability to the M270A2 (MLRS) tracked launcher upon receipt of a hardware Fire Control System upgrade.						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		34.763	8.929	8.981	-	8.981
Current President's Budget		34.391	8.929	8.886	-	8.886
Total Adjustments		-0.372	0.000	-0.095	-	-0.095
• Congressional General Reductions		-0.005	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.367	-			
• Other Adjustments 2		-	-	-0.095	-	-0.095
Change Summary Explanation						
FY17: \$0.367 million SBIR transfer						
FY17: \$0.005 million FFRDC transfer						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
093: Multi-Launch Rocket System (MLRS)	-	25.100	5.000	4.947	-	4.947	4.943	5.041	5.040	31.506	0.000	81.577
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 093. The Multiple Launch Rocket System (MLRS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the MLRS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems.

FY2019 Base funding in the amount of \$4.947 million for project 093 continues software development of an organic tactical software build in support of the Common Fire Control System (CFCS) hardware supporting both the current MLRS Fleet (upon upgrade with a modern hardware FCS) and the Army's MLRS Fleet Expansion effort. This software development leverages the program's completed software transition from the prime contractor to the government in FY2016. The CFCS solution will be ready to field in FY2021. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and will be the first release of organic software common to both the MLRS and HIMARS launcher.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MLRS Product Improvement Program	25.100	5.000	4.947	-	4.947
Description: The MLRS Product Improvement Program provides the preservation of platform viability and readiness to accept technology insertion as capability enhancements and obsolescence mitigations are developed. Support efforts include: obsolescence mitigation and enhancements for the M993A1 carrier, Fire Control System, Launcher Loader Module and Enhanced Command and Control (EC2); develop and update the Fire Control System software to keep pace with changes to the munitions; and perform Command, Control, Communications, Computers and Intelligence (C4I)/interoperability and Information Assurance compliance certification and network interoperability testing. Perform technical assessments and concept studies for: obsolescence mitigation; crew protection; automotive, hardware and software enhancements; improving operational timelines; and risk reduction.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Began tactical launcher software development to support the Fire Control System obsolescence mitigation hardware upgrade required to operate a MLRS launcher.												
FY 2019 Base Plans: Continue tactical launcher software development to support the Fire Control System obsolescence mitigation hardware upgrade required to operate a MLRS launcher.												
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease is due to economic adjustment from FY18 to FY19.												
Accomplishments/Planned Programs Subtotals								25.100	5.000	4.947	-	4.947
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• C67500: MLRS Mods	25.052	138.235	383.216	122.000	505.216	290.039	412.452	216.428	208.888	Continuing	Continuing	
• CA0265: MLRS MODIFICATION INITIAL SPARES	0.476	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
The MLRS Product Improvement Program performs development efforts required to address emerging requirements. The Army completed transition from the prime contractor (legacy v7.x) to an organic (government developed, maintained, and owned) approach (v8.x forward)) by utilizing the Aviation & Missile Research & Development Engineering Center's (AMRDEC) Software Engineering Directorate (SED) as the software developer and maintainer. These efforts are funded via Military Interdepartmental Purchase Request (MIPR). Emerging requirements include updates to address emerging threats of the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility. Communication suite changes, munitions updates, and introduction of new munitions require software and/or hardware updates to ensure full compatibility and maintain operational viability. The enduring organic v8.2 software effort is projected for Materiel Release and fielding to the M270A2 (MLRS) launcher when upgraded with the Fire Control System solution.												
E. Performance Metrics												
N/A												

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Various	PFRMS Project Office : Redstone Arsenal, AL	8.955	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			8.955	-		-		-		-		-	Continuing	Continuing	N/A
Remarks PFRMS - Precision Fires Rocket and Missile Systems															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Agencies OGA	MIPR	FT SILL OK, CECOM-NJ AMRDEC-RSA AL, : various	17.108	-		-		-		-		-	Continuing	Continuing	Continuing
MLRS IAC	C/CPFF	Lockheed Martin : Grand Prairie, TX	30.498	-		-		-		-		-	Continuing	Continuing	Continuing
MLRS FCS Development	SS/CR	Lockheed Martin : Grand Prairie, TX	70.200	-		-		-		-		-	Continuing	Continuing	Continuing
Organic Software Development	MIPR	AMRDEC's Software Engineering Directorate : Redstone Arsenal, AL	-	-		5.000		4.947	Mar 2019	-		4.947	Continuing	Continuing	Continuing
Risk Reduction Effort: Common Fire Control System	SS/TBD	TBD : TBD	-	21.900	Feb 2018	-		-		-		-	0.000	21.900	-
Risk Reduction Effort: Hulls	MIPR	Red River Army Depot : Red River Army Depot, TX	-	3.200	Jan 2018	-		-		-		-	0.000	3.200	-
Subtotal			117.806	25.100		5.000		4.947		-		4.947	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program						Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)			
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks AMRDEC - Aviation and Missile Research Development and Engineering Center															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Contract	Various	Multiple : Multiple	4.834	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			4.834	-		-		-		-		-	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support, Joint Interoperability Test Certificate	MIPR	CTSF, Ft. Hood : Texas	10.712	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			10.712	-		-		-		-		-	Continuing	Continuing	N/A
Remarks CTSF - Central Technical Support Facility															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			142.307	25.100		5.000		4.947		-		4.947	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0603778A / MLRS Product Improvement Program

Project (Number/Name)

093 / Multi-Launch Rocket System (MLRS)

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Development	2	2013	4	2023

Note
Software Development by Aviation and Missile Research, Development, and Engineering Center (AMRDEC) Software Engineering Directorate (SED).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) DX8 / HIMARS Product Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DX8: HIMARS Product Improvement Program	-	9.291	3.929	3.939	-	3.939	3.934	5.126	7.439	4.042	0.000	37.700
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project DX8. The M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the HIMARS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems.

FY2019 Base funding in the amount of \$3.939 for project DX8 supports development of HIMARS-unique software build, version 8.2. In addition to addressing software maintenance, software version 8.2 enables portability to the M270A2 (MLRS) tracked launcher upon receipt of a hardware Fire Control System upgrade.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MLRS Production Improvement Program (PIP)-HIMARS PIP	9.291	3.929	3.939	-	3.939
Description: Provide enduring tactical software development and maintenance required to address security concerns, implement fixes to newly discovered issues, and address emerging threats.					
FY 2018 Plans: Completed version 8.1 tactical software build for HIMARS launcher and achieve readiness for operational fielding. Began version 8.2 tactical software build to add support to launcher Insensitive Munitions Propulsion System (IMPS) Guided Multiple Launch Rocket System (GMLRS) munitions starting production. This software upgrade will be required to launch the newest production munitions.					
FY 2019 Base Plans: Complete developing version 8.2 tactical software build to add support to launcher IMPS GMLRS munitions starting production. This software upgrade will be required to launch the newest production munitions.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) DX8 / HIMARS Product Improvement Program				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
No change												
Accomplishments/Planned Programs Subtotals								9.291	3.929	3.939	-	3.939
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• C67501: HIMARS Modifications (C67501)	1.847	9.566	10.196	-	10.196	12.483	6.089	7.300	9.711	204.749	261.941	
• C02901: High Mobility Artillery Rocket System (HIMARS)	-	41.000	0.000	171.138	171.138	-	-	89.077	41.274	0.000	342.489	
Remarks												
D. Acquisition Strategy												
The HIMARS Product Improvement Program performs development efforts required to address emerging requirements. The Army completed transition from the prime contractor (legacy v7.x) to an organic approach organic (government developed, maintained, and owned) approach (v8.x forward)) by utilizing the Aviation & Missile Research & Development Engineering Center's (AMRDEC) Software Engineering Directorate (SED) as both the software developer and maintainer. These efforts are funded via Military Interdepartmental Purchase Request (MIPR). Emerging requirements include updates to address emerging threats of the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility. Communication suite changes, munitions updates, and introduction of new munitions require software and/or hardware updates to ensure full compatibility and maintain operational viability. The enduring organic version 8 software effort is projected for Materiel Release and fielding to HIMARS fleet in FY2019. When fielded, Version 8.2 will enable portability to the M270A2 (MLRS) launcher when upgraded with the Common Fire Control System solution.												
E. Performance Metrics												
N/A												

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) DX8 / HIMARS Product Improvement Program					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Various	PFRMS Project Office : Redstone Arsenal, AL	0.422	0.395	Oct 2016	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			0.422	0.395		-		-		-		-	Continuing	Continuing	N/A
Remarks PFRMS - Precision Fires Rocket and Missile Systems															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Agencies (OGA)	MIPR	AMCOM, GSA, RSA : Various	3.318	-		-		-		-		-	Continuing	Continuing	Continuing
Organic Software Development & Maintenance	MIPR	AMRDEC's Software Engineering Directorate : Redstone Arsenal, AL	0.463	6.400	Feb 2017	3.929		3.939	Mar 2019	-		3.939	Continuing	Continuing	Continuing
Subtotal			3.781	6.400		3.929		3.939		-		3.939	Continuing	Continuing	N/A
Remarks AMRDEC - Aviation & Missile Research, Development, and Engineering Center															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	Ft Hood, TX, ATEC, APG, MD, WSMR, RTC, RSA : Various	0.963	2.496	Aug 2017	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			0.963	2.496		-		-		-		-	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018					
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) DX8 / HIMARS Product Improvement Program							
Test and Evaluation (\$ in Millions)						FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks ATEC - US Army Test and Evaluation Command; APG MD - Aberdeen Proving Ground, Maryland; WSMR - White Sands Missile Range; RTC RSA - Redstone Test Center, Redstone Arsenal, Alabama																	
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			5.166	9.291		3.929		3.939		-		3.939	Continuing	Continuing	N/A		
Remarks																	

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
Appropriation/Budget Activity 2040 / 7								R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program								Project (Number/Name) DX8 / HIMARS Product Improvement Program												
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Software Development	Software Development																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / <i>MLRS Product Improvement Program</i>	Project (Number/Name) DX8 / <i>HIMARS Product Improvement Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Development	2	2017	4	2023

Note

Software Development by Aviation and Missile Research, Development, and Engineering Center (AMRDEC) Software Engineering Directorate (SED).

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0603813A / <i>TRACTOR PULL</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	3.960	4.014	4.067	-	4.067	4.333	4.414	4.544	4.635	0.000	29.967
ET1: <i>Tractor Peel</i>	-	3.960	4.014	4.067	-	4.067	4.333	4.414	4.544	4.635	0.000	29.967

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).

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	3.960	4.014	4.067	-	4.067
Current President's Budget	3.960	4.014	4.067	-	4.067
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0605024A I Anti-Tamper Technology Support							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	3.498	4.094	4.254	-	4.254	7.017	6.384	6.571	6.698	Continuing	Continuing
FB1: Anti-Tamper Technology Support	-	3.498	4.094	4.254	-	4.254	7.017	6.384	6.571	6.698	Continuing	Continuing

Note

Prior to FY17, the Anti-Tamper Technology Support program was funded under APE 0605801A M46.

A. Mission Description and Budget Item Justification

Anti-Tamper (AT) Technology Support. The Protective Technologies (PT) organization is the Army's Technical Center for the DoD AT program, which is focused on preventing exploitation reverse engineering (RE) of U.S. systems lost or captured on the battlefield or sold via Foreign Military Sales (FMS) or Direct Commercial Sales (DCS). In support of this mission, PT's classified efforts are focused on AT Validation and Verification (V&V) activities with Army programs, AT/RE Lab facilities and equipment and AT/RE Lab assessments.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	3.638	4.094	4.362	-	4.362
Current President's Budget	3.498	4.094	4.254	-	4.254
Total Adjustments	-0.140	0.000	-0.108	-	-0.108
• Congressional General Reductions	-0.002	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.136	-			
• Adjustments to Budget Years	-0.002	-	-0.108	-	-0.108

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0605024A / Anti-Tamper Technology Support				Project (Number/Name) FB1 / Anti-Tamper Technology Support			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB1: Anti-Tamper Technology Support	-	3.498	4.094	4.254	-	4.254	7.017	6.384	6.571	6.698	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Anti-Tamper (AT) Technology Support. The Protective Technologies (PT) organization is the Army's Technical Center for the DoD AT program, which is focused on preventing exploitation reverse engineering (RE) of U.S. systems lost or captured on the battlefield or sold via Foreign Military Sales (FMS) or Direct Commercial Sales (DCS). In support of this mission, PT's classified efforts are focused on AT Validation and Verification (V&V) activities with Army programs, AT/RE Lab facilities and equipment and AT/RE Lab assessments.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Anti-Tamper (AT) Technology Support									3.498	4.094	4.254	
Description: AT is a DoD program that encompasses the systems engineering activities intended to prevent and/or delay exploitation of critical technologies in U.S. weapon systems. These activities involve the entire life-cycle of systems acquisition, including research, development, implementation, and testing of AT measures.												
FY 2018 Plans: Maintain the core team of subject matter experts (SMEs) available for this mission to support the development of and evaluate the AT designs for Army programs, and in support of that primary mission, conduct technical assessments of micro-electronic parts used in the electronic designs of a number of critical Army weapons systems.												
FY 2019 Plans: Will build and maintain the PT core team of subject matter experts (SMEs) available for this mission to support the development of and evaluate the AT designs for Army programs. In support of that primary mission, will continue to build state-of-the-art RE capabilities to facilitate technical assessments of micro-electronic parts used in the electronic designs of critical Army weapons systems.												
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 adjustment supports current senior leader strategy/priorities.												
Accomplishments/Planned Programs Subtotals									3.498	4.094	4.254	
C. Other Program Funding Summary (\$ in Millions)												
N/A												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0605024A / Anti-Tamper Technology Support	Project (Number/Name) FB1 / Anti-Tamper Technology Support
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0605024A / Anti-Tamper Technology Support						Project (Number/Name) FB1 / Anti-Tamper Technology Support			
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AT V&V Activities	Various	Redstone Arsenal & Prime Contract locations : Redstone Arsenal	-	1.267	Jun 2017	2.092	Jul 2018	2.040	Sep 2019	-		2.040	0.000	5.399	-
Subtotal			-	1.267		2.092		2.040		-		2.040	0.000	5.399	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AT/RE Lab Facilities & Equipment	Various	Redstone Arsenal, AL : Redstone Arsenal, AL	-	1.598	Sep 2017	1.230	Jul 2018	1.352	Sep 2019	-		1.352	0.000	4.180	-
Subtotal			-	1.598		1.230		1.352		-		1.352	0.000	4.180	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AT/RE Laboratory Assessments	Various	Redstone Arsenal, AL : Redstone Arsenal, AL	-	0.633	Jun 2017	0.772	Jul 2018	0.862	Sep 2019	-		0.862	0.000	2.267	-
Subtotal			-	0.633		0.772		0.862		-		0.862	0.000	2.267	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	3.498		4.094		4.254		-		4.254	0.000	11.846	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0605024A / Anti-Tamper Technology
Support

Project (Number/Name)

FB1 / Anti-Tamper Technology Support

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0605024A / <i>Anti-Tamper Technology Support</i>	Project (Number/Name) FB1 / <i>Anti-Tamper Technology Support</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AT V&V Activities	1	2017	4	2021
AT/RE Lab Facilities and Equipment	1	2017	4	2021
AT/RE Laboratory Assessments	1	2017	4	2021

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	19.969	15.738	16.022	2.548	18.570	12.740	9.023	4.952	2.198	Continuing	Continuing
ER2: Close Combat Technology	-	6.036	3.774	3.147	-	3.147	2.056	0.000	0.000	0.000	Continuing	Continuing
ER5: Indirect Fire and Fuze Technology	-	2.525	2.268	2.820	-	2.820	5.387	5.387	4.200	2.025	0.000	24.612
ER6: Direct Fire Technology	-	11.408	9.696	10.055	2.548	12.603	5.297	3.636	0.752	0.173	Continuing	Continuing

Note

In FY 2019, Program Element (PE) 0603639A, Project EL8, Lightweight Cartridge Case for Small Caliber, will transition to PE 0607131, Project ER6, Direct Fire Technology. This project is not a new start.

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 2019 funds resource improvements to the following programs: MK3A2 Offensive Hand Grenade, AN-M82A1 Obscuration Grenade, M82 Simulant Smoke Practice Grenade Improved Propellant Retainer, and M84 Stun Grenade Design.

Project ER5: The Indirect Fire and Fuze Technology project includes 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 Projects include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products.

This supports the identification, study, analysis, and development of fuzing technologies and Safe & Arm (S&A) devices in production and in the field. This project will implement technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The project addresses two major areas: (1) analysis and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce costs 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

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		PE 0607131A / Weapons and Munitions Product Improvement Programs				
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.						
FY 2019 will support modeling and simulation on medium caliber S&A modifications, will evaluate medium caliber prototype modifications against performance requirements, will conduct studies on mortar fuze design architecture with the latest Fuze safety guidelines to preclude component obsolescence, will conduct studies on hand grenade fuze to reduce the number of critical defects that will improve producibility and increase safety, will conduct engineering tests to prove-out electronic transceiver replacement prototypes for indirect fire and direct fire proximity fuzes, will conduct studies on artillery fuze electronic safe and arm designs for low cost safe and arm performance enhancements, and will evaluate optimized impact switch prototypes.						
Project ER6: The Direct Fire Technology 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. FY 2019 funds are used for a more lethal and safer design for 40mm grenades that will be built and tested. Warhead improvement and primer improvement for the 30mm Apache ammunition are also under development. A number of studies on potential improvements for training ammunition and environmentally friendly primers will be conducted. Potential improvements to 105mm and 120mm ammunition will be examined.						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		19.617	15.738	13.599	-	13.599
Current President's Budget		19.969	15.738	16.022	2.548	18.570
Total Adjustments		0.352	0.000	2.423	2.548	4.971
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• Adjustments to Budget Years		0.352	-	2.423	-	2.423
• Other Adjustments 1		-	-	0.000	2.548	2.548

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER2 / Close Combat Technology			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ER2: Close Combat Technology	-	6.036	3.774	3.147	-	3.147	2.056	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This 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 2019 funds will resource improvements to the following programs: MK3A2 Offensive Hand Grenade, AN-M8A1 Obscuration Grenade, M82 Simulant Smoke Practice Grenade Improved Propellant Retainer, and M84 Stun Grenade Design.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Claymore Force-on-Force Training Aids, Devices, Simulators, and Simulations (TADSS) Trainer								0.914	-	-	-	-
Description: Develop an improved Claymore Force-on-Force Training Aids, Devices, Simulators, and Simulations (TADSS) Trainer. The Claymore does not have a TADSS trainer with sight, sound & Multiple Integrated Laser Engagement System (MILES) capability. Development of an improved Claymore trainer will allow Claymore to be trained at Combat Training Centers (CTCs) and will provide more realistic and effective training for the user when they are training Claymore as an end item and when training Claymore as initiated by Spider.												
Title: MK3A2 Replacement, Offensive Hand Grenade Effort								2.481	0.867	0.182	-	0.182
Description: The Current MK3A2 Offensive Hand Grenade can expose the warfighter to toxic levels of asbestos and is restricted for use in Continental United States and Outside Continental United State (CONUS/OCONUS). The warfighter cannot safely employ this grenade. Alternate munitions do not satisfy user requirements for incapacitating the enemy. This effort incorporates modern materials and insensitive explosives to provide a safer, producible offensive grenade.												
FY 2018 Plans:												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs		Project (Number/Name) ER2 / Close Combat Technology		
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Both Production Qualification and Arena testing will be conducted as well as documentation for Type Classification (TC) (planned for 3QFY19). FY 2019 Base Plans: Complete TC/FMR documentation. FY 2018 to FY 2019 Increase/Decrease Statement: Decreased ARDEC support is required in FY19.					
Title: Countermeasure Flare Decoy Formulations Description: Improve the producibility of countermeasure (CM) decoy formulations in order to increase the production safety and functional reliability to protect aircraft against multiple threat systems. FY 2018 Plans: Improve the producibility of countermeasure (CM) decoy formulations and solutions in order to increase the production safety and functional reliability and performance improvement of solutions to protect aircraft against multiple threat systems. Develop prototype solutions and conduct testing. Effort will result in a production representative prototype countermeasure solutions. FY 2018 to FY 2019 Increase/Decrease Statement: Effort ends in FY18; no FY19 funds required.	0.548	1.635	-	-	-
Title: AN-M8A1 Obscuration Grenade Description: This effort supports the Type Classification/Production Prove Out of an improved obscurant grenade that provides the warfighter with screening performance of the legacy AN-M8 smoke grenade without exposing Soldiers to the toxic effects of that legacy grenade's Hexachloroethane smoke. Use of the AN-M8 Obscuration Grenade has been discontinued inside and outside the Continental United States (CONUS/ OCONUS) due to restrictions on the use of Hexachloroethane on the battlefield. The M83 training smoke grenade is currently used in lieu of the AN-M8 in both training and tactical operations. However, since the M83 does not give screening performance comparable to the legacy AN-M8 grenade, the current warfighter strategy is to use two M83 Obscuration Grenades in lieu of a single AN-M8. FY 2018 Plans: Requirement Validation and completion of the HX grenade fill Toxicity Study. Assessment of suitability of the legacy M201A1 Fuze for use with the proposed HX fill, and detailed review of the AN-M8 Technical Data	0.192	1.272	1.266	-	1.266

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs	Project (Number/Name) ER2 / Close Combat Technology				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Package (TDP) for adequacy to support future production. Also, development of a plan to facilitize Pine Bluff Arsenal (PBA) for future production of the M8A1. FY 2019 Base Plans: Perform Energetic Material Qualification Testing (EMQ) testing. Review/Finalize Technical Data Package. Coordinate with Pine Bluff Arsenal (PBA) to ensure PBA programs required production facility upgrades, in synchronization with PM CCS program objectives, to establish an AN-M8A1 production capability that currently does not exist. FY 2018 to FY 2019 Increase/Decrease Statement: Reduced ARDEC support required.						
Title: M84 Stun Grenade Design Description: The M84 Stun Grenade was previously procured using a performance specification acquisition approach. Based on upcoming buys due to increased quantities, the current detailed TDP needs to be evaluated to ensure a consistent design. FY 2019 Base Plans: Work to complete TDP validation and testing is required, as well as complete TC/FMR activities. FY 2018 to FY 2019 Increase/Decrease Statement: New improvement effort funded in FY19; not previously funded.		-	-	1.080	-	1.080
Title: M82 Simulant Smoke Practice Grenade Description: The M82 encountered performance issues during the last production as a result of the less than optimal design for the base. Developing a new base design that minimizes any leak paths and facilitates the metal clip contact surface with the launcher will greatly improve the producibility and reliability of the grenade. This effort consists of the development and prove out of the base design. FY 2019 Base Plans: Develop base design, procure mold and parts for testing. FY 2018 to FY 2019 Increase/Decrease Statement: New improvement effort funded in FY19; not previously funded.		-	-	0.619	-	0.619
Title: FASCAM		1.901	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>		Project (Number/Name) ER2 / <i>Close Combat Technology</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: This effort supports the development of a new Deep Terrain Shaping Obstacle (DTSO). The current DTSO in the U.S. inventory has a life expectancy of 36 years (losing capability in 2025). The methods used to make this determination are unknown. Testing effort is to determine the actual life expectancy and effectiveness of the current DTSO system in order to decide when a replacement capability needs to be fielded. In parallel, evaluation the technical data package and determining the cost of producing additional units of the current DTSO.						
Accomplishments/Planned Programs Subtotals		6.036	3.774	3.147	-	3.147
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy The strategy for the MK3A2 Offensive Hand Grenade is to develop, test and qualify a new design that eliminates the toxic hazards and provides the required performance for the user in FY19. Follow-on procurement efforts will be competitive pending market research. The strategy for the AN-M8A1 is to develop a safer smoke for use by the soldiers that meet the existing requirements. Once the smoke fill is developed and qualified, the plan is to examine the potential use of adding this capability to Pine Bluff Arsenal. The strategy for the M84 Stun Grenade is to complete the development of the technical data package and test/qualify the design prior to being used in future competitive pending the results of a market survey. The M82 program is updating the design of specific parts to make it more producible and will be proving out the design for use in future production efforts.						
E. Performance Metrics N/A						

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER2 / Close Combat Technology					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MK3A2 Replacement, Offensive Hand Grenade	MIPR	PM CCS : Picatinny Arsenal, NJ	-	-		0.090		-		-		-	Continuing	Continuing	-
AN-M8A1 Enhanced Obscuration Grenade	MIPR	PM CCS : Picatinny Arsenal, NJ	-	-		0.150		-		-		-	Continuing	Continuing	-
M82 Simulant Smoke Practice Grenade Improved Propellant Retainer	MIPR	PM CCS : Picatinny Arsenal, NJ	-	-		-		0.044	Jan 2019	-		0.044	Continuing	Continuing	-
M84 Stun Grenade	MIPR	PM-CCS : Picatinny Arsenal, NJ	-	-		-		0.048	Jan 2019	-		0.048	Continuing	Continuing	-
Subtotal			-	-		0.240		0.092		-		0.092	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Claymore Force-on-Force TADSS Trainer - Design, Develop and Deliver a Production Prototype	MIPR	ARDEC : Picatinny Arsenal, NJ	0.353	0.914	May 2017	-		-		-		-	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	C/FFP	Battelle Memorial Institute : Columbus, OH	0.359	0.189	Apr 2017	-		-		-		-	Continuing	Continuing	-
M82 Simulant Smoke Practice Grenade Improved Propellant Retainer	MIPR	ARDEC : Picatinny Arsenal, NJ	-	-		-		0.381	Jan 2019	-		0.381	Continuing	Continuing	-
Subtotal			0.712	1.103		-		0.381		-		0.381	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs						Project (Number/Name) ER2 / Close Combat Technology			
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MK3A2 Replacement, Offensive Hand Grenade	MIPR	ARDEC : Picatinny Arsenal	-	1.227	May 2017	0.660		0.182	Dec 2018	-		0.182	Continuing	Continuing	-
Countermeasure Flare Decoy Formulations	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.269	Aug 2017	0.415		-		-		-	Continuing	Continuing	-
Countermeasure Flare Decoy Formulations	MIPR	CERDEC Flight Testing Support : Lakehurst, NJ	-	-		0.170		-		-		-	Continuing	Continuing	-
AN-M8A1 Enhanced Obscuration Grenade	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.125	Aug 2017	0.413		0.429	Jan 2019	-		0.429	Continuing	Continuing	-
AN-M8A1 Enhanced Obscuration Grenade	MIPR	ECBC : Edgewood, MD	-	-		0.387		0.370	Jan 2019	-		0.370	Continuing	Continuing	-
AN-M8A1 Enhanced Obscuration Grenade	MIPR	Pine Bluff : Pine Bluff Arsenal	-	0.067	Jan 2017	0.322		0.244	Jan 2019	-		0.244	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	MIPR	Defense Information Technical Center : Fort Belvoir, VA	-	0.007	Mar 2017	-		-		-		-	Continuing	Continuing	-
M82 Simulant Smoke Practice Grenade Improved Propellant Retainer	MIPR	ECBC : Edgewood, MD	-	-		-		0.095	Jan 2019	-		0.095	Continuing	Continuing	-
M82 Simulant Smoke Practice Grenade Improved Propellant Retainer	MIPR	Pine Bluff Arsenal : PBA, AR	-	-		-		0.099	Mar 2019	-		0.099	Continuing	Continuing	-
M84 Stun Grenade	MIPR	ARDEC : Picatinny Arsenal, NJ	-	-		-		0.832	Jan 2019	-		0.832	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	MIPR	DTIC : Ft. Belvoir, VA	-	0.001	Oct 2017	-		-		-		-	Continuing	Continuing	-
FASCAM Study - Mine Design and Producibility Review	C/CPFF	Savit : Rockaway, NJ	-	0.401	Aug 2017	-		-		-		-	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER2 / Close Combat Technology					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FASCAM Study - Gator Landmine System Reliability Review	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.440		-		-		-		-	Continuing	Continuing	-
FASCAM Study - GATOR Drop Test	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.160		-		-		-		-	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	MIPR	Nova Tech : NJ	-	0.104	Aug 2017	-		-		-		-	Continuing	Continuing	-
FASCAM Study - YPG Gator Component Testing	MIPR	Yuma Proving Ground (YPG) : Yuma, AZ	-	0.383		-		-		-		-	Continuing	Continuing	-
FASCAM Study - ARDEC Gator Component Testing	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.290		-		-		-		-	Continuing	Continuing	-
FASCAM Study - ARDEC Gator Component Testing	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.227		-		-		-		-	Continuing	Continuing	-
Subtotal			-	3.701		2.367		2.251		-		2.251	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MK3A2 Replacement, Offensive Hand Grenade	MIPR	Army Test and Evaluation Command : Aberdeen Proving Grounds, MD	-	0.626	Aug 2017	-		-		-		-	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	MIPR	Fort Hood, Tx : TBD	-	-		0.117		-		-		-	Continuing	Continuing	-
Countermeasure Flare Decoy Formulations	MIPR	Naval Air Warfare Center Aircraft Division : Patuxent River, MD	-	0.150	Sep 2017	0.300		-		-		-	Continuing	Continuing	-
Countermeasure Flare Decoy Formulations	MIPR	Naval Air Warfare Center Weapons	-	0.129	Sep 2017	0.750		-		-		-	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER2 / Close Combat Technology					
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Division - Flight Testing : China Lake, CA													
MK3A2 Replacement, Offensive Hand Grenade	MIPR	ATEC : Aberdeen Proving Grounds, NJ	-	0.147	Jan 2018	-		-		-		-	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	MIPR	Dugway Proving Grounds : UT	-	0.024	Aug 2017	-		-		-		-	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	MIPR	Various : Various	-	0.116	Jan 2018	-		-		-		-	Continuing	Continuing	-
MK3A2 Replacement, Offensive Hand Grenade	MIPR	Public Health Command : MD	-	0.040	Jan 2018	-		-		-		-	Continuing	Continuing	-
AN-M8A1 Enhanced Obscuration Grenade	MIPR	ARDEC : Picatinny Arsenal. NJ	-	-		-		0.112	Nov 2018	-		0.112	Continuing	Continuing	-
AN-M8A1 Enhanced Obscuration Grenade	MIPR	Pine Bluff Arsenal (PBA) : Pine Bluff Arsenal, AR	-	-		-		0.111	Nov 2018	-		0.111	Continuing	Continuing	-
M84 Stun Grenade	MIPR	TBD : TBD	-	-		-		0.200	Mar 2019	-		0.200	Continuing	Continuing	-
Subtotal			-	1.232		1.167		0.423		-		0.423	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.712	6.036		3.774		3.147		-		3.147	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0607131A / Weapons and Munitions
Product Improvement Programs

Project (Number/Name)

ER2 / Close Combat Technology

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Claymore Force-on-Force TADSS Trainer																												
Multiple Integrated Laser Engagement Sys (MILES) Emitting																												
Non-Pyro Claymore Simulation Design and Test																												
Critical Design Review																												
Preliminary Drop and Loose Cargo Test																												
Systems Verification Test																												
Environmental Testing																												
Delivery 1 - Production Representative Prototypes																												
MK3A2 Replacement, Offensive Hand Grenade Effort																												
Produce Test Quantity																												
Production Qualification Testing																												
Production Qualification Testing - 2																												
Testing (IM, E3)																												

UNCLASSIFIED

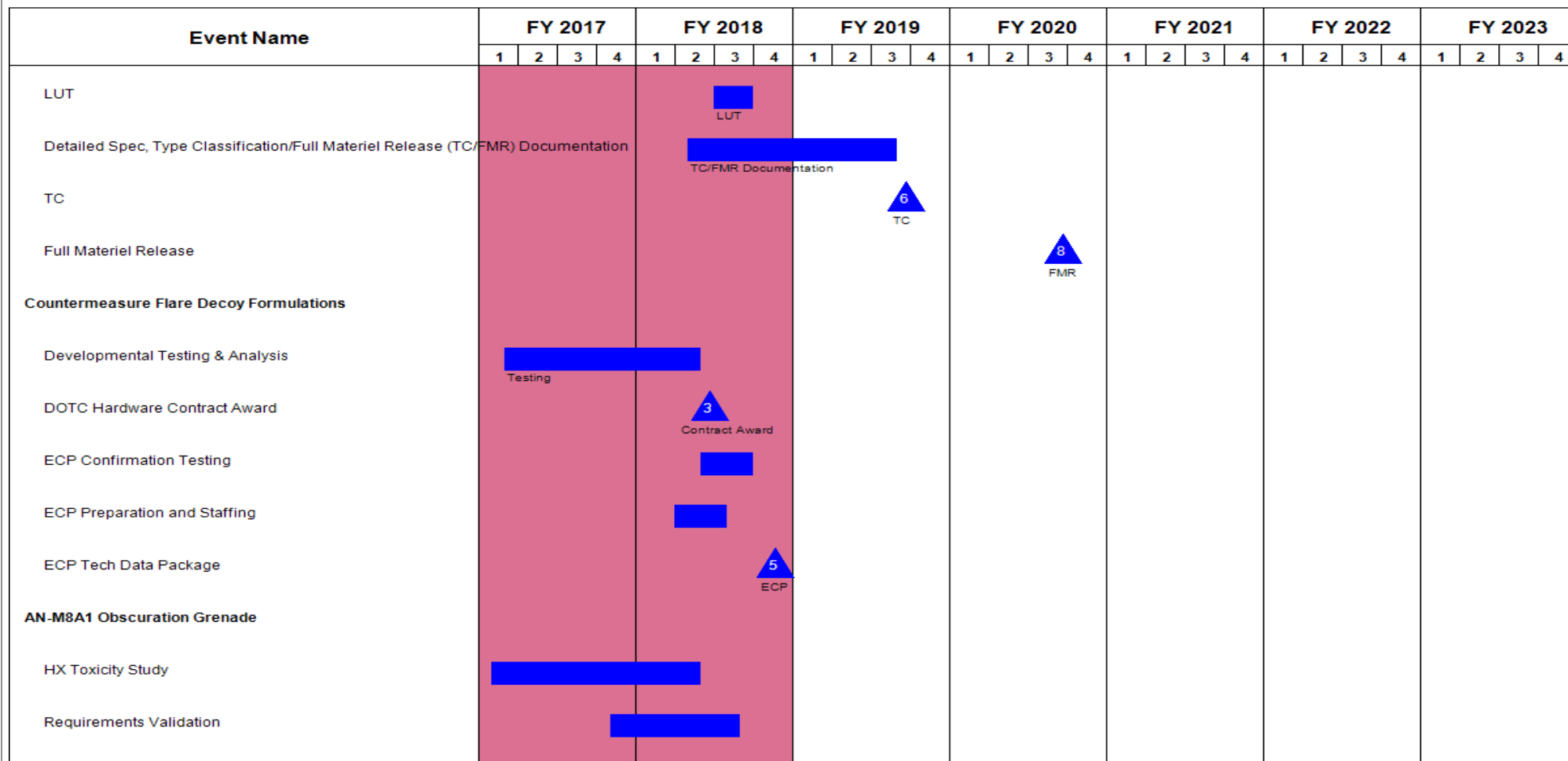
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0607131A / Weapons and Munitions
Product Improvement Programs

Project (Number/Name)
ER2 / Close Combat Technology



UNCLASSIFIED

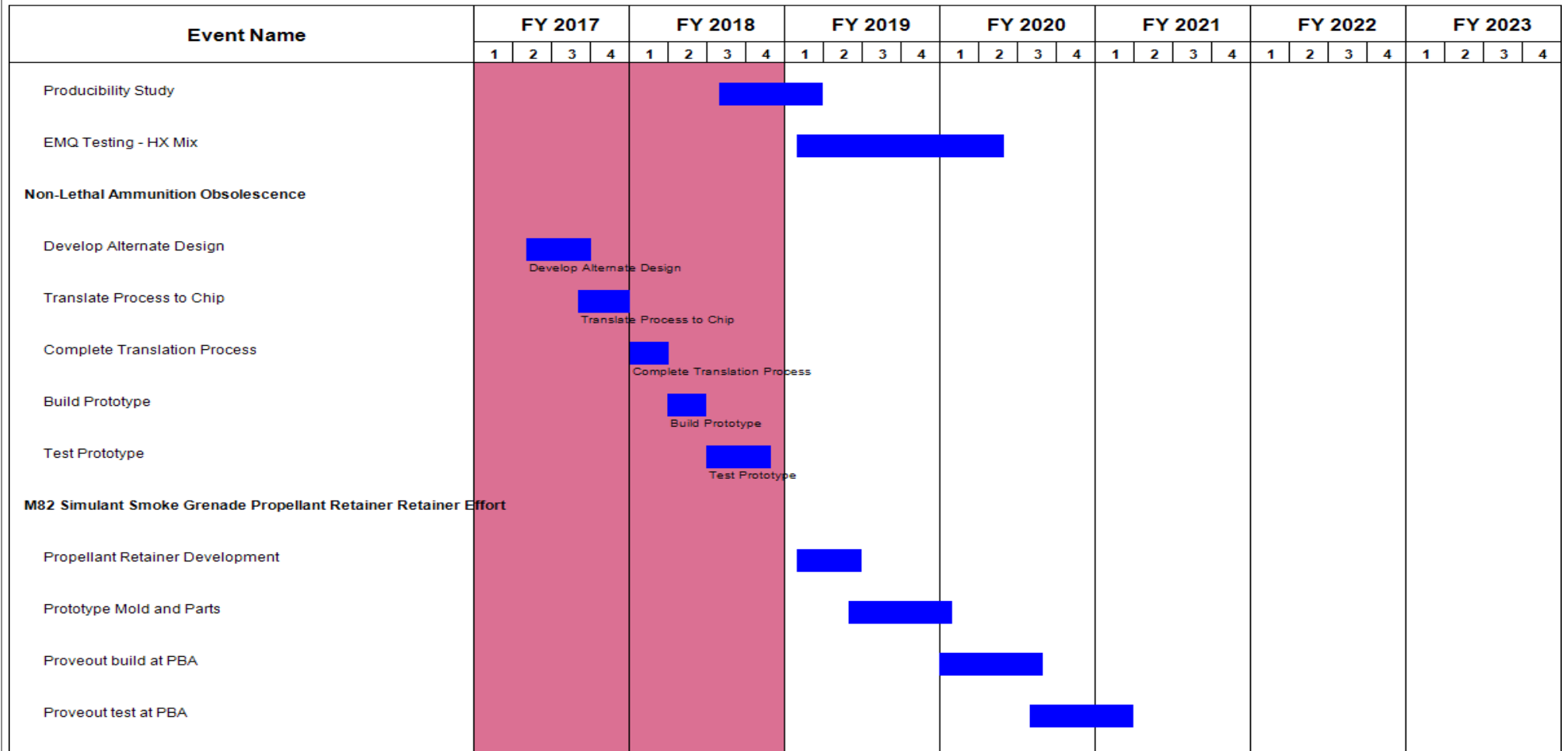
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0607131A / *Weapons and Munitions
Product Improvement Programs*

Project (Number/Name)
ER2 / *Close Combat Technology*



UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>		Project (Number/Name) ER2 / <i>Close Combat Technology</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Update TDP																												
M84 Stun Grenade																												
TDP Development & Testing																												
Type Classification																												
FASCAM Study																												
Mine Design and Producibility Review																												
Gator Landmine System Dynamic Reliability Review																												
Gator Laboratory Reliability Testing																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>	Project (Number/Name) ER2 / <i>Close Combat Technology</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Claymore Force-on-Force TADSS Trainer	1	2017	4	2020
Fireset Board Design and Test	1	2016	3	2016
Multiple Integrated Laser Engagement Sys (MILES) Emitting Unit Design and Test	1	2016	1	2017
Non-Pyro Claymore Simulation Design and Test	1	2016	2	2017
Early User Assessment	1	2016	1	2016
Critical Design Review	2	2017	2	2017
Fort Leonard Wood and Benning Demonstration	4	2016	4	2016
Preliminary Drop and Loose Cargo Test	2	2017	2	2017
Systems Verification Test	1	2018	1	2018
Environmental Testing	4	2017	1	2018
Delivery 1 - Production Representative Prototypes	3	2018	3	2018
MK3A2 Replacement, Offensive Hand Grenade Effort	1	2017	4	2020
Produce Test Quantity	2	2016	2	2017
Production Qualification Testing	3	2016	1	2017
Production Qualification Testing - 2	4	2017	1	2018
Testing (IM, E3)	3	2017	3	2018
LUT	3	2018	3	2018
Detailed Spec, Type Classification/Full Materiel Release (TC/FMR) Documentation	2	2018	3	2019
TC	3	2019	3	2019
Full Materiel Release	3	2020	3	2020
Countermeasure Flare Decoy Formulations	1	2017	4	2020
Developmental Testing & Analysis	1	2017	2	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs		Project (Number/Name) ER2 / Close Combat Technology	
		Start		End	
Events	Quarter	Year	Quarter	Year	
DOTC Hardware Contract Award	2	2018	2	2018	
ECP Confirmation Testing	2	2018	3	2018	
ECP Preparation and Staffing	2	2018	3	2018	
ECP Tech Data Package	4	2018	4	2018	
AN-M8A1 Obscuration Grenade	1	2017	4	2020	
HX Toxicity Study	1	2017	2	2018	
Requirements Validation	4	2017	3	2018	
Producibility Study	3	2018	1	2019	
EMQ Testing - HX Mix	1	2019	2	2020	
Non-Lethal Ammunition Obsolescence	1	2017	4	2020	
Develop Alternate Design	2	2017	3	2017	
Translate Process to Chip	3	2017	4	2017	
Complete Translation Process	1	2018	1	2018	
Build Prototype	2	2018	2	2018	
Test Prototype	3	2018	4	2018	
M82 Simulant Smoke Grenade Propellant Retainer Retainer Effort	1	2017	4	2020	
Propellant Retainer Development	1	2019	2	2019	
Prototype Mold and Parts	2	2019	1	2020	
Proveout build at PBA	1	2020	3	2020	
Proveout test at PBA	3	2020	1	2021	
Update TDP	2	2020	2	2021	
M84 Stun Grenade	1	2017	4	2020	
TDP Development & Testing	1	2019	2	2020	
Type Classification	1	2020	1	2020	
FASCAM Study	3	2017	3	2018	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs		Project (Number/Name) ER2 / Close Combat Technology	
		Start		End	
Events		Quarter	Year	Quarter	Year
Mine Design and Producibility Review		4	2017	3	2018
Gator Landmine System Dynamic Relilability Review		1	2018	2	2018
Gator Laboratory Reliability Testing		3	2017	1	2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER5 / Indirect Fire and Fuze Technology			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ER5: Indirect Fire and Fuze Technology	-	2.525	2.268	2.820	-	2.820	5.387	5.387	4.200	2.025	0.000	24.612
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Indirect Fire and Fuze Technology project includes 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 Projects include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products.

This supports the identification, study, analysis, and development of fuzing technologies and Safe & Arm (S&A) devices in production and in the field. This project will implement technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The project addresses two major areas: (1) analysis and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce costs 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.

FY 2019 will support modeling and simulation on medium caliber S&A modifications, will evaluate medium caliber prototype modifications against performance requirements, will conduct studies on mortar fuze design architecture with the latest Fuze safety guidelines to preclude component obsolescence, will conduct studies on hand grenade fuze to reduce the number of critical defects that will improve producibility and increase safety, will conduct engineering tests to prove-out electronic transceiver replacement prototypes for indirect fire and direct fire proximity fuzes, will conduct studies on artillery fuze electronic safe and arm designs for low cost safe and arm performance enhancements, and will evaluate optimized impact switch prototypes.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Fuze Technology Improvements (FTI)	0.625	1.818	2.820	-	2.820
Description: Activities include maturation, validation, and risk reduction of fuze technology and fuze component alternatives to increase sources of supply, improve performance, increase safety, and lower cost. Activities also include integration of fuze initiation improvements to increase reliability and lower fuze costs, evaluation of fuze					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs		Project (Number/Name) ER5 / Indirect Fire and Fuze Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
electronic upgrades to improve safety and increase performance reliability, assessment of inductive fuze setting improvements to lower costs, and evaluation of medium caliber fuze safe and arm improvements for increased safety.						
FY 2018 Plans: Block Upgrades: Conduct engineering tests to prove-out the mortar fuze electronics upgrades. Conduct studies on medium caliber fuze safe and arm features to improve safety and increase throughput. Conduct tests to prove-out mortar fuze impact switch upgrades.						
Analysis/Risk Mitigation: Conduct evaluations on transceiver component replacement prototype devices for indirect fire and direct fire fuzes. Conduct studies on Microelectromechanical systems (MEMS) based impact switches for medium and large caliber applications for reduced cost and improved producibility.						
FY 2019 Base Plans: Block Upgrades: Will conduct modeling and simulation on medium caliber S&A design modifications, will evaluate medium caliber prototype modifications against performance requirements, will conduct studies on hand grenade fuze to reduce the number of critical defects that will improve producibility and increase safety, will conduct studies on artillery fuze electronic safe and arm designs for low cost S&A performance enhancements.						
Analysis / Risk Mitigation: Will conduct engineering tests to prove-out electronic transceiver replacement prototypes for indirect fire and direct fire proximity fuzes, will evaluate optimized impact switch prototypes, will conduct studies on mortar fuze design architecture with the latest fuze safety guidelines to preclude component obsolescence.						
FY 2018 to FY 2019 Increase/Decrease Statement: There is an increase in funding from FY 2018 to FY 2019 due to three additional Fuze Technology Integration (FTI) projects that have been added to the program portfolio in FY 2019.						
Title: 81mm M821A3E1 HE IM Mortar Program		1.900	0.450	-	-	-
Description: Activities include the maturation of the lethality through modeling and simulation as well as testing to ensure the 81mm will meet all user requirements. Activities also include ballistic testing to ensure safe and effective firing of the 81mm Mortar. This will also include modeling to ensure the contour of the round will ensures stable interior and exterior ballistics. Activities will also focus on maturation of the manufacturability						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>		Project (Number/Name) ER5 / <i>Indirect Fire and Fuze Technology</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
of the round to ensure unit cost is as low as possible, this will be executed through loading studies and other Design of Experiments (DOE).						
<i>FY 2018 Plans:</i> Program completes safety/environmental test and analysis. Activities will include full arena testing and analysis of test data.						
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> In FY 2018, the M821A3E1 Program is transitioning to PAA dollars. Zero RDT&E dollars are required in FY 2019 for this effort.						
Accomplishments/Planned Programs Subtotals		2.525	2.268	2.820	-	2.820
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Fuze Technology Improvement (FTI) will improve current production munitions by exploiting existing fuzing technologies and inserting them into current fielded and/or production fuzes, providing safer, more producible, and more lethal fuzing solutions. FTI develops second source suppliers and resolves component obsolescence issues to mitigate risk and prevent production interruptions in order to continue to provide safer, more reliable munitions for the Warfighter with significant risk reduction to production fuzes also benefiting the U.S. Taxpayer. The effort is a continuation of studies, analysis, evaluations, 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 component obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The Fuze Technology Integration Program utilizes both the DoD Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) initiatives to produce prototypes of the fuze technologies and devices, and FAR-based contracts to implement proven efforts into production fuzes.						
E. Performance Metrics						
N/A						

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER5 / Indirect Fire and Fuze Technology					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
40mm Fuze Improvements	SS/FFP	AMTEC Corporation : Janesville, WI	-	-		0.100	Mar 2018	0.200	Sep 2019	-		0.200	0.000	0.300	0.100
Fuze Technology Development	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	0.200	0.152	Feb 2017	1.060	Dec 2017	1.481	Oct 2018	-		1.481	0.000	2.893	-
81mm M821A3E1 HE IM Mortar Prototyping	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	-	1.040	Jan 2017	-		-		-		-	0.000	1.040	-
Subtotal			0.200	1.192		1.160		1.681		-		1.681	0.000	4.233	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Technology Integration Engineering Support	MIPR	Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	1.136	0.473	Dec 2016	0.658	Nov 2017	0.819	Nov 2018	-		0.819	0.000	3.086	-
M821A3E1 Engineering Support	MIPR	Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	-	0.491	Dec 2016	-		-		-		-	0.000	0.491	-
Subtotal			1.136	0.964		0.658		0.819		-		0.819	0.000	3.577	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs						Project (Number/Name) ER5 / Indirect Fire and Fuze Technology			
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FTI Ballistic Testing	MIPR	Army Test and Evaluation Command (ATEC) : Yuma Proving Ground, AZ	0.100	-		-		0.320	Mar 2019	-		0.320	0.000	0.420	-
M821A3E1 Full Arena Testing and Analysis	MIPR	Army Research Lab : Aberdeen Proving Ground, MD	-	-		0.450	Mar 2018	-		-		-	0.000	0.450	-
M821A3E1 HE IM Mortar Testing	MIPR	Army Test and Evaluation Command (ATEC) : Yuma Proving Ground, AZ	-	0.369	Jun 2017	-		-		-		-	0.000	0.369	-
Subtotal			0.100	0.369		0.450		0.320		-		0.320	0.000	1.239	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1.436	2.525		2.268		2.820		-		2.820	0.000	9.049	N/A
Remarks															

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>	Project (Number/Name) ER5 / <i>Indirect Fire and Fuze Technology</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
M734A1/M783 Delay Primer Improvements	■																											
M734A1 Electronics Upgrade	■	■	■	■	■	■	■	■	■	■	■	■																
M734A1/M783 Impact Switch Upgrade	■	■	■	■																								
40mm M550 Setback Spring Interface Improvement	■	■	■	■																								
Fuze Initialization Improvement	■	■	■	■																								
Replacement of Obsolete Prox Electronic Component for Direct In	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■												
Mortar Fuze Microcontroller Replacement													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Power Source Improvements													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
MEMS G-Switch Producibility Improvements													■	■	■	■												
40mm Fuze Safety Improvements													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Electronic Safe and Arm Indirect Fire Enhancements													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Hand Grenade Fuze Improvements													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Training Fuze Product Improvements																	■	■	■	■	■	■	■	■	■	■	■	■

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018													
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs										Project (Number/Name) ER5 / Indirect Fire and Fuze Technology									
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Airburst Technologies for Munitions																													
Alternate Critical Fuzing Component Studies																													
Improved Multi-Option Fuze Product Improvements																													
Lethality Modeling and Improvement																													
Charge Establishment Testing and Analysis																													
IMX-104 Loading Study (DOE)																													
Fragmentation Pack Mold Design and Production Prove-out																													
Strength Of Design Testing																													
Production of PQT Samples																													
Conduct PQT to support MS-C and TC-LP																													
Evaluation of PQT Data																													
Assemble MS-C and TC-LP Packaging																													
Full Arena Testing and Analysis																													

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>	Project (Number/Name) ER5 / <i>Indirect Fire and Fuze Technology</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
M734A1/M783 Delay Primer Improvements	1	2016	1	2017
M734A1 Electronics Upgrade	1	2016	1	2019
M734A1/M783 Impact Switch Upgrade	1	2016	4	2017
40mm M550 Setback Spring Interface Improvement	1	2016	1	2018
Fuze Initialization Improvement	1	2016	3	2017
Replacement of Obsolete Prox Electronic Component for Direct/Indirect Fire Fuzes	1	2017	4	2020
Mortar Fuze Microcontroller Replacement	1	2019	4	2022
Power Source Improvements	1	2020	4	2022
MEMS G-Switch Producibility Improvements	1	2018	4	2020
40mm Fuze Safety Improvements	1	2018	4	2021
Electronic Safe and Arm Indirect Fire Enhancements	1	2019	4	2022
Hand Grenade Fuze Improvements	1	2019	4	2022
Training Fuze Product Improvements	1	2021	4	2024
Airburst Technologies for Munitions	1	2021	4	2024
Alternate Critical Fuzing Component Studies	1	2022	4	2024
Improved Multi-Option Fuze Product Improvements	1	2023	4	2025
Lethality Modeling and Improvement	3	2016	1	2017
Charge Establishment Testing and Analysis	2	2017	4	2017
IMX-104 Loading Study (DOE)	2	2017	3	2017
Fragmentation Pack Mold Design and Production Prove-out	2	2017	3	2017
Strength Of Design Testing	4	2017	4	2017
Production of PQT Samples	4	2017	1	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018	
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs		Project (Number/Name) ER5 / Indirect Fire and Fuze Technology	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER6 / Direct Fire Technology			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ER6: Direct Fire Technology	-	11.408	9.696	10.055	2.548	12.603	5.297	3.636	0.752	0.173	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note												
In FY 2019, Program Element (PE) 0603639A, Project EL8, Lightweight Cartridge Case for Small Caliber, will transition to PE 0607131, Project ER6, Direct Fire Technology. This project is not a new start.												
A. Mission Description and Budget Item Justification												
The Direct Fire Technology 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. FY 2019 funds are used for a more lethal and safer design for 40mm grenades that will be built and tested. Warhead improvement and primer improvement for the 30mm Apache ammunition are also under development. A number of studies on potential improvements for training ammunition and environmentally friendly primers will be conducted. Potential improvements to 105mm and 120mm ammunition will be examined.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Lightweight Ammunition								-	0.855	3.000	-	3.000
Description: Develop, demonstrate, and qualify a Lightweight Small Caliber Ammunition (LSCA) 7.62mm, 5.56mm, and .50 caliber capability that will provide an ammunition weight savings of ten to fifty percent to the M2, M240, M4A1, and M249 gunner, assistant gunner, and ammo bearer.												
FY 2018 Plans:												
Phase II Contractors are developing a preliminary lightweight cartridge design. The Government is completing the Systems Requirement Review and Preliminary Design Review then beginning Pre-Validation Testing.												
FY 2019 Base Plans:												
Phase II contractor will continue to develop preliminary lightweight cartridge design. The government will conduct Pre-Validation Testing (PVT) and a Limited User Evaluation (LUE) prior to down-selecting to a single contractor for Phase III award.												
FY 2018 to FY 2019 Increase/Decrease Statement:												
Funding needed to continue research and development of lightweight ammunition in FY 2019.												
Title: Lead Free Primer								1.868	1.500	0.755	-	0.755

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs	Project (Number/Name) ER6 / Direct Fire Technology				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Automate and Integrate environmental friendly lead free primary explosives within the small caliber family of ammunition. Addresses health concerns of lead intake during firing by removing lead styphnate from small caliber primers. Automated pilot line combined with new mix reduces human exposure, improves quality, improves safety and reduces environmental waste in manufacturing process. FY 2018 Plans: FY 2018 funding completes the build for the 5.56mm primer qualification and initiates the 7.62mm and .50 caliber pilot lines. FY 2018 finalizes the Technical Data Packages for the three calibers and completes the EMQB process. Finally, the program refines and optimizes the automation of the manufacturing process. FY 2019 Base Plans: FY 2019 funding will provide the ability to conduct primer qualification testing on 5.56mm primers, complete the build for the 7.62mm primer qualification, and begin the build for Caliber .50 primer qualification. The program will continue to work through the transition of the automated primer manufacturing process to Lake City Army Ammunition Plant (LCAAP), as well as refinement and optimization of the automated process. FY 2018 to FY 2019 Increase/Decrease Statement: Funding needed to continue research and development of Green Primer ammunition in FY 2019.						
Title: Support Sniper Ammunition Integration Into Army Standard Sniper Weapons Description: Modify existing sniper ammunition to support integration into new Army standard sniper weapons. Maintain compatibility with legacy sniper weapons while improving operational availability. FY 2018 Plans: FY 2018 work continues to test and evaluate sniper ammunition improvements. FY 2019 Base Plans: FY 2019 work will continue to test and evaluate sniper ammunition improvements. FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding needed for continued sniper ammunition development.		0.243	1.360	0.500	-	0.500
Title: Support Improvements in Direct Fire Propulsion Systems Description: Improve Direct Fire Propulsion Systems to increase user survivability. FY 2018 Plans:		0.117	0.500	0.500	-	0.500

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs		Project (Number/Name) ER6 / Direct Fire Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 work continues to explore additional sources of supply in the National Technology and Industrial Base (NTIB) to reduce the dependence on foreign suppliers and pursue improvements to address temperature sensitivities of energetics and primer ballistics. Work also includes technology improvements to reduce muzzle flash and increase precision by reducing dispersion of the M80A1, M118LR, and other sniper compatible ammunition. FY 2019 Base Plans: FY 2019 work will continue to explore additional sources of supply in the NTIB and pursue improvements to address temperature sensitivities of energetics and primer ballistics. Efforts will also be made to continue to explore technology improvements to reduce muzzle flash and increase precision by reducing dispersion of the M80A1, M118LR, and other sniper compatible ammunition.						
Title: Improved M789 Lethality, Warhead Fragmentation Improvement Description: Improve 30mm M789 warhead lethality by performing trade studies and implementing advanced warhead and fuze technologies to promote more efficient fragmentation. FY 2018 Plans: FY 2018 work supports the completion and implementation of trade studies following testing, Technical Data Packages (TDP) updating, and preparing for manufacturability and qualification build. FY 2019 Base Plans: FY 2019 work will continue to support the completion and implementation of trade studies following testing, TDP updating, and preparing for manufacturability and qualification build. Funding will also support the initial build to be used to for qualification testing. FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding needed for continued M789 lethality development.		0.020	1.000	2.900	-	2.900
Title: M433 Warhead Improvement Description: 40mm: Improve lethality (fragmentation) of the M433 grenade. FY 2018 Plans:		3.360	1.570	0.500	-	0.500

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs	Project (Number/Name) ER6 / Direct Fire Technology				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 work finishes Pre Production Qualification Tests (PPQT), perform Materiel Release (MR)/Engineering Change Proposal (ECP) actions, and support contracting actions to transition new Technical Data Package (TDP) into Full Rate Production (FRP). FY 2019 Base Plans: FY 2019 work will complete ECP and TDP actions. FY 2019 work will also complete qualification testing. FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding needed to finalize the development of the M433E1 round.						
Title: 20mm C-RAM Ammo Improvement Description: As per Joint Urgent Operational Needs Statement (JUONS) CC-0562 for enhanced lethality, M940 20mm ammunition requires research and development efforts to increase the lethality effects of the Land-based Phalanx Weapon System (LPWS) against larger rocket threats. This effort will increase the current capability of the M940 by incorporating design features to provide improvement to probability of Kill. FY 2018 Plans: FY 2018 funding continues to support the design and testing of multiple improved M940 concepts aimed at quickly providing enhanced lethality effects against large rocket threats. Concurrently, an optimized concept is being designed and tested to provide a more permanent solution with enhanced lethality and significant improvement to probability of kill. FY 2019 Base Plans: FY 2019 funding will continue to support the design and development of an optimized M940 concept to achieve enhanced lethality and an improved probability of kill. FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding needed for additional M940 research and development.		5.800	0.580	0.250	-	0.250
Title: 30x173mm and 30x113mm Airburst Munitions Description: Increase anti-personnel lethality and lethality within Military Operations in an Urban Terrain (MOUT) structures compared to current Army medium caliber solutions. FY 2018 Plans: FY 2018 funding supports the study of the 30x173mm airburst capable cartridge and programming/communication unit which interfaces with Stryker Infantry Carrier Vehicle (ICV) and/or Army Future Fighting		-	0.653	0.250	-	0.250

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs	Project (Number/Name) ER6 / Direct Fire Technology				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Vehicles. Funding supports the 30x113 airburst capable cartridge and unit programming. Efforts will try to establish commonality for these key systems. FY 2019 Base Plans: FY 2019 funding will continue to support the study of the 30x173mm airburst capable cartridge and programming/communication unit which interfaces with Stryker Infantry Carrier Vehicle (ICV) and/or Army Future Fighting Vehicles. Funding will support the 30x113mm cartridge development for the Apache aircraft and other Army weapon platforms. FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding needed for additional research, development, and testing of the munitions.						
Title: Tank Ammunition Improvements Description: Develop and test potential improvements to 105mm and 120mm gun system ammunition. FY 2018 Plans: FY 2018 work includes various efforts for 105mm and 120mm tank ammunition, including chemical tracer improvements, combustible cartridge case design and fabrication improvements, and non-developmental cartridge testing for the M68 cannon. FY 2019 Base Plans: FY 2019 work will continue to support various efforts for 105mm and 120mm tank ammunition, including tracer improvements, combustible cartridge case design and fabrication improvements, and non-developmental cartridge testing for the M68 cannon. Additionally, preliminary design work will be conducted to improve the M1002 training cartridge to an acceptable training cartridge for the new 120mm Advanced Multipurpose (AMP) cartridge. FY 2018 to FY 2019 Increase/Decrease Statement: Additional funding in FY 2019 needed to continue development of combustible cartridge case on other large caliber enhancements.		-	1.450	0.250	-	0.250
Title: 40mm M576 Improvement Study Description: 40mm M576 product improvement will provide the warfighter with the ability to quickly defeat closed-in personnel targets FY 2018 Plans:		-	0.178	0.200	-	0.200

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs	Project (Number/Name) ER6 / Direct Fire Technology				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 funding supports efforts to baseline the current M576 capabilities and explore improved candidate designs. FY 2019 Base Plans: FY 2019 funding will be used to continue to explore improved candidate designs. FY 2018 to FY 2019 Increase/Decrease Statement: Additional funding in FY 2019 will support M576 baseline and exploration of enhanced designs.						
Title: Medium Caliber Single Crystal Tungsten Evaluation Description: Testing will be conducted to determine the effectiveness of single crystal tungsten penetrators against armored targets. FY 2018 Plans: FY 2018 work includes testing to determine the effectiveness of single crystal tungsten penetrators against armored targets. FY 2019 Base Plans: FY 2019 work will continue to include testing to determine the effectiveness of single crystal tungsten penetrators against armored targets.		-	0.050	0.050	-	0.050
Title: M550 Fuze Improvement Description: Replace 40mm M550 single stage fuze with a dual spinlock fuze to improve safety and performance reliability. FY 2019 Base Plans: FY 2019 funding will be used to acquire and study M550 fuzes and materials in order to support the new fuze build and FY 2020 testing events. FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding needed for research and development activities for the M550 Fuze.		-	-	0.400	-	0.400
Title: Caliber .50 Improvement Description: Explore options for improvement to current legacy .50 caliber ammunition in response to the .50 caliber Munitions Capabilities Development Document (CDD).		-	-	0.500	-	0.500

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs		Project (Number/Name) ER6 / Direct Fire Technology	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<i>FY 2019 Base Plans:</i> FY2019 funding will support the exploration of improvements to various .50 caliber munitions to include the M903 and M962 rounds.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Increase of funds will support improvements to .50 caliber munitions.					
<i>Title:</i> Operation Inherent Resolve for ISIL - JUONS CC-0562 M940 Ammunition <i>Description:</i> FY 2019 Overseas Contingency Operations request includes \$2.548 Million for a Joint Urgent Operational Needs Statement for M940 ammunition.	-	-	0.000	2.548	2.548
<i>FY 2019 Base Plans:</i> OCO only					
<i>FY 2019 OCO Plans:</i> OCO funds will provide M940 ammunition improvements.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> JUONS CC-0562					
Accomplishments/Planned Programs Subtotals	11.408	9.696	10.055	2.548	12.603

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	1.807	2.500	0.000	-	0.000	-	-	-	-	0.000	4.307
Remarks The funding lines started work on the 7.62mm lightweight ammunition which transitions to PE 0607131A ER6, Direct Fire Technology.											
D. Acquisition Strategy All contracts will be full and open competition firm fixed price.											
E. Performance Metrics N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER6 / Direct Fire Technology					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Manager Maneuver Ammunition Systems (PM MAS) - Labor & Travel	Various	Picatinny Arsenal : NJ	0.009	0.100		0.300		0.400		-		0.400	Continuing	Continuing	Continuing
Contract 1 - M433 Warhead Improvement	C/FFP	Polymer Technologies Incorporated : Newark, DE	0.171	-		-		-		-		-	0.000	0.171	-
Contract 2 - M433 Warhead Improvement	C/IDIQ	Amtec Corporation : Huntsville, AL	0.134	-		-		-		-		-	0.000	0.134	-
Contract 3 - M433 Warhead Improvement	C/FFP	Amtec Corporation : Huntsville, AL	-	2.275		1.500		-		-		-	0.000	3.775	-
Contract 1 - M789 Enhanced Lethality	C/FFP	TBD : TBD	-	-		-		0.500		-		0.500	0.000	0.500	-
Contract 1 - Lightweight Ammunition	C/FFP	TBD : TBD	-	-		0.500		1.742		-		1.742	0.000	2.242	-
Contract 1 - Green Primer	C/FFP	Innovative Materials & Processes (IMP), LLC : Rapid City, SD	0.415	0.556		-		0.500		-		0.500	0.000	1.471	-
Contract 2 - Green Primer	C/FFP	Alion Science and Technology Corporation : McLean, VA	0.038	-		-		-		-		-	0.000	0.038	-
Contract 3 - Green Primer	C/FFP	Orbital - ATK : Independence, MO	-	0.750		-		0.500		-		0.500	0.000	1.250	-
Contract 4 - Green Primer	C/FFP	Frankilin Engineering Group : Nashville, TN	-	0.170		-		-		-		-	0.000	0.170	-
Contract 1 - M940 Enhancement	C/FFP	General Dynamics Ordnance and Tactical Systems : Marion, VA	-	0.231		-		-		-		-	0.000	0.231	-
Contract 2 - M940 Enhancement	C/FFP	MATSYS : Sterling, VA	-	0.168		-		-		-		-	0.000	0.168	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs				Project (Number/Name) ER6 / Direct Fire Technology					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract 3 - M940 Enhancement	C/FFP	TBD : TBD	-	-		0.500		-		-		-	0.000	0.500	-
Contract 1 - M80A1	C/FFP	TBD : TBD	-	-		-		0.575		-		0.575	0.000	0.575	-
Contract 1 - JUONS CC-0562 M940 Ammunition	C/FFP	TBD : TBD	-	-		-		0.000		2.548		2.548	0.000	2.548	-
Subtotal			0.767	4.250		2.800		4.217		2.548		6.765	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Armament Research Development and Engineering Center (ARDEC)	MIPR	ARDEC : Picatinny Arsenal, NJ	1.361	3.702		6.296		5.438		-		5.438	Continuing	Continuing	Continuing
Subtotal			1.361	3.702		6.296		5.438		-		5.438	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Research Lab (ARL)	MIPR	Aberdeen : MD	0.015	0.200		0.300		0.400		-		0.400	Continuing	Continuing	Continuing
Aberdeen Test Center (ATC)	MIPR	Aberdeen Test Center : Aberdeen, MD	0.036	-		0.300		-		-		-	Continuing	Continuing	Continuing
Redstone Arsenal	MIPR	Redstone Arsenal : Redstone Arsenal AL	-	3.256		-		-		-		-	0.000	3.256	-
Subtotal			0.051	3.456		0.600		0.400		-		0.400	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army										Date: February 2018					
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs					Project (Number/Name) ER6 / Direct Fire Technology					
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.179	11.408		9.696		10.055		2.548		12.603	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0607131A / Weapons and Munitions
Product Improvement Programs

Project (Number/Name)

ER6 / Direct Fire Technology

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
M433 Warhead Improvement																												
Improved M789 Lethality, Warhead Fragmentation Improvement																												
Lightweight Ammunition																												
Lead Free Primer																												
20mm C-RAM Ammo Improvement																												
Support Sniper Ammunition Integration Into Army Standard Sniper Weapons																												
Support improvements in Direct Fire Propulsion Systems																												
Stryker 30x173mm Airburst Munition																												
Tank Ammunition Improvements																												
40mm M576 Improvement Study																												
Medium Caliber Single Crystal Tungsten Evaluation																												
.50 Caliber Improvements																												
M550 Fuze Escapement																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018																					
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0607131A / Weapons and Munitions Product Improvement Programs										Project (Number/Name) ER6 / Direct Fire Technology																	
Event Name										FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
XM1158 Dispersion Improvement																																					
																										XM1158 Dispersion Improvement											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / <i>Weapons and Munitions Product Improvement Programs</i>	Project (Number/Name) ER6 / <i>Direct Fire Technology</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Improved Door Breach	1	2016	4	2016
Target Practice Spotter Technology Insertion	1	2015	4	2016
New Ammo Design Qualification & NATO Mission Support	1	2016	4	2016
M433 Warhead Improvement	1	2015	4	2019
Improved M789 Lethality, Warhead Fragmentation Improvement	1	2015	4	2019
Lightweight Ammunition	1	2015	4	2023
Lead Free Primer	1	2015	4	2021
20mm C-RAM Ammo Improvement	1	2017	4	2019
Support Sniper Ammunition Integration Into Army Standard Sniper Weapons	1	2017	4	2019
Support improvements in Direct Fire Propulsion Systems	1	2017	4	2021
Stryker 30x173mm Airburst Munition	1	2018	4	2022
Tank Ammunition Improvements	1	2018	4	2022
40mm M576 Improvement Study	1	2018	4	2022
Medium Caliber Single Crystal Tungsten Evaluation	1	2018	4	2019
.50 Caliber Improvements	1	2019	4	2020
M550 Fuze Escapement	1	2019	4	2020
XM1158 Dispersion Improvement	1	2021	4	2023

UNCLASSIFIED

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

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	PE 0607133A / <i>TRACTOR SMOKE</i>											
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.479	4.513	4.577	7.780	12.357	6.876	7.966	10.723	9.426	0.000	56.340
ET2: <i>Tractor Stove</i>	-	4.479	4.513	4.577	7.780	12.357	6.876	7.966	10.723	9.426	0.000	56.340

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.479	4.513	4.577	-	4.577
Current President's Budget	4.479	4.513	4.577	7.780	12.357
Total Adjustments	0.000	0.000	0.000	7.780	7.780
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.000	7.780	7.780

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607134A I Long Range Precision Fires (LRPF)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	36.322	102.014	186.475	-	186.475	89.182	122.852	105.019	93.939	Continuing	Continuing
ES1: Long Range Precision Fires (LRPF)	-	36.322	102.014	186.475	-	186.475	89.182	122.852	105.019	93.939	Continuing	Continuing
Program MDAP/MAIS Code: 494												
A. Mission Description and Budget Item Justification												
Long Range Precision Fires (LRPF) is being developed as a cluster and insensitive munition compliant system that replaces and improves upon Army Tactical Missile System (ATACMS) capabilities. LRPF is a major improvement over the current ATACMS with increased range, lethality, loadout, and an open systems architecture. The mission of the LRPF System is to attack/neutralize/suppress/destroy targets using missile delivered indirect precision fires. LRPF will provide Joint Force Commanders with a 24/7, all-weather capability to attack critical and time sensitive area and point targets including threat air defense, missile launchers, command and control centers, assembly/staging areas and high payoff targets at all depths of the multi-domain battlefield. The LRPF will counter the enemy's ability to conduct combat maneuver and air defense operations. LRPF requirements include: max range of greater than 400km, 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 Multiple Launch Rocket System (MLRS) and M142 High Mobility Artillery Rocket System (HIMARS)). LRPF is being designed with an open system architecture that provides the capability for future growth to counter new and emerging threats. Milestone A; Technology Maturation and Risk Reduction (TMRR) was approved on 31 March 2017.												
FY 2019 base dollars in the amount of \$186.475 million support the continuation of LRPF development through the execution of two TMRR competitive prototyping and flight demonstration agreements. FY 2019 funding increase supports integration of test assets for risk reduction activities and allows both contractors to complete their tactical designs through the Critical Design Review (CDR), allows both contractors to conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments and ensures risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Carrying 2 contractors through CDR prior to down select, will reduce risk and ensure a more mature design. FY 2019 efforts include conducting a Preliminary Design Review (PDR) and completion of the final prototype tactical design with an assessment of future growth capabilities. Each contractor will complete final integration of four (4) prototype missiles. The first two prototype flight demonstrations are planned for FY19. Results will provide performance data to inform the contractor's proposed design.												

UNCLASSIFIED

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

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>

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	67.006	102.014	111.505	-	111.505
Current President's Budget	36.322	102.014	186.475	-	186.475
Total Adjustments	-30.684	0.000	74.970	-	74.970
• Congressional General Reductions	-0.018	-			
• Congressional Directed Reductions	-1.500	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.435	-			
• Adjustments to Budget Years	-	-	74.970	-	74.970
• Amended FY2017	-27.731	-	-	-	-

Change Summary Explanation

FY 2017 funding reflects an adjustment of \$30.684M which includes \$27.731M that was requested in the Request for Additional FY17 Appropriations, but Congress did not appropriate the funds, a \$1.5M funding decrement and \$1.453M allocated against Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR).

FY 2019 funding reflects an increase of \$74.970M to support the integration of test assets and continuation of design maturation activities for both vendors through the Critical Design Review (CDR). The increase in funding will allow both contractors to conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments and ensures risk mitigation activities support transition to Engineering and Manufacturing Development (EMD).

Note: Program Office core employee labor costs moved from RDTE to OMA as part of an OSD auditability directive.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607134A / Long Range Precision Fires (LRPF)				Project (Number/Name) ES1 / Long Range Precision Fires (LRPF)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES1: Long Range Precision Fires (LRPF)	-	36.322	102.014	186.475	-	186.475	89.182	122.852	105.019	93.939	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Long Range Precision Fires (LRPF) is being developed as a cluster and insensitive munition compliant system that replaces and improves upon Army Tactical Missile System (ATACMS) capabilities while enabling an architecture which facilitates future growth. LRPF is a major improvement over the current ATACMS with increased range, lethality, loadout, and an open systems architecture. The mission of the LRPF System is to attack/neutralize/suppress/ destroy targets using missile delivered indirect precision fires. LRPF will provide Joint Force Commanders with a 24/7, all-weather capability to attack critical and time sensitive area and point targets including threat air defense, missile launchers, command and control centers, assembly/staging areas and high payoff targets at all depths of the multi-domain battlefield. LRPF will counter the enemy's ability to conduct combat maneuver and air defense operations. LRPF requirements include: max range of greater than 400km, 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 Multiple Launch Rocket System (MLRS) and M142 High Mobility Artillery Rocket System (HIMARS)). LRPF is being designed with an open system architecture that provides the capability for future growth to counter new and emerging threats. Milestone A; Technology Maturation and Risk Reduction (TMRR) was approved on 31 March 2017.

FY 2019 base dollars in the amount of \$186.475 million support the continuation of LRPF development through the execution of two TMRR competitive prototyping and flight demonstration agreements. FY 2019 funding increase supports integration of test assets for risk reduction activities and allows both contractors to complete their tactical designs through the Critical Design Review (CDR), allows both contractors to conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments and ensures risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Carrying 2 contractors through CDR prior to down select, will reduce risk and ensure a more mature design. FY 2019 efforts include conducting a Preliminary Design Review (PDR) and completion of the final prototype tactical design with an assessment of future growth capabilities. Each contractor will complete final integration of four (4) prototype missiles. The first two prototype flight demonstrations are planned for FY19. Results will provide performance data to inform the contractor's proposed design.

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

	FY 2017	FY 2018	FY 2019
Title: TMRR	36.322	102.014	186.475
Description: Develop and prototype an insensitive munition compliant missile that provides increased range, improved lethality for both point and area targets, meets cluster munition policy requirements, and provides increased firepower with a multiple missile per launch pod solution. Long Range Precision Fires (LRPF) provides field artillery units with a deep-strike capability while supporting Brigade, Division, Corps, Army, Theater, Joint and Coalition forces in full, limited or expeditionary operations.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607134A / Long Range Precision Fires (LRPF)	Project (Number/Name) ES1 / Long Range Precision Fires (LRPF)	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018
FY 2018 Plans: Continued execution of two TMRR prototyping and flight demonstration agreements. Completed Launch Pod Missile Container (LPMC), static motor, warhead arena and insensitive munition component level testing and flight termination system development. Conducted Hardware in the Loop (HWIL), Software in the Loop (SWIL) and 6 degrees of freedom analysis of test data. Developed system level designs that incorporate technologies required to defeat an emerging threat. Initiated fabrication of prototype missiles required to support prototype flight demonstration. Conducted missile and launcher software development. Conducted assessment and implementation of software cyber security requirements. FY 2019 Plans: Continue execution of two TMRR prototyping and flight demonstration agreements. Complete system level designs that incorporate technologies required to defeat an emerging threat. Complete integration of a Flight Termination System (FTS) to support White Sands Missile Range testing. Complete a Preliminary Design Review (PDR) with each competing contractor. Continue risk reduction activities and allow both contractors to complete their tactical designs through the Critical Design Review (CDR). Both contractors will conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments, and ensure risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Continue to conduct Hardware in the Loop (HWIL), Software in the Loop (SWIL) and 6 Degrees of Freedom (6DoF) analysis of test data. Complete missile and launcher software development. Complete assessment and implementation of software cybersecurity requirements. FY 2018 to FY 2019 Increase/Decrease Statement: \$84.461M funding increase from FY18-19 is required to support completion of missile integration efforts, initiation of the TMRR flight test program, and procuring EDT test articles for competing contractors.			
Accomplishments/Planned Programs Subtotals		36.322	102.014
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy The LRPF Acquisition Strategy supports development of a cluster and insensitive munition compliant system that replaces and improves upon ATACMS capabilities while enabling an architecture which facilitates future growth. LRPF provides responsive engagement of high value point and area targets by Army and Joint Force Commanders under all weather conditions, at operational ranges defended by enemy air-defense systems. An AoA supporting the MS A decision was completed by U.S. Army Training and Doctrine Command (TRADOC) Analysis Center-White Sands Missile Range (TRAC-WSMR), with an OSD letter of sufficiency issued in September 2015. In 4QFY16, the Army awarded 9 month risk reduction, trade study and initial design development agreements to two contractors. The effort resulted			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607134A / <i>Long Range Precision Fires (LRPF)</i>	Project (Number/Name) ES1 / <i>Long Range Precision Fires (LRPF)</i>
in development of initial baseline designs presented during final technical reviews that resulted in a seamless transition into the TMRR phase. Subsequent to MS A approval on 31 March 2017, the Army awarded TMRR agreements to two contractors. TMRR is ongoing and includes risk reduction activities and further maturation of contractor design concepts. Both contractors will participate in a PDR and build four (4) missile prototypes culminating in flight tests to provide demonstration of their system capabilities. Both contractors will continue risk reduction activities allowing the contractors to mature their tactical designs through the Critical Design Review (CDR), conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments, and ensure risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Component level testing during TMRR, results of prototype flight tests, and results of EDT flight tests will inform the Source Selection. The EMD phase will complete product development, qualification, production readiness assessment, and a Limited User Test (LUT). <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607134A / Long Range Precision Fires (LRPF)				Project (Number/Name) ES1 / Long Range Precision Fires (LRPF)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : RSA	-	3.869	Nov 2016	7.659	Nov 2017	7.889	Nov 2018	-		7.889	47.706	67.123	-
Subtotal			-	3.869		7.659		7.889		-		7.889	47.706	67.123	N/A
Remarks RSA - Redstone Arsenal, Alabama															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LRPF Risk Reduction - 2 Vendors (Raytheon and Lockheed Martin)	C/CPIF	DOTC : Picatinny, NJ	-	29.652	May 2017	86.130	Nov 2017	169.768	Nov 2018	-		169.768	434.469	720.019	-
Development Engineering Support	MIPR	AMCOM/AMRDEC : RSA	-	1.022	Nov 2016	2.665	Nov 2017	2.978	Nov 2018	-		2.978	38.972	45.637	-
Subtotal			-	30.674		88.795		172.746		-		172.746	473.441	765.656	N/A
Remarks AMCOM - Aviation and Missile Command; AMRDEC - U.S. Army Research, Development and Engineering Command; DOTC - DoD Ordnance Technology Consortium; OTA - Other Transaction Agreements; RSA - Redstone Arsenal, Alabama															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering, Testing, and Analysis	SS/T&M	ACC : RSA	-	1.496	Nov 2016	2.461	Nov 2017	2.508	Nov 2018	-		2.508	16.133	22.598	-
Subtotal			-	1.496		2.461		2.508		-		2.508	16.133	22.598	N/A
Remarks ACC - Army Contracting Command; RSA - Redstone Arsenal, AL															

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607134A / Long Range Precision Fires (LRPF)				Project (Number/Name) ES1 / Long Range Precision Fires (LRPF)					

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	WSMR; RTC : WSMR,NM; RSA, AL	-	0.283	Nov 2016	3.099	Nov 2017	3.332	Nov 2018	-		3.332	60.106	66.820	-
Subtotal			-	0.283		3.099		3.332		-		3.332	60.106	66.820	N/A

Remarks
WSMR,NM - White Sands Missile Range, New Mexico; RTC - Redstone Test Center; RSA - Redstone Arsenal, Alabama

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	36.322	102.014	186.475	-	186.475	597.386	922.197	N/A

Remarks

UNCLASSIFIED

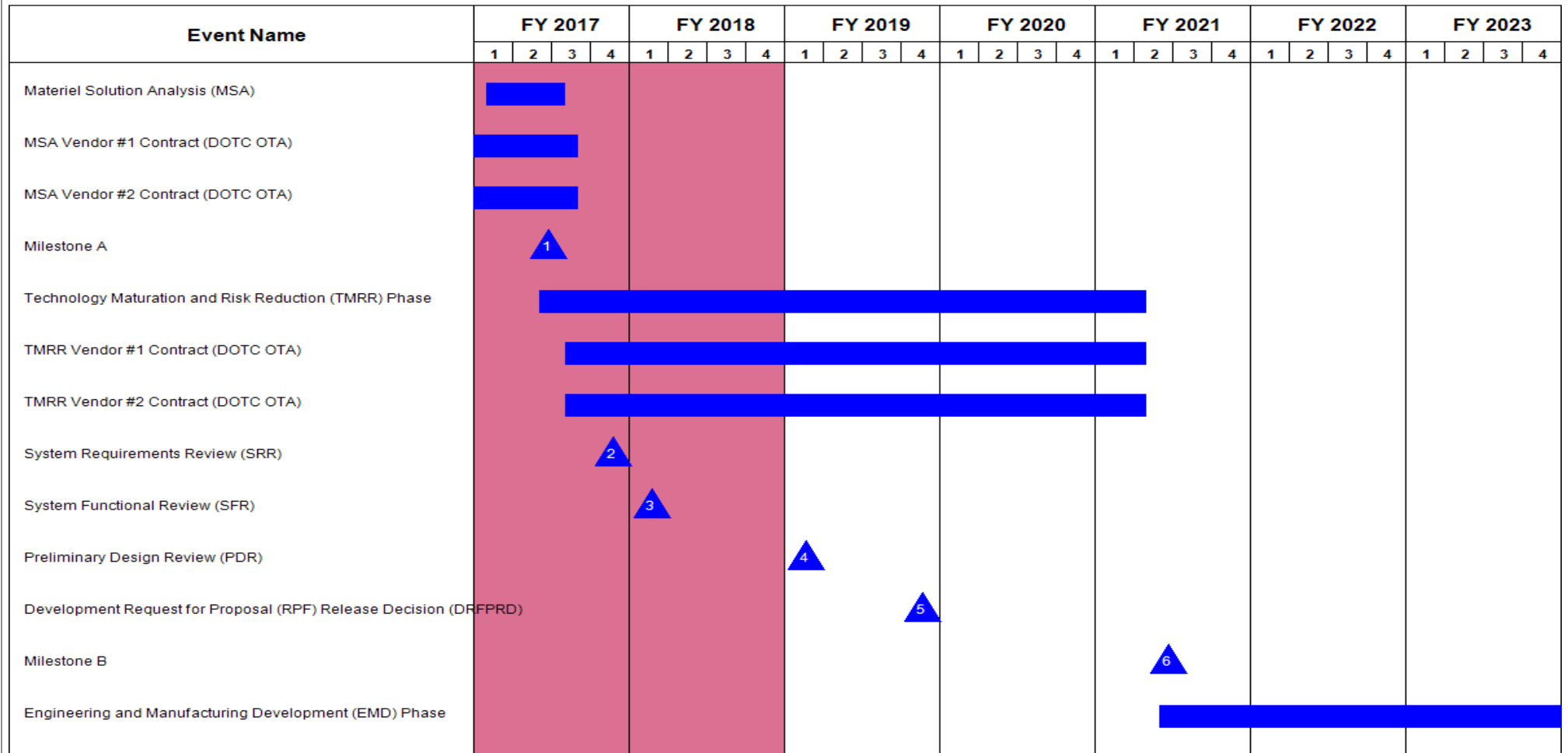
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0607134A / Long Range Precision Fires (LRPF)

Project (Number/Name)
ES1 / Long Range Precision Fires (LRPF)



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607134A / <i>Long Range Precision Fires (LRPF)</i>	Project (Number/Name) ES1 / <i>Long Range Precision Fires (LRPF)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AoA	2	2015	3	2015
Materiel Solution Analysis (MSA)	1	2014	3	2017
MSA Vendor #1 Contract (DOTC OTA)	3	2016	3	2017
MSA Vendor #2 Contract (DOTC OTA)	3	2016	3	2017
Milestone A	2	2017	2	2017
Technology Maturation and Risk Reduction (TMRR) Phase	2	2017	2	2021
TMRR Vendor #1 Contract (DOTC OTA)	3	2017	2	2021
TMRR Vendor #2 Contract (DOTC OTA)	3	2017	2	2021
System Requirements Review (SRR)	4	2017	4	2017
System Functional Review (SFR)	1	2018	1	2018
Preliminary Design Review (PDR)	1	2019	1	2019
Development Request for Proposal (RPF) Release Decision (DRFPRD)	4	2019	4	2019
Milestone B	2	2021	2	2021
Engineering and Manufacturing Development (EMD) Phase	2	2021	2	2025

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607135A / Apache Product Improvement Program							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	60.995	59.977	31.049	-	31.049	0.169	0.173	0.000	0.000	0.000	152.363
ES2: Apache Product Improvement Program	-	60.995	59.977	31.049	-	31.049	0.169	0.173	0.000	0.000	0.000	152.363

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2019 budget request for Apache AH-64E, previously known as Apache Block III, will fund the non-recurring engineering (NRE), development, and testing work associated with the planned remanufacture and new build of 690 Apache aircraft in the AH-64E configuration (deliveries began in Oct 2011). The AH-64E program consists of two Major Defense Acquisition Programs (MDAP), AH-64E Remanufacture and AH-64E New Build. This project also addresses obsolescence and reliability challenges and provides increased combat capability to the aircraft. Upgrades include: Unmanned Aircraft System (UAS) Level III-IV Control, Improved Situational Awareness, Upgraded Communications Suite, Improved Drive and Propulsion Systems, Improved Targeting Capability, Increased Computer Processing Capability and Speed, Improved Navigation Systems, Improved Diagnostics and Maintainability, and Joint Air to Ground Missile (JAGM) integration. Upgrades are integrated as incremental block modifications. The program addresses operational shortfalls identified during real-world combat missions and meets Longbow Apache Capability Production Document (CPD) requirements for modernization.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	66.441	59.977	0.180	-	0.180
Current President's Budget	60.995	59.977	31.049	-	31.049
Total Adjustments	-5.446	0.000	30.869	-	30.869
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-2.000	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-1.512	-	30.869	-	30.869
• Other Adjustments 1	-1.934	-	-	-	-

Change Summary Explanation

Funding for FY19 moved from PE 677145, Project FD5 line. 1) Allows alignment with Joint Air to Ground Missile (JAGM) without requiring a future software insertion. 2) Improves efficiency and effectiveness of operational testing by conducting a combined OT event for JAGM and AH-64Ev6. 3) Reduces burden on FORSCOM and Soldiers by consolidating two test events into one event. 4) Allows further development and refinement of AH-64Ev6 software with user input prior to fielding.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607135A / Apache Product Improvement Program				Project (Number/Name) ES2 / Apache Product Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES2: Apache Product Improvement Program	-	60.995	59.977	31.049	-	31.049	0.169	0.173	0.000	0.000	0.000	152.363
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2019 budget request for Apache AH-64E, previously known as Apache Block III, will fund the non-recurring engineering (NRE), development, and testing work associated with the planned remanufacture and new build of 690 Apache aircraft in the AH-64E configuration (deliveries began in Oct 2011). The AH-64E program consists of two Major Defense Acquisition Programs (MDAP), AH-64E Remanufacture and AH-64E New Build. This project also addresses obsolescence and reliability challenges and provides increased combat capability to the aircraft. Upgrades include: Unmanned Aircraft System (UAS) Level III-IV Control, Improved Situational Awareness, Upgraded Communications Suite, Improved Drive and Propulsion Systems, Improved Targeting Capability, Increased Computer Processing Capability and Speed, Improved Navigation Systems, Improved Diagnostics and Maintainability, and Joint Air to Ground Missile (JAGM) integration. Upgrades are integrated as incremental block modifications. The program addresses operational shortfalls identified during real-world combat missions and meets Longbow Apache Capability Production Document (CPD) requirements for modernization.

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

	FY 2017	FY 2018	FY 2019
Title: Product Development	51.105	55.316	22.325
Description: Funding is provided for the following efforts by Boeing.			
FY 2018 Plans: Development, Integration & Testing work associated with the planned remanufacture and new build of Apache aircraft in the AH-64E Capability Version 6 configuration (cognitive decision aiding, soldier radio waveform, modernized dayside assembly, modernized radio frequency interferometer, maritime targeting, and radar upgrades) and to enhance operational capabilities, and JAGM integration.			
FY 2019 Plans: Development, Integration & Testing work associated with the planned remanufacture and new build of Apache aircraft in the AH-64E Capability Version 6 configuration (cognitive decision aiding, soldier radio waveform, modernized dayside assembly, modernized radio frequency interferometer, maritime targeting, and radar upgrades) and to enhance operational capabilities, and JAGM integration.			
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 Funding is expected to complete efforts by Boeing.			
Title: Support Costs	1.129	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0607135A / Apache Product Improvement Program				Project (Number/Name) ES2 / Apache Product Improvement Program			
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019
Description: Funding is provided for GFE supporting Apache AH-64E tests and government R&D Facilities.											
Title: Test and Evaluation									6.500	2.100	7.289
Description: Funding is provided for Development Testing and Evaluation and Operational Test and Evaluation.											
FY 2018 Plans: Funding is provided for Development Testing and Evaluation and Operational Test and Evaluation.											
FY 2019 Plans: Funds required for completion of FOT&E II											
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 funding is expected to complete FOT&E II.											
Title: Management Services									2.261	2.561	1.435
Description: Funding is provided for the following effort: Payroll, Travel, Support Contractors, Matrix Support.											
FY 2018 Plans: Funding is provided for the following effort: Payroll, Travel, Support Contractors, Matrix Support.											
FY 2019 Plans: Funding is provided for the following effort: Payroll, Travel, Support Contractors, Matrix Support.											
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 Funding is provided for Payroll, Travel, Support Contractors, and Matrix Support.											
Accomplishments/Planned Programs Subtotals									60.995	59.977	31.049
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• AA6605: AH-64 Mods	187.883	238.141	104.996	-	104.996	95.027	85.546	112.579	89.240	580.576	1,493.988
• A05111: AH-64 Apache Block IIIA Reman	852.112	765.016	753.248	-	753.248	808.514	789.701	707.777	509.487	Continuing	Continuing
• A05133: AH-64 Apache Block IIIB New Build	261.900	374.100	284.687	-	284.687	100.640	184.258	-	-	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0607135A / Apache Product Improvement Program				Project (Number/Name) ES2 / Apache Product Improvement Program			
C. Other Program Funding Summary (\$ in Millions)											
			FY 2019	FY 2019	FY 2019					Cost To	
Line Item	FY 2017	FY 2018	Base	OCO	Total	FY 2020	FY 2021	FY 2022	FY 2023	Complete	Total Cost
Remarks											
D. Acquisition Strategy											
The NRE will encompass subsystem integration and will utilize existing test aircraft, incorporate the technical insertions, and initiate appropriate qualification and operational flight-testing. In FY14, a contract for Apache AH-64E Lot 3, initiating Full Rate Production, was awarded with options for Lot 4 and will continue to a total of 690 remanufactured and new build aircraft. Training device concurrency will be maintained with each technical insertion. The Engineering/Manufacturing Design (EMD) effort is managed as Cost Reimbursable. Production efforts will be awarded as Fixed Price Incentive (FPI) and include the Advance Procurement requirements. In FY13, FY14, and FY15 MRL NRE encompassed US Government (USG) design of the Hydra Launcher Electronics Assembly (LEA), modification of the M261 launcher, launcher fabrication, and launcher testing. In FY15-FY19, Apache AH-64E Version 6 System Development and Demonstration (SDD) Contract. Multi-year production awarded March 15, 2017.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607135A / Apache Product Improvement Program						Project (Number/Name) ES2 / Apache Product Improvement Program			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services (In-House, Travel, etc.)	MIPR	PMO AAH Matrix Support AMCOM Express : Redstone Arsenal, AL	6.030	2.261		2.561		1.435		-		1.435	0.000	12.287	-
Subtotal			6.030	2.261		2.561		1.435		-		1.435	0.000	12.287	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
The Boeing Company	SS/CPIF	Boeing Contracts : Mesa, AZ	114.407	51.105		55.316		22.325		-		22.325	0.000	243.153	-
Longbow Limited Liability (LBL) Contracts	SS/CPIF	Longbow Limited Liability (LBL) Contracts : Orlando, FL	9.000	-		-		-		-		-	0.000	9.000	-
Ground Fire Acquisition Development (GFAD)	SS/CPIF	PM AVIATION SYSTEMS Various Activities : Various	12.000	-		-		-		-		-	0.000	12.000	-
Subtotal			135.407	51.105		55.316		22.325		-		22.325	0.000	264.153	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support Activities	MIPR	Various : Various	2.726	1.129		-		-		-		-	0.000	3.855	-
Subtotal			2.726	1.129		-		-		-		-	0.000	3.855	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607135A / Apache Product Improvement Program				Project (Number/Name) ES2 / Apache Product Improvement Program					

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Assessments, Test Integration Working Group (TWIG), TEMP, etc.	MIPR	Various : Various	4.900	6.500		2.100		7.289		-		7.289	0.000	20.789	-
Subtotal			4.900	6.500		2.100		7.289		-		7.289	0.000	20.789	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	149.063	60.995	59.977	31.049	-	31.049	0.000	301.084	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0607135A / Apache Product
Improvement Program

Project (Number/Name)

ES2 / Apache Product Improvement Program

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607135A / <i>Apache Product Improvement Program</i>	Project (Number/Name) ES2 / <i>Apache Product Improvement Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
NRE Contracts - Boeing	1	2011	3	2018
NRE Contracts - Longbow Limited Liability	1	2011	4	2016
MRL Design	3	2013	4	2014
Force Develop Test & Evaluation (FDTE III)	4	2017	4	2017
Follow-On Test & Eval II	3	2019	3	2019
MRL Integration and Test	2	2015	4	2015

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	44.966	34.416	35.240	-	35.240	13.039	11.247	5.232	3.571	Continuing	Continuing
ES3: <i>Blackhawk Product Improvement Program</i>	-	44.966	34.416	35.240	-	35.240	13.039	11.247	5.232	3.571	Continuing	Continuing

Note

UH-60V:

Funds in this program were realigned in Fiscal Year (FY) 2015 from Program Element 0203744A Aircraft Modifications/Product Improvement Programs, Projected 504, for more efficient program management.

MEDEVAC:

Incremental RDT&E funding to support integration of a MEDEVAC capability on UH-60V is planned for FY19-22. In accordance with AR 40-60, Medical Materiel Acquisition Policy, the Army's Aeromedical Evacuation capability is funded by two portfolio managers, PEOAVN and MRMC. PEOAVN is responsible for the integration of MEDEVAC Mission Equipment Package (MEP) on the UH-60V. MRMC is responsible for recurring costs to procure kits and resource the installation of MEP kits on UH-60V MEDEVAC helicopters.

A. Mission Description and Budget Item Justification

UH-60V:

The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging. Continuing funding will provide hardware and software development, training material development, as well as developmental and operational testing.

MEDEVAC:

Beginning in FY19, RDT&E funding will support the non-recurring engineering and integration of MEDEVAC MEP into the UH-60V Black Hawk. The Surgeon General (TSG) has a requirement for a MEDEVAC capability provided by Black Hawk helicopters that were not initially produced for MEDEVAC, but are designated to support the MEDEVAC mission. In accordance with AR 40-60 Medical Materiel Acquisition Policy, the PEOAVN is responsible for the costs associated with medical MEP integration on Black Hawk helicopters that were not initially produced for MEDEVAC, but require medical MEP modifications/upgrades to support the MEDEVAC mission. MEDEVAC MEP integration on the UH-60V will address obsolescence and reduce the logistics footprint by increasing equipment commonality across the MEDEVAC fleet and will reduce the number of Black Hawk MEDEVAC configurations. Additionally, UH-60V MEDEVAC capabilities will increase when comparing MEDEVAC MEP integration on legacy Black Hawk helicopters. Capability improvements will include simultaneous Rescue Hoist and extended range capability, enabled

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607136A / <i>Blackhawk Product Improvement Program</i>

MEDEVAC Mission Sensor (MMS) use in Arctic conditions, UH-60V Multi-Function Display (MFD) integrated MMS video, and Multi-Function Controller Unit (MFCU) integration of MMS functions.

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	46.765	34.416	17.085	-	17.085
Current President's Budget	44.966	34.416	35.240	-	35.240
Total Adjustments	-1.799	0.000	18.155	-	18.155
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.799	-			
• Adjustments to Budget Years	-	-	18.155	-	18.155

Change Summary Explanation

FY2019 Funding added for MEDEVAC MEP RDT&E.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program				Project (Number/Name) ES3 / Blackhawk Product Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES3: Blackhawk Product Improvement Program	-	44.966	34.416	35.240	-	35.240	13.039	11.247	5.232	3.571	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

UH-60V:

Funds in this program were realigned in Fiscal Year (FY) 2015 from Program Element 0203744A Aircraft Modifications/Product Improvement Programs, Projected 504, for more efficient program management.

MEDEVAC:

Incremental RDT&E funding to support integration of a MEDEVAC capability on UH-60V is planned for FY19-22. In accordance with AR 40-60, Medical Materiel Acquisition Policy, the Army's Aeromedical Evacuation capability is funded by two portfolio managers, PEOAVN and MRMC. PEOAVN is responsible for the integration of MEDEVAC Mission Equipment Package (MEP) on the UH-60V. MRMC is responsible for recurring costs to procure kits and resource the installation of MEP kits on UH-60V MEDEVAC helicopters.

A. Mission Description and Budget Item Justification

UH-60V:

The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging. Continuing funding will provide hardware and software development, training material development, as well as developmental and operational testing.

MEDEVAC:

Beginning in FY19, RDT&E funding will support the non-recurring engineering and integration of MEDEVAC MEP into the UH-60V Black Hawk. The Surgeon General (TSG) has a requirement for a MEDEVAC capability provided by Black Hawk helicopters that were not initially produced for MEDEVAC, but are designated to support the MEDEVAC mission. In accordance with AR 40-60 Medical Materiel Acquisition Policy, the PEOAVN is responsible for the costs associated with medical MEP integration on Black Hawk helicopters that were not initially produced for MEDEVAC, but require medical MEP modifications/upgrades to support the MEDEVAC mission. MEDEVAC MEP integration on the UH-60V will address obsolescence and reduce the logistics footprint by increasing equipment commonality across the MEDEVAC fleet and will reduce the number of Black Hawk MEDEVAC configurations. Additionally, UH-60V MEDEVAC capabilities will increase when comparing MEDEVAC MEP integration on legacy Black Hawk helicopters. Capability improvements will include simultaneous Rescue Hoist and extended range capability, enabled

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program		Project (Number/Name) ES3 / Blackhawk Product Improvement Program		
MEDEVAC Mission Sensor (MMS) use in Arctic conditions, UH-60V Multi-Function Display (MFD) integrated MMS video, and Multi-Function Controller Unit (MFCU) integration of MMS functions.						
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development Description: The UH-60V program provides an integrated digital map, integrated performance planning, common functionality and commonality of training with UH-60M. Product Development includes all activities related to Hardware and Software development, Prototype Manufacturing (3 units), Training Equipment, Data, and Production Engineering and Planning for the UH60V program. Examples of specific activities include drawing development, work instruction development, prototype builds, Preliminary Design Review (PDR)/Critical Design Review (CDR), Software Engineering Directorate (SED) Simulation Integration Laboratory (SIL) design, Software Development (aircraft and off aircraft), trainers, and training material development. FY 2018 Plans: Delivery of software Build 2 and associated technical data package (TDP) that will be used to support Limited User Test (LUT). Complete installation of UH-60V kit on EDM 3 and begin Government verification of Technical Manuals (TMs). FY 2019 Base Plans: Continued 60V EMD efforts including hardware development, Flight Test Software Build 2, and PIF labor in support of 60V development. FY 2018 to FY 2019 Increase/Decrease Statement: Software development nearing completion.		32.536	24.007	8.486	-	8.486
Title: Support Description: Support Costs include Systems Engineering/Program Management (SEPM) type activities performed at the Prototype Integration Facility (PIF). This includes Army Engineering Directorate (AED) support for propulsion, structures, aeromechanics, mission equipment, as well as PIF program management. FY 2018 Plans: Continue SEPM activities in support of UH-60V. FY 2019 Base Plans:		3.104	2.681	3.348	-	3.348

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program		Project (Number/Name) ES3 / Blackhawk Product Improvement Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue AED support for propulsion, structures, aeromechanics, mission equipment, SED SIL Support, Air Worthiness Release (AWR), as well as PIF program management.						
FY 2018 to FY 2019 Increase/Decrease Statement: Increased effort to support Material Fielding and Training Support Development.						
Title: Test & Evaluation		3.597	3.800	4.475	-	4.475
Description: The Utility Helicopters Project Office (UHPO) is responsible for day-to-day test management activities to include execution of all developmental tests and support of operational tests for the UH-60V Program. The focal point for test management is the UH-60V Test Lead Engineer who is the chair for the UH-60V Test and Evaluation (T&E) Working-level Integrated Product Team. The UH-60 T&E team ensures integration and coordination of test and data requirements among all agencies involved in the test and acquisition of the UH-60V effort. T&E activities include, AFTD Baseline Flight Testing, Initial Operational Test and Evaluation (IOTE), Cybersecurity and Interoperability tests.						
FY 2018 Plans: Complete flight testing on software Build 2 and review flight test report. Continue test planning and execution efforts for continuous improvement of system level testing to include software builds (3 & 4) for IOT&E. Conduct LUT.						
FY 2019 Base Plans: ATEC Initial Operational Testing and Evaluation (IOT&E).						
FY 2018 to FY 2019 Increase/Decrease Statement: Initial Operational Testing and Evaluation (IOT&E).						
Title: Management Services		5.729	3.928	1.794	-	1.794
Description: Management Services includes all activities related to Government/Contractor SEPM to include the cost of Government and Contractor personnel supporting the UH-60V program.						
FY 2018 Plans: Continue core and contractor (SEPM) activities in support of UH-60V.						
FY 2019 Base Plans:						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018				
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program		Project (Number/Name) ES3 / Blackhawk Product Improvement Program				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue core and contractor (SEPM) activities in support of UH-60V.								
FY 2018 to FY 2019 Increase/Decrease Statement: Management activities transitioning to production.								
Title: MEDEVAC MEP Integration Product Development Description: MEDEVAC MEP Integration Product Development.				-	-	13.947	-	13.947
FY 2019 Base Plans: Develop Contract with PIF Contractor to perform Hardware (HW) design and Software (SW) Design activities for H-60V MEDEVAC MEP Integration effort. FY 2018 to FY 2019 Increase/Decrease Statement: MEDEVAC MEP effort begins in FY19.								
Title: MEDEVAC MEP Integration Support Description: Support the HW and SW Design Activities with Airworthiness and Technical data division support.				-	-	0.592	-	0.592
FY 2019 Base Plans: Support the HW and SW Design Activities with Airworthiness and Technical data division support. FY 2018 to FY 2019 Increase/Decrease Statement: MEDEVAC MEP effort begins in FY19.								
Title: MEDEVAC MEP Management Services Description: Management Services includes all activities related to Government/Contractor SEPM to include the cost of Government and Contractor personnel supporting the H-60V MEDEVAC MEP Integration Program.				-	-	2.598	-	2.598
FY 2019 Base Plans: Provide Management Services with Government / Contractor System Engineering Program Management (SEPM) to include the cost of the Government and contractor personnel supporting the H-60V MEDEVAC MEP Integration Program. FY 2018 to FY 2019 Increase/Decrease Statement: MEDEVAC MEP effort begins in FY19.								
Accomplishments/Planned Programs Subtotals				44.966	34.416	35.240	-	35.240

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607136A / <i>Blackhawk Product Improvement Program</i>	Project (Number/Name) ES3 / <i>Blackhawk Product Improvement Program</i>	

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• A05009: <i>UH-60 BLACK HAWK A AND L MODELS</i>	46.173	76.516	146.138	-	146.138	173.690	166.969	171.634	174.656	0.000	955.776
• MN1000: <i>Combat Support Medical</i>	75.524	69.033	57.752	17.527	75.279	30.496	35.727	37.072	33.513	0.000	356.644

Remarks

A05009 UH-60 Blackhawk A and L Models provides procurement funding for conversions to UH-60V starting in FY2018.

MN1000, MEDEVAC Mission Equipment Package provides procurement funding for MEDEVAC MEP capability on UH-60 helicopters. Starting in FY22, MN1000 will resource procurement of MEDEVAC MEP kits and installations at a rate of 15 aircraft per year through FY34 when the AAO of 200 UH-60V MEDEVAC is reached.

* Figures shown above reflect the full MN1000 - OPA3/MN1000/Combat Support Medical funding line. UH-60V MEDEVAC MEP MN1000 requirements are \$5.630 in FY22 and \$6.040 in FY23.

D. Acquisition Strategy

The UH-60V program plans to leverage the Prototype Integration Facility (PIF), a Government Owned Government Operated (GOGO) facility, to design, integrate and build three production representative aircraft. The GOGO facility uses a cost plus contract vehicle and conducted full and open competition for the selection of the avionics solution provider.

The MEDEVAC MEP program plans to utilize the U. S. Army Aviation and Missile Research Development and Engineering Center (AMRDEC) Prototype Integration Facility (PIF) to design and integrate MEDEVAC capability into the UH-60V. By leveraging the same Government Owned/Government Operated (GOGO) facility utilized by the UH-60V program, efficient design, software development, integration, and testing will occur by eliminating redundant tasks and employing experienced government resources already in possession of pertinent UH-60V technical data required to support the MEDEVAC MEP non-recurring engineering (NRE) effort. Prototype, validation, and verification of technical publications, as well as airworthiness testing will be accomplished following completion of the UH-60V IOT&E, at which time up to two UH-60V EDM aircraft will be allocated to the MEDEVAC MEP program. Following completion of MEDEVAC MEP NRE, technical products will feed production and fielding contracts, which will be resourced by MEDCOM. Procurement funding is programmed on MN1000 Combat Support Medical, G13010 MEDEVAC MEP.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program				Project (Number/Name) ES3 / Blackhawk Product Improvement Program					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V - Organic	MIPR	Various : Redstone Arsenal, AL	7.121	3.231	Oct 2016	1.657	Oct 2017	1.117	Oct 2018	-		1.117	Continuing	Continuing	-
UH-60V - Contractor	C/LH	Various : Redstone Arsenal, AL	4.985	2.498	Oct 2016	2.271	Oct 2017	0.677	Oct 2018	-		0.677	Continuing	Continuing	-
MEDEVAC MEP Integration - Organic	MIPR	Various : Redstone Arsenal	-	-		-		1.015	Oct 2018	-		1.015	Continuing	Continuing	-
MEDEVAC MEP Integration - Contractor	C/LH	Various : Redstone Arsenal, AL	-	-		-		1.583	Oct 2018	-		1.583	Continuing	Continuing	-
Subtotal			12.106	5.729		3.928		4.392		-		4.392	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V Development Engineering	C/CPFF	AMRDEC PIF : Redstone Arsenal, AL	92.055	32.536	Oct 2016	24.007	Oct 2017	8.486	Oct 2018	-		8.486	Continuing	Continuing	-
MEDEVAC MEP Product Development and Integration	C/CPFF	AMRDEC PIF : Redstone Arsenal AL	-	-		-		13.947	Oct 2018	-		13.947	Continuing	Continuing	-
Subtotal			92.055	32.536		24.007		22.433		-		22.433	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V	MIPR	Various : Redstone Arsenal, AL	6.236	3.104	Oct 2016	2.681	Oct 2017	3.348	Oct 2018	-		3.348	Continuing	Continuing	-
MEDEVAC MEP Integration Support	MIPR	Various : Redstone Arsenal AL	-	-		-		0.592	Oct 2018	-		0.592	Continuing	Continuing	-
Subtotal			6.236	3.104		2.681		3.940		-		3.940	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607136A / <i>Blackhawk Product Improvement Program</i>				Project (Number/Name) ES3 / <i>Blackhawk Product Improvement Program</i>					

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V	MIPR	Redstone Test Center : Redstone Arsenal, AL	2.020	3.597	Oct 2016	3.800	Oct 2017	4.475	Oct 2018	-		4.475	Continuing	Continuing	-
Subtotal			2.020	3.597		3.800		4.475		-		4.475	Continuing	Continuing	N/A

Remarks Government Support															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			112.417	44.966		34.416		35.240		-		35.240	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607136A / <i>Blackhawk Product Improvement Program</i>		Project (Number/Name) ES3 / <i>Blackhawk Product Improvement Program</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
UH-60V Development (Research, Development, Test, and Evaluation)																												
UH-60V EMD (Product Development)																												
Support (RDTE)																												
Support																												
Test and Evaluation (RDTE)																												
Test and Evaluation																												
Management Services (RDTE)																												
Management Services																												
UH-60V Future Integration Efforts (RDTE)																												
Integration																												
UH-60V Digital Modifications (Low Rate Initial Production (LRIP)) (APA)																												
UH-60V LRIP																												
UH-60V Digital Modifications Production (APA)																												
UH-60V Production																												
MEDEVAC MEP Integraton Management Support																												
MEDEVAC MEP Integration Management Support																												
MEDEVAC MEP Product Development and Integration																												
MEDEVAC MEP Product Development and Integration																												
MEDEVAC MEP Integration Support																												
MEDEVAC MEP Integration Support																												
MEDEVAC MEP Integration Test and Evaluation																												
MEDEVAC MEP Integration Test and Evaluation																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607136A / <i>Blackhawk Product Improvement Program</i>	Project (Number/Name) ES3 / <i>Blackhawk Product Improvement Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UH-60V Development (Research, Development, Test, and Evaluation (RDTE)	4	2014	4	2020
Support (RDTE)	1	2014	4	2019
Test and Evaluation (RDTE)	4	2015	4	2019
Management Services (RDTE)	1	2014	4	2019
UH-60V Future Integration Efforts (RDTE)	1	2021	4	2022
UH-60V Digital Modifications (Low Rate Initial Production (LRIP); (APA)	4	2018	4	2019
UH-60V Digital Modifications Production (APA)	1	2019	1	2024
MEDEVAC MEP Integraton Management Support	1	2019	4	2022
MEDEVAC MEP Product Development and Integration	1	2019	4	2022
MEDEVAC MEP Integration Support	4	2019	4	2022
MEDEVAC MEP Integration Test and Evaluation	2	2021	4	2022

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607137A I Chinook Product Improvement Program							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	88.314	194.567	157.822	-	157.822	174.371	49.178	32.641	34.817	0.000	731.710
ES4: Chinook Product Improvement Program	-	88.314	194.567	157.822	-	157.822	174.371	49.178	32.641	34.817	0.000	731.710

A. Mission Description and Budget Item Justification

The CH-47 Chinook is the Army's only heavy lift helicopter and is an essential element of the Army Aviation portfolio strategy. This program budget activity funds improvements to the CH-47F System that include the transition from individual Engineering Change Proposals (ECPs) to a CH-47F Block II program of record. Engineering/Manufacturing Design (EMD) contract awarded July 2017. EMD phase will produce three production representative test articles to support a Milestone C decision in 4th quarter FY 2021. Additionally, funding supports: continued development and testing of the Advanced Chinook Rotor Blades (ACRB) to increase lift in high/hot conditions, and improvements to flight control and drive train components to increase aircraft performance and reduce Operation and Support (O&S) costs.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	91.848	194.567	131.124	-	131.124
Current President's Budget	88.314	194.567	157.822	-	157.822
Total Adjustments	-3.534	0.000	26.698	-	26.698
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.489	-			
• GP SEC 8025 FFRDC	-0.045	-	-	-	-
• CH-47F RECAP ACP	-	-	26.698	-	26.698

Change Summary Explanation

FY 2017 funds have been adjusted -.450 million for GP SEC 8025 FFRDC -3.489 SBR/STTR
FY 2019 program increase for 26.698 million for Block II EMD and Test and Evaluation efforts

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program				Project (Number/Name) ES4 / Chinook Product Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES4: Chinook Product Improvement Program	-	88.314	194.567	157.822	-	157.822	174.371	49.178	32.641	34.817	0.000	731.710
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The CH-47 Chinook is the Army's only heavy lift helicopter and is an essential element of the Army Aviation portfolio strategy. This program budget activity funds improvements to the CH-47F System that include the transition from individual Engineering Change Proposals (ECPs) to a CH-47F Block II program of record. Engineering/Manufacturing Design (EMD) contract awarded July 2017. EMD phase will produce three production representative test articles to support a Milestone C decision in 4th quarter FY 2021. Additionally, funding supports: continued development and testing of the Advanced Chinook Rotor Blades (ACRB) to increase lift in high/hot conditions, and improvements to flight control and drive train components to increase aircraft performance and reduce Operation and Support (O&S) costs.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Modernization Integration								15.404	4.400	-	-	-
Description: Continued system integration non-recurring engineering prior to EMD. Developed the Air Vehicle Airworthiness Qualification Specification (AQS) and EMD Disposition Document completion of manufacturing tool designs for specific cockpit and cabin positions. Updated weight and balance information. Generated and provided structural, stress, and fatigue substantiation. Created manufacturing tool orders for all zones and prepared them for release. Generated preliminary manufacturing planning for the Block II Air Vehicle. Continued Ground Test Vehicle (GTV) design work. Released engineering to support test article development.												
FY 2018 Plans: This effort will continue to develop and finalize a test article design that converts a CH-47D aircraft to a GTV; continue Block II Common Avionics Architecture System (CAAS) coordination and vehicle interface planning; and update weight and balance data with the latest design inputs. Additionally, the effort will finalize Reliability and Maintainability (R&M) and safety analyses; structural, stress, and fatigue substantiation; vehicle level drawings and assemblies (including alignment definitions). Complete all manufacturing tooling designs.												
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease due to CH-47F ECPs transitioning to the Block II Program.												
Title: Electronic Control Unit (ECU) Software Upgrade								2.697	3.840	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program		Project (Number/Name) ES4 / Chinook Product Improvement Program		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Software upgrade improves engine communication with the aircraft monitoring system to increase aircrew situational awareness and reduce workload. In addition software enhancements accommodate increased capability of the Improved Drive Train (IDT). Software upgrades will occur at designated intervals to allow efficient and expedient fielding of any improvements/enhancements. FY 2018 Plans: Complete qualification testing and integration of Version 3+ ECU software with Block II aircraft. Conduct Electromagnetic Environmental Effects (E3) and engine testing on the Hydro Mechanical Assembly improvements. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease due to R&D ECU Software upgrade program complete.						
Title: Improved Drive Train (IDT) Description: This effort addresses O&S cost reduction while simultaneously re-qualifying the combining, forward, and aft transmissions to a higher power level to maximize engine power available at sea-level conditions. FY 2018 Plans: Continue test preparation. Continue test execution for the forward transmission, static/dynamics strain surveys test, sync shaft fatigue tests. Initiate qualification endurance, overstress, gear tooth bending fatigue test for aft/forward transmission. Initiate reduced lubrication and oil out test planning for aft/combiner/forward transmissions. FY 2019 Base Plans: Complete test preparation. Complete qualification test for the aft transmission, overstress test, gear tooth bending fatigue test, reduced lubrication and oil out testing. Document results of aft transmission qualification testing. Complete qualification test for the forward transmission, gear tooth bending fatigue test, reduced lubrication and oil out testing. Document results of forward transmission qualification testing. Complete qualification test for the combiner transmission, reduced lubrication and oil out testing. Document results of combiner transmission qualification testing. FY 2018 to FY 2019 Increase/Decrease Statement:		6.842	19.500	7.700	-	7.700

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018				
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program		Project (Number/Name) ES4 / Chinook Product Improvement Program				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding decrease due to completion of testing on the IDT.								
Title: Transportable Flight Proficiency Simulator (TFPS) Description: The TFPS is a certified trainer using high fidelity, motion cueing, transportable, flight simulator capable of training to include training for mission tasks and emergency procedures and provides flying hour dollars savings. The Block II TFPS is required to safely support initial trainer and operator aircrew training for the Limited User Test (LUT) and beyond. The TFPS will decrease risk to unit aircrew and trainers by allowing them to train with the new design modifications, handling quality changes and pilot visibility differences versus learning in aircraft. Training in the TFPS significantly reduces LUT timelines and improves aircrew proficiency as confirmed in the CH-47F (Block I) Phase 2 User Test Report. Additionally, the initial TFPS serves as a prototype for the remainder of the required TFPS upgrades. FY 2018 Plans: Redesign of the existing CH-47F TFPS to incorporate Block II changes and order bulk of materials. FY 2019 Base Plans: Continue integration of hardware and software components. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease due to completion of initial TFPS to support Block II.				-	28.838	3.723	-	3.723
Title: CH-47F Block II Engineering and Manufacturing Development (EMD) Description: Description: The EMD contract award July 2017 which will develop affordable and executable manufacturing processes, complete system fabrication, remanufacture three production representative CH-47F Block II Chinook test articles, and reduce program risk. FY 2018 Plans: Conduct System Level Delta Preliminary Design Review (PDR) and System Level Critical Design Review (CDR). Conduct and support aircraft development and assembly to include ACRB, airframe components, Improved Drive Train (IDT) and rotor components, light weight fuel system and electrical components. Deliver documentation that demonstrates requirements verification and production configuration baseline. Initiate building of the GTV. FY 2019 Base Plans:				34.964	107.726	110.052	-	110.052

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program		Project (Number/Name) ES4 / Chinook Product Improvement Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete building of the GTV and conduct the GTV testing. Complete building test aircraft. Conduct Test Readiness Review (TRR) for EMD flight testing. Release of EMD flight test software. FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase due to Block II approval to the ACP.						
Title: In-house and Program Management Administration Description: This funding provides support costs for various government agencies. FY 2018 Plans: Continue funding support costs for various government agencies in addition to funding for Project Management Office Full Time Equivalent (FTE) employees supporting the Block II development Program. FY 2019 Base Plans: Continue funding support costs for various government agencies in addition to funding for Project Management Office FTE employees and other matrix organizations supporting the Block II development Program. FY 2018 to FY 2019 Increase/Decrease Statement: Funding changes meet R&D requirements as program ramps to LRIP.		4.547	13.874	13.767	-	13.767
Title: Advanced Chinook Rotor Blade (ACRB) Description: This effort provides an ACRB which is a redesign of the current rotor blade to provide improved capability. It improves high/hot performance, reduces Operations and Support (O&S) costs and is a form, fit, function replacement for the legacy blade. FY 2018 Plans: Complete build of ACRB blades to support component level qualification testing. Commence testing of material coupons (samples) for component structural testing and development of material allowables in support of ACRB full qualification requirements. Begin preparation of blades for live fire static and quasi static testing. Begin building blades to support the ACRB dynamic Live Fire Test and Evaluation (LFTE). FY 2019 Base Plans: Complete material coupon testing. Finalize fatigue, stress and material allowable reports to support EMD Airworthiness Release (AWR). FY 2018 to FY 2019 Increase/Decrease Statement:		12.828	14.368	13.779	-	13.779

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program				Project (Number/Name) ES4 / Chinook Product Improvement Program			
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding decrease due to CH-47F ACRB completing final testing.											
Title: Testing and Evaluation							11.032	2.021	8.801	-	8.801
Description: This effort supports component level and system level testing to qualify design improvement in the airframe, fuel system, avionics, drive train, rotor subsystem, and ACRB. Through endurance, live-fire, E3, and limited user, testing and evaluation activities will validate Block II improvements.											
FY 2018 Plans: Emplacement of a GTV fixture and endurance testing of the IDT and Improved Rotor Subsystem											
FY 2019 Base Plans: Begin system level LFTE excluding ACRB LFTE. Initiate system level developmental testing (ie E3 and ground test). Initiate planning of Limited User Test (LUT).											
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase due to LFTE and LUT.											
Accomplishments/Planned Programs Subtotals							88.314	194.567	157.822	-	157.822
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• AA0252: CH-47 CARGO HELICOPTER MODS	102.943	20.166	7.807	-	7.807	11.785	23.957	15.092	15.697	Continuing	Continuing
• A05105: CH-47 SLEP (Including Adv Proc)	553.257	70.740	99.278	25.000	124.278	128.644	332.421	300.324	417.570	Continuing	Continuing
• A05008: CH-47 CARGO HELICOPTER NEW BUILD	-	131.836	0.000	-	0.000	-	-	-	-	0.000	131.836
Remarks											
The Block II program will restore performance lost due to the added weight of safety and survivability equipment incorporated since initial fielding of the CH-47F Block I in 2007. The CH-47F Block II will also increase the operational envelope allowing more to be carried at high hot conditions.											
D. Acquisition Strategy											
Given the need to maintain the Chinook fleet's sustained relevance until replaced, the PM is proposing a block strategy to facilitate incremental upgrades. The Block II program will restore performance lost due to the added weight of safety and survivability equipment incorporated since initial fielding in 2007. Additional objectives of											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607137A / <i>Chinook Product Improvement Program</i>	Project (Number/Name) ES4 / <i>Chinook Product Improvement Program</i>
the Block II program include: Efficiently incorporating multiple engineering changes; Accomplishing required mid-life airframe recapitalization; Converging the special operations and conventional Army designs; Establishing a foundation for future block upgrades; and Maintaining the industrial base until Future Vertical Lift (FVL)-Heavy is realized. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program						Project (Number/Name) ES4 / Chinook Product Improvement Program			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support	C/T&M	Various : Redstone Arsenal AL	-	-		2.663	Oct 2018	-		-		-	0.000	2.663	-
Subtotal			-	-		2.663		-		-		-	0.000	2.663	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Modernization Integration	SS/CPFF	Boeing Ridley : Park PA	15.477	15.404	Nov 2016	4.400		-		-		-	Continuing	Continuing	Continuing
Engineering and Manufacturing Development (Pre-Decisional)	SS/CPFF	Boeing Ridley : Park, PA	-	34.964	Jul 2017	107.726	Dec 2017	110.052	Dec 2018	-		110.052	Continuing	Continuing	Continuing
Advanced Chinook Rotor Blade (ACRB)	SS/CPFF	Boeing Ridley : Park PA	18.695	12.828	Mar 2017	14.368	Nov 2017	13.779	Nov 2018	-		13.779	Continuing	Continuing	Continuing
Improved Drive Train	SS/CPFF	Boeing Ridley : Park, PA	11.662	6.842	Oct 2016	19.500	Nov 2017	7.700	Nov 2018	-		7.700	Continuing	Continuing	Continuing
Electronic Control Unit (ECU) Software Upgrade	SS/CPFF	Honeywell : Phoenix, AZ	5.910	2.697	Apr 2017	3.840	Apr 2018	-		-		-	Continuing	Continuing	Continuing
Ratio Detector Power Supply (RDPS)	SS/CPFF	Boeing Ridley : Park, PA	5.570	-		-		-		-		-	0.000	5.570	-
Transportable Flight Proficient Simulator (TFPS)	MIPR	NAVAIR : Patuxent River NAS, MD	-	-		28.838		3.723		-		3.723	Continuing	Continuing	-
Subtotal			57.314	72.735		178.672		135.254		-		135.254	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program						Project (Number/Name) ES4 / Chinook Product Improvement Program			
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/OGA	Various	Various Government : Redstone Arsenal AL	3.391	4.547	Oct 2016	11.211	Oct 2017	13.767	Oct 2018	-		13.767	Continuing	Continuing	Continuing
Subtotal			3.391	4.547		11.211		13.767		-		13.767	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing of configuration update ECPs to include the Advanced Chinook Rotor Blades	SS/CPFF	Boeing Ridley : Park PA	5.841	11.032	Jul 2017	2.021	Dec 2017	8.801	Dec 2018	-		8.801	Continuing	Continuing	Continuing
Subtotal			5.841	11.032		2.021		8.801		-		8.801	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			66.546	88.314		194.567		157.822		-		157.822	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607137A / Chinook Product Improvement Program	Project (Number/Name) ES4 / Chinook Product Improvement Program

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Modernization Integration																												
Electronic Control Unit (ECU) Software Upgrade (Engine)																												
Improved Drive Train (IDT)																												
Transportable Flight Proficiency Simulator (TFPS)																												
CH-47F Block II EMD																												
In-house and Program Management Administration																												
Testing and Evaluation																												
Advanced Chinook Rotor Blade (ACRB)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607137A / <i>Chinook Product Improvement Program</i>	Project (Number/Name) ES4 / <i>Chinook Product Improvement Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Modernization Integration	3	2015	4	2018
Electronic Control Unit (ECU) Software Upgrade (Engine)	4	2010	4	2018
Improved Drive Train (IDT)	3	2014	3	2019
Transportable Flight Proficiency Simulator (TFPS)	2	2018	1	2020
CH-47F Block II EMD	4	2017	4	2021
In-house and Program Management Administration	1	2016	4	2023
Testing and Evaluation	3	2015	4	2023
Advanced Chinook Rotor Blade (ACRB)	1	2010	1	2024

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607138A / Fixed Wing Product Improvement Program							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.765	9.981	4.189	-	4.189	4.545	1.920	1.979	1.908	Continuing	Continuing
ES5: Fixed Wing Product Improvement Program	-	0.765	9.981	4.189	-	4.189	4.545	1.920	1.979	1.908	Continuing	Continuing

A. Mission Description and Budget Item Justification

The budget line provides for Fixed Wing (FW) fielded fleet Non-Recurring Engineering (NRE), development of supplemental type certificates (STC) and associated developmental testing, and integration of all Army fixed wing aircraft to provide Communications, Navigation and Surveillance (CNS), Aircraft Survivability Equipment (ASE), and Department of Defense (DoD) mandated safety equipment to meet current and evolving international and Army standards. As requirements for new avionics equipment evolve, aircraft delays and airspace exclusions are likely for aircraft not properly equipped. Upgrade of communication and aircraft modifications assures worldwide deployability for those required to deploy. This budget line provides funding for studies, evaluations and Analysis of Alternatives to support emerging Army fixed wing requirements for product improvements to support the FW fleet. This budget line also provides funding for Test and Evaluation of Fixed Wing Aircraft.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.796	9.981	2.234	-	2.234
Current President's Budget	0.765	9.981	4.189	-	4.189
Total Adjustments	-0.031	0.000	1.955	-	1.955
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.031	-			
• Adjustments to Budget Years	-	-	1.955	-	1.955

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607138A / Fixed Wing Product Improvement Program				Project (Number/Name) ES5 / Fixed Wing Product Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES5: Fixed Wing Product Improvement Program	-	0.765	9.981	4.189	-	4.189	4.545	1.920	1.979	1.908	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for this Program Element (PE) was previously on PE 0203744A Project D18 - Aircraft Modifications/Product Improvement Programs

A. Mission Description and Budget Item Justification

The budget line provides for Fixed Wing (FW) fielded fleet Non-Recurring Engineering (NRE), development of supplemental type certificates (STC) and associated developmental testing, and integration of all Army fixed wing aircraft to provide Communications, Navigation and Surveillance (CNS), Aircraft Survivability Equipment (ASE), and Department of Defense (DoD) mandated safety equipment to meet current and evolving international and Army standards. As requirements for new avionics equipment evolve, aircraft delays and airspace exclusions are likely for aircraft not properly equipped. Upgrade of communication and aircraft modifications assures worldwide deployability for those required to deploy. This budget line provides funding for studies, evaluations and Analysis of Alternatives to support emerging Army fixed wing requirements for product improvements to support the FW fleet. This budget line also provides funding for continued Test and Evaluation of Fixed Wing Aircraft.

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

	FY 2017	FY 2018	FY 2019
Title: Program Management (PM)	-	0.594	0.377
Description: PM Fixed Wing (FW)			
FY 2018 Plans: PM Fixed Wing (FW)			
FY 2019 Plans: PM Fixed Wing (FW)			
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 was decreased due to reduction in Test and Evaluation efforts.			
Title: Test And Evaluation	0.765	9.387	1.906
Description: Support for Test and Evaluation efforts on Fixed Wing Aircraft.			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0607138A / Fixed Wing Product Improvement Program				Project (Number/Name) ES5 / Fixed Wing Product Improvement Program			
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019	
FY18 funding supports FUA Developmental Test (DT) Production Qualification, planning/execution for Live Fire Test and Evaluation (LFT&E) for FUA and LFT&E hardware materials consisting of Structural Wing, Engine, Propeller, Fuselage, Wing Iron Bird, Hydraulic System, Dry Bay Fire Suppression System, and ESOS System. PQT includes electromagnetic environmental effects (E3), handling qualities, Safety of Flight (SOF), human factors, cyber security, AIMS certification, ASE, interoperability and COM/NAV to support final airworthiness release (AWR) for Phase 4 Initial Operational T&E (IOT&E). FY 2019 Plans: This budget line provides funding for continued Test and Evaluation of Fixed Wing Aircraft. FY 2018 to FY 2019 Increase/Decrease Statement: FY19 was decreased due to reduction in Test and Evaluation efforts.											
Title: Support Cost Description: Non-recurring Engineering Support for Fixed Wing (FW) Aircraft. FY 2019 Plans: This budget line provides funding for Support Cost of FW Aircraft. FY 2018 to FY 2019 Increase/Decrease Statement: FY19 was increase as this provides funding for Support Cost of FW Aircraft.								-	-	1.906	
Accomplishments/Planned Programs Subtotals								0.765	9.981	4.189	
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• A11300: Utility F/W Aircraft	41.342	75.115	0.744	-	0.744	34.269	42.431	41.731	31.257	0.000	266.889
• AA0270: Utility/ Cargo Airplane Mods	17.526	57.737	17.719	-	17.719	14.676	13.882	16.042	10.781	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
The US Army Fixed Wing acquisition and modernization strategy leverages commercial derivative aircraft through the use of supplemental type certificates (STC) and associated testing and includes cockpit modernization for civil and tactical upgrades of military unique equipment and integration of Mission Equipment Packages (MEP). Cockpit modernization upgrades include items such as dual Flight Management Systems, Terrain Area Warning Systems, transponder, Mode S/5 transponders, Satellite Communications, Traffic Alert and Collision Avoidance II, Flight Data Recorders, Cockpit Voice Recorders, communication radios, military Global Positioning System											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607138A / <i>Fixed Wing Product Improvement Program</i>	Project (Number/Name) ES5 / <i>Fixed Wing Product Improvement Program</i>
(GPS), Wide Area Augmentation System/ Localizer Performance with Vertical Guidance, Automatic Dependence Surveillance Broadcast (ADS-B) Out, M-code GPS, Blue Force Tracker, and Smart books.		
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607138A / Fixed Wing Product Improvement Program						Project (Number/Name) ES5 / Fixed Wing Product Improvement Program			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	PM Fixed Wing : Redstone Arsenal, AL	0.118	-		0.594		0.377		-		0.377	Continuing	Continuing	-
Subtotal			0.118	-		0.594		0.377		-		0.377	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Fixed Wing Non-recurring Engineering	Various	Various : Various	1.806	-		-		1.906		-		1.906	Continuing	Continuing	-
Subtotal			1.806	-		-		1.906		-		1.906	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing Support	Various	Various : Various	-	0.765		9.387		1.906		-		1.906	Continuing	Continuing	-
Subtotal			-	0.765		9.387		1.906		-		1.906	Continuing	Continuing	N/A
			Prior Years	FY 2017	FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			1.924	0.765		9.981		4.189		-		4.189	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army												Date: February 2018																	
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0607138A / Fixed Wing Product Improvement Program										Project (Number/Name) ES5 / Fixed Wing Product Improvement Program									
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
FW Non-Recurring Engineering																													
Testing Support																													

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607138A / <i>Fixed Wing Product Improvement Program</i>	Project (Number/Name) ES5 / <i>Fixed Wing Product Improvement Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FW Non-Recurring Engineering	3	2019	3	2022
Testing Support	3	2019	3	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018			
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607139A I Improved Turbine Engine Program								
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
Total Program Element	-	111.638	204.304	192.637	-	192.637	246.810	240.846	315.360	250.728	Continuing	Continuing	
ES6: Improved Turbine Engine Program	-	111.638	204.304	192.637	-	192.637	246.810	240.846	315.360	250.728	Continuing	Continuing	

Note

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to PE 0607139A, Project ES6.

A. Mission Description and Budget Item Justification

ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on the Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970's and meets the operational requirement of 6,000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth, without increasing the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, as well as integration into the airframe.

FY 2017 funding continues engine design effort and the platform/engine integration trade studies. FY 2018 funds the remaining TMRR engine design effort, the Engineering and Manufacturing Development (EMD) Source Selection Evaluation Board (SSEB) for entry into Milestone B (MS B), and concludes the platform/engine integration trade studies. In FY 2019, the EMD contract will be awarded to one vendor, and platform/engine integration design engineering will begin. FY 2020 funding continues both the EMD effort and platform/engine integration A-kit development, resulting in a Critical Design Review (CDR) in FY 2020. FY 2021 continues the EMD effort, provides for First Engine To Test (FETT), and begins physical airframe integration. FY 2022 funding will provide Preliminary Flight Rating (PFR) testing, leading to an Air Worthiness Rating (AWR). FY 2023 funding will provide for aircraft flight/qualification testing for both Apache and Black Hawk.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0607139A I Improved Turbine Engine Program			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	126.105	204.304	196.074	-	196.074
Current President's Budget	111.638	204.304	192.637	-	192.637
Total Adjustments	-14.467	0.000	-3.437	-	-3.437
• Congressional General Reductions	-10.056	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.411	-			
• Other Adjustments 1	-	-	-3.437	-	-3.437
Change Summary Explanation					
For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to PE 0607139A, Project ES6.					
FY 2017 funding was reduced due to a delay in TMRR contract award.					
The FY 2019 funding request was reduced by \$3.437M to account for the availability of prior year execution balances.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program				Project (Number/Name) ES6 / Improved Turbine Engine Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES6: Improved Turbine Engine Program	-	111.638	204.304	192.637	-	192.637	246.810	240.846	315.360	250.728	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to PE 0607139A, Project ES6.

A. Mission Description and Budget Item Justification

ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on the Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970's and meets the operational requirement of 6000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth, without increasing the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, as well as integration into the airframe.

FY 2017 funding continues engine design effort and the platform/engine integration trade studies. FY 2018 funds the remaining TMRR engine design effort, the Engineering and Manufacturing Development (EMD) Source Selection Evaluation Board (SSEB) for entry into Milestone B (MS B), and concludes the platform/engine integration trade studies. In FY 2019, the EMD contract will be awarded to one vendor, and platform/engine integration design engineering will begin. FY 2020 funding continues both the EMD effort and platform/engine integration A-kit development, resulting in a Critical Design Review (CDR) in FY 2020. FY 2021 continues the EMD effort, provides for First Engine To Test (FETT), and begins physical airframe integration. FY 2022 funding will provide Preliminary Flight Rating (PFR) testing, leading to an Air Worthiness Rating (AWR). FY 2023 funding will provide for aircraft flight/qualification testing for both Apache and Black Hawk.

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

	FY 2017	FY 2018	FY 2019
Title: ITEP	111.638	204.304	192.637
Description: ITEP - a multi-platform turbine engine development required across existing Army aircraft to fill the capability gaps for Army Aviation Operations			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program	Project (Number/Name) ES6 / Improved Turbine Engine Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Continue Systems Engineering/Program Management activities, provide for final increment of funding of dual vendor competitive TMRR contract awarded in FY16, culminating in a Preliminary Design Review (PDR), continues aircraft platform/engine integration trade studies. Executes EMD SSEB.				
FY 2019 Plans: Down-select to a single vendor, and award an EMD contract to develop, test, and qualify the engine design. Platform/engine integration design engineering will begin.				
FY 2018 to FY 2019 Increase/Decrease Statement: Down-select to a single vendor results in an engine OEM EMD contract award in FY 2019.				
Accomplishments/Planned Programs Subtotals		111.638	204.304	192.637
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to to PE 0607139A, Project ES6. This is not a New Start.				
D. Acquisition Strategy ITEP TMRR contracts were based on Full and Open Competition. Awarded Fixed Price Incentive (Firm Target) contracts in FY 2016 to two vendors for TMRR. Following a successful Milestone B decision, there will be a cost-plus-incentive-fee contract awarded to one vendor for EMD contractual effort.				
E. Performance Metrics N/A				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program						Project (Number/Name) ES6 / Improved Turbine Engine Program			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ITEP SEPM - Organic	Allot	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITE/FVL), Various : Redstone Arsenal, AL	12.162	0.256	Oct 2016	13.267	Oct 2017	10.299	Oct 2018	-		10.299	Continuing	Continuing	Continuing
ITEP SEPM - Contractor	C/IDIQ	PMO Huntsville, AL Various : PMO Huntsville, AL Various	4.782	0.319	Oct 2016	4.567	Oct 2017	4.664	Oct 2018	-		4.664	Continuing	Continuing	Continuing
ITEP SEPM - OGA	MIPR	PMO Huntsville, AL Various : PMO Huntsville, AL Various	9.654	1.967	Oct 2016	3.394	Oct 2017	3.465	Oct 2018	-		3.465	Continuing	Continuing	Continuing
ITEP EMD SSEB	MIPR	PMO Huntsville, AL Various : PMO Huntsville, AL Various	-	-		7.744	Oct 2017	-		-		-	0.000	7.744	-
Subtotal			26.598	2.542		28.972		18.428		-		18.428	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ITEP Technology Maturation/Risk Reduction (TMRR) Contracts	C/FPIF	General Electric Company (GE), and Advanced Turbine Engine Company (ATEC) : Lynn, MA (GE), and Huntsville, AL (ATEC)	38.710	103.626	Oct 2016	115.907	Oct 2017	-		-		-	0.000	258.243	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program				Project (Number/Name) ES6 / Improved Turbine Engine Program					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engine OEM EMD Contract	C/FPIF	TBD : TBD	-	-		-		129.903	Jan 2019	-		129.903	Continuing	Continuing	-
Boeing - ITEP Vehicle Platform Integration Trade Studies Contract	SS/IDIQ	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	9.998	-		11.652	Oct 2017	-		-		-	0.000	21.650	-
Sikorsky Aircraft - ITEP Vehicle Platform Integration Trade Studies Contract	SS/FPIF	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	18.900	-		4.832	Oct 2017	-		-		-	0.000	23.732	-
Apache Integration and Qualification Phase I	SS/CPFF	The Boeing Company : Phoenix AZ	-	-		29.806	Oct 2017	-		-		-	0.000	29.806	-
Platform Integration and Qualification Contracts, Phase I	SS/CPIF	Sikorsky Corporation, The Boeing Company : Stratford, CT; Phoenix, AZ	-	-		-		30.012	Oct 2018	-		30.012	Continuing	Continuing	-
Subtotal			67.608	103.626		162.197		159.915		-		159.915	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ITEP Engineering Support - Organic	Allot	Program Management Office	0.164	0.149	Oct 2016	0.170	Oct 2017	0.174	Oct 2018	-		0.174	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program						Project (Number/Name) ES6 / Improved Turbine Engine Program			
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		(PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL													
ITEP Engineering Support - Contractor	C/IDIQ	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	0.781	0.654	Oct 2016	3.488	Oct 2017	3.561	Oct 2018	-		3.561	Continuing	Continuing	Continuing
ITEP Engineering Support - OGA	MIPR	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	3.314	4.667	Oct 2016	9.477	Oct 2017	7.046	Oct 2018	-		7.046	Continuing	Continuing	Continuing
Subtotal			4.259	5.470		13.135		10.781		-		10.781	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engine OEM EMD Contract	C/CPIF	TBD : TBD	-	-		-		2.697	Jan 2019	-		2.697	0.000	2.697	Continuing
Government Test Planning	SS/TBD	TBD : TBD	-	-		-		0.816	Oct 2018	-		0.816	0.000	0.816	-
Subtotal			-	-		-		3.513		-		3.513	0.000	3.513	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program					Project (Number/Name) ES6 / Improved Turbine Engine Program			
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	98.465	111.638		204.304		192.637		-		192.637	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program		Project (Number/Name) ES6 / Improved Turbine Engine Program	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ITEP Systems Engineering/Program Management																												
ITEP Development Engineering (TMRR)																												
EMD RFP Release Decision Point								1																				
Milestone B												2																
ITEP EMD Contract Award															3													
ITEP Detailed Design (EMD)																												
ITEP Air Vehicle Integration Trade Studies																												
ITEP Air Vehicle Integration																												
Critical Design Review (CDR)																4												
First Engine To Test (FETT)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / <i>Improved Turbine Engine Program</i>	Project (Number/Name) ES6 / <i>Improved Turbine Engine Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ITEP Systems Engineering/Program Management	1	2015	1	2026
ITEP Development Engineering (TMRR)	4	2016	4	2018
EMD RFP Release Decision Point	1	2018	1	2018
Milestone B	1	2019	1	2019
ITEP EMD Contract Award	2	2019	2	2019
ITEP Detailed Design (EMD)	2	2019	3	2024
ITEP Air Vehicle Integration Trade Studies	1	2015	4	2018
ITEP Air Vehicle Integration	2	2019	2	2024
Critical Design Review (CDR)	3	2020	3	2020
First Engine To Test (FETT)	4	2021	4	2021

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607140A / Emerging Technologies from NIE							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	2.278	1.023	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.301
ES7: Emerging Technologies from NIE	-	2.278	1.023	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.301

A. Mission Description and Budget Item Justification

Emerging Technologies from Network Integration Evaluation (NIE) supports the Army's Equipment Modernization Strategy, Army Force Generation (ARFORGEN) cycle and consolidates capabilities to gain efficiencies. These funds provide for an iterative and incremental approach to software development and hardware/software integration as a result of NIEs and Joint Warfighter Assessments (JWA). These funds promote industry's efforts to support the Army's Modernization Plan for Force 2025 and beyond. These funds will facilitate the identification, assessment and acquisition of capability solutions for the Army.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.369	1.023	0.000	-	0.000
Current President's Budget	2.278	1.023	0.000	-	0.000
Total Adjustments	-0.091	0.000	0.000	-	0.000
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.090	-			

Change Summary Explanation

FY 2017 funds in the amount of \$0.001 million was transferred to support FFRDC.
FY 2017 funds in the amount of \$0.09 million was transferred to support SBIR/STTR.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607140A / <i>Emerging Technologies from NIE</i>				Project (Number/Name) ES7 / <i>Emerging Technologies from NIE</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES7: <i>Emerging Technologies from NIE</i>	-	2.278	1.023	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.301
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 Emerging Technologies from Network Integration Evaluation (NIE) supports the Army's Equipment Modernization Strategy, Army Force Generation (ARFORGEN) cycle and consolidates capabilities to gain efficiencies. These funds provide for an iterative and incremental approach to software development and hardware/software integration as a result of NIEs and Army Warfighting Assessments (AWA). These funds promote industry's efforts to support the Army's Modernization Plan for Force 2025 and beyond. These funds will facilitate the identification, assessment and acquisition of capability solutions for the Army.

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

	FY 2017	FY 2018	FY 2019
Title: Emerging Technologies from NIEs	2.278	1.023	-
Description: To mature, test, integrate and evaluate traditional and nontraditional small business and industry's technologies.			
FY 2018 Plans: Electronic Warfare Phase 1 Requirements (in support of USAREUR ONS ? 16-21509) will complete Ground EW capability with enhanced and networked for Versatile Radio Observation & Direction Finding (VROD) / Modular Adaptive Transmitter (VMAX) and Sabre Fury previously assessed at AWA 17.1.			
FY 2018 to FY 2019 Increase/Decrease Statement: Based on requirements.			
Accomplishments/Planned Programs Subtotals	2.278	1.023	-

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

Remarks
This is the only project within this Program Element.

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607140A / <i>Emerging Technologies from NIE</i>						Project (Number/Name) ES7 / <i>Emerging Technologies from NIE</i>			

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technologies from NIEs	TBD	Various Locations : -	7.299	2.278	Dec 2016	1.023		-		-		-		-	0.000	10.600	-
Subtotal			7.299	2.278		1.023		-		-		-		-	0.000	10.600	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.299	2.278	1.023	-	-	-	0.000	10.600	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
Appropriation/Budget Activity 2040 / 7								R-1 Program Element (Number/Name) PE 0607140A / Emerging Technologies from NIE								Project (Number/Name) ES7 / Emerging Technologies from NIE												
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NIE 17.2 Event																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607140A / Emerging Technologies from NIE	Project (Number/Name) ES7 / Emerging Technologies from NIE

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
NIE 17.2 Event	4	2017	4	2017

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607141A / Logistics Automation							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	1.542	1.504	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.046
DY1: Logistics Information Warehouse (LIW)	-	1.374	1.504	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.878
DY2: Lead Material Integrator (LMI) (DST)	-	0.168	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.168

A. Mission Description and Budget Item Justification

The Logistics Information Warehouse (LIW) has been designated by the Secretary of the Army as the primary system for the accessing, acquiring, and delivery of materiel data. This includes data from all sources designated as Authoritative, as well as, system derived data and appropriate reference data. This data will be used in support of materiel sourcing and distribution and other Materiel Enterprise missions. It enables Command visibility of business intelligence and resulting metrics for critical logistics components enabling enterprise-level analytics to be performed in support of the equipping mission within the Army's Tiered Readiness processes. LOGSA and its LIW suite of products and services provide the Army community with vital logistics data necessary for the planning, conducting and sustainment of war fighting capability worldwide. The LMI-DST directly supports Tiered Readiness by linking available equipment to the Generated Force model. Specifically, LMI-DST synchronizes an Army authoritative Demand Signal for manning, equipping, services & infrastructure and authoritative resourcing (money) information, resulting in an accurate prediction of a ready and properly equipped force. The Army Financial Liability Investigation of Property Loss Tracker (AFT) tool is a web-based, automated FLIPL processing and tracking system which provides an electronic FLIPL documentation packet that includes intelligent, digital versions of required forms and allows for attachment of supporting documentation.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.563	1.504	0.000	-	0.000
Current President's Budget	1.542	1.504	0.000	-	0.000
Total Adjustments	-3.021	0.000	0.000	-	0.000
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-2.827	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.127	-			
• SBIR/STTR Transfer	-0.066	-			

Change Summary Explanation

No FY 2019 funding is requested because this program is entering sustainment.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607141A / <i>Logistics Automation</i>				Project (Number/Name) DY1 / <i>Logistics Information Warehouse (LIW)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DY1: <i>Logistics Information Warehouse (LIW)</i>	-	1.374	1.504	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.878
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Logistics Information Warehouse (LIW) is designated as the Army's authoritative materiel data repository. As chartered by the Secretary of The Army, LIW will provide enterprise-accepted and trusted information for analysis, aggregation, and reuse in support of the Lead Materiel Integrator (LMI) mission. As an Army enterprise level repository and retrieval system to facilitate accurate choices and rapid decision making. Specifically, LIW will provide all required data structured in a way that allows for querying and reporting; e.g., equipment authorizations, equipment on-hand, new procurement schedules, RESET production schedules and in transit visibility from origin and distribution to final destination, in support of the information needs of the Army Materiel Command (AMC) and other command logistics managers. This includes data from all sources designated as authoritative, as well as system derived data and appropriate reference data. This data will be used in support of materiel sourcing and distribution and other Materiel Enterprise missions. LIW enables visibility of business intelligence and resulting metrics for critical logistics components enabling enterprise-level analytics to be performed in support of the equipping mission within the Army's Tiered Readiness processes. LIW supports the tenants of Mission Command by logistically empowering the Commander to successfully integrate and synchronize logistics information with warfighter functions in time and space to maximize potential for mission success.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: LIW	1.374	1.504	-
Description: Execution of tasks to create Army Logistics Repository.			
FY 2018 Plans: Funds Logistics Information Warehouse			
FY 2018 to FY 2019 Increase/Decrease Statement: No FY 2019 funding is requested because this program is entering sustainment.			
Accomplishments/Planned Programs Subtotals	1.374	1.504	-

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

Remarks

D. Acquisition Strategy
Utilize contract services available through LiTES contract vehicle in CHES.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607141A / <i>Logistics Automation</i>	Project (Number/Name) DY1 / <i>Logistics Information Warehouse (LIW)</i>

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607141A / Logistics Automation				Project (Number/Name) DY1 / Logistics Information Warehouse (LIW)					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Priority Group 3 Sprint, continue Best of Breed. Develop Materiel Operating Picture (M-COP)	TBD	IBM Contract - currently under recomplete status. : Huntsville, AL	2.514	1.374		1.504		-		-		-	Continuing	Continuing	Continuing
Subtotal			2.514	1.374		1.504		-		-		-	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.514	1.374		1.504		-		-		-	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0607141A / *Logistics Automation*

Project (Number/Name)
DY1 / *Logistics Information Warehouse*
(LIW)

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607141A / <i>Logistics Automation</i>	Project (Number/Name) DY1 / <i>Logistics Information Warehouse (LIW)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Develop Materiel Common Operating Picture	4	2015	4	2017

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607141A / Logistics Automation				Project (Number/Name) DY2 / Lead Material Integrator (LMI) (DST)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DY2: Lead Material Integrator (LMI) (DST)	-	0.168	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.168
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Lead Materiel Integrator Decision Support Tool (LMI DST) is a software solution, resident within the Logistics Information Warehouse, that supports the Army Materiel Command in its mission as the Army Lead Materiel Integrator as well as materiel managers at Army Commands, Army Service Component Commands, Direct Reporting Units, Corps and Divisions with making informed equipping decisions. The LMI DST directly supports Army Forces Generation (ARFORGEN) by linking available equipment to the Generated Force model.												
Specifically, development will enable the tool to consume and display additional data sources, such as maintenance data from both legacy and Enterprise data sources- a critical capability during the fielding of Global Combat Support System (GCSS)-Army; provide additional modules, including Second Destination Transportation Planning, supporting United States Army Reserve Command and National Guard Bureau requirements to deprecate legacy systems and a Readiness Cost Banding module to implement analysis algorithms to deliver decisions to optimize readiness within Army cost constraints. New development will also enable equippers to redistribute items, based on their level of modernization, limiting transportation costs of moving outdated equipment.												
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2017	FY 2018	FY 2019
Title: LMI/DST										0.168	-	-
Description: The Lead Materiel Integrator Decision Support Tool (LMI DST) is a software solution, resident within the Logistics Information Warehouse.												
Accomplishments/Planned Programs Subtotals										0.168	-	-
C. Other Program Funding Summary (\$ in Millions)												
N/A												
Remarks												
D. Acquisition Strategy												
The LMI DST is a development effort to meet the Secretary of the Army's intent in designating the Army Materiel Command as the Lead Materiel Integrator and the Logistics Information Warehouse (LIW) as the authoritative repository of Army logistics domain data. The LMI DST integrates logistics domain data from the LIW with materiel demand requirements from the Readiness Enterprise to enable automated decision support for equippers throughout the Army. In August 2011, a sole source contract was awarded to ProModel Corporation to leverage their COTS modeling and simulation capability, the ProModel Application Framework to develop the Lead Materiel Integrator Decision Support Tool, which is a GOTS product. The project utilizes an agile development methodology. Versions 1-4 were released on a six-month												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607141A / <i>Logistics Automation</i>	Project (Number/Name) DY2 / <i>Lead Material Integrator (LMI) (DST)</i>
cadence between December 2011 and April 2013. LMI DST development and sustainment have been transitioned to LOGSA's Information and Technology Services Contract. Requirements for additional development were collected from Army Commands and vetted through a General Officer Steering Committee, chaired by Army Materiel Command. RDTE funding supports future major version releases.		
<u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607141A / <i>Logistics Automation</i>	Project (Number/Name) DY2 / <i>Lead Material Integrator (LMI) (DST)</i>

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development of LMI DST	C/T&M	IBM IT CONTRACT : Huntsville, AL	5.909	-		-		-		-		-	0.000	5.909	-
Subtotal			5.909	-		-		-		-		-	0.000	5.909	N/A

Remarks

Current LOGSA RDTE missions are complete.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development of LMI DST Version 5	C/T&M	IBM IT CONTRACT SERVICES : Huntsville, AL	5.909	0.168		-		-		-		-	0.000	6.077	-
Subtotal			5.909	0.168		-		-		-		-	0.000	6.077	N/A

			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			11.818	0.168		0.000		-		-		-	0.000	11.986	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607141A / <i>Logistics Automation</i>	Project (Number/Name) DY2 / <i>Lead Material Integrator (LMI) (DST)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development of LMI DST Version 5																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607141A / <i>Logistics Automation</i>	Project (Number/Name) DY2 / <i>Lead Material Integrator (LMI) (DST)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Development of LMI DST Version 5	1	2017	4	2017

Note

LOGSA currently does not have an approved problem statement for RDTE. Due to mandatory DISA migration, RDTE missions are completed.

UNCLASSIFIED

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

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	10.064	60.860	-	60.860	24.221	17.171	13.608	11.066	Continuing	Continuing
EW9: Aviation Rocket System Product Improvement and Dev	-	0.000	10.064	60.860	-	60.860	24.221	17.171	13.608	11.066	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Aviation Rockets Product Improvement and Development line funds the development, integration and test of munitions and their interface to launcher and platforms to meet user requirements. Additionally, it will 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. 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) validated Lightweight Precision Munition (LPM) Operational Needs Statement ONS 16-21556 and 4) existing/emerging HQDA G-3/5/7 and TRADOC aviation weapon requirements for guided and unguided rocket systems. Improvements to existing rocket systems and munitions 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	8.000	10.064	26.103	-	26.103
Current President's Budget	0.000	10.064	60.860	-	60.860
Total Adjustments	-8.000	0.000	34.757	-	34.757
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	34.757	-	34.757
• RAA not Appropriated	-8.000	-	-	-	-

Change Summary Explanation

Additional funding is required to support technical assessments, concept studies, perform risk reduction, technology maturation, demonstration, engineering design, engineering / manufacturing development, test, integration and document preparation for Army Aviation manned and unmanned platforms.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev				Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EW9: Aviation Rocket System Product Improvement and Dev	-	0.000	10.064	60.860	-	60.860	24.221	17.171	13.608	11.066	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aviation Rockets Product Improvement and Development line funds the development, integration and test of munitions and their interface to launcher and platforms to meet user requirements. Additionally, it will 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. 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", 3) validated Lightweight Precision Munition (LPM) Operational Needs Statement ONS 16-21556, and 4) existing/emerging HQDA G-3/5/7 and TRADOC aviation weapon requirements for guided and unguided rocket systems. Improvements to existing rocket systems and munitions 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. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Advanced Precision Kill Weapon System (APKWS)	-	3.536	2.064	-	2.064
Description: These funds will be used to optimize APKWS integration on the Apache and for activities required to obtain an Army Full Materiel Release (FMR) for APKWS II. This effort includes design and build of all-up-round (AUR) containers and test assets, conduct environmental qualification testing, perform ground firings, update aviation platform software, support Apache weapon survey firings, provide technical support to platform integration and testing, and development and revision of training/maintenance materiel.					
FY 2018 Plans: Begin FMR efforts and analysis needed to optimize fire control integration on the AH-64 for guided variants.					
FY 2019 Base Plans: Complete FMR efforts and analysis needed to optimize fire control integration on the AH-64 for guided variants. Continue APKWS IM AUR container.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev	Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease due to effort completion of FMR and containers activities.						
Title: Modernized Rocket Launcher Increment 1 Description: This effort will provide the interface with aircraft and emerging munitions utilizing non-proprietary, open systems architecture allowing easy compatibility when integrating with aircrafts. This inherent flexibility of an open architecture serves as a building block for future weapons systems. FY 2018 Plans: Design and development of the HYLEA software and hardware efforts. FY 2019 Base Plans: Perform technical performance assessments, concept studies, and prepare documentation in effort to merge Modernized Rocket Launcher (MRL) and Smart Digital Interface (SDI) efforts into a single, universal capability. FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to merging of Modernized Rocket Launcher (MRL) and Smart Digital Interface (SDI) into single, integrated capability.		-	2.930	9.176	-	9.176
Title: Insensitive Munitions (IM) Compliance Description: Incorporation of IM-compliant explosives and design features into the Hydra-70 Rocket System to make system less sensitive. FY 2018 Plans: 1. Continue efforts to qualify the XM283 Warhead / XM1165 Fuze for fielding in place of the M151, achieving warhead compliance with Fast Cook Off, Slow Cook Off, and Bullet Impact IM requirements. 2. Continue efforts to begin transition of demonstrated venting technology to production MK66 motor and associated containers to achieve compliance with Fast Cook Off and Slow Cook Off IM requirements. FY 2019 Base Plans: 1. Continue qualification of the XM283 Warhead / XM1165 Fuze for fielding in place of the M151 warhead, achieving warhead compliance with Fast Cook Off, Slow Cook Off, and Bullet Impact IM requirements to comply with 1) USC - Title 10, Chapter 141, Section 2389, and 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. 2. Complete transition of demonstrated venting technology to production MK66 motor and associated containers to achieve compliance with Fast Cook Off and Slow Cook Off IM requirements to comply with 1) USC - Title		-	2.000	6.042	-	6.042

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev		Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
10, Chapter 141, Section 2389, and 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."						
FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to delay start of efforts in FY2018 due to new start.						
Title: Smart Digital Interface Description: The Smart Digital Interface program is an effort to support the future smart, two-way digital communications capability to be included in the fully capable Integrated Munitions Launcher (IML). This effort will evaluate launcher-to-munition physical interfaces for the fully capable smart munition and launcher system to reduce both programmatic and technical risk, as well as to inform requirements for a government owned, non-proprietary physical interface definition. FY 2018 Plans: Complete the program phase 1 physical interface candidate evaluation, interface asset availability determination, and interface concept selection. Begin the phase 2 test asset development/procurement and testing. FY 2019 Base Plans: Continue phase 2 test asset development/procurement and testing. FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to merging of MRL and SDI into single, integrated capability		-	1.598	4.941	-	4.941
Title: Army aviation weapons Description: These funds will be used for Army Aviation modular weapon systems and their interface to launchers and platforms. This effort will include technical assessments, concept studies, perform risk reduction efforts, technology maturation, demonstration, engineering design, engineering / manufacturing development, test, integration and document preparation for Army Aviation manned and unmanned platforms. FY 2019 Base Plans: 1. Perform technical assessments, concept studies, perform risk reduction efforts and prepare appropriate documentation for emerging Army Aviation Weapons, Sub-systems and Munitions (AAWSM) Initial Capability Document requirements.		-	-	38.637	-	38.637

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev		Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
2. Begin Lightweight Precision Munition (LPM) technology maturity and risk reduction efforts with industry to include fabrication of munition/launch system prototypes, evaluate mature existing systems to meet validated ONS 16-21556, integration and test efforts on the MQ-1C Gray Eagle.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> This is a new start.					
Accomplishments/Planned Programs Subtotals	-	10.064	60.860	-	60.860

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• E37300: Rockets Hydra, All Types	144.794	236.975	211.211	39.974	251.185	74.536	73.527	78.906	129.758	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
The Acquisition Strategy is to utilize in-house expertise, Other Government Agencies and defense industry capabilities. The strategy allows for the Government to have the ability to support urgent operational needs and to support unanticipated incidents, which require immediate and expert attention. Each product will have an individual strategy developed in a timely manner. This strategy will allow for the Government to maintain the capability of the Hydra-70 all-up-round rocket, its variants, Small Guided Munitions and posture for emerging requirements.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev						Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering/ Project Management	SS/ Various	Various : Performers	-	-		0.507	Mar 2018	3.874	Oct 2018	-		3.874	Continuing	Continuing	-
Subtotal			-	-		0.507		3.874		-		3.874	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Precision Kill Weapon System (APKWS)	MIPR	AMRDEC : Redstone Arsenal, AL	-	-		2.944	Mar 2018	1.156	Nov 2018	-		1.156	Continuing	Continuing	-
Modernized Rocket Launcher Increment 1	MIPR	AMRDEC : Redstone Arsenal, AL	-	-		2.197	Mar 2018	9.176	Nov 2018	-		9.176	Continuing	Continuing	-
Insensitive Munitions (IM) Compliance	SS/CPFF	GDOTS : Wilmington, VT	-	-		1.710	Mar 2018	4.306	Dec 2018	-		4.306	Continuing	Continuing	-
Smart Digital Interface	MIPR	AMRDEC : Redstone Arsenal, AL	-	-		0.500	Mar 2018	4.941	Dec 2018	-		4.941	Continuing	Continuing	-
Army aviation weapons	MIPR	Various : Various Performers	-	-		-		21.207	Jan 2019	-		21.207	Continuing	Continuing	-
Subtotal			-	-		7.351		40.786		-		40.786	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Research Studies	MIPR	AMRDEC : Redstone Arsenal, AL	-	-		0.415	Mar 2018	14.467	Dec 2018	-		14.467	Continuing	Continuing	-
Subtotal			-	-		0.415		14.467		-		14.467	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev				Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev				

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Confidence Testing	C/Various	TBD : TBD	-	-		1.791	Mar 2018	1.733	Dec 2018	-		1.733	Continuing	Continuing	-
Subtotal			-	-		1.791		1.733		-		1.733	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	10.064	60.860	-	60.860	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army												Date: February 2018																
Appropriation/Budget Activity 2040 / 7								R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev								Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev												
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
APKWS																												
Insensitve Munitions (IM) Compliance																												
Army aviation weapons																												
Moderized Rocket Launcher Increment 1																												
Smart Digital Interface																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement & Dev	Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
APKWS	2	2018	4	2020
Insensitive Munitions (IM) Compliance	2	2018	4	2021
Army aviation weapons	2	2019	4	2028
Moderized Rocket Launcher Increment 1	2	2018	1	2021
Smart Digital Interface	2	2018	1	2021

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607143A I Unmanned Aircraft System Universal Products							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	38.463	52.019	-	52.019	6.716	5.585	3.512	1.241	0.000	107.536
EX1: Unmanned Aircraft Systems Universal Products	-	0.000	38.463	52.019	-	52.019	6.716	5.585	3.512	1.241	0.000	107.536

A. Mission Description and Budget Item Justification

The Universal Products consist of the Universal Ground Control Station (UGCS), the Universal Ground Data Terminal (UGDT) and the Universal Mission Simulator (UMS), to support the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record. The Universal Products will be capable of flight and payload control of multiple types of Unmanned Aircraft Systems (UAS). Protected in a climate-controlled, standard S-280 or S-788 U.S. Army shelter and mounted on either a standard Army FMTV or HMMWV, the UGCS receives and disseminates battlefield video and situational awareness data through state-of-the-art operator consoles. Consoles can be used to provide aircraft command and control, payload control and weapons launch.

The UGDT provides a Line of Sight (LOS) capability for transmit and receipt of UAS command and control, and UAS payload product. The UGDT is the common datalink system for U. S. Army UAS.

The Universal Mission Simulator (UMS) consists of the hardware and software required to fully train UAS operators to full Readiness Level (RL) 1. The UMS will be capable of training and simulating flight and payload control of multiple types of unmanned aircraft systems and features Directorate of Simulation (DOS) accredited Shadow software and Gray Eagle software.

Justification: FY2019 Universal Product Base funding of \$52.019 Million will be used for continuing the development of modifications needed to address UGCS obsolescence, maintain interoperability, increase commonality for the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record, including System Engineering, Logistics, and Program Management.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		PE 0607143A / Unmanned Aircraft System Universal Products			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	38.463	25.794	-	25.794
Current President's Budget	0.000	38.463	52.019	-	52.019
Total Adjustments	0.000	0.000	26.225	-	26.225
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	26.225	-	26.225

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607143A / Unmanned Aircraft System Universal Products				Project (Number/Name) EX1 / Unmanned Aircraft Systems Universal Products			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EX1: Unmanned Aircraft Systems Universal Products	-	0.000	38.463	52.019	-	52.019	6.716	5.585	3.512	1.241	0.000	107.536
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Universal Products consist of the Universal Ground Control Station (UGCS), the Universal Ground Data Terminal (UGDT) and the Universal Mission Simulator (UMS), to support the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record. The Universal Products will be capable of flight and payload control of multiple types of Unmanned Aircraft Systems (UAS). Protected in a climate-controlled, standard S-280 or S-788 U.S. Army shelter and mounted on either a standard Army FMTV or HMMWV, the UGCS receives and disseminates battlefield video and situational awareness data through state-of-the-art operator consoles. Consoles can be used to provide aircraft command and control, payload control and weapons launch.

The UGDT provides a Line of Sight (LOS) capability for transmit and receipt of UAS command and control, and UAS payload product. The UGDT is the common datalink system for U. S. Army UAS.

The Universal Mission Simulator (UMS) consists of the hardware and software required to fully train UAS operators to full Readiness Level (RL) 1. The UMS will be capable of training and simulating flight and payload control of multiple types of unmanned aircraft systems and features Directorate of Simulation (DOS) accredited Shadow software and Gray Eagle software.

Justification:

FY2019 Universal Product Base funding of \$52.019 Million will be used for continuing the development of modifications needed to address UGCS obsolescence, maintain interoperability, increase commonality for the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record, including System Engineering, Logistics, and Program Management.

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

	FY 2017	FY 2018	FY 2019
Title: Universal Products (UGCS and UGDT) Improvements	-	33.009	47.244
Description: Universal Product Improvements are with respect to the Universal Ground Control Station (UGCS) and the Universal Ground Data Terminal (UGDT), which are used to operate the Gray Eagle (MQ-1C) and Shadow (RQ-7) Unmanned Aircraft Systems (UAS).			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607143A / <i>Unmanned Aircraft System Universal Products</i>	Project (Number/Name) EX1 / <i>Unmanned Aircraft Systems Universal Products</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018
Funding supports the Development of Universal Products Improvements to include: Hardware, Software and documentation to ensure a supportable UGCS and UGDT that is interoperable and increases commonality. The UGCS and UGDT will be used across Army UAS. FY 2019 Plans: Funding continues to support Development of Universal Products Improvements to include: Hardware, Software and documentation to ensure a supportable UGCS and UGDT that is interoperable and increases commonality. The UGCS and UGDT will be used across Army UAS. FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased from \$25.794 Million to \$52.019 Million in FY2019 in order to support the Developmental of Universal Products.			
Title: Training Device Improvements Description: Training Device Improvements are with respect to the Universal Mission Simulator (UMS), which is used for training and simulating flight and payload control of multiple types of Unmanned Aircraft Systems (UAS). FY 2018 Plans: Funding supports development and integration of hardware, software and documentation to support updated training capabilities utilizing the UMS and UGCS. FY 2019 Plans: Funding supports increased training capability of Unmanned Aircraft Systems to support Manned Unmanned Training (MUMT), Live/Virtual and Constructive Integrated Architecture (LVC-IA), and other PEO Aviation training devices. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to economic adjustments.		-	5.454
Accomplishments/Planned Programs Subtotals		-	38.463
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
The Universal Products began full rate production as a part of the MQ-1C and RQ-7 programs of record (both ACAT 1C) after Milestone III/C decisions were reached for both programs. Continued development of the Universal Products will be accomplished through a series of modifications and retrofits. Individual development/integration efforts will be based on competitive awards. Expected to award in May 2018 timeframe and will result in a Cost Plus Fixed Fee contracts.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607143A / Unmanned Aircraft System Universal Products	Project (Number/Name) EX1 / Unmanned Aircraft Systems Universal Products

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607143A / <i>Unmanned Aircraft System Universal Products</i>						Project (Number/Name) EX1 / <i>Unmanned Aircraft Systems Universal Products</i>			
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Universal Products (UGCS and UGDT) Improvements	C/CPFF	TBD : TBD	-	-		33.009		47.244		-		47.244	0.000	80.253	-
Training Device Improvements	C/CPFF	TBD : TBD	-	-		5.454		4.775		-		4.775	0.000	10.229	-
Subtotal			-	-		38.463		52.019		-		52.019	0.000	90.482	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		38.463		52.019		-		52.019	0.000	90.482	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607143A / Unmanned Aircraft System Universal Products		Project (Number/Name) EX1 / Unmanned Aircraft Systems Universal Products	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Universal Products (UGCS and UGDT) Improvements																												
Training Device Improvements																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607143A / Unmanned Aircraft System Universal Products	Project (Number/Name) EX1 / Unmanned Aircraft Systems Universal Products

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Universal Products (UGCS and UGDT) Improvements	3	2018	4	2022
Training Device Improvements	3	2018	4	2018

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607665A I Family of Biometrics							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	11.632	6.159	2.400	-	2.400	1.421	1.325	1.193	1.209	0.000	25.339
DT2: Non-MIP Biometrics	-	10.431	5.500	0.989	-	0.989	0.000	0.000	0.000	0.000	0.000	16.920
DU2: Management Agency	-	1.201	0.659	1.411	-	1.411	1.421	1.325	1.193	1.209	0.000	8.419

A. Mission Description and Budget Item Justification

The Biometrics Enabling Capability (BEC) product office has full life-cycle management responsibility of the DoD authoritative biometrics enterprise repository system, known as DoD Automated Biometrics Identification System (DoD ABIS). BEC Increment 0 is comprised of the current version (v1.2) of DoD ABIS and the Service Life Extension Program (SLEP) which is DoD ABIS v1.3. DoD ABIS supports identity superiority capabilities for Warfighters to identify known or suspected terrorists and third country nationals in the course of military operations. DoD ABIS provides matching, sharing, and storing of biometrics data. The capability can receive multi-modal biometrics submissions to include iris, face, palm, and finger prints from biometrics collection devices, which will support the Warfighter in making retain, capture, or release decisions. DoD ABIS has a direct impact on the availability of critical intelligence information that is of vital interest to DoD and other government agencies, including Department of Justice (DoJ), Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), and Department of State (DoS).

The Defense Forensics and Biometrics Agency (DFBA) is the Executive Agent for DoD Biometrics and the proponent to establish and maintain Research, Development, Test & Evaluation (RDTE) and information management support throughout the Armed Services and DoD. DFBA leads and facilitates in the development of improvements, and implementation of efficiencies to developed and deployed biometric technologies for Combatant Commands (CCMDs), Services, DoD, and Agencies; facilitates transition of capabilities that contribute to the enhancement of the biometric community; increases Joint Service interoperability; and empowers the warfighter by improving operational effectiveness on the battlefield. The DFBA strategy pursues technology opportunities through scientific discovery and makes investments responsive to specific requirements identified by combat developers.

Justification:

FY 2019 RDT&E funding in the amount of \$989 Thousand (DT2: Non-MIP Biometrics) supports developmental testing and limited user testing for the SLEP (DoD ABIS v 1.3)

FY 2019 funding in the amount of \$1.411 million for Project DU2 will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. DFBA conducts biometric activities (e.g. standards conformance and interoperability assessments), support to DoD acquisition organizations, and provision of subject matter expertise to DoD and non-DoD government stakeholders.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	12.098	6.159	1.426	-	1.426
Current President's Budget	11.632	6.159	2.400	-	2.400
Total Adjustments	-0.466	0.000	0.974	-	0.974
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-0.460	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-0.006	-	0.974	-	0.974

Change Summary Explanation

Net increase of FY19 BASE RDT&E by \$0.974 million from that reflected in the FY18 PB submission is to support developmental testing and limited user testing of DoD ABIS V1.3.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607665A / Family of Biometrics				Project (Number/Name) DT2 / Non-MIP Biometrics			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DT2: Non-MIP Biometrics	-	10.431	5.500	0.989	-	0.989	0.000	0.000	0.000	0.000	0.000	16.920
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Biometrics Enabling Capability (BEC) product office has full life-cycle management responsibility of the DoD authoritative biometrics enterprise repository system, known as DoD Automated Biometrics Identification System (DoD ABIS). BEC Increment 0 is comprised of the current version (v1.2) of DoD ABIS and the Service Life Extension Program (SLEP) which is DoD ABIS v1.3. DoD ABIS supports identity superiority capabilities for Warfighters to identify known or suspected terrorists and third country nationals in the course of military operations. DoD ABIS provides matching, sharing, and storing of biometrics data. The capability can receive multi-modal biometrics submissions to include iris, face, palm, and finger prints from biometrics collection devices, which will support the Warfighter in making retain, capture, or release decisions. DoD ABIS has a direct impact on the availability of critical intelligence information that is of vital interest to DoD and other government agencies, including Department of Justice (DoJ), Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), and Department of State (DoS).

Justification:

FY 2019 RDT&E funding in the amount of \$989 Thousand (DT2: Non-MIP Biometrics) supports developmental testing and limited user testing for the SLEP (DoD ABIS v 1.3)

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

	FY 2017	FY 2018	FY 2019
Title: DoD ABIS (BEC 0)	10.431	5.500	0.989
Description: Funding in FY18 and prior supports development and testing activities for the DoD ABIS (BEC Increment 0).			
FY 2018 Plans: Supports development and testing activities for the DoD Automated Biometric Identification System (ABIS) (BEC Increment 0). BEC Increment 0 is comprised of the current version (v1.2) of DoD ABIS and the Service Life Extension Program (SLEP) which is DoD ABIS v1.3. Funding supports the continuation of the SLEP of the DoD (ABIS), including a required update to the Search core, transaction manager, and the authoritative repository, as well as improved / enhanced interoperability with FBI, Department of Homeland Security, and other government entities.			
FY 2019 Plans: FY 2019 RDT&E funding in the amount of \$989 Thousand (DT2: Non-MIP Biometrics) supports developmental testing and limited user testing for the SLEP (DoD ABIS v 1.3)			
FY 2018 to FY 2019 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>	Project (Number/Name) DT2 / <i>Non-MIP Biometrics</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Decrease from FY18 to FY19 is due to the migration from development to testing for the Service Life Extension for DoD ABIS			
Accomplishments/Planned Programs Subtotals	10.431	5.500	0.989

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• BA1300: <i>FAMILY OF BIOMETRICS</i>	2.978	-	8.319	-	8.319	0.281	1.447	1.240	1.252	0.000	15.517

Remarks

D. Acquisition Strategy

The Army conducted a fair opportunity competition in FY17 to competitively select the contractor to continue to sustain the system and perform the Service Life Extension Project (SLEP) (DoD ABIS v1.3) Development and Deployment. The resulting contract for DoD ABIS Sustainment Services and SLEP was awarded on June 30, 2017. This upgrade is extremely critical in order to replace end of life hardware and software components, including Commercial Off the Shelf products whose versions currently included in DoD ABIS v1.2 are no longer supported. The SLEP (v1.3) will extend the service life of the current capability through FY22 and transition to sustainment and will improve interoperability with other government entities such as the FBI, DHS, and Department of Justice. The Army is currently staffing an Information System-Capability Development Document (IS-CDD) for BEC Increment 1 that will continue to improve upon the DoD ABIS.

E. Performance Metrics

N/A

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>	Project (Number/Name) DT2 / <i>Non-MIP Biometrics</i>

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPFF	Various : various	87.351	-		-		-		-		-	0.000	87.351	-
Service Life Extension	Option/ Various	Various : Various	5.772	10.431	Jun 2017	5.500		0.839	Jun 2019	-		0.839	0.000	22.542	-
Subtotal			93.123	10.431		5.500		0.839		-		0.839	0.000	109.893	N/A

Remarks

FY 2018, \$150K will cover the cost of Test & Evaluation (T&E) and \$839K will cover the developmental testing (DT).

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Civilian Personnel	TBD	Alexandria : Virginia	3.358	-		-		-		-		-	0.000	3.358	-
Other Support Costs (Facility Related Expenses)	TBD	Alexandria : Virginia	0.794	-		-		-		-		-	0.000	0.794	-
Subtotal			4.152	-		-		-		-		-	0.000	4.152	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation (System Testing)	MIPR	Army Test and Evaluation (ATEC); Joint Interoperability Test Command : Various Locations	3.282	-		-		0.150	Jun 2019	-		0.150	0.000	3.432	-
Subtotal			3.282	-		-		0.150		-		0.150	0.000	3.432	N/A

Remarks

Funding in the amount of \$150K is used to fund Testing and Evaluation in FY 2018.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army										Date: February 2018				
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607665A / Family of Biometrics					Project (Number/Name) DT2 / Non-MIP Biometrics				
		Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		100.557	10.431		5.500		0.989		-		0.989	0.000	117.477	N/A
Remarks														

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>	Project (Number/Name) DT2 / <i>Non-MIP Biometrics</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(1) DoD ABIS v1.2 Sustainment																												
Contract Award - 6 month Bridge (DoD ABIS v1.2) Sustainment																												
(2) DoD ABIS v1.3 SLEP Development and Developmental Testing																												
Competitive Contract Award - SLEP (DoD ABIS v1.3)																												
(3) Limited User Test																												
(4) DoD ABIS v1,3 Service Life Extension Sustainment																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>	Project (Number/Name) DT2 / <i>Non-MIP Biometrics</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
(1) DoD ABIS v1.2 Sustainment	1	2015	3	2019
Contract Award - 6 month Bridge (DoD ABIS v1.2) Sustainment	2	2017	2	2017
(2) DoD ABIS v1.3 SLEP Development and Developmental Testing	3	2017	3	2019
Competitive Contract Award - SLEP (DoD ABIS v1.3)	3	2017	3	2017
(3) Limited User Test	3	2019	3	2019
(4) DoD ABIS v1,3 Service Life Extension Sustainment	3	2019	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607665A / Family of Biometrics				Project (Number/Name) DU2 / Management Agency			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DU2: Management Agency	-	1.201	0.659	1.411	-	1.411	1.421	1.325	1.193	1.209	0.000	8.419
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Defense Forensics and Biometrics Agency (DFBA) is the Executive Agent for DoD Biometrics and the proponent to establish and maintain Research, Development, Test & Evaluation (RDTE) and information management support throughout the Armed Services and DoD. DFBA leads and facilitates in the development of improvements, and implementation of efficiencies to developed and deployed biometric technologies for Combatant Commands (CCMDs), Services, DoD, and Agencies; facilitates transition of capabilities that contribute to the enhancement of the biometric community; increases Joint Service interoperability; and empowers the warfighter by improving operational effectiveness on the battlefield. The DFBA strategy pursues technology opportunities through scientific discovery and makes investments responsive to specific requirements identified by combat developers.

Justification:

FY 2019 funding in the amount of \$1.411 million for Project DU2 will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. DFBA conducts biometric activities (e.g. standards conformance and interoperability assessments), support to DoD acquisition organizations, and provision of subject matter expertise to DoD and non-DoD government stakeholders.

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

	FY 2017	FY 2018	FY 2019
Title: Development and Implementation of Biometric Technologies	1.201	0.659	1.411
Description: Internal and External Research of Biometric Technologies			
FY 2018 Plans: FY 2018 funding in the amount of \$.659 million will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. Funding will be used to support enhancements for automated matching and detection capabilities for fingerprints, face, iris, voice, DNA modalities supporting DoD acquisition organizations and stakeholders, and in coordination with non-DoD stakeholders.			
FY 2019 Plans: FY 2019 funding in the amount of \$1.411 million will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. Funding will be used to support enhancements for automated matching and detection capabilities for fingerprints, face, iris, voice, DNA modalities supporting DoD acquisition organizations and stakeholders, and in coordination with non-DoD stakeholders.			
FY 2018 to FY 2019 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>	Project (Number/Name) DU2 / <i>Management Agency</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018
The increase of \$0.752 million between FY 2018 and FY 2019 will allow DFBA the ability to actively manage additional planned biometric research efforts.			
Accomplishments/Planned Programs Subtotals		1.201	0.659
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
DFBA uses a variety of existing contract vehicles to support the continued development of technology advancements for the fingerprint, face, iris, palm, and voice modalities. In addition to advancing the state of the art, these efforts enable DFBA to produce updated standards and architectures for the DoD Biometrics Enterprise in support of interoperability objectives.			
E. Performance Metrics			
N/A			

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607665A / Family of Biometrics				Project (Number/Name) DU2 / Management Agency					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DFBA RDTE efforts	MIPR	Various Activities : Various locations	9.221	1.201		0.659		1.411		-		1.411	0.000	12.492	-
Subtotal			9.221	1.201		0.659		1.411		-		1.411	0.000	12.492	N/A
Remarks															
Continuation of development of state of the art sensor capabilities enables the advancement of collection, match, share, and store capabilities. As sensors mature and take advantage of new spectra for biometric identification, the results from these capabilities enable DFBA to proactively advance the standards and architectures needed to use the advanced capabilities.															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			9.221	1.201		0.659		1.411		-		1.411	0.000	12.492	N/A
Remarks															

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>	Project (Number/Name) DU2 / <i>Management Agency</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DFBA RDT&E Fingerprint, Face, Iris, Palm, and Voice FY19 Projects									[REDACTED]				[REDACTED]				[REDACTED]				[REDACTED]							
DFBA RDT&E Fingerprint, Face, Iris, Palm, and Voice FY21 Projects									[REDACTED]				[REDACTED]				[REDACTED]											
DFBA Interoperability FY19 Projects									[REDACTED]				[REDACTED]				[REDACTED]											
DFBA Interoperability FY21 Projects									[REDACTED]				[REDACTED]				[REDACTED]											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / <i>Family of Biometrics</i>	Project (Number/Name) DU2 / <i>Management Agency</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DFBA RDT&E Fingerprint, Face, Iris, Palm, and Voice FY19 Projects	2	2019	4	2020
DFBA RDT&E Fingerprint, Face, Iris, Palm, and Voice FY21 Projects	2	2021	4	2022
DFBA Interoperability FY19 Projects	2	2019	4	2020
DFBA Interoperability FY21 Projects	2	2021	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607865A I Patriot Product Improvement							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	48.073	90.217	65.369	-	65.369	42.803	61.495	78.745	94.510	Continuing	Continuing
DV8: Patriot Product Improvement	-	48.073	90.217	65.369	-	65.369	42.803	61.495	78.745	94.510	Continuing	Continuing

Note

Beginning FY17, funding specific to LTAMD-C realigned to PE 0604114A, Lower Tier Missile Defense (LTAMD) Capability.

A. Mission Description and Budget Item Justification

PATRIOT is an advanced Surface-to-Air guided missile system with a high probability of kill, capable of operation in the presence of Electronic Countermeasures (ECM) and able to conduct multiple simultaneous engagements against high performance air breathing targets and ballistic missiles likely to be encountered by U.S. Forces. The PATRIOT Product Improvement Program provides for the upgrade of the PATRIOT System through individual materiel changes and upgrades to the PATRIOT system to address operational lessons learned, enhancements to joint force interoperability, and other system performance improvements to provide overmatch capability with the emerging threat.

The hardware and software funding provides for the identification, analysis, design and test improvements to the PATRIOT system against the evolving threat. This effort supports work with national agencies to evaluate, assess, and develop means to mitigate threat trends and specific threat developments potentially impacting system performance. Specific improvements may be developed and fielded under this task if warranted. The effort maintains the Mission Tailoring Database, responding to immediate tactical concerns. Database updates are fielded between major software upgrades as necessary.

Funding provides authority to identify, analyze, design and test materiel solutions to counter cybersecurity and electronic warfare shortcomings to all elements of the Lower Tier Battle Space.

FY2019 base dollars in the amount of \$65.369 million support the continuance of Software Improvement for Threat Evolution, Advanced Electronic Counter Measures (AECM), Assured Positioning, Navigation and Timing (PNT), Combat ID enhancements, Tasks 2, 6, and 7 activities, listed under project DV8.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607865A / <i>Patriot Product Improvement</i>

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	49.482	90.217	69.976	-	69.976
Current President's Budget	48.073	90.217	65.369	-	65.369
Total Adjustments	-1.409	0.000	-4.607	-	-4.607
• Congressional General Reductions	-0.016	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.393	-			
• Adjustments to Budget Years	-	-	-4.607	-	-4.607

Change Summary Explanation

FY2019: Program Office core employee labor costs moved from RDTE to OMA as part of an OSD auditability directive.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607865A / Patriot Product Improvement				Project (Number/Name) DV8 / Patriot Product Improvement			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DV8: Patriot Product Improvement	-	48.073	90.217	65.369	-	65.369	42.803	61.495	78.745	94.510	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning FY17, funding specific to LTAMD-C realigned to PE 0604114A, Lower Tier Missile Defense (LTAMD) Capability.

A. Mission Description and Budget Item Justification

Software and hardware improvements for threat evolution: Performs necessary analysis and development efforts to maintain PATRIOT system effectiveness against evolving threat technologies and specific threat capabilities. This effort identifies evolving threats and threat characteristics that might present a challenge to PATRIOT's current capabilities and develops initial concepts to maintain system effectiveness relative to these threats.

Upper-Tier Debris Mitigation (UTDM): Implements algorithms to mitigate system impacts of debris from Upper Tier intercepts associated with operating in the Ballistic Missile Defense System (BMDS) environment. Debris from Upper Tier intercepts can cause significant radar loading effects and the potential for erroneous engagements and missile wastage on debris.

Radar Digital Processor (RDP) Waveform Suite: Develops a comprehensive set of waveforms in the RDP to improve PATRIOT radar capabilities against current and evolving threats, including support to Task 6 and 7 efforts (see below), and implements advanced data collection enabled by the RDP to support further system improvements. The new waveforms enabled by the RDP allow capability improvements in Discrimination, Combat ID, Electronic Protection, Search, Tracking, and other areas of need.

THAAD/PATRIOT Interoperability: Implements improvements to THAAD/PATRIOT Interoperability and addresses Joint Defense Network deficiencies that impact Tactical Ballistic Missile battle management and force/engagement operations. Efforts will be concentrated on joint, collaborative force operations (defense design and planning) and enhanced Tactical Digital Information Link - Joint interoperability.

Advanced Electronic Counter Measures (AECM): This task investigates the implications of advanced technology Digital Radio Frequency Memory available on airborne platforms that enables new ECM techniques which could adversely affect Air and Missile Defense System effectiveness.

Task 2: Implements improved ground system and interceptor capabilities (PATRIOT Advanced Capability-2/Guidance Enhanced Missiles, PATRIOT Advanced Capability-3, and Missile Segment Enhancement) to counter emerging Tactical Ballistic Missile threats.

Task 6: Software improvements enhance discrimination of higher altitude Tactical Ballistic Missile Re-entry Vehicles (RVs) from associated objects to support the full engagement capabilities of the interceptor. Longer-range detection, track, and improved high-altitude discrimination are required to achieve the required lethality

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / Patriot Product Improvement	Project (Number/Name) DV8 / Patriot Product Improvement		
performance against the RV and to mitigate missile wastage against separation debris. This task leverages the signal processing capabilities of the Radar Digital Processor, and supports the high altitude engagements required by the PATRIOT Advanced Capability-3 (PAC-3) and PAC-3 Missile Segment Enhancement (MSE) missiles.				
Task 7: Performs analysis on existing and evolving Tactical Ballistic Missile countermeasures to determine the effects on PATRIOT system effectiveness. Develops hardware and software concepts to address countermeasure effects to ensure the PATRIOT system maintains its effectiveness. Develops detailed system requirements to implement concepts; design/code/test software implementation leveraging Radar Digital Processor, Modernized Adjunct Processor, Enhanced Weapons Control Computer - Emulator and Flight Solution Computer-Redesign processing capabilities. Implements simulation based concepts to define tradespace and establish system requirements.				
Assured Positioning, Navigation, and Timing (PNT): Efforts will develop and test the military's improved Global Position M-Code with Patriot Major End Items (MEI) integrating the improved anti-jamming and secure access of military GPS signals. This effort meets the requirement for Assured PNT through M-Code as mandated by FY2011 National Defense Act, public law 111-383 & 913.				
Combat ID Enhancements: Develop and implement improvements to the Radar Digital Processor-Capability Combat ID capabilities and additional Non-Cooperative Target Recognition techniques to further mitigate misclassification and fratricide risk, and to provide the Warfighter with improved situational awareness.				
Anti-Radiation Missile (ARM) Asset Defense: Provides improved capability for PATRIOT to protect other Army and Joint Services Sensors from ARM attacks. Builds on an initial capability provided in Post-Deployment Build-7 by determining remaining gaps, identifying and evaluating alternatives, and implementing further improvements.				
Tactical Telemetry Ground Station: Develops a ground-based telemetry receive station to be deployed with the tactical units and collect PAC-3 telemetry data for tactical engagements. This data will be used to assess missile and system effectiveness in tactical environments against real-world threats, and will support the development of operational improvements (Firing Doctrine and other system settings) and system software improvements to mitigate stressing threat behaviors.				
U.S. Government and contractor support for PIP efforts.				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Title: PATRIOT Product Improvement		48.073	90.217	65.369
Description: Continuous Improvement to Counter the Evolving Threat.				
FY 2018 Plans:				
-Continued Software Improvement for Threat Evolution, Upper-Tier Debris Mitigation (UTDM), THAAD/PATRIOT Interoperability and Advanced Electronic Countermeasures (AECM).				
-Began Tactical Telemetry Ground Station development.				
-Continued Combat ID enhancements, PNT and ARM Asset Defense development.				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0607865A / <i>Patriot Product Improvement</i>			Project (Number/Name) DV8 / <i>Patriot Product Improvement</i>					
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019		
-Continued Tasks 2, 6, and 7 activities. -Began Radar Digital Processor (RDP) Waveform Suite activities. -U.S. Government and contractor support to counter emerging threat. FY 2019 Plans: -Continues Software Improvement for Threat Evolution and Advanced Electronic Countermeasures (AECM). -Continues Combat ID enhancements and Assured Positioning, Navigation, and Timing (PNT). -Continues Tasks 2, 6, and 7 activities. -U.S. Government and contractor support to counter emerging threat. FY 2018 to FY 2019 Increase/Decrease Statement: FY2018 PIP funding of \$90.2M was reduced to \$65.4M in FY2019. Scheduled improvements are constrained by budget allocation for each respective fiscal year. Current funding profile will enable the development of a capability to address evolving threats; however, any further reductions in funding will increase risk in delivering a mature, fully tested Combat ID capability in PDB-8.1.											
Accomplishments/Planned Programs Subtotals							48.073	90.217	65.369		
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• C50700: <i>Patriot Mods (C50700)</i>	197.107	496.073	313.228	-	313.228	292.218	209.387	146.657	160.679	Continuing	Continuing
Remarks											
The improvements/enhancements developed through the PATRIOT Product Improvement Program (PIP) are interrelated with the hardware kits that are procured and installed under the Missile Procurement, Army (MIPA) appropriation's PATRIOT Mods program and maximizes PAC-3 MSE capabilities.											
D. Acquisition Strategy											
The design objective of the PATRIOT system was to provide a baseline system capable of modification to cope with continuing threat evolution. This program minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The PATRIOT Product Improvement Program upgrades the PATRIOT system to address operational lessons learned, enhancements to joint force interoperability and communications, and other system performance improvements to provide overmatch capability against the emerging threat. Upgrades are implemented through individual hardware and software materiel changes and fielded incrementally. This program encompasses several changes which will require the use of a variety of acquisition methods to develop, test, procure and field. Future hardware and software capabilities will be incorporated into future Post Deployment Build (PDB) releases.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0607865A / Patriot Product Improvement				Project (Number/Name) DV8 / Patriot Product Improvement					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	RSA, AL : RSA, AL	3.621	2.379	Oct 2016	5.177	Oct 2017	2.538	Oct 2018	-		2.538	Continuing	Continuing	Continuing
U.S. Contracts	Various	Multiple : Multiple	3.761	1.600	Feb 2017	1.600	Feb 2018	1.600	Feb 2019	-		1.600	Continuing	Continuing	Continuing
Subtotal			7.382	3.979		6.777		4.138		-		4.138	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Improvement for Threat Evolution	Various	Multiple : Multiple	31.370	7.729	Jan 2017	9.246	Jan 2018	9.018	Jan 2019	-		9.018	Continuing	Continuing	-
Upper Tier Debris Mitigation (UTDM)	Various	Multiple : Multiple	1.000	-		4.000	Jan 2018	-		-		-	Continuing	Continuing	-
Radar Digital Processor (RDP) Development	Various	Raytheon : Andover, Massachusetts	49.835	-		-		-		-		-	0.000	49.835	49.835
RDP Waveform Suite	Various	Raytheon : Andover, Massachusetts	-	-		2.500	Jan 2018	-		-		-	Continuing	Continuing	-
THAAD PATRIOT Interoperability	Various	Raytheon : Andover, Massachusetts	3.200	-		4.000	Jan 2018	-		-		-	Continuing	Continuing	-
Advanced Electronic Counter Measures (AECM)	Various	Multiple : Multiple	41.700	8.304	Jan 2017	15.158	Jan 2018	18.576	Jan 2019	-		18.576	Continuing	Continuing	-
Task 2 Non-Ballistic Tactical Ballistic Missile (TBM)	Various	Multiple : Multiple	24.700	5.400	Feb 2017	8.000	Feb 2018	4.400	Feb 2019	-		4.400	Continuing	Continuing	-
Task 6 Discrimination Improvements	Various	Multiple : Multiple	22.000	6.000	Feb 2017	9.500	Feb 2018	3.700	Feb 2019	-		3.700	Continuing	Continuing	-
Task 7 TBM Countermeasures / Effectors	Various	Multiple : Multiple	13.000	4.000	May 2017	10.700	May 2018	10.000	May 2019	-		10.000	Continuing	Continuing	-
Assured PNT	Various	Multiple : Multiple	-	7.440	Jan 2017	3.600	Jan 2018	3.300	Jan 2019	-		3.300	Continuing	Continuing	-
Combat ID Enhancements	Various	Multiple : Multiple	10.816	4.621	May 2017	9.000	May 2018	11.537	May 2019	-		11.537	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7							R-1 Program Element (Number/Name) PE 0607865A / <i>Patriot Product Improvement</i>				Project (Number/Name) DV8 / <i>Patriot Product Improvement</i>				

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Flat Panel Array Concept Development	Various	Multiple : Multiple	3.300	-		-		-		-		-	0.000	3.300	3.300
Anti-Radiation Missile (ARM) Asset Defense	Various	Raytheon : Andover, Massachusetts	2.000	-		3.000	Jan 2018	-		-		-	Continuing	Continuing	-
Tactical Telemetry Ground Station	Various	Multiple : Multiple	-	-		4.036	Jan 2018	-		-		-	Continuing	Continuing	-
Subtotal			202.921	43.494		82.740		60.531		-		60.531	Continuing	Continuing	N/A

Remarks
The contract method type Sole Source/Various is Fixed Price Level of Effort which includes Cost Plus Fixed Fee for material, ODC, and travel.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RDEC and Other Govt Agencies	MIPR	RDEC and OGA'S : RSA, AL	3.912	0.600	Jan 2017	0.700	Jan 2018	0.700	Jan 2019	-		0.700	Continuing	Continuing	Continuing
Subtotal			3.912	0.600		0.700		0.700		-		0.700	Continuing	Continuing	N/A

			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			214.215	48.073		90.217		65.369		-		65.369	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0607865A / <i>Patriot Product Improvement</i>		Project (Number/Name) DV8 / <i>Patriot Product Improvement</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Software Build																												
Software Build																												
Advanced Electronic Counter Measures (AECM)																												
AECM																												
Software Improvement for Threat Evolution																												
Software Threat																												
Combat ID Enhancements																												
Combat ID Enhancements																												
PDB 8 IOC																												
PDB 8 Fielding																												
PDB 8.1																												
PDB 8.1																												
Task 2 Non-Ballistic Tactical Ballistic Missile (TBM)																												
Task 2 Non-Ballistic TBM																												
Task 6 Discrimination Improvements																												
Task 6 Discrimination Improvements																												
Task 7 TBM Countermeasures / Effectors																												
Task 7 TBM Countermeasures																												
Assured PNT																												
Assured PNT																												
Tactical Telemetry Ground Station																												
Tactical Telemetry Ground Station																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / <i>Patriot Product Improvement</i>	Project (Number/Name) DV8 / <i>Patriot Product Improvement</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Build	4	2005	4	2023
Advanced Electronic Counter Measures (AECM)	1	2014	4	2023
Software Improvement for Threat Evolution	1	2014	4	2023
Combat ID Enhancements	1	2014	4	2023
PDB 8 IOC	4	2018	4	2018
PDB 8 Fielding	2	2018	4	2022
PDB 8.1	2	2016	4	2022
Radar Digital Processor Development	1	2012	3	2016
Task 2 Non-Ballistic Tactical Ballistic Missile (TBM)	1	2015	4	2023
Task 6 Discrimination Improvements	1	2014	4	2023
Task 7 TBM Countermeasures / Effectors	1	2015	4	2023
Assured PNT	1	2017	4	2021
Lower Tier Air & Missile Defense-Capability (LTAMD-C) Concept Study	1	2014	4	2016
Tactical Telemetry Ground Station	2	2018	4	2023

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0202429A / Aerostat Joint Project - COCOM Exercise							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	6.178	6.749	0.001	-	0.001	0.000	0.000	0.000	0.000	0.000	12.928
EP8: COCOM Exercise	-	6.178	6.749	0.001	-	0.001	0.000	0.000	0.000	0.000	0.000	12.928

A. Mission Description and Budget Item Justification

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) is a supporting program for Army and Joint Integrated Air and Missile Defense, providing elevated, persistent, over the horizon surveillance and fire control quality data on Army and Joint networks, enabling protection of the U.S. and coalition forces as well as critical geo political assets from Cruise Missiles, Aircraft, Unmanned Aerial Vehicles, Tactical Ballistic Missiles, Large Caliber Rockets, and Surface Moving Targets. A JLENS Orbit consists of two systems: a fire control radar system and a wide-area surveillance radar system. Each radar system consists of a separate 74-meter tethered aerostat, mobile mooring station, radar and communications payload, processing station, and associated ground support equipment. The systems are designed to work together, but can operate independently. The JLENS Orbit is transportable by road, rail, sea and air.

JLENS uses advanced sensor and networking technologies to provide persistent, 360-degree, wide-area surveillance and precision tracking of Land Attack Cruise Missiles and other types of Air Breathing Threats. This information is distributed via joint service networks and provides fire control quality data to Surface to Air missile systems, such as Army Patriot and Navy Aegis, increasing the weapons' capabilities by allowing systems to engage targets normally below, outside, or beyond surface based weapons' field of view. JLENS also provides fire control quality data to fighter aircraft, allowing the aircraft to engage hostile threats from extended ranges, and contributes to the development of a single integrated air picture.

JLENS prepared and participated in Operation Noble Eagle (ONE) with NORAD-USNORTHCOM National Capital Region (NCR) Integrated Air Defense System (IADS) Operational Exercise (OPEX) from FY14-FY16 as directed by the Joint Requirements Oversight Council Memorandum (JROCM) 021-13 signed by the Vice Chairman of the Joint Chiefs of Staff on 31 January 2013. The OPEX included an operational assessment to "inform a future decision for enduring operational employment", in accordance with Joint Requirements Oversight Council Memorandum (JROCM) 021-13. The Combatant Command (CCMD) objective for the OPEX was to provide the full range of JLENS Orbit level capability to include: Persistent Wide Area Surveillance (WAS) through Battle Command System Fixed (BCS-F) Integration Combat Identification (CID) / Electronic Identification (EID) Precision Cue to Fighters/Ground-Based Air Defense (GBAD) via Tactical Data Link (TDL) Integrated Fire Control to Fighters (IFC)/GBAD via TDL.

JLENS ended OPEX participation in October 2015 with the direction to store the system in place.

JLENS received an Acquisition Decision Memorandum (ADM), dated 18 July 2017, directing the program to prepare and submit a program termination plan. Disposition of 185 ISO containers consisting of classified and unclassified material along with 12 trailers will take two years (FY 2018-2019). In FY 2018, the focus is on the disposition of classified and starting the disposition of unclassified material. The remaining unclassified material will be disposed of in FY 2019.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0202429A / <i>Aerostat Joint Project - COCOM Exercise</i>

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	45.482	6.749	0.001	-	0.001
Current President's Budget	6.178	6.749	0.001	-	0.001
Total Adjustments	-39.304	0.000	0.000	-	0.000
• Congressional General Reductions	-0.003	-			
• Congressional Directed Reductions	-39.082	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.219	-			

Change Summary Explanation

FY 2017 adjustments are the result of Congressional mark as part of the FY 2017 Appropriation Act, SBIR/STTR and FFRDC transfer.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0202429A / Aerostat Joint Project - COCOM Exercise				Project (Number/Name) EP8 / COCOM Exercise			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EP8: COCOM Exercise	-	6.178	6.749	0.001	-	0.001	0.000	0.000	0.000	0.000	0.000	12.928
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) is a supporting program for Army and Joint Integrated Air and Missile Defense, providing elevated, persistent, over the horizon surveillance and fire control quality data on Army and Joint networks, enabling protection of the U.S. and coalition forces as well as critical geo political assets from Cruise Missiles, Aircraft, Unmanned Aerial Vehicles, Tactical Ballistic Missiles, Large Caliber Rockets, and Surface Moving Targets. A JLENS Orbit consists of two systems: a fire control radar system and a wide-area surveillance radar system. Each radar system consists of a separate 74-meter tethered aerostat, mobile mooring station, radar and communications payload, processing station, and associated ground support equipment. The systems are designed to work together, but can operate independently. The JLENS Orbit is transportable by road, rail, sea and air.

JLENS uses advanced sensor and networking technologies to provide persistent, 360-degree, wide-area surveillance and precision tracking of Land Attack Cruise Missiles and other types of Air Breathing Threats. This information is distributed via joint service networks and provides fire control quality data to Surface to Air missile systems, such as Army Patriot and Navy Aegis, increasing the weapons' capabilities by allowing systems to engage targets normally below, outside, or beyond surface based weapons' field of view. JLENS also provides fire control quality data to fighter aircraft, allowing the aircraft to engage hostile threats from extended ranges, and contributes to the development of a single integrated air picture.

JLENS prepared for and participated in Operation Noble Eagle (ONE) with NORAD-USNORTHCOM National Capital Region (NCR) Integrated Air Defense System (IADS) Operational Exercise (OPEX) from FY14-FY16, as directed by the Joint Requirements Oversight Council Memorandum (JROCM) 021-13 signed by the Vice Chairman of the Joint Chiefs of Staff on 31 January 2013. JLENS participation in the OPEX was to allow for a combatant commander's operational assessment of JLENS capabilities to "inform a future decision for enduring operational employment".

Operational Control of JLENS for the OPEX was transferred to the NORAD/NORTHCOM Joint Air Defense Operations Center (JADOC) on 15 October 2015. Due to a tether break accident on 28 October 2015 and resulting loss of the Fire Control System aerostat and significant damage to the Radar and Mobile Mooring Station, the Commander NORAD/NORTHCOM suspended JLENS participation in the OPEX pending results of accident investigations and Failure Review Board recommendations. JLENS participation in the OPEX was terminated per an Under Secretary for Defense Policy decision memorandum dated 15 June 2016. In accordance with Army Acquisition Executive (AAE) direction, JLENS equipment supporting the OPEX was packed and stored at the APG sites effective 21 June 2016, pending higher headquarters decision on the future of the JLENS program.

JLENS ended OPEX participation in October 2015 with the direction to store the system in place.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0202429A / Aerostat Joint Project - COCOM Exercise	Project (Number/Name) EP8 / COCOM Exercise		
JLENS received an Acquisition Decision Memorandum (ADM), dated 18 July 2017, directing the program to prepare and submit a program termination plan. Disposition of 185 ISO containers consisting of classified and unclassified material along with 12 trailers will take two years (FY 2018-2019). In FY 2018, the focus is on the disposition of classified and starting the disposition of unclassified material. The remaining unclassified material will be disposed of in FY 2019.				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Title: JLENS Exercise		6.178	6.749	0.001
Description: Plan and execute JLENS participation in the NORAD-USNORTHCOM National Capital Region Integrated Air Defense System (IADS) OPEX.				
FY 2018 Plans: Perform program shutdown activities to include disposition of assets and program office support.				
FY 2019 Plans: Perform program shutdown activities.				
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 remaining activity is disposal of unclassified material.				
Accomplishments/Planned Programs Subtotals		6.178	6.749	0.001
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
JLENS prepared for and participated in Operation Noble Eagle (ONE) with NORAD-USNORTHCOM National Capital Region (NCR) Integrated Air Defense System (IADS) Operational Exercise (OPEX) from FY 2014-FY 2016, as directed by the Joint Requirements Oversight Council Memorandum (JROCM) 021-13 signed by the Vice Chairman of the Joint Chiefs of Staff on 31 January 2013. JLENS participation in the OPEX was to allow for a combatant commander's operational assessment of JLENS capabilities to "inform a future decision for enduring operational employment".				
Operational Control of JLENS for the OPEX was transferred to the NORAD/NORTHCOM Joint Air Defense Operations Center (JADOC) on 15 October 2015. Due to a tether break accident on 28 October 2015 resulting in the loss of the Fire Control System aerostat, significant damage to the Radar and Mobile Mooring Station, the Commander NORAD/NORTHCOM suspended JLENS participation in the OPEX pending results from accident investigations and Failure Review Board recommendations. JLENS participation in the OPEX was terminated per an Under Secretary for Defense Policy decision memorandum dated 15 June 2016. In accordance with Army Acquisition Executive (AAE) direction, JLENS equipment supporting the OPEX was packed and stored at the APG sites effective 21 June 2016, pending higher headquarters decision on the future of the JLENS program. Courses of action under consideration are staging JLENS equipment in indefinite storage to meet potential future contingency requirements; and termination of the JLENS program with disposition/demilitarization of JLENS equipment.				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0202429A / Aerostat Joint Project - COCOM Exercise	Project (Number/Name) EP8 / COCOM Exercise

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0202429A / Aerostat Joint Project - COCOM Exercise				Project (Number/Name) EP8 / COCOM Exercise					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JLENS Exercise - PM Support, OGA, Travel, Transportation, Licenses, Agreements and program shutdown	MIPR	Multiple Various : AL/ MD/UT/SC	10.624	6.178	Jan 2017	6.749		0.001		-		0.001	4.396	27.948	-
JLENS Exercise Aberdeen Proving Ground, MD (APG) Support	MIPR	Multiple Various : MD	9.814	-		-		-		-		-	2.350	12.164	-
Subtotal			20.438	6.178		6.749		0.001		-		0.001	6.746	40.112	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JLENS - COCOM Exercise, Failure Review Board and Displacement Contract	SS/FFP	Multiple Various : AL/ MD/NC/MA/CA	45.257	-		-		-		-		-	0.000	45.257	-
JLENS - Technical Services Contract	SS/ FFPLOE	Multiple Various : MD/MA/CA	2.000	-		-		-		-		-	0.000	2.000	-
UTTR Orbit 2 Staging	IA	Various : UT	1.257	-		-		-		-		-	0.000	1.257	-
Subtotal			48.514	-		-		-		-		-	0.000	48.514	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			68.952	6.178		6.749		0.001		-		0.001	6.746	88.626	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0202429A / <i>Aerostat Joint Project - COCOM Exercise</i>		Project (Number/Name) EP8 / <i>COCOM Exercise</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JLENS NCR Exercise Contract																												
JLENS NCR Operations																												
JLENS System Displacement																												
Combatant Command (COCOM) Assessment																												
Enduring Operation Decision Point																												
JLENS NCR Operations Final Data Submission																												
Continued New Equipment Training for Replacement Soldiers																												
Program Disposition of Assets and shutdown																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0202429A / <i>Aerostat Joint Project - COCOM Exercise</i>	Project (Number/Name) EP8 / <i>COCOM Exercise</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Aberdeen Proving Grounds (APG) Site Planning and Preparation	1	2014	4	2015
JLENS NCR Exercise Contract	1	2015	4	2017
JLENS NCR Operations	1	2015	3	2017
JLENS System Displacement	4	2017	4	2017
Combatant Command (COCOM) Assessment	3	2017	3	2017
Enduring Operation Decision Point	3	2017	3	2017
JLENS NCR Operations Final Data Submission	3	2017	3	2017
New Equipment Training for Replacement Soldiers	2	2015	1	2016
Continued New Equipment Training for Replacement Soldiers	2	2017	2	2017
Program Disposition of Assets and shutdown	1	2018	1	2019

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0203728A I Joint Automated Deep Operation Coordination System (JADOCS)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	29.412	33.520	30.954	-	30.954	32.807	18.299	5.261	7.839	0.000	158.092
EF6: JADOCS	-	2.717	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.717
EF7: Pocket-Sized Forward Entry Device (PFED) Inc 2	-	2.891	4.537	3.884	-	3.884	3.118	1.508	0.000	2.648	0.000	18.586
EF8: AFATDS Increment 1	-	23.804	28.983	27.070	-	27.070	29.689	16.791	5.261	5.191	0.000	136.789

A. Mission Description and Budget Item Justification

This program element provides development for fire support command and control systems used by all Services from platoon to echelons above Corps. There are two developmental efforts that are being executed concurrently FY 2018 and beyond: Pocket-sized Forward Entry Device (Increment II) (project code EF7) and Advanced Field Artillery Tactical Data System (AFATDS) (Increment I) (project code EF8). The development on the Joint Automated Deep Operations Coordination System (JADOCS) (project code EF6) was completed in FY 2017.

Joint Automated Deep Operations Coordination System (JADOCS) is a Joint and Coalition targeting, coordination mission management software application. It links Command and Control (C2), Intelligence, and Air operations information with execution systems using real time collaborative targeting managers, customized for each service or specific functional area. JADOCS is used to significantly enhance the Joint Force and Component Command's capability to simultaneously develop, coordinate and execute Dynamic and Time Sensitive targets and fire missions, as well as battle space coordination worldwide. JADOCS provides coordination and de-confliction of targeting information at all levels of command structure for the military. JADOCS is used by Air, Ground, Maritime, and Special Operations forces. It provides horizontal (across Services) as well as vertical (within Services) coordination of missions to ensure a common picture of targeting operational status across the entire joint force. As a software application, JADOCS can be configured and customized for each user and location.

Pocket-sized Forward Entry Device (PFED) Increment II is a software application that operates on the Nett Warrior End User Device (EUD). It will provide the dismounted Forward Observer (FO) and Fire Support Teams (FISTs) the capability and functionality to accurately and rapidly locate ground targets and digitally process a Call For Fire. PFED Increment II answers the Mobile Handheld Computing Environment requirement that all handheld applications reside on the Nett Warrior EUD.

AFATDS 7.0 modernizes the existing AFATDS program currently in the field. AFATDS 7.0 enhances the existing AFATDS baseline by: (1) Providing a modernized web service based backend that will simplify long-term maintenance of the software, (2) Bringing AFATDS into full compliance with the Army's Common Operating Environment (COE) Command Post Computing Environment (CPCE) initiative and (3) Enhancing overall usability of the system through the implementation of a role-based capability architecture with embedded training that allows the AFATDS operator to receive on-the-spot training for any aspect of AFATDS via interactive instruction.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	30.455	33.520	29.558	-	29.558
Current President's Budget	29.412	33.520	30.954	-	30.954
Total Adjustments	-1.043	0.000	1.396	-	1.396
• Congressional General Reductions	-0.013	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-1.030	-	1.396	-	1.396

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)				Project (Number/Name) EF6 / JADOCS			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EF6: JADOCS	-	2.717	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.717
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Joint Automated Deep Operations Coordination System (JADOCS) is a Joint and Coalition targeting, coordination mission management software application. It links Command and Control (C2), Intelligence, and Air operations information with execution systems using real time collaborative targeting managers, customized for each service or specific functional area. JADOCS is used to significantly enhance the Joint Force and Component Command's capability to simultaneously develop, coordinate and execute Dynamic and Time Sensitive targets and fire missions, as well as battle space coordination worldwide. JADOCS provides coordination and de-confliction of targeting information at all levels of command structure for the military.

JADOCS is used by Air, Ground, Maritime, and Special Operations forces. It provides horizontal (across Services) as well as vertical (within Services) coordination of missions to ensure a common picture of targeting operational status across the entire joint force. As a software application, JADOCS can be configured and customized for each user and location.

JADOCS fires and targeting capabilities will migrate to AFATDS v 7.1. JADOCS v2.0 will be sustained throughout the force until AFATDS 7.1 is fielded and satisfies the requirement for JADOCS fires and targeting functionality. JADOCS v 2.0 software is being developed by CECOM Life Cycle Management Command, Software Engineering Center (SEC).

There is no FY 2019 RDTE funding request.

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

	FY 2017	FY 2018	FY 2019
Title: JADOCS Software Development Efforts	1.222	-	-
Description: Software development of JADOCS v2.0 software.			
Title: Program Management Support Costs for JADOCS	0.596	-	-
Description: Program support for JADOCS v2.0 software development efforts.			
Title: Army and Joint Testing Activities	0.791	-	-
Description: Conduct and support Army and Joint Testing Activities.			
Title: FFRDC	0.001	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)			Project (Number/Name) EF6 / JADOCS				

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Description: FFRDC			
Title: SBIR/STTR	0.107	-	-
Accomplishments/Planned Programs Subtotals	2.717	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B28504: JOINT AUTOMATED DEEP OPNS COORDINATION SYSTEM	1.969	1.722	1.679	-	1.679	0.494	-	-	-	0.000	5.864
Remarks											
D. Acquisition Strategy JADOCS v2.0 is the last version of JADOCS software. JADOCS v2.0 will interoperate with AFATDS. JADOCS v 2.0 will be maintained and sustained until the Joint Users requirements are met by AFATDS and other systems. JADOCS 2.0 is developed under agreement with the LCMC SEC.											
E. Performance Metrics N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)						Project (Number/Name) EF6 / JADOCS					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	IA	CECOM LCMC SEC FD : Ft. Sill, OK	21.525	1.221		-		-		-		-	0.000	22.746	-
Subtotal			21.525	1.221		-		-		-		-	0.000	22.746	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	PM Mission Command (MC) : APG, MD	1.400	0.596		-		-		-		-	0.000	1.996	-
Subtotal			1.400	0.596		-		-		-		-	0.000	1.996	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Army and Joint Test Support	Various	Joint Service Testing : Various	0.700	0.900		-		-		-		-	0.000	1.600	-
Subtotal			0.700	0.900		-		-		-		-	0.000	1.600	N/A
			Prior Years	FY 2017	FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			23.625	2.717	0.000		-		-		-	0.000	26.342	N/A	
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

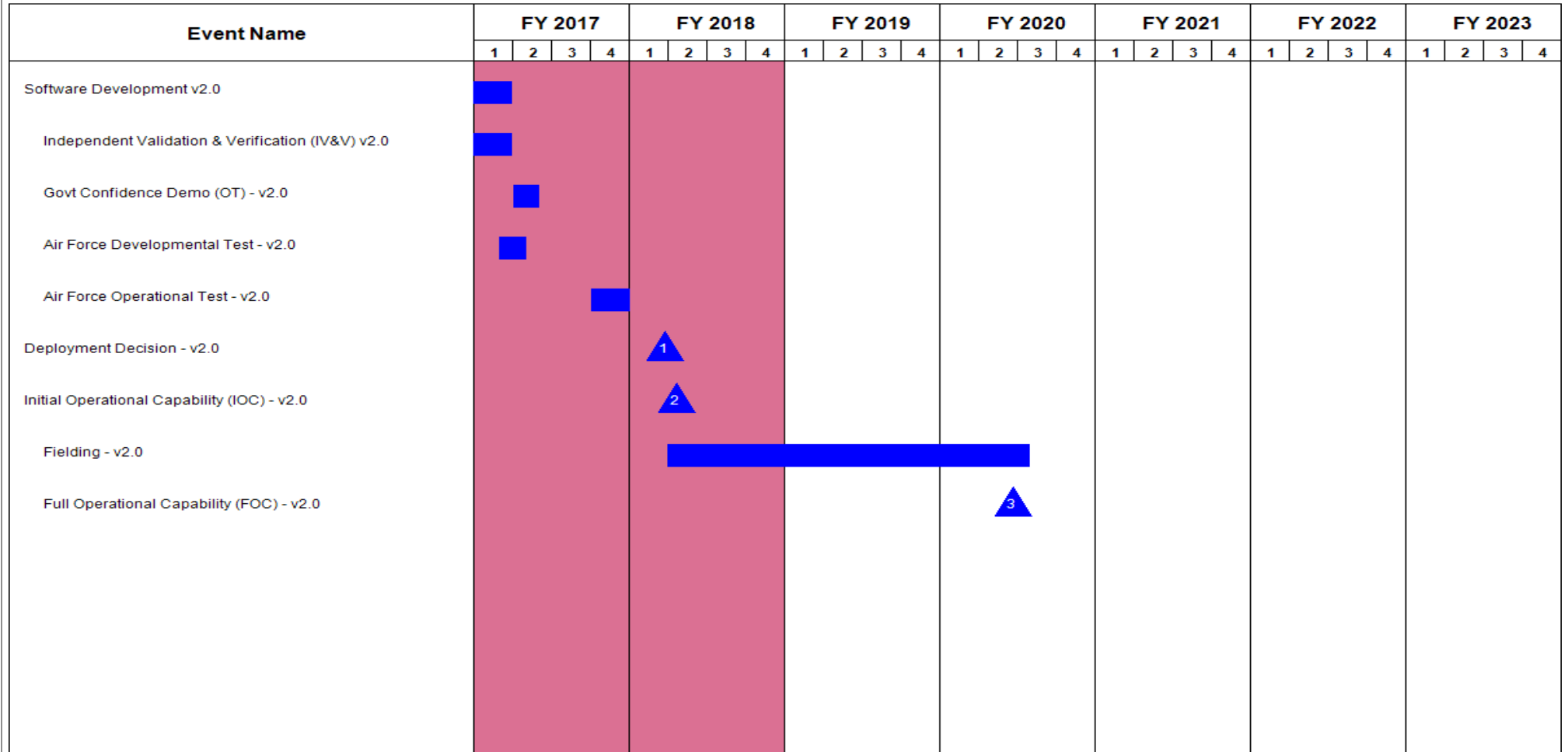
2040 / 7

R-1 Program Element (Number/Name)

PE 0203728A / *Joint Automated Deep
Operation Coordination System (JADOCS)*

Project (Number/Name)

EF6 / JADOCS



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)	Project (Number/Name) EF6 / JADOCS	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Development v2.0	3	2014	1	2017
Independent Validation & Verification (IV&V) v2.0	3	2015	1	2017
Govt Confidence Demo (OT) - v2.0	2	2017	2	2017
Air Force Developmental Test - v2.0	1	2017	2	2017
Air Force Operational Test - v2.0	4	2017	4	2017
Deployment Decision - v2.0	1	2018	1	2018
Initial Operational Capability (IOC) - v2.0	2	2018	2	2018
Fielding - v2.0	2	2018	3	2020
Full Operational Capability (FOC) - v2.0	2	2020	2	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)				Project (Number/Name) EF7 / Pocket-Sized Forward Entry Device (PFED) Inc 2			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EF7: Pocket-Sized Forward Entry Device (PFED) Inc 2	-	2.891	4.537	3.884	-	3.884	3.118	1.508	0.000	2.648	0.000	18.586
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Pocket-sized Forward Entry Device (PFED) Increment II is a software application that operates on the Nett Warrior End User Device (EUD). It will provide the dismounted Forward Observer (FO) and Fire Support Teams (FISTs) the capability and functionality to accurately and rapidly locate ground targets and digitally process a Call For Fire. PFED Increment II answers the Mobile Handheld Computing Environment requirement that all handheld applications reside on the Nett Warrior EUD.

FY 2019 funding of \$3.884 million supports the evolutionary software development and testing of PFED Increment II and transition to the mounted computing environment.

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

	FY 2017	FY 2018	FY 2019
Title: Program Management Support Costs for PFED Increment II Description: Program support for PFED INC II software development efforts. FY 2018 Plans: Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspects of the PFED Inc II program including requirements development, software development efforts, logistics, and business management support. FY 2019 Plans: Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspects of the PFED Inc II program including requirements development, software development efforts, logistics, and business management support. FY 2018 to FY 2019 Increase/Decrease Statement: RDTE management requirements decreasing as development moves to fielding	0.267	0.662	0.390
Title: PFED INC II Software Development Description: PFED INC II Software Development FY 2018 Plans: Development and testing of Block 2 capabilities. Complete hardware/software integration with Nett Warrior EUD and MFOCS. Complete software Information Assurance certification. FY 2019 Plans:	2.453	3.525	3.244

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)			Project (Number/Name) EF7 / Pocket-Sized Forward Entry Device (PFED) Inc 2				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019		
Development and testing of Block 2 capabilities. Complete hardware/software integration with Nett Warrior EUD and MFOCS. Complete software Information Assurance certification.											
FY 2018 to FY 2019 Increase/Decrease Statement: RDTE development requirements decreasing as development moves to fielding											
Title: Testing							0.171	0.350	0.250		
Description: Conduct and Support Army Testing Activities											
FY 2018 Plans: Prepare and execute Engineering Release Evaluation/Testing.											
FY 2019 Plans: Prepare and execute Engineering Release Evaluation/Testing.											
FY 2018 to FY 2019 Increase/Decrease Statement: RDTE test requirements decreasing as development moves to fielding											
Accomplishments/Planned Programs Subtotals							2.891	4.537	3.884		
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• BZ9851: BZ9851 POCKET FORWARD ENTRY DEVICE (PFED) - OPA	4.340	4.213	10.644	-	10.644	3.726	3.802	5.850	-	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
On 18 May 2015, the Milestone Decision Authority (PEO C3T) signed the Acquisition Decision Memorandum (ADM) approving the PFED Increment II Milestone B. The Acquisition Decision Memorandum (ADM) officially approved entry into the Development phase as an Acquisition Category (ACAT) III program. The system received a limited deployment decision in Dec 2016 to enter into operational test and subsequently expects to receive full material release in Jan 2018											
PFED Increment II leverages an Army Science and Technology investment by transitioning a software application that has been developed and used in proponent experimentation events (e.g. Army Expeditionary Warrior Experiment (AEWE) and Bold Quest). Upon a successful Milestone B decision in FY2015, this software application transitioned to PM Mission Command to conduct all Army developmental and operational test and evaluation requirements. PFED Increment II will be											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / <i>Joint Automated Deep Operation Coordination System (JADOCS)</i>	Project (Number/Name) EF7 / <i>Pocket-Sized Forward Entry Device (PFED) Inc 2</i>
integrated onto the Nett Warrior End User Devices (EUDs) and will be fielded by PM Soldier Warrior (PM SWAR). Training on the PFED Increment II software will be conducted by PM Mission Command as units are fielded the capability. PM Mission Command will continue to manage future capability blocks of software development. PM Mission Command will continue to coordinate with PM Soldier Warrior to field and train future versions of the software, as described above. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)				Project (Number/Name) EF7 / Pocket-Sized Forward Entry Device (PFED) Inc 2					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support for PFED Inc2 (CORE)	Sub Allot	PM Mission Command (MC) : APG, MD	-	-		0.100		0.100		-		0.100	0.000	0.200	-
Program Management Support for PFED Inc2 (Matrix)	IA	Various Mix Orgs (Govt) : APG, MD	-	0.075		0.226		0.196		-		0.196	0.000	0.497	-
Program Management Support for PFED Inc2 (SETA)	C/FFP	CRSA : APG, MD	-	-		0.450		0.390		-		0.390	0.000	0.840	-
Subtotal			-	0.075		0.776		0.686		-		0.686	0.000	1.537	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PFED Increment II Software Development efforts	IA	AMRDEC : Redstone, AL	5.163	2.419	Oct 2017	3.048		2.384		-		2.384	Continuing	Continuing	Continuing
Subtotal			5.163	2.419		3.048		2.384		-		2.384	Continuing	Continuing	N/A
Remarks SW development contract awarded 6 October 2017															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	PM Mission Command (MC) : APG, MD	1.003	0.151		0.363		0.314		-		0.314	Continuing	Continuing	Continuing
Subtotal			1.003	0.151		0.363		0.314		-		0.314	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)				Project (Number/Name) EF7 / Pocket-Sized Forward Entry Device (PFED) Inc 2							
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support (Engineering Release)	Various	Testing : Various	0.560	0.246		0.350		0.500		-		0.500	Continuing	Continuing	Continuing
Subtotal			0.560	0.246		0.350		0.500		-		0.500	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			6.726	2.891		4.537		3.884		-		3.884	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

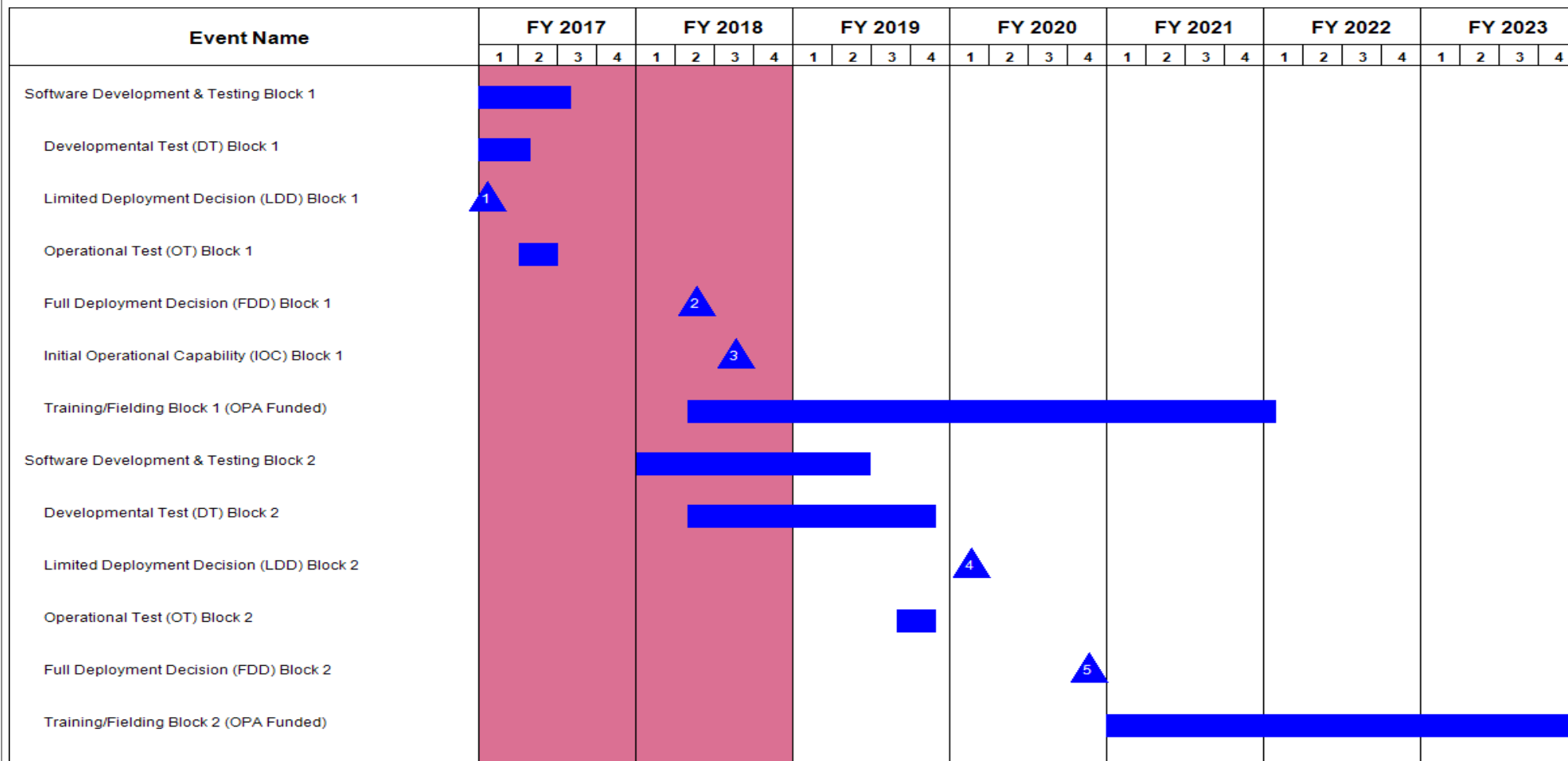
2040 / 7

R-1 Program Element (Number/Name)

PE 0203728A / Joint Automated Deep
Operation Coordination System (JADOCS)

Project (Number/Name)

EF7 / Pocket-Sized Forward Entry Device
(PFED) Inc 2



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / <i>Joint Automated Deep Operation Coordination System (JADOCS)</i>	Project (Number/Name) EF7 / <i>Pocket-Sized Forward Entry Device (PFED) Inc 2</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Development & Testing Block 1	3	2015	3	2017
Developmental Test (DT) Block 1	1	2017	1	2017
Limited Deployment Decision (LDD) Block 1	1	2017	1	2017
Operational Test (OT) Block 1	2	2017	2	2017
Full Deployment Decision (FDD) Block 1	2	2018	2	2018
Initial Operational Capability (IOC) Block 1	3	2018	3	2018
Training/Fielding Block 1 (OPA Funded)	2	2018	1	2022
Software Development & Testing Block 2	1	2018	2	2019
Developmental Test (DT) Block 2	2	2018	4	2019
Limited Deployment Decision (LDD) Block 2	1	2020	1	2020
Operational Test (OT) Block 2	3	2019	4	2019
Full Deployment Decision (FDD) Block 2	4	2020	4	2020
Training/Fielding Block 2 (OPA Funded)	1	2021	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)				Project (Number/Name) EF8 / AFATDS Increment 1			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EF8: AFATDS Increment 1	-	23.804	28.983	27.070	-	27.070	29.689	16.791	5.261	5.191	0.000	136.789
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Advanced Field Artillery Tactical Data System (AFATDS) 7.0 modernizes the existing AFATDS software currently in the field. AFATDS 7.0 enhances the existing AFATDS baseline by: (1) Providing a modernized web service based backend that will simplify long-term maintenance of the software, (2) Bringing AFATDS into full compliance with the Army's Common Operating Environment (COE) Command Post Computing Environment (CPCE) initiative and (3) Enhancing overall usability of the system through the implementation of a role-based capability architecture with embedded training that allows the AFATDS operator to receive on-the-spot training for any aspect of AFATDS via interactive instruction.												
FY 2019 funding in the amount of \$27.070 million will be used to continue development efforts on AFATDS version 7.0.												
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2017	FY 2018	FY 2019
Title: Program Management Costs for AFATDS software development										2.350	2.560	2.416
Description: Provide program support for AFATDS software development efforts.												
FY 2018 Plans: Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspect of the AFATDS program including requirements analysis, software development efforts, logistics, and business management support.												
FY 2019 Plans: Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspect of the AFATDS program including requirements analysis, software development efforts, logistics, and business management support.												
FY 2018 to FY 2019 Increase/Decrease Statement: Economic adjustment.												
Title: AFATDS software development efforts										19.931	26.423	24.654
Description: Development of AFATDS software - including V6.8.1.1 and V7.0												
FY 2018 Plans: FY 2018 Development will focus on the AFATDS v7.0 effort to include building fire support, fire control and fire direction role based capabilities, integrating available CP CE v3 common components, and updating the user interface for the application.												
FY 2019 Plans:												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)			Project (Number/Name) EF8 / AFATDS Increment 1				
B. Accomplishments/Planned Programs (\$ in Millions)											
FY 2019 Development will continue to focus on the AFATDS v7.0 effort to include building fire support, fire control and fire direction role based capabilities, integrating available CP CE v3 common components, and updating the user interface for the application. FY 2018 to FY 2019 Increase/Decrease Statement: Software development continuing at a steady rate. Title: Defensive Cyber Tools Description: Integration of Tactical Public Key Infrastructure (T-PKI) defensive cyber tools into AFATDS v7.0 Title: Operational and Developmental Testing Description: Conduct and support test activities for AFATDS development.							FY 2017	FY 2018	FY 2019		
							1.100	-	-		
							0.423	-	-		
Accomplishments/Planned Programs Subtotals							23.804	28.983	27.070		
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• B28620: MOD OF IN-SVC EQUIP, AFATDS	2.598	2.765	6.830	-	6.830	6.063	6.006	0.878	4.575	0.000	29.715
Remarks											
D. Acquisition Strategy											
On 13 May 2015, the Army Acquisition Executive (AAE) determined that a modernization of the existing AFATDS software code is required to comply with Army Common Operating Environment (COE) standards to be executed as AFATDS 7.0. In V7.0, the PM will re-design AFATDS to provide the operator role/duty-based interaction, a dynamic embedded training capability, integration of COE compliant architectures and allowance for more efficient insertion of future capabilities. Development of future AFATDS capabilities will be considered based on requirements approved through the Fires Center of Excellence (FCoE) Tactical Software Requirements Governance Board.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)				Project (Number/Name) EF8 / AFATDS Increment 1					

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support for AFATDS (Core)	Sub Allot	PM Mission Command (MC) : APG, MD	2.491	0.707		0.810		0.837		-		0.837	0.000	4.845	-
Program Management Support for AFATDS (Matrix)	IA	Various Matrix Orgs (Govt) : Aberdeen PG, MD	0.890	0.900		1.010		0.968		-		0.968	0.000	3.768	-
Program Management Support for AFATDS (SETA Contr)	C/FFP	CRSA : Aberdeen PG, MD	0.500	0.743	Feb 2017	0.540		0.627		-		0.627	0.000	2.410	-
Program Management Support for AFATDS (FFRDC)	FFRDC	MITRE : APG, MD	-	-		0.200		0.183		-		0.183	0.000	0.383	-
Subtotal			3.881	2.350		2.560		2.615		-		2.615	0.000	11.406	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development of AFATDS Version 6.8.1.1	C/CPFF	Raytheon Systems Corp. : Ft. Wayne, IN	21.636	-		-		-		-		-	0.000	21.636	33.188
Software Development of AFATDS Version 7.0	C/CPFF	TBD : TBD	3.000	18.931	Jun 2017	26.423		24.455		-		24.455	0.000	72.809	-
Subtotal			24.636	18.931		26.423		24.455		-		24.455	0.000	94.445	N/A

Remarks
AFATDS 7.0 contract awarded 8 June 2017

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)						Project (Number/Name) EF8 / AFATDS Increment 1			
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Information Assurance and Engineering Support for AFATDS requirements	C/CPFF	CSC : Various Locations	1.060	-		-		-		-		-	0.000	1.060	-
Defensive Cyber Tools (T-PKI)	TBD	TBD : TBD	-	1.100		-		-		-		-	0.000	1.100	-
Risk Reduction Analysis, Solution Refinement, Requirements Development, RFP Development.	IA	US Army Operational Test Command : Ft Hood, Tx	1.506	-		-		-		-		-	0.000	1.506	-
Subtotal			2.566	1.100		-		-		-		-	0.000	3.666	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Confidence Demo for AFATDS V6.8.x requirements.	IA	Army Test & Evaluation Command (ATEC)/Fires Test Directorate (FTD) : Various Locations	0.626	-		-		-		-		-	0.000	0.626	-
Independent Verification and Validation of AFATDS V7.0 requirements	C/CPFF	Engility : Various Locations	0.515	1.023		-		-		-		-	0.000	1.538	-
Developmental Testing for AFATDS v7.0	IA	Multiple Govt Test Agencies (ATEC, ATC, EPG) : Multiple	0.350	0.400		-		-		-		-	0.000	0.750	-
Subtotal			1.491	1.423		-		-		-		-	0.000	2.914	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			32.574	23.804		28.983		27.070		-		27.070	0.000	112.431	N/A

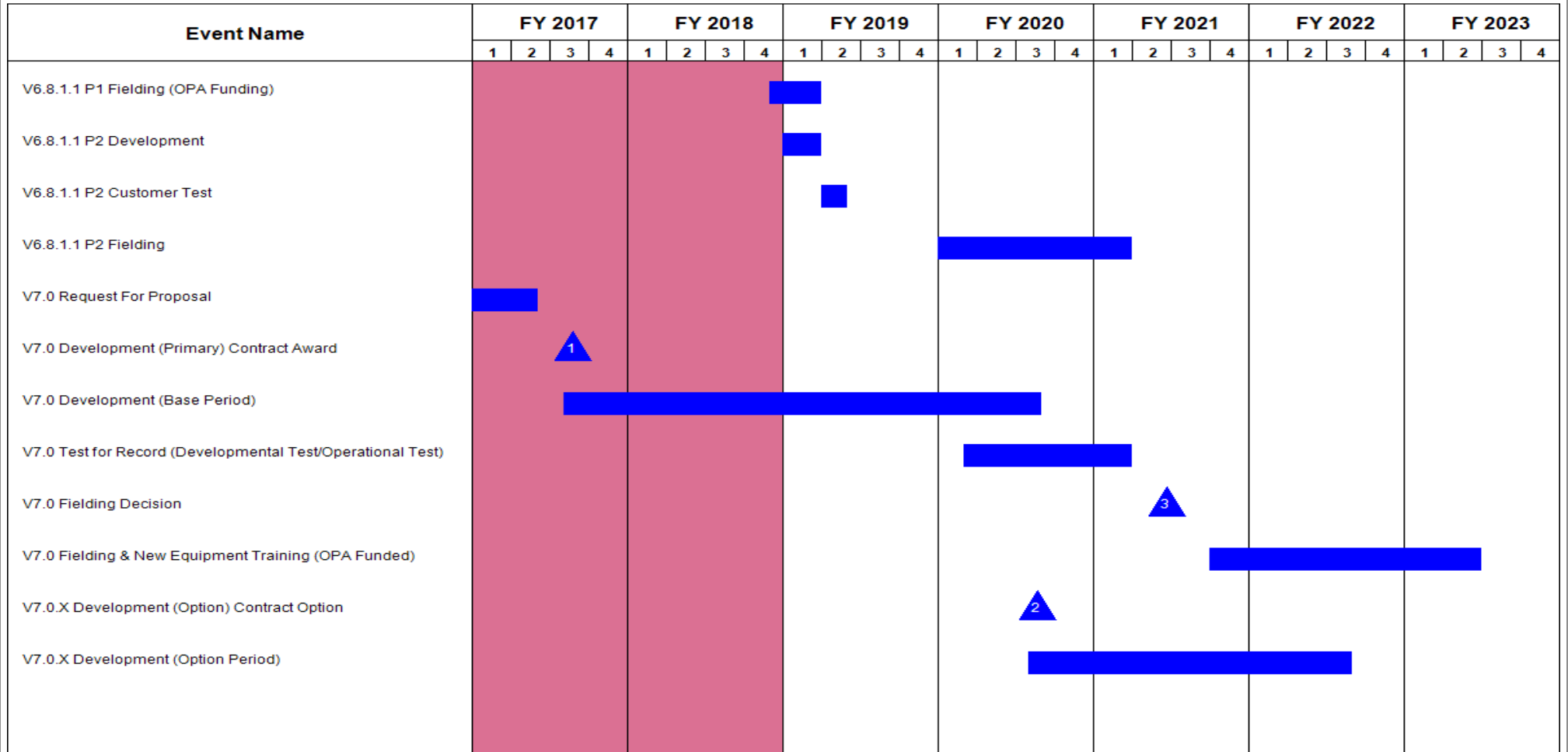
UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018			
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)			Project (Number/Name) EF8 / AFATDS Increment 1				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)	Project (Number/Name) EF8 / AFATDS Increment 1



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / Joint Automated Deep Operation Coordination System (JADOCS)	Project (Number/Name) EF8 / AFATDS Increment 1	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
V6.8.1.1 P1 Fielding (OPA Funding)	4	2018	1	2019
V6.8.1.1 P2 Development	1	2019	1	2019
V6.8.1.1 P2 Customer Test	2	2019	2	2019
V6.8.1.1 P2 Fielding	1	2020	1	2021
V7.0 Request For Proposal	4	2016	2	2017
V7.0 Development (Primary) Contract Award	3	2017	3	2017
V7.0 Development (Base Period)	3	2017	3	2020
V7.0 Test for Record (Developmental Test/Operational Test)	1	2020	1	2021
V7.0 Fielding Decision	2	2021	2	2021
V7.0 Fielding & New Equipment Training (OPA Funded)	4	2021	2	2023
V7.0.X Development (Option) Contract Option	3	2020	3	2020
V7.0.X Development (Option Period)	3	2020	3	2022

UNCLASSIFIED

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

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							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	340.353	343.175	411.927	-	411.927	335.086	296.425	246.195	172.710	Continuing	Continuing
280: Recov Veh Improv Prog	-	0.000	5.000	13.321	-	13.321	15.159	94.591	85.054	57.436	0.000	270.561
330: Abrams Tank Improve Prog	-	117.707	108.570	164.840	-	164.840	105.901	66.332	58.338	53.425	0.000	675.113
371: Bradley Improve Prog	-	107.330	130.863	166.985	-	166.985	152.705	87.933	80.389	48.851	Continuing	Continuing
431: M113 IMPROVEMENTS	-	0.000	15.000	7.915	-	7.915	4.943	0.000	0.000	0.000	0.000	27.858
EE2: Stryker Improvement	-	114.988	80.642	58.866	-	58.866	56.378	47.569	22.414	12.998	0.000	393.855
FD8: Light Armored Vehicle Improvement	-	0.328	3.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.428

Note

PE Number 0203735A/Project EE2 funds development efforts for the Stryker Double V-Hull A1 (DVH A1) Engineering Change Proposal (ECP) (formerly named Stryker ECP 1), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS) (formerly named Stryker ONS Lethality), Stryker Survivability Enhancements, and Stryker Lethality ECPs (formerly referred to as Stryker ECP 2). PE Number 0203735A/Project FD8 funds the development of LAV25 enhancements.

A. Mission Description and Budget Item Justification

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 Recovery Vehicle Improvement program is a group of ECPs that will allow the current recovery vehicle to regain Single Vehicle Recovery (SVR) for the heaviest tracked combat vehicle. The current M88A2 is not capable of Single Vehicle Recovery of the M1A2 SEPv2 in all situations and the M1A2 SEPv3 fielding in FY 2020 will further exacerbate the recovery problem.

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

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0203735A I Combat Vehicle Improvement Programs	
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. M113 improvements will develop an affordable solution for upgrading the M113s to enhance protection, survivability, mobility and power generation to support the current and future network systems. This will provide the necessary enhancements to the M113 capability for Echelons Above Brigade (EAB) units with priority to the forward deployed units and equipment sets. The Armored Multi Purpose Vehicle (AMPV) program will replace all M113 family of vehicles in Armored Brigade Combat Teams (ABCT). 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 Stryker Double V-Hull (DVH) A1 Engineering Change Proposal (ECP), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS), Stryker Survivability Enhancement, and Stryker Lethality ECPs. DVH A1 ECP power generation, suspension, and network upgrades will both restore Stryker 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 30mm ICVD ONS 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 30mm ICVD ONS effort will integrate a 30mm-equipped weapon station that will provide USAREUR with precision direct firepower to overwhelm the enemy in encounter actions and suppressive fire to preserve mounted and dismounted freedom of movement. The Stryker Survivability Enhancement will address evolving threats by assessing survivability improvements, to include passive protection systems, active protection systems, and an under-armor fire capability for Stryker-equipped reconnaissance troops. Stryker Lethality ECP efforts focus on the integration of a suite of complementary Mission Equipment Package (MEP) lethality upgrades (medium caliber weapon ECP, Common Remotely Operated Weapon Station-Javelin (CROWS-J) ONS, CROWS-J ECP, Anti-Tank Guided Missile (ATGM) ECP, common mast sensor ECP, and other capabilities) that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs) and address Remote Weapon Station (RWS) and Improved Target Acquisitions System (ITAS) obsolescence issues that will impact fleet sustainment beginning in FY2020. Light Armored Vehicle improvement program will design, test and modify two Light Armored Vehicles (LAV-25A2s) for Low Velocity Air Drop (LVAD) to inform operational concepts for Infantry Brigade Combat Teams (IBCT) in support of Global Response Force early entry operations. This will directly support the expeditionary maneuver excursion that will be conducted by the XVIII Airborne Corps in FY17-18.		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		PE 0203735A / Combat Vehicle Improvement Programs			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	327.357	343.175	422.303	-	422.303
Current President's Budget	340.353	343.175	411.927	-	411.927
Total Adjustments	12.996	0.000	-10.376	-	-10.376
• Congressional General Reductions	-0.147	-			
• Congressional Directed Reductions	-12.826	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	38.000	-			
• SBIR/STTR Transfer	-11.531	-			
• Adjustments to Budget Years	-	-	-10.376	-	-10.376
• Amended 2017	-0.500	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 280 / Recov Veh Improv Prog			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
280: Recov Veh Improv Prog	-	0.000	5.000	13.321	-	13.321	15.159	94.591	85.054	57.436	0.000	270.561
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The M88A2 Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES), designated as an ACAT IC program on 15 Jun 2016, has been providing towing, winching, and hoisting operations to support battlefield recovery operations and evacuation of heavy tanks and other tracked combat vehicles since its production and deployment in 1998. The HERCULES recovers tanks mired to different depths, removes M1 Abrams turrets and power packs, and uprights overturned heavy combat vehicles. Currently, the M88A2 is unable to safely perform Single Vehicle Recovery (SVR) of the Abrams tank in all conditions, due to added weight/survivability improvements made to the tank. In order to ensure SVR is met, Project Director- Main Battle Tank Systems (PD-MBTS) will develop and integrate technologies for the M88A2 HERCULES through an Operations and Support (O&S) initiative to meet its operational requirements of SVR throughout its life cycle. This initiative is not intended to exceed current operational capability, but will instead regain SVR capability of the heaviest tracked combat vehicle.

Technical assessments and analyses will be used to evaluate design solutions to meet SVR, and inform key program decision points. The goal of the assessments will be to provide confidence to Army Leadership that a M88A2 HERCULES solution is affordable, achievable, and feasible using existing technology with manageable risk. Limited analyses, conducted to date, suggests that upgrades to the M88A2 track, suspension, hydraulics, engine, transmission and other related components are required.

FY 2019 Base dollars will be used to continue the development of SVR ECP, initiate fabrication of vehicle prototypes, and continue the development of the transmission upgrade ECP (the longest developmental item).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Program Management (PMO) Support	-	2.000	2.000	-	2.000
Description: Program Management Office Support includes Systems Engineering, Government and Contractor salaries, travel and other support costs required to effectively manage the program.					
FY 2018 Plans: The United States Government (USG) will conduct system and sub-system tests/analysis to inform decisions for key vehicle sub-systems such as engine, suspension, track, transmission and other related components to inform the Scope of Work for the Development contract for the M88A2 HERCULES program. The analysis and testing will occur at various government sites (Army Test and Evaluation Command (ATEC), Aberdeen Proving					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs		Project (Number/Name) 280 / Recov Veh Improv Prog		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Ground (APG), Yuma Proving Grounds (YPG) and TARDEC). Contractors will conduct subsystem trades, technical evaluations, requirements development, and test support. FY 2019 Base Plans: Continue the United States Government (USG) acquisition activities to support a contractor full vehicle prototype delivery in FY 2021, continue the transmission ECP contract with a target completion in FY 2020. These activities will include conducting contractor surveillance, receipt of CDRLS, contract changes as required and conducting of key program milestones such as SRR.						
Title: Test and Evaluation Description: Concept and Evaluation activities include contractor and government testing, as well as test documentation development. Contractor prove-out testing will be conducted using U.S. Army test facilities. Evaluation activities also include the testing of other platform inbound technologies, along with the development of test documentation to include Test and Evaluation Master Plans, test procedures and reports. FY 2018 Plans: USG will begin conducting system/sub-system tests on engine, suspension, track, etc. The concept, demonstration and evaluation events will occur at various government sites (Army Test and Evaluation Command (ATEC), Aberdeen Proving Ground (APG), Yuma Proving Grounds (YPG) and TARDEC. Contractor will begin conducting sub-system trades, technical evaluations, requirements development, test support, deliverables, and powertrain upgrades. Begin developing the Test and Evaluation Master Plan (TEMP) to inform Request for Proposal (RFP) and award in FY 2020. FY 2018 to FY 2019 Increase/Decrease Statement: Refinements to schedule highlight no need for test and evaluation in FY 2019.		-	3.000	-	-	-
Title: Product Development Description: Design, and Development of Engineering Change Proposals (ECPs). FY 2019 Base Plans: Funding supports contractor development of transmission and modernization ECPs. FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase from FY 2018 to FY 2019 allows for the program to start Product Development efforts.		-	-	11.321	-	11.321
Accomplishments/Planned Programs Subtotals		-	5.000	13.321	-	13.321

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) 280 / <i>Recov Veh Improv Prog</i>	

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• GA0570: <i>Improved Recovery Vehicle (M88A2 HERCULES)</i>	91.963	72.402	110.500	42.354	152.854	-	-	10.500	-	215.454	543.173
• G80571: <i>M88 FOV MODS</i>	8.685	4.826	4.517	-	4.517	-	-	-	-	0.000	18.028

Remarks

D. Acquisition Strategy

The M88A2 HERCULES O&S initiative is designed to regain Single Vehicle Recovery (SVR) capability. An Acquisition Strategy is being developed for this effort.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>				Project (Number/Name) 280 / <i>Recov Veh Improv Prog</i>					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office (PMO) Support	MIPR	PMO Support Offices : Various	-	-		2.000	Dec 2017	2.000	Dec 2018	-		2.000	0.000	4.000	-
Subtotal			-	-		2.000		2.000		-		2.000	0.000	4.000	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	Various : TBD	-	-		-		11.321	Dec 2018	-		11.321	0.000	11.321	-
Subtotal			-	-		-		11.321		-		11.321	0.000	11.321	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	Various	Various : Various	-	-		3.000	Jul 2018	-		-		-	0.000	3.000	-
Subtotal			-	-		3.000		-		-		-	0.000	3.000	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		5.000		13.321		-		13.321	0.000	18.321	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																				Date: February 2018			
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>										Project (Number/Name) 280 / <i>Recov Veh Improv Prog</i>			

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Modernization Transmission ECP Development																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs	Project (Number/Name) 280 / Recov Veh Improv Prog	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Modernization Transmission ECP Development	2	2019	4	2019

Note

.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018			
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 330 / Abrams Tank Improve Prog			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
330: Abrams Tank Improve Prog	-	117.707	108.570	164.840	-	164.840	105.901	66.332	58.338	53.425	0.000	675.113
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Army has approved Engineering Change Proposals (ECPs) for the Abrams Main Battle Tank to restore lost capability, host inbound technologies, and to meet objective performance requirements called out in approved platform requirements documents. The strategy for Abrams 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 approach was approved by the Army Acquisition Executive in 3Q FY2011.												
The Abrams vehicle is at or exceeds Space, Weight, and Power-Cooling (SWaP-C) limitations. In order to restore lost platform capability, the Abrams Tank will execute a series of ECPs to support the current embedded systems and to facilitate integration of technologies currently in development. 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. The ECPs will incorporate lost power generation and distribution technologies, force protection and survivability improvements to counter evolving threats to include, but not limited to Active Protection Systems, technologies to mitigate obsolescence issues, in-bound technologies under development, and technologies to decrease the overall weight of the tank and technologies in support of any validated Army requirement.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Abrams Power Engineering Change Proposal (ECP) 1A								10.000	7.998	12.283	-	12.283
Description: The improvements implemented through the Abrams Power ECP 1A program will restore lost power generation and distribution, mitigate impending obsolescence, and incorporate inbound technologies currently under development.												
FY 2018 Plans: The USG will complete Production Prove-Out Test (PPT). The USG will begin Production Qualification Testing (PQT), Live Fire Test and Evaluation (LFT&E), and preparations for Follow-on Operational Test and Evaluation (FOT&E). The team will continue to complete root cause and corrective actions (hardware and software) for failures found during testing. Logistics will complete technical manual development and begin conducting the logistics demonstration.												
FY 2019 Base Plans:												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs		Project (Number/Name) 330 / Abrams Tank Improve Prog		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The USG will complete Live Fire Test and Evaluation (LFT&E). The USG will continue Production Qualification Testing (PQT) and begin Follow-on Operational Test and Evaluation (FOT&E). Logistics will finalize technical manual development and complete the logistics demonstration. FY 2018 to FY 2019 Increase/Decrease Statement: The ECP 1A increase in FY19 funding is needed to cover logistics product development in support of log demo. The additional funds will also cover the start of Production Qualification Test support.						
Title: Training Device Updates Description: Development and design of training device upgrades to reflect upgrades to the vehicle. FY 2018 Plans: Development, design, test, and evaluation activities of training device upgrade kits. FY 2019 Base Plans: Continue development, design, test, and evaluation activities of training device upgrade kits. FY 2018 to FY 2019 Increase/Decrease Statement: Increase in FY19 is due to additional training device upgrades (maintenance trainers) coming on line in FY19 that were not part of the FY18 work.		-	3.300	7.231	-	7.231
Title: Abrams Lethality Engineering Change Proposal (ECP) 1B Description: The Abrams Lethality ECP 1B program consists of lethality improvements. The primary focus is the integration of 3GEN Forward Looking Infrared (FLIR) and the integration of Ammunition Data Link (ADL) for the Advanced Multi-purpose (AMP) round. Additional improvements to the target acquisition sensors consist of inclusion of color cameras, laser capabilities, and image processing improvements. Other potential improvements consist of an improved environmental control system, laser warning receiver, vehicle smoke generation, and weight reduction efforts. Trade studies, analysis and technology maturation will be performed to evaluate prospective improvements, along with obsolescence mitigation, and incorporation of inbound technologies currently under development. FY 2018 Plans: ECP 1B will continue preliminary design efforts. The primary tasks will be focused on systems engineering, design trade studies, engineering modeling and analysis, initial hardware mockups, and software development.		25.452	60.561	110.463	-	110.463

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs		Project (Number/Name) 330 / Abrams Tank Improve Prog		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Early hardware will be used to start Design Verification Testing (DVT). PM Abrams will continue to integrate the Advanced Multi-Purpose (AMP) round into the Abrams family of vehicles (FOV). FY 2019 Base Plans: ECP 1B will complete a Preliminary Design Review (PDR) in 1Q FY19 and begin critical design efforts. The primary tasks will be focused on systems engineering, design trade studies, engineering modeling and analysis, initial hardware mockups, and software development. Early hardware will be used to continue Design Verification Testing (DVT). Test and logistics planning will be completed throughout FY19. PM Abrams will continue to integrate the Advanced Multi-Purpose (AMP) round into the Abrams family of vehicles (FOV). FY 2018 to FY 2019 Increase/Decrease Statement: The ECP 1B program is ramping up from FY18 to FY19 to complete the Preliminary Design Review (PDR) and the majority of the Critical Design Phase. Significant long lead material and subcontractor labor will increase throughout FY19.						
Title: Program Management Office (PMO) Support Description: Program Management Office Support includes Systems Engineering and Government and Contractor salaries, travel and other support costs required to effectively manage the program. FY 2018 Plans: Continue Government Systems Engineering and Program Management office support in FY2018. This will include labor, training, travel, supplies, and equipment to effectively manage the program. FY 2019 Base Plans: Continue Government Systems Engineering and Program Management office support in FY2019. This will include labor, training, travel, supplies, and equipment to effectively manage the program. FY 2018 to FY 2019 Increase/Decrease Statement: Program Management has decreased slightly in FY19 due to completion of some SEP V3 program tasks.		7.337	12.620	11.873	-	11.873
Title: Test & Evaluation - Engineering Change Proposal (ECP) 1A Description: Test and Evaluation activities includes contractor and government testing, as well as test documentation development. Contractor shakedown/proveout testing will be conducted using U.S. Army test facilities. Government development testing of prototype vehicles will evaluate vehicle performance, to include Reliability, Availability, and Maintainability testing. Early User evaluation will also be performed. Test and		7.234	24.091	22.990	-	22.990

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 330 / Abrams Tank Improve Prog				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
evaluation activities also include the testing of other platform inbound technologies, along with the development of test documentation to include Test and Evaluation Master Plans, test procedures, and reports.												
FY 2018 Plans: In FY18 the USG will complete ECP 1a Production Prove-Out Test (PPT) including all automotive RAM testing, and EMI/EMC testing. The USG will also conduct ECP 1a Live Fire Test and Evaluation (LFT&E) and transportability testing. The USG will begin ECP 1a Production Qualification Testing (PQT) and preparations for Follow-on Operational Test and Evaluation (FOT&E). These test and evaluation events will occur at various sites (Aberdeen Proving Ground, Yuma Proving Ground, and White Sands Missile Range).												
FY 2019 Base Plans: The USG will complete Live Fire Test and Evaluation (LFT&E). The USG will continue Production Qualification Testing (PQT) and begin Follow-on Operational Test and Evaluation (FOT&E).												
FY 2018 to FY 2019 Increase/Decrease Statement: ECP 1A live fire testing wraps up half way through FY19 and requires slightly less funding than required in FY18.												
Title: Survivability Enhancements								67.684	-	-	-	-
Description: PM Abrams will integrate and test survivability, lethality, mobility, reliability, and architecture improvements on the Abrams Family of Vehicles. Force protection and survivability improvements to counter evolving threats include, but are not limited to, Active Protective Systems. Lethality improvements include, but are not limited to, cannon and ammunition upgrades.												
Accomplishments/Planned Programs Subtotals								117.707	108.570	164.840	-	164.840
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• GA0750: Abrams Upgrade Program	276.829	717.800	1,075.999	455.000	1,530.999	1,118.156	801.009	832.481	1,044.492	Continuing	Continuing	
• GA0700: M1 Abrams Tank (MOD)	492.044	387.526	927.600	34.000	961.600	284.209	289.323	269.175	286.432	Continuing	Continuing	
Remarks												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) 330 / <i>Abrams Tank Improve Prog</i>
D. Acquisition Strategy Abrams Power ECP 1A: Research & Development Contract - Sole Source, Cost Plus Incentive Fee (CPIF); ECP 1B - Research & Development Contract - Sole Source, Cost Plus Incentive Fee (CPIF)		
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 330 / Abrams Tank Improve Prog					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Abrams ECP 1A	SS/CPIF	General Dynamics Land Systems : Sterling Heights, MI	327.519	3.613	Feb 2017	7.998	Feb 2018	5.642	Feb 2019	-		5.642	Continuing	Continuing	Continuing
ECP 1A Training Device Upgrades	MIPR	PEO, STRI : Orlando, FL	-	-		3.300	Dec 2017	7.231	Dec 2018	-		7.231	Continuing	Continuing	Continuing
Abrams ECP 1B	SS/CPIF	General Dynamics Land Systems : Sterling Heights, MI	15.969	18.324	Aug 2017	58.561	Nov 2017	110.463	Nov 2018	-		110.463	Continuing	Continuing	Continuing
Advanced Multi-Purpose (AMP) Round	SS/CPIF	General Dynamics Land Systems : Sterling Heights, MI	-	7.128	Sep 2017	2.000	Mar 2018	-		-		-	0.000	9.128	-
Survivability Enhancements	Various	US Army TARDEC; Rafael Advanced Defense Systems; General Dynamics Land Systems (GDLS) : Sterling Heights, MI	10.645	41.243	Dec 2016	-		-		-		-	0.000	51.888	-
Subtotal			354.133	70.308		71.859		123.336		-		123.336	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office (PMO)Support	MIPR	PMO Support Offices : Various	65.090	7.337	Jan 2017	12.620	Jan 2018	11.873	Jan 2019	-		11.873	Continuing	Continuing	Continuing
Program Management Office (PMO) Support - Survivability Enhancements	MIPR	PMO Support Offices : Various	0.127	2.080	Dec 2016	-		-		-		-	0.000	2.207	-
Subtotal			65.217	9.417		12.620		11.873		-		11.873	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 330 / Abrams Tank Improve Prog					
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Testing	MIPR	Aberdeen Proving Ground; Yuma Proving Ground; White Sands Missile Range, : Various	28.368	7.234	Jan 2017	12.089	Jan 2018	22.990	Jan 2018	-		22.990	Continuing	Continuing	Continuing
Contractor Testing	Various	Various : Various	28.574	6.387	Feb 2017	12.002	Feb 2018	6.641	Feb 2019	-		6.641	Continuing	Continuing	Continuing
Government Testing - Survivability Enhancements	Various	Various : Various	0.130	24.361	Apr 2017	-		-		-		-	0.000	24.491	-
Subtotal			57.072	37.982		24.091		29.631		-		29.631	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			476.422	117.707		108.570		164.840		-		164.840	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

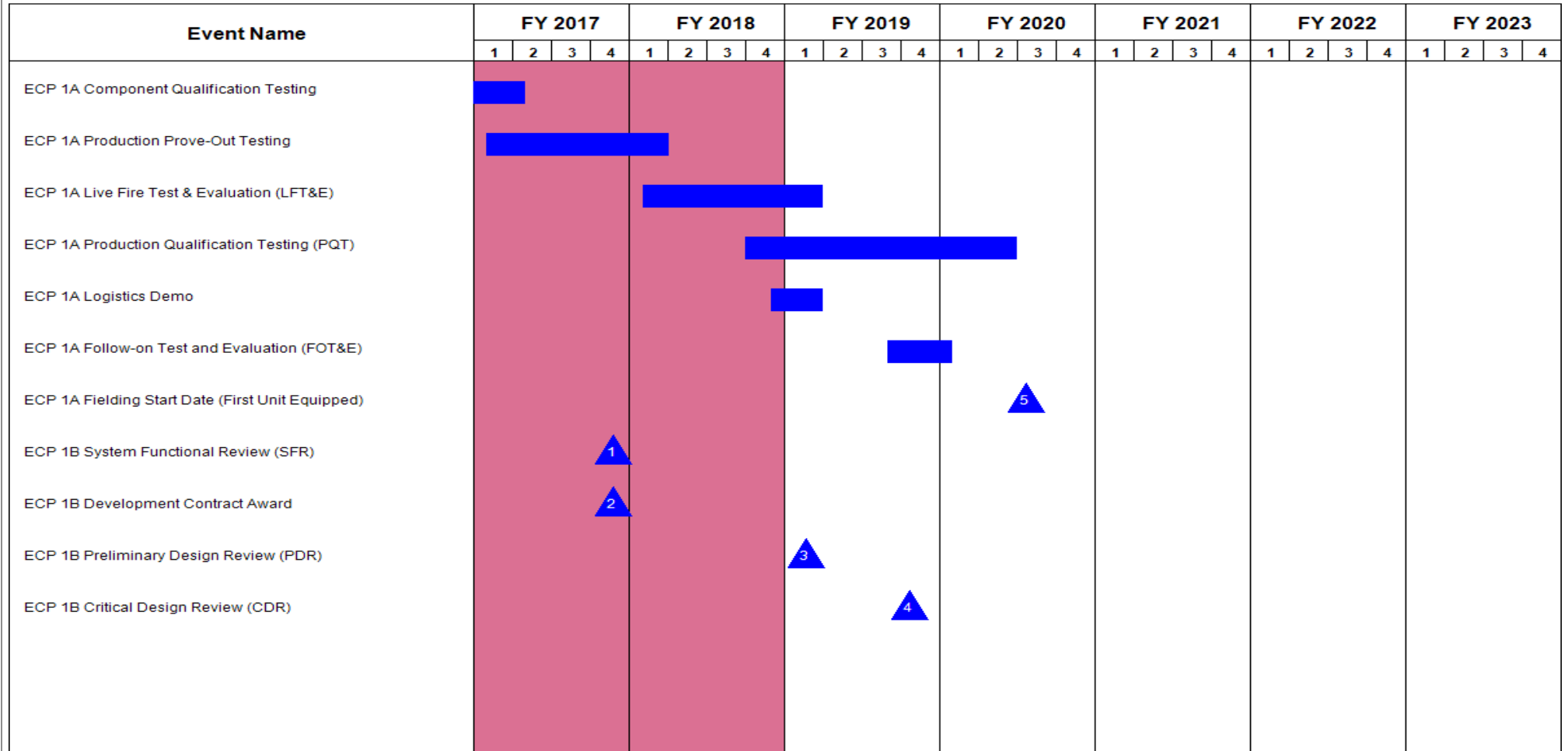
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0203735A / *Combat Vehicle Improvement Programs*

Project (Number/Name)
330 / *Abrams Tank Improve Prog*



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) 330 / <i>Abrams Tank Improve Prog</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ECP 1A Component Qualification Testing	4	2014	1	2017
ECP 1A Contractor Prototype Proveout	3	2015	1	2016
ECP 1A Production Prove-Out Testing	1	2016	1	2018
ECP 1A Live Fire Test & Evaluation (LFT&E)	1	2018	1	2019
ECP 1A Production Qualification Testing (PQT)	4	2018	2	2020
ECP 1A Logistics Demo	4	2018	1	2019
ECP 1A Follow-on Test and Evaluation (FOT&E)	3	2019	1	2020
ECP 1A Fielding Start Date (First Unit Equipped)	3	2020	3	2020
ECP 1B System Functional Review (SFR)	4	2017	4	2017
ECP 1B Development Contract Award	4	2017	4	2017
ECP 1B Preliminary Design Review (PDR)	1	2019	1	2019
ECP 1B Critical Design Review (CDR)	4	2019	4	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 371 / Bradley Improve Prog			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
371: Bradley Improve Prog	-	107.330	130.863	166.985	-	166.985	152.705	87.933	80.389	48.851	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Bradley Family of Vehicles is at or exceeds Space, Weight, and Power-Cooling (SWAP-C) limitations. To restore lost platform capability and to host other Army existing programs of record, the Bradley Fighting Vehicle program shall execute a series of Engineering Change Proposals (ECPs). ECP 1 improves vehicle's track and suspension while the Bradley A4 ECP improves the power train and electrical system to enable the A3 fleet to host inbound technologies from Army program of records, including continued SINCGARS integration and Handheld Manpack Small (HMS) Radios and Joint Battle Command - Platform (JBC-P). The Bradley A4 development effort led to a production decision in FY 2017. The Bradley M2A4/M7A4 Vehicle is the combination of the M2A3/M7A3 Base Vehicle with ECP 1 and ECP 2 components installed and integrated. Additionally, a follow on Engineering Change Proposal to the Bradley A4 ECP, Bradley A5 ECP (Lethality) integrates Third Generation Forward Looking Infrared (3GEN FLIR) to replace the current FLIR for increased lethality through improved target acquisition capability along with other technology upgrades and insertions (i.e. laser pointing, color camera, laser range finder, etc). Product Manager Bradley will characterize a Non Developmental Item (NDI) to develop force protection and survivability improvements to counter evolving threats to include, but not limited to Active Protection System. A separate integration effort began in FY 2018 for an underbelly armor kit for improved survivability against blast threats.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Bradley A4 Engineering Change Proposal (ECP) Program								43.711	21.875	-	-	-
Description: The Bradley Fighting Vehicle System (BFVS) improvements implemented through the Engineering Change Proposal (ECP) Program will focus on restoring lost platform capability to support Army inbound technologies and to facilitate integration of technologies currently in development under other existing programs of record.												
FY 2018 Plans: The Bradley A4 ECP program will continue system level development and support software and reliability upgrades to include integrated electronic technical manuals (IETM) development and vehicle diagnostics. Conduct a logistics demonstration at the contractor's facility.												
FY 2018 to FY 2019 Increase/Decrease Statement: Bradley A4 has decreased to zero in FY 2019 since A4 EMD will be complete.												
Title: Bradley A5 Engineering Change Proposal (ECP) Program								18.575	85.155	128.039	-	128.039

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs		Project (Number/Name) 371 / Bradley Improve Prog		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Continues Third Generation Forward Looking Infrared (3GEN FLIR) and other necessary technology integration efforts. FY 2018 Plans: The Bradley A5 ECP (Lethality) program will continue the developmental engineering effort for integration of the 3GEN FLIR into the Bradley Commander's Independent Viewer (CIV) and Improved Bradley Acquisition System (IBAS), providing the commander an independent weapon station, and integrating additional lethality improvements within the sight systems (laser pointer, Laser Range Finder, and Color Day Camera). The A5 ECP will complete the System Functional Review (SFR) and begin working towards the Preliminary Design Review (PDR). The A5 ECP will coordinate commonality and synchronization with PD Main Battle Tank Systems Abrams SEPv4 ECP (Lethality), PM Ground Sensors, PM Close Combat Weapon Systems. FY 2019 Base Plans: The Bradley A5 ECP (Lethality) program will continue the developmental engineering effort for integration of the 3GEN FLIR into the Bradley Commander's Independent Viewer (CIV) and Improved Bradley Acquisition System (IBAS), providing the commander an independent weapon station, and integrating additional lethality improvements within the sight systems (laser pointer, laser range finder, and color day camera). The A5 ECP will complete the Preliminary Design Review (PDR), support test planning development, and begin working towards the Critical Design Review (CDR). The A5 ECP will coordinate commonality and synchronization with PD Main Battle Tank Systems Abrams SEPv4 ECP (Lethality), PD Ground Sensors, PM Close Combat Weapon Systems. FY 2018 to FY 2019 Increase/Decrease Statement: Bradley A5 has increased in FY 2019 to fund developmental engineering effort for integration of the 3GEN FLIR and integrating additional lethality improvements within the sight systems (laser pointer, laser range finder, and color day camera). The A5 ECP will complete the Preliminary Design Review (PDR), support test planning development, and begin working towards the Critical Design Review (CDR).						
Title: Survivability Enhancements Description: Initiate a Non Development Initiative (NDI) Active Protection System (APS) installation and characterization initiative to evaluate Bradley performance with an APS solution installed which includes developing force protection and survivability improvements to counter evolving threats to include, but not limited to Active Protection System in FY 2017. The Bradley Family of Vehicles (BFV) will integrate underbelly armor for improved survivability against underbelly blast events. Conduct integration activities for Army directed		17.343	-	5.445	-	5.445

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs		Project (Number/Name) 371 / Bradley Improve Prog		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
improvements such as, but not limited to, rear view sensor system, and installing a man portable short range air defense (SHORAD).						
FY 2019 Base Plans: Engineering, logistics, test, and program management to continue development; complete contractor testing; conduct USG testing; and complete the logistics support Maintenance Allocation Chart (MAC), provisioning plan, test support package, MWO development, and Logistics Demonstration (LOGDEMO) of the Underbelly Interim Solution (UBIS). Development of software upgrades such as, but not limited to, rearview sensor system and installation of a man portable short range air defense (SHORAD).						
FY 2018 to FY 2019 Increase/Decrease Statement: Survivability enhancements has increased FY 2019 to fund UBIS and software upgrades. FY 2018 NDI APS funding was included in PE 0604852A/XU9.						
Title: Program Management Office (PMO) Support Description: Program Management Office Support includes systems engineering, government and contractor salaries, travel, training and other support costs required to effectively manage the program.		8.916	9.448	9.084	-	9.084
FY 2018 Plans: Continue government program management and system engineering support costs. These funds cover the costs of government and direct support contractor salaries, travel, training, supplies, equipment and facilities to manage the issues resulting from Bradley A4 ECP testing and developing logistics products, engineering phases of Bradley A5 ECP (Lethality), and execute UBIS development activities.						
FY 2019 Base Plans: Continue government program management and system engineering support costs. These funds cover the costs of government and direct support contractor salaries, travel, training, supplies, equipment and facilities to manage the issues resulting from Bradley A4 ECP testing and developing logistics products, engineering phases of Bradley A5 ECP (Lethality), and execute UBIS and other development activities.						
FY 2018 to FY 2019 Increase/Decrease Statement: Program Management has decreased slightly in FY 2019 due to the fluctuations in support costs.						
Title: Test & Evaluation		18.785	14.385	17.125	-	17.125

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs	Project (Number/Name) 371 / Bradley Improve Prog				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Test & Evaluation efforts support developmental and operational test events. These events include system sub-system test events, planning and development of test documentation. FY 2018 Plans: In accordance with the OSD approved Bradley ECP Test and Evaluation Master Plan (TEMP), Bradley A4 ECP testing and evaluation completes all Reliability, Availability and Maintainability Test as well as conducts Live Fire testing to complete initial developmental testing on the program. Additional developmental testing will be completed to support the test-fix-test cycle and testing at Cold Regions Test Center in Alaska will be completed. The Logistics Demonstration will also be preformed to demonstrate supportability of the platform and associated logistics materials. Detailed planning will be conducted to support operational testing that will occur in FY 2019. FY 2019 Base Plans: Conduct Bradley A4 production verification testing and Bradley A4 ECP operational testing. Continue MWO test activities. FY 2018 to FY 2019 Increase/Decrease Statement: Test & Evaluation has increased in FY 2019 to continue A4 production verification testing.						
Title: Current Fleet Enhancements Description: Current fleet enhancement efforts support development and testing of capabilities that will increase the reliability of the Bradley Family of Vehicles. FY 2019 Base Plans: Conduct integration activities for Army directed improvements such as, but not limited to, rear view sensor system, vehicle generated smoke, and upgrade and maintain software for the current fleet of vehicles. FY 2018 to FY 2019 Increase/Decrease Statement: Current fleet enhancements is a new effort in FY 2019 to conduct integration activities for Army directed improvements.		-	-	7.292	-	7.292
Accomplishments/Planned Programs Subtotals		107.330	130.863	166.985	-	166.985

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 371 / Bradley Improve Prog			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• GZ2400: Bradley Program (MOD)	265.333	474.851	625.424	50.000	675.424	637.190	663.460	650.662	840.733	0.000	4,207.653
• G80718: Bradley Program	72.800	200.000	0.000	205.000	205.000	-	-	-	-	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
Product Manager Bradley will execute a series of Engineering Change Proposals (ECP) reestablishing Space, Weight, Power and Cooling (SWAP-C) to facilitate integration of technologies being developed under existing Programs of Record (POR). ECP 1 production contract was awarded in FY 2014, and began fielding in FY 2015. Bradley A4 ECP is scheduled to begin fielding in FY 2020 to address powerpack and electrical power upgrades, which will enable the vehicle to host Army directed inbound technologies with no further performance degradation to the vehicle. Bradley A4 development has been executed on a sole source cost plus incentive fee contract to the current platform Original Equipment Manufacturer. Initiate studies and analysis in order to integrate Third Generation Forward Looking Infrared (3GEN FLIR) sights began in FY 2016. The 3GEN FLIR (A5 Lethality) system will be developed by Project Manager, Ground Sensors (PM GS) and be provided to Product Manager Bradley as a Horizontal Technology Insertion effort. Product Manager Bradley will characterize a Non Developmental Item (NDI) Active Protection System in order to develop force protection and survivability improvements to counter evolving threats.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) 371 / Bradley Improve Prog					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Bradley A4 Engineering Change Proposal (ECP) Program	SS/CPIF	PMO : Warren	79.009	-		-		-		-		-	0.000	79.009	-
Non Recurring Engineering-Bradley A4 ECP	SS/FFP	L3COM : Muskegon, MI	15.695	0.528	May 2017	-		-		-		-	Continuing	Continuing	Continuing
Non Recurring Engineering- Bradley A4 ECP	SS/CPIF	BAE : Sterling Heights, MI	209.834	43.183	Nov 2016	21.875	Nov 2017	-		-		-	Continuing	Continuing	Continuing
Bradley A5 ECP (Lethality)	SS/CPIF	BAE : Sterling Heights, MI	21.242	18.575	Nov 2016	80.574	Nov 2017	128.039	Jan 2019	-		128.039	Continuing	Continuing	Continuing
Survability Enhancements - Underbelly Armor	SS/CPIF	TBD : TBD	0.182	-		4.581	Jan 2018	5.445	Feb 2019	-		5.445	Continuing	Continuing	Continuing
Survivability Enhancements - Active Protection System (APS)	SS/CPIF	TBD : TBD	11.000	17.343	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
Current Fleet Enhancements	C/TBD	TBD : TBD	-	-		-		7.292	Nov 2019	-		7.292	0.000	7.292	-
Subtotal			336.962	79.629		107.030		140.776		-		140.776	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support/OGA	MIPR	PMO/PEO : Bradley ECP Program	24.238	3.076	Dec 2016	3.260	Dec 2017	2.283	Dec 2018	-		2.283	Continuing	Continuing	Continuing
Government Engineering Support	MIPR	Various : Bradley ECP Program	38.593	5.840	Dec 2016	6.188	Dec 2017	6.801	Dec 2018	-		6.801	Continuing	Continuing	Continuing
Subtotal			62.831	8.916		9.448		9.084		-		9.084	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>				Project (Number/Name) 371 / <i>Bradley Improve Prog</i>				

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Testing	MIPR	Various : Test Sites	14.269	18.785	Jan 2017	14.385	Dec 2017	17.125	Jan 2019	-		17.125	Continuing	Continuing	Continuing
Subtotal			14.269	18.785		14.385		17.125		-		17.125	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	414.062	107.330	130.863	166.985	-	166.985	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

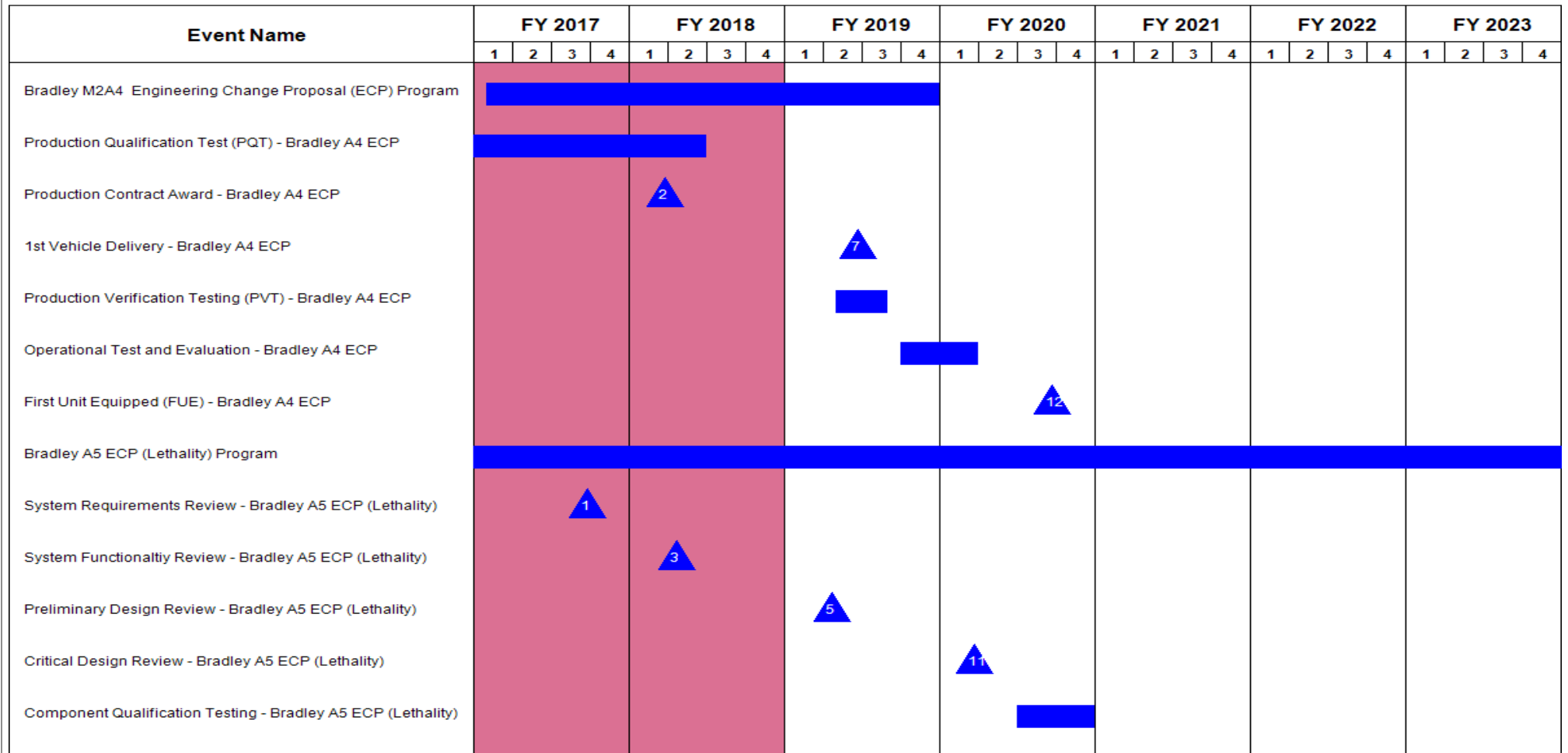
2040 / 7

R-1 Program Element (Number/Name)

PE 0203735A / *Combat Vehicle Improvement Programs*

Project (Number/Name)

371 / *Bradley Improve Prog*



UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>		Project (Number/Name) 371 / <i>Bradley Improve Prog</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Contractor Vehicle Testing - Bradley A5 ECP (Lethality)																												
Production Qualification Test (PQT) - Bradley A5 ECP (Lethality)																												
Development Contract - UBIS																												
Test Readiness Review - UBIS																												
Engineer Change Proposal/ Engineering Release Record- UBIS																												
Production Contract Award - UBIS																												
Production Decision Point - UBIS																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) 371 / <i>Bradley Improve Prog</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Bradley M2A4 Engineering Change Proposal (ECP) Program	1	2012	4	2019
Component Qualification Testing - Bradley A4 ECP	3	2014	3	2015
Contractor Vehicle Testing - Bradley A4 ECP	3	2015	3	2016
Production Qualification Test (PQT) - Bradley A4 ECP	2	2016	2	2018
Production Contract Award - Bradley A4 ECP	1	2018	1	2018
1st Vehicle Delivery - Bradley A4 ECP	2	2019	2	2019
Production Verification Testing (PVT) - Bradley A4 ECP	2	2019	3	2019
Operational Test and Evaluation - Bradley A4 ECP	4	2019	1	2020
First Unit Equipped (FUE) - Bradley A4 ECP	3	2020	3	2020
Bradley A5 ECP (Lethality) Program	3	2016	3	2025
System Requirements Review - Bradley A5 ECP (Lethality)	3	2017	3	2017
System Functionality Review - Bradley A5 ECP (Lethality)	2	2018	2	2018
Preliminary Design Review - Bradley A5 ECP (Lethality)	2	2019	2	2019
Critical Design Review - Bradley A5 ECP (Lethality)	1	2020	1	2020
Component Qualification Testing - Bradley A5 ECP (Lethality)	3	2020	4	2020
Contractor Vehicle Testing - Bradley A5 ECP (Lethality)	1	2021	2	2022
Production Qualification Test (PQT) - Bradley A5 ECP (Lethality)	2	2022	2	2023
Development Contract - UBIS	2	2018	2	2018
Test Readiness Review - UBIS	2	2019	2	2019
Engineer Change Proposal/ Engineering Release Record- UBIS	4	2019	4	2019
Production Contract Award - UBIS	1	2020	1	2020
Production Decision Point - UBIS	1	2020	1	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>				Project (Number/Name) 431 / M113 IMPROVEMENTS			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
431: M113 IMPROVEMENTS	-	0.000	15.000	7.915	-	7.915	4.943	0.000	0.000	0.000	0.000	27.858
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
M113 improvements will develop an affordable solution for upgrading the M113s to enhance protection, survivability, mobility and power generation to support the current and future network systems. This will provide the necessary enhancements to the M113 capability for Echelons Above Brigade (EAB) units with priority to the forward deployed units and equipment sets. The Armored Multi Purpose Vehicle (AMPV) program will replace all M113 family of vehicles in Armored Brigade Combat Teams (ABCT).												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development								-	14.100	6.015	-	6.015
Description: Design, fabrication and testing of Engineering Change Proposals (ECPs).												
FY 2018 Plans: Government RFP development and competitive source selection planning to include the preparation of government furnished material and technical data that will support a competitively awarded contract. After award the contractor will complete Engineering Change Proposals (ECP) vehicle modifications designs, fabricate ECP vehicle modifications kits for test, provide support to testing and finalize ECPs in support of production.												
FY 2019 Base Plans: Complete test and collect performance data to down select to one vendor for production.												
FY 2018 to FY 2019 Increase/Decrease Statement: Fixed price contract awarded in FY18 moving the focus on test execution in FY19.												
Title: Government Program Management								-	0.900	1.900	-	1.900
Description: Program Management Office Support includes Systems Engineering, support to logistics development, Government salaries, travel, training and other support costs required to effectively manage the program.												
FY 2018 Plans: Provide integrated program management to oversee technical development and fabrication efforts of the contractor. Provide program management to plan and oversee test efforts if test vehicles are delivered ahead of												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>		Project (Number/Name) 431 / M113 IMPROVEMENTS	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
schedule. <i>FY 2019 Base Plans:</i> Program Management Office Support includes Systems Engineering, contract execution, support to Government test sites, Government salaries, travel, training and other support costs required to effectively manage the program. Government RFP development for follow-on production contract and competitive source selection planning and execution for planned award in FY20. <i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Fixed Price contract awarded in FY 2018 with test execution in FY 2019 requiring an increase in government support.					
Accomplishments/Planned Programs Subtotals	-	15.000	7.915	-	7.915

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• GB1930: <i>CARRIER, MOD GB1930 WTCV</i>	-	-	0.000	-	0.000	49.563	49.562	49.560	-	0.000	148.685
<u>Remarks</u>											
D. Acquisition Strategy											
The Acquisition strategy will be finalized upon receipt of finalized Department of the Army Directed Requirement with a planned competitive contract award by 2Q FY18. The Army plans to conduct a formal source selection to competitively down select to no more than three vendors. Vendor(s) will complete vehicle design and fabricate vehicle modifications for testing. Test results will be used to down select to one vendor for the follow-on production contract in FY20. Overall program schedule could be accelerated if vendor designs are mature.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>						Project (Number/Name) 431 / M113 IMPROVEMENTS			

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/FFP	TBD : TBD	-	-		14.100	May 2018	6.015	May 2019	-		6.015	0.000	20.115	-
Program Management Support	MIPR	TBD : TBD	-	-		0.900	Jan 2018	1.900	Jan 2019	-		1.900	0.000	2.800	-
Subtotal			-	-		15.000		7.915		-		7.915	0.000	22.915	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	15.000	7.915	-	7.915	0.000	22.915	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>		Project (Number/Name) 431 / M113 IMPROVEMENTS	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
RFP Release					1																							
Contract Award						2																						
Test																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) 431 / <i>M113 IMPROVEMENTS</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
RFP Release	1	2018	1	2018
Contract Award	2	2018	2	2018
Test	3	2018	3	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) EE2 / Stryker Improvement			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EE2: Stryker Improvement	-	114.988	80.642	58.866	-	58.866	56.378	47.569	22.414	12.998	0.000	393.855
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE Number 0203735A/Project EE2 funds development efforts for the Stryker Double V-Hull A1 (DVH A1) Engineering Change Proposal (ECP) (formerly named Stryker ECP 1), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS) (formerly named Stryker ONS Lethality), Stryker Survivability Enhancements, and Stryker Lethality ECPs (formerly referred to as Stryker ECP 2).

A. Mission Description and Budget Item Justification

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 Stryker Double V-Hull (DVH) A1 Engineering Change Proposal (ECP), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS), Stryker Survivability Enhancement, and Stryker Lethality ECPs. DVH A1 ECP power generation, suspension, and network upgrades will both restore Stryker 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 30mm ICVD ONS 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 30mm ICVD ONS effort will integrate a 30mm-equipped weapon station that will provide USAREUR with precision direct firepower to overwhelm the enemy in encounter actions and suppressive fire to preserve mounted and dismounted freedom of movement. The Stryker Survivability Enhancement will address evolving threats by assessing survivability improvements, to include passive protection systems, active protection systems, and an under-armor fire capability for Stryker-equipped reconnaissance troops. Stryker Lethality ECP efforts focus on the integration of a suite of complementary Mission Equipment Package (MEP) lethality upgrades (medium caliber weapon ECP, Common Remotely Operated Weapon Station-Javelin (CROWS-J) ONS, CROWS-J ECP, Anti-Tank Guided Missile (ATGM) ECP, common mast sensor ECP, and other capabilities) that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs) and address Remote Weapon Station (RWS) and Improved Target Acquisitions System (ITAS) obsolescence issues that will impact fleet sustainment beginning in FY2020.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Stryker DVH A1 ECP Development (Engineering/Prototypes)	14.278	-	7.883	-	7.883
Description: Funding is provided for the following effort					
FY 2019 Base Plans:					
Continuing DVH A1 ECP engineering efforts, to include finalization of In-Vehicle Network (IVN) design, development, validation/verification and logistic demonstration of revisions to Stryker Operator and Maintenance					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018				
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs		Project (Number/Name) EE2 / Stryker Improvement				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Manuals, provisioning of DVH A1 ECP-unique parts, and incorporation of DVH A1 ECP design changes resulting from deficiencies identified during prototype build and development testing.								
FY 2018 to FY 2019 Increase/Decrease Statement: No funding requirements for Development in FY2018.								
Title: Stryker DVH A1 ECP Testing Description: Funding is provided for the following effort FY 2018 Plans: Continuing test execution activities for the Stryker ECP 1 upgrade technologies, including tests for Communications, Command, and Control (C3) and electronics, and information assurance testing. These events will be conducted at various test sites throughout the US including Yuma Proving Ground (YPG), Electronic Proving Ground (EPG), and White Sands Missile Range (WSMR). Conduct Follow-on Operational Test & Evaluation (FOT&E). FY 2019 Base Plans: Completion of DVH A1 ECP test execution and development of final assessment/report. FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 decrease of funding due to a single final test event occurring in FY 2019, the DVH A1 ECP Capabilities Set test.				7.023	18.760	1.186	-	1.186
Title: Stryker DVH A1 Training Device Updates Description: Funding is provided for the following effort FY 2019 Base Plans: Development of updates to Stryker training devices resulting from DVH A1 ECP engine, alternator, suspension, and network design changes. FY 2018 to FY 2019 Increase/Decrease Statement: FY19 funding initiates development of updates to Stryker training devices resulting from DVH A1 engine, alternator, suspension, and network design changes.				-	-	1.242	-	1.242
Title: Stryker DVH A1 Contractor Support to Test Description: Funding is provided for the following effort				12.220	0.080	2.222	-	2.222

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs	Project (Number/Name) EE2 / Stryker Improvement				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continuing contractor technical support (system troubleshooting, maintenance and repair of prototypes during execution of tests) to ECP 1 developmental test and operational test.						
FY 2019 Base Plans: Continuing contractor technical support (system troubleshooting, maintenance and repair of prototypes during execution of tests) to ECP 1.						
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 increase due to ramp up of ECP1 developmental an operational testing.						
Title: Stryker 30mm ICVD ONS Testing		17.000	-	-	-	-
Title: Stryker 30mm ICVD ONS Training Device Updates		0.393	-	-	-	-
Title: Stryker 30mm ICVD ONS Contractor Support to Test		10.114	-	-	-	-
Title: Survivability Enhancements Description: Funding is provided for the following effort		14.364	2.133	-	-	-
FY 2018 Plans: Continuing assessment of force protection and survivability improvements, to include passive and protection systems.						
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 NDI APS funding transferred to PE0604852A/XU9.						
Title: Stryker Lethality ECPs Development (Engineering/Prototypes) Description: Funding is provided for the following effort		21.144	50.639	23.727	-	23.727
FY 2018 Plans: Continuing developmental engineering of the Engineering Change Proposal (ECP) 2 lethality upgrades to include under armor Javelin, medium caliber weapon, and improved target acquisition optics.						
FY 2019 Base Plans:						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs	Project (Number/Name) EE2 / Stryker Improvement				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Stryker Lethality ECPs developmental engineering to include completion of CROWS-J ECP integration, continuation of ATGM ECP integration, and continuation of medium caliber weapon system design. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease in FY 2019 due to completion of CROWS-J ONS and work accomplished on CROWS-J ECP in FY 2018. FY 2019 completes design of the CROWS-J ECP and ATGM ECP, and continues development of the medium caliber weapon system.						
Title: Stryker Lethality ECPs Testing Description: Funding is provided for the following effort FY 2018 Plans: Initiation of developmental test, to include safety, performance and environmental test planning and execution activities for the Stryker ECP 2 under armor Javelin effort. FY 2019 Base Plans: Continuation of developmental test, to include safety, performance and environmental test planning and execution activities for the CROWS-J ECP. FY 2018 to FY 2019 Increase/Decrease Statement: FY18 funding supports initial test planning activities for the CROWS-J ECP effort. FY19 funding supports the execution of CROWS-J ECP developmental testing.		3.851	0.380	5.016	-	5.016
Title: Stryker Lethality ECPs Contractor Support to Test Description: Funding is provided for the following effort FY 2019 Base Plans: Contractor technical support to government safety, performance and environmental test execution activities for the CROWS-J ECP effort. FY 2018 to FY 2019 Increase/Decrease Statement: Contractor technical support (system troubleshooting, maintenance and repair of prototypes during execution of tests) for the CROWS-J ECP effort initiates in FY 2019.		1.015	-	1.572	-	1.572
Title: Government Systems Engineering and Project Management Description: Funding is provided for the following effort		13.586	8.650	16.018	-	16.018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>				Project (Number/Name) EE2 / <i>Stryker Improvement</i>				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<i>FY 2018 Plans:</i> Continuing Government Systems Engineering and Program Management support (labor, travel, training, supplies, and equipment) to support ECP 1, ONS Lethality, Survivability Enhancements, and ECP 2 development efforts. Includes execution of an ECP 2 medium caliber weapon Source Selection and Evaluation Board (SSEB). <i>FY 2019 Base Plans:</i> Continuing Government Systems Engineering and Program Management support (labor, travel, training, supplies, and equipment) for Stryker DVH A1 ECP, 30mm ICVD ONS, Survivability Enhancement, and Lethality ECP (CROWS-J ECP, ATGM ECP, medium caliber weapon system) development efforts. Includes completion of a medium caliber weapon system Source Selection and Evaluation Board (SSEB). <i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> FY 2019 includes additional armament-specific systems engineering and program management support necessary to execute Stryker 30mm ECP development engineering. Additionally, FY 2019 includes increased program management support necessary to develop plans required to initiate medium caliber weapon system developmental test in FY 2020.												
Accomplishments/Planned Programs Subtotals								114.988	80.642	58.866	-	58.866
C. Other Program Funding Summary (\$ in Millions)												
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>	
• GM0100: <i>Stryker (Mod)</i>	82.681	97.552	287.490	-	287.490	465.780	570.391	544.979	500.041	Continuing	Continuing	
• G85200: <i>Stryker Upgrade</i>	418.561	-	21.900	-	21.900	-	-	-	-	Continuing	Continuing	
Remarks												
AAE approval for a 3rd Double V-Hull (DVH) SBCT Brigade of 337 Exchange Vehicles was given on July 26, 2013 (funded in G85100). A successful production decision for the DVH A1 Engineering Change Proposal (ECP) was executed on July 22, 2016, which provided approval to begin 4th Brigade DVH A1 ECP production (funded in Stryker Upgrade - G85200). Approval to procure an additional 123 DVH A1 ECP vehicles was received through a successful decision point on April 26, 2017. Stryker MOD (GM0100) supports Stryker Fleet modifications to include Infantry Carrier Vehicle Dragoon (ICVD) production and fielding in FY16-18, DVH A1 ECP retrofits in FY19-23, and Lethality ECP retrofits in FY19-23.												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) EE2 / <i>Stryker Improvement</i>
<u>D. Acquisition Strategy</u> The Stryker Engineering Change Proposal (ECP) 1 effort will buy back the vehicle space, weight, and power margin lost due to the addition of numerous kits in response to eleven years of war (20-combat rotations & 37+ million total miles), in order to allow integration of the future network (as directed by VCSA in August 2011) without further degrading the performance of the platform. In May 2012, Stryker ECP 1 program (Phase I) was approved, permitting preliminary design and integration efforts on both the Flat Bottom (FB) and Double-V Hull (DVH) variants. In March 2013, Phase II was approved continuing design and integration of ECP 1 mechanical power, electrical power generation, chassis upgrades, and the in-vehicle network upgrades. Based on additional testing conducted in the summer of 2013, the decision was made to focus ECP 1 efforts on the DVH platform and defer efforts on flat-bottom Strykers. The effort has subsequently been renamed the Stryker DVH A1 ECP. The DVH A1 ECP Phase II contract, awarded November 25, 2013, continues development engineering, prototype build test and evaluation. The initial DVH A1 ECP production contract was awarded in October 2016 (Sole-Source Firm Fixed Price arrangement). A second buy of DVH A1 ECP vehicles was awarded in October 2017 (Fixed Price Incentive Fee arrangement). On July 2, 2015, ASARC authorization was granted to execute the Stryker 30mm ICVD Operational Needs Statement (ONS) effort. 30mm ICVD Engineering, Manufacturing, and Development (EMD) contracts for Non-Recurring Engineering (NRE) and Logistics Products Development/Test Support were awarded in January 2016 and May 2016, respectively (Cost Plus Incentive-Fee basis). The 30mm ICVD ONS Production/Retrofit contract was awarded in May 2016 through an Undefinitized Contract Action (UCA). Definitization of the Fixed Price Incentive Fee (FPIF) Production contract occurred in March 2017. The Stryker Lethality ECP efforts will focus on the integration of a suite of complementary Mission Equipment Package (MEP) lethality upgrades (medium caliber weapon system, Common Remotely Operated Weapon Station-Javelin (CROWS-J), common masted sensor, Anti-Tank Guided Missile (ATGM) target acquisition optics, and other capabilities) that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs). Army Acquisition Executive (AAE) approval to initiate the Stryker CROWS-J ECP and ATGM ECP efforts was received in a September 30, 2016 Acquisition Decision Memorandum (ADM). <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>						Project (Number/Name) EE2 / <i>Stryker Improvement</i>			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker 30mm ICVD ONS Project Management	MIPR	PEO GCS/TACOM : Sterling Heights, MI	4.919	5.914	Jan 2017	-		-		-		-	0.000	10.833	-
Survivability Enhancement Government Engineering and Project Management	MIPR	PEO GCS/TACOM : Various	0.161	0.682	Jan 2017	-		-		-		-	0.000	0.843	-
Project Management Office (PMO)	MIPR	PEO GCS/TACOM : Various	9.236	6.990	Jan 2017	8.650	Oct 2017	16.018	Nov 2018	-		16.018	25.597	66.491	-
Subtotal			14.316	13.586		8.650		16.018		-		16.018	25.597	78.167	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker DVH A1 ECP Development	SS/CPIF	GDLS, MI : Various	157.869	14.278	Dec 2016	-		7.883	Dec 2018	-		7.883	0.000	180.030	-
Stryker DVH A1 ECP Training Device Updates	MIPR	PEO STRI, FL : Various	-	-		-		1.242	Dec 2018	-		1.242	0.000	1.242	-
Stryker 30mm ICVD ONS Development	SS/CPIF	GDLS, MI : Various	79.220	-		-		-		-		-	0.000	79.220	-
Stryker 30mm ICVD ONS Training Device Updates	MIPR	PEO STRI, FL : Various	-	0.393	Jan 2018	-		-		-		-	0.000	0.393	-
Stryker Lethality ECPs Development	C/Various	PM CSW; PM CCWS : Various	5.373	21.144	Mar 2017	50.639	Apr 2018	23.727	Jan 2019	-		23.727	101.381	202.264	-
Stryker Survivability Enhancement	Various	US Army TARDEC, Various : Sterling Heights, MI	12.860	8.370	Jan 2017	2.133	Oct 2017	-		-		-	0.000	23.363	-
Subtotal			255.322	44.185		52.772		32.852		-		32.852	101.381	486.512	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) EE2 / Stryker Improvement					
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker DVH A1 ECP Testing	MIPR	Army Test Centers : Various	24.160	7.023	Dec 2016	18.760	Dec 2017	1.186	Dec 2018	-		1.186	0.000	51.129	-
Stryker DVH A1 ECP Contractor Support to Test	SS/CPFF	GDLS, MI : Various	23.234	12.220	Dec 2016	0.080	Feb 2018	2.222	Dec 2018	-		2.222	0.000	37.756	-
Stryker 30mm ICVD ONS Test	MIPR	Army Test Centers : Various	6.546	17.000	Oct 2016	-		-		-		-	0.000	23.546	-
Stryker 30mm ICVD ONS Contractor Support to Test	SS/CPFF	GDLS, MI : Various	16.456	10.114	Dec 2016	-		-		-		-	0.000	26.570	-
Stryker Lethality ECPs Testing	MIPR	Army Test Centers : Various	-	3.851	Mar 2017	0.380	Aug 2018	5.016	Dec 2018	-		5.016	7.561	16.808	-
Stryker Lethality ECPS Contractor Support to Test	MIPR	Various : Various	-	1.015	Dec 2016	-		1.572	Dec 2018	-		1.572	6.460	9.047	-
Stryker Survivability Enhancement	MIPR	Army Test Centers : Various	0.635	5.994	Oct 2016	-		-		-		-	0.000	6.629	-
Subtotal			71.031	57.217		19.220		9.996		-		9.996	14.021	171.485	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			340.669	114.988		80.642		58.866		-		58.866	140.999	736.164	N/A
Remarks															

UNCLASSIFIED

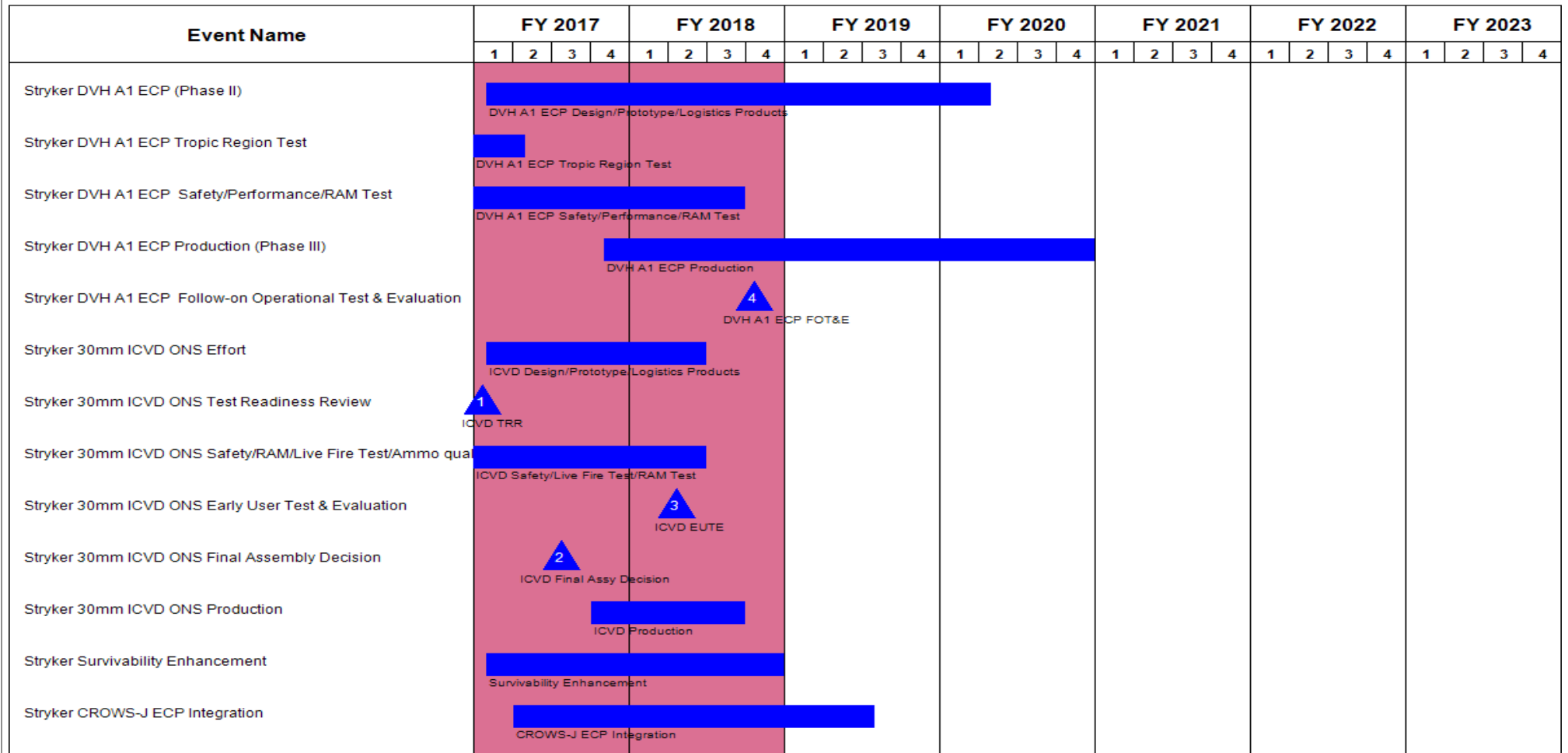
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0203735A / *Combat Vehicle Improvement Programs*

Project (Number/Name)
EE2 / *Stryker Improvement*



UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) EE2 / <i>Stryker Improvement</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Stryker CROWS-J ECP Safety/Software/Performance Test																												
Stryker CROWS-J ECP Retrofit																												
Stryker CROWS-J ECP First Unit Equipped (FUE)																												
Stryker ATGM ECP Integration																												
Stryker ATGM ECP Safety/Perf./Elec. Test																												
Stryker Medium Caliber Weapon Trade Study/Cost Benefit Analysis/SSEB																												
Stryker Medium Caliber Weapon Integration																												
Stryker Medium Caliber Weapon Safety/Perf./Live Fire/Electronics Testing																												
Stryker Medium Caliber Weapon Production/Retrofit																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) EE2 / <i>Stryker Improvement</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Stryker DVH A1 ECP (Phase II)	1	2014	2	2020
Stryker DVH A1 ECP Tropic Region Test	3	2016	1	2017
Stryker DVH A1 ECP Cold Region Test	1	2016	3	2016
Stryker DVH A1 ECP Safety/Performance/RAM Test	4	2015	3	2018
Stryker DVH A1 ECP Production (Phase III)	4	2017	4	2020
Stryker DVH A1 ECP Follow-on Operational Test & Evaluation	4	2018	4	2018
Stryker 30mm ICVD ONS Effort	1	2016	2	2018
Stryker 30mm ICVD ONS Test Readiness Review	1	2017	1	2017
Stryker 30mm ICVD ONS Safety/RAM/Live Fire Test/Ammo qualification	2	2016	2	2018
Stryker 30mm ICVD ONS Early User Test & Evaluation	2	2018	2	2018
Stryker 30mm ICVD ONS Final Assembly Decision	3	2017	3	2017
Stryker 30mm ICVD ONS Production	4	2017	3	2018
Stryker Survivability Enhancement	1	2017	4	2018
Stryker CROWS-J ECP Integration	2	2017	3	2019
Stryker CROWS-J ECP Safety/Software/Performance Test	4	2019	1	2020
Stryker CROWS-J ECP Retroft	2	2019	4	2026
Stryker CROWS-J ECP First Unit Equipped (FUE)	3	2020	3	2020
Stryker ATGM ECP Integration	4	2017	4	2022
Stryker ATGM ECP Safety/Perf./Elec. Test	2	2020	3	2021
Stryker Medium Caliber Weapon Trade Study/Cost Benefit Analysis/SSEB	1	2018	2	2019
Stryker Medium Caliber Weapon Integration	2	2019	2	2023
Stryker Medium Caliber Weapon Safety/Perf./Live Fire/Electronics Testing	1	2020	2	2023

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs		Project (Number/Name) EE2 / Stryker Improvement
		Start		End
Events		Quarter	Year	Quarter Year
Stryker Medium Caliber Weapon Production/Retrofit		1	2022	4 2026

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203735A / Combat Vehicle Improvement Programs				Project (Number/Name) FD8 / Light Armored Vehicle Improvement			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FD8: Light Armored Vehicle Improvement	-	0.328	3.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.428
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Light Armored Vehicle improvement program will design, test and modify two Light Armored Vehicles (LAV-25A2s) for Low Velocity Air Drop (LVAD) to inform operational concepts for Infantry Brigade Combat Teams (IBCT) in support of Global Response Force early entry operations. This will directly support the expeditionary maneuver excursion that will be conducted by the XVIII Airborne Corps in FY17-18.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Government Engineering and Project Management								0.328	3.100	-	-	-
Description: Funding is provided for the following effort												
FY 2018 Plans: The Army plans to use 6 LAV-25A2s in a training excursion to inform operational concepts for Airborne Infantry Brigade Combat Teams in support of Global Response Force early entry operation and to determine airdrop feasibility. XVIII Airborne Corps will have an opportunity to assess operational employment of LAV-25A2s, develop tactics, techniques and procedures and assess the air drop feasibility through air certification testing. The Army plans to determine whether or not to field additional LAV-25A2s to XVIII Airborne Corps based on results of the excursion and air drop testing.												
In FY2018 the Army will complete air certification testing to determine LAV-25A2 airdrop feasibility. If the excursion is successful and the Army decides to field additional vehicles it is anticipated that additional modifications and testing will be required to address upgrades to survivability, mobility, integrate Army communications equipment and add obsolescence upgrades for commonality with USMC fielded systems.												
FY 2018 to FY 2019 Increase/Decrease Statement: Funding ends in FY18												
Accomplishments/Planned Programs Subtotals								0.328	3.100	-	-	-
C. Other Program Funding Summary (\$ in Millions)												
N/A												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) FD8 / <i>Light Armored Vehicle Improvement</i>
C. Other Program Funding Summary (\$ in Millions) Remarks D. Acquisition Strategy N/A E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>				Project (Number/Name) FD8 / <i>Light Armored Vehicle Improvement</i>					

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office	Allot	PM office : Warren, MI	-	0.328	Nov 2016	0.325	Nov 2017	-		-		-	0.000	0.653	-
Subtotal			-	0.328		0.325		-		-		-	0.000	0.653	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Support cost	RO	TBD : TBD	-	-		2.775	Mar 2018	-		-		-	0.000	2.775	-
Subtotal			-	-		2.775		-		-		-	0.000	2.775	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.328	3.100	-	-	-	0.000	3.428	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0203735A / *Combat Vehicle Improvement Programs*

Project (Number/Name)

FD8 / Light Armored Vehicle Improvement

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / <i>Combat Vehicle Improvement Programs</i>	Project (Number/Name) FD8 / <i>Light Armored Vehicle Improvement</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Airdrop Certification NATICK Testing	4	2017	4	2018
2018-CT-ABN-MBPFP-G8710 ATEC Testing	3	2017	4	2018
2017-DT-ATC-MBPFP-G7415 ATC Testing	4	2017	4	2018

UNCLASSIFIED

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

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	PE 0203740A / <i>Maneuver Control System</i>											
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	3.943	6.639	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.582
484: <i>Maneuver Control System</i>	-	3.943	6.639	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.582

A. Mission Description and Budget Item Justification

Tactical Mission Command (TMC) is a suite of products and services that provide commanders and their staff executive decision making capability in a collaborative environment. The suite of products currently in development consist of Command Web (CW), Tactical Services Infrastructure (TSI), and an Army Voice Communication System (WAVE). TMC satisfies requirements and capabilities identified in the Maneuver Control System (MCS) 6.4 Capability Production Document. The overarching capability includes a user-defined Common Operating Picture (COP) with integrated Command and Control (C2) and Situational Awareness (SA), map-centric collaboration, Army Mission Command Systems (and others) enabling system interoperability, data management, and enterprise services. TMC contributes to Mission Command (MC) Convergence for commanders and staff to effectively conduct collaborative mission planning and execution across a range of operations and spectrum of conflict. Legacy products supported by this Budget Item include Command Post of the Future (CPOF) and Battle Command Common Services (BCCS).

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.031	6.639	4.047	-	4.047
Current President's Budget	3.943	6.639	0.000	-	0.000
Total Adjustments	-0.088	0.000	-4.047	-	-4.047
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.087	-			
• Adjustments to Budget Years	-	-	-4.047	-	-4.047

Change Summary Explanation

TMC (MCS) will be transitioning into sustainment in FY 2019.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203740A / Maneuver Control System				Project (Number/Name) 484 / Maneuver Control System			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
484: Maneuver Control System	-	3.943	6.639	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.582
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Mission Command (TMC) is a portfolio of products and services that enable commanders and their staff with collaborative environment, planning tools, and Common Operation Picture (COP) management and other maneuver functional tools. The overarching capability includes above platform level user-defined COP with integrated Command and Control (C2) and Situational Awareness (SA), map-centric collaboration, Army Mission Command System and other enabling system interoperability, data management and enterprise services. Products include:

Command Web is a set of modular software widgets served up over the web providing engineering functionality, improved supportability and ease-of-use in robust network environments.

Tactical Server Infrastructure (TSI) provides the network available services critical to ensuring system and software can transmit the network effectively. Additionally, TSI serves as the hosting platform for many other enabling software systems, as well as multiple Warfighter Functional Area Applications (WFAs) such as Intel, Air Missile Defense Workstations and Fires gateway, providing efficiencies in the Command Post via decreased size, weight and power.

WAVE is the voice of the internet protocol common voice solution for the CPOF portfolio of programs. It provides real-time voice interoperability between radios, intercom and other previously fielded technologies in support of the Commander's update briefing and other Mission Command tasks.

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

	FY 2017	FY 2018	FY 2019
Title: BCCS / TSI software development / integration	2.456	-	-
Title: Command Web Development	0.549	-	-
Description: Command Web provides modular software widgets served up over the web providing engineering functionality. Improved supportability and ease-of-use in robust network environments (compliant w/COE guidance)			
Title: Program Management Office	0.320	0.639	-
Description: Codification of program operational requirements into discrete technical packages for development, testing, deployment, and support over the systems lifecycle.			
FY 2018 Plans: Codification of program operational requirements into discrete technical packages for development, testing, deployment, and support over the systems lifecycle			
FY 2018 to FY 2019 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203740A / Maneuver Control System			Project (Number/Name) 484 / Maneuver Control System				
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019
TMC (MCS) will be transitioning into sustainment in FY19.											
Title: Test and Evaluation									0.018	0.512	-
Description: Encompasses formal test (operational assessment/test, joint certification, interoperability, and information assurance) and informal testing such as acceptance testing and risk reduction testing.											
FY 2018 Plans: Formal test (Joint certification, interoperability, and information assurance) and informal testing such as acceptance testing and risk reduction testing.											
FY 2018 to FY 2019 Increase/Decrease Statement: TMC (MCS) will be transitioning into sustainment in FY19.											
Title: WAVE MIP / Development / Intergration									0.600	5.488	-
Description: Developing and integrating voice over IP solutions into the CPOF portfolio of programs. It provides real-time voice interoperability between radios,											
FY 2018 Plans: Finalize integration of WAVE (VOIP) with TMC portfolio of products.											
FY 2018 to FY 2019 Increase/Decrease Statement: Requirements for MIP/WAVE are incorporated under CPCE development in FY19 and out.											
Accomplishments/Planned Programs Subtotals									3.943	6.639	-
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• BA9320: Maneuver Control System (MCS)	151.464	132.572	38.015	-	38.015	0.260	-	-	-	0.000	322.311
• BS9710: MCS SPARES	-	4.869	0.000	-	0.000	-	-	-	-	0.000	4.869
Remarks											
D. Acquisition Strategy											
In accordance with the Training and Doctrine Command (TRADOC) requirements document approved in 2008, Maneuver Control System Capabilities Production Document, software capability will be developed in 3-year increments in support of Common Operating Environment (COE) Guidance designed to deploy specified Mission Command Essential Capabilities to operating force commanders and their integrated battle staffs. This strategy accounts for subsequent Army directives and											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203740A / <i>Maneuver Control System</i>	Project (Number/Name) 484 / <i>Maneuver Control System</i>
continued migration to the Army COE; designed to optimize opportunities for improved interoperability. The products developed under this funding line are an integral part of the Army Mission Command System of Systems. TMC (MCS) will be transitioning into sustainment in FY 2019. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203740A / Maneuver Control System						Project (Number/Name) 484 / Maneuver Control System			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Mgmt	Various	PM Mission Command : Aberdeen Proving Grounds, MD	19.990	0.320	Jan 2017	0.639		-		-		-	Continuing	Continuing	Continuing
Subtotal			19.990	0.320		0.639		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Tactical Applications (TacApps)	IA	Software Development: WSEC : Picatinny Arsenal, NJ	19.107	-		-		-		-		-	0.000	19.107	-
Command Web Development	Various	CECOM SEC : APG, MD	1.450	0.549	Apr 2017	-		-		-		-	0.000	1.999	-
Log Widget Development	TBD	Development: Government Agency : TBD	3.665	-		-		-		-		-	Continuing	Continuing	-
Misc Contracts	Various	Various : Various	24.931	-		-		-		-		-	Continuing	Continuing	Continuing
ABCS SoS Contract (Joint Convergence Development)	Various	Lockheed Martin : Tinton Falls, NJ	6.404	-		-		-		-		-	Continuing	Continuing	Continuing
Technical Support	Various	PM Mission Command/SEC : Various	27.251	-		-		-		-		-	Continuing	Continuing	Continuing
CPOF Development	Various	General Dynamics : Scottsdale, AZ	137.255	-		-		-		-		-	Continuing	Continuing	Continuing
ABCS SoS Contract (Joint Convergence Development) Follow-on	Various	General Dynamics : Scottsdale, AZ	1.025	-		-		-		-		-	Continuing	Continuing	-
Mission Command Convergence Development & Integration	Various	Various : Various	42.698	-		-		-		-		-	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203740A / Maneuver Control System						Project (Number/Name) 484 / Maneuver Control System			
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Mission Command Convergence - CP CE Software Development & Integration (Common Software)	Various	software development Future Skies : APG, MD	11.055	-		-		-		-		-	0.000	11.055	-
Mission Command Convergence Development & Integration (TAIS)	Various	software development SED : Redstone Arsenal, AL	2.103	-		-		-		-		-	0.000	2.103	-
Software Development & Technical Support for BCCS	Various	CECOM Software Engineering Center : APG, MD	68.906	2.456	Feb 2017	-		-		-		-	Continuing	Continuing	Continuing
PAL Integration	IA	SRI : AZ	11.000	-		-		-		-		-	Continuing	Continuing	-
WAVE / MIP Development & intergration	Various	TBD : APG	-	0.600	Apr 2017	5.488		-		-		-	Continuing	Continuing	Continuing
Subtotal			356.850	3.605		5.488		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Misc Engineering Support	Various	PM Mission Command/SEC : Aberdeen Proving Ground, MD	10.340	-		-		-		-		-	Continuing	Continuing	Continuing
Misc Contracts	Various	PM Mission Command : Aberdeen Proving Ground	5.743	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			16.083	-		-		-		-		-	Continuing	Continuing	N/A

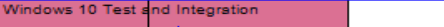
UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203740A / Maneuver Control System				Project (Number/Name) 484 / Maneuver Control System					
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental tests / CTSF integration testing	Various	Various : APG, MD	9.627	0.018		-		-		-		-	Continuing	Continuing	Continuing
AIC/NIE Testing	TBD	VARIOUS : APG, MD	10.060	-		0.512		-		-		-	0.000	10.572	-
Operational Assessment/ testing	Various	Various : APG, MD	36.804	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			56.491	0.018		0.512		-		-		-	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			449.414	3.943		6.639		-		-		-	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203740A / Maneuver Control System	Project (Number/Name) 484 / Maneuver Control System

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
COE V2	 COE v2 T&I																											
COE V2 Development & Test																												
AWA 17.1																												
	AWA 7.1																											
NIE 17.2																												
			NIE 17.2																									
Systems Integration Effort																												
Arch, System Engineering, & Dev																												
																												
Windows 10 Test and Integration																												
																												
Windows 10 Test and Integration																												
AWA 18.1																												
							AWA 18.1																					
NIE 18.2																												
								NIE 18.2 (V3) Operational Assessment)																				
AWA 19.1																												
									AWA 19.1																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203740A / <i>Maneuver Control System</i>	Project (Number/Name) 484 / <i>Maneuver Control System</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
COE V2	2	2012	2	2017
COE v2 Arch, System Engineering, & Dev	2	2012	2	2016
COE V2 Development & Test	1	2015	2	2017
AWA 17.1	1	2017	1	2017
NIE 17.2	3	2017	3	2017
Systems Integration Effort	4	2014	2	2019
Arch, System Engineering, & Dev	4	2014	3	2018
Windows 10 Test and Integration	2	2017	2	2019
AWA 18.1	1	2018	1	2018
NIE 18.2	3	2018	3	2018
AWA 19.1	1	2019	1	2019

UNCLASSIFIED

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

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					PE 0203743A / 155MM Self-Propelled Howitzer Improvements							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	40.784	40.676	-	40.676	33.953	22.147	0.000	0.000	0.000	137.560
FF9: PIM Improvement Program	-	0.000	40.784	40.676	-	40.676	33.953	22.147	0.000	0.000	0.000	137.560

A. Mission Description and Budget Item Justification

The current Paladin Integrated Management (PIM) is an ACAT1C Acquisition program. The PIM improvement program is intended to address the current Howitzer capability gap based on a capability needs assessment performed by the user community to restore indirect fires support overmatch to the US Army. This effort will evaluate developing technologies to determine which configuration will add optimal value to the Army. This effort may include but is not limited to the integration of a new cannon, gun mount, gun drive systems, fire control systems and autoloader into the M109A7 Howitzer. Analysis will be required to evaluate the impact of the new cannon technology on current platform chassis, cab, suspension, mobility, and electronic architecture. This evaluation will be the foundation for this Engineering Change Proposal (ECP) and further inform the level of effort needed to integrate this capability into the current SPHS.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	40.784	42.137	-	42.137
Current President's Budget	0.000	40.784	40.676	-	40.676
Total Adjustments	0.000	0.000	-1.461	-	-1.461
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.024	-	-1.024
• Other Adjustments 1	-	-	-0.437	-	-0.437

Change Summary Explanation

Adjustments

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements				Project (Number/Name) FF9 / PIM Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FF9: PIM Improvement Program	-	0.000	40.784	40.676	-	40.676	33.953	22.147	0.000	0.000	0.000	137.560
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The current Paladin Integrated Management (PIM) is an ACAT1C Acquisition program. The PIM improvement program is intended to address the current Howitzer capability gap based on a capability needs assessment performed by the user community to restore indirect fires support overmatch to the US Army. This effort will evaluate developing technologies to determine which configuration will add optimal value to the Army. This effort may include but is not limited to the integration of a new cannon, gun mount, gun drive systems, fire control systems and autoloader into the M109A7 Howitzer. Analysis will be required to evaluate the impact of the new cannon technology on current platform chassis, cab, suspension, mobility, and electronic architecture. This evaluation will be the foundation for this Engineering Change Proposal (ECP) and further inform the level of effort needed to integrate this capability into the current SPHS. .												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: PIM Improvement Program									-	40.784	-	
Description: Funding is provided to support Cost Benefit Analysis (CBA) and associated following on activities, and range requirements												
FY 2018 Plans: Will conduct a Cost Benefit Analysis (CBA) comparing several different packages of upgrades for the M109A7. Each upgrade package will be evaluated for cost, technology readiness and added performance. At the conclusion of the CBA the Army will be better informed to choose a path which can be sole source with the current vendor, open competition, or continue with government development through Engineering Manufacturing Development (EMD). This work effort is to pursue Objective Indirect Fire Range Requirement in the current M109 FOV Capability Production Document (CPD). The effort will address increased range requirements from a holisitic development process. Program will focus on gun mount, breech, tube, and fire control. It will be designed around M109A7 objective requirements for range. It is intended to address capability gaps as identified by the Army Chief of Staff.												
FY 2018 to FY 2019 Increase/Decrease Statement: Funding in FY19 has decreased to zero and transitioned to the Extended Range ECP Development (ERCA)												
Title: Extended Range ECP Development (ERCA)									-	-	35.585	
Description: Funds support Range ECP development.costs												
FY 2019 Plans:												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements	Project (Number/Name) FF9 / PIM Improvement Program	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018
Will focus on executing the plan to begin Integration of improved armament configuration developed by ARDEC Science & Technology (S&T) effort onto the M109A7. Purchase of long lead hardware and prototype build. Develop testing strategy, systems engineering documentation and logistics input.			
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 transition to ERCA as result of Army CBA conclusion			
Title: Program Management		-	-
Description: Funding is provided for all Program Management efforts on the Extended Range ECP program.			4.231
FY 2019 Plans: Begin the development for all required documents, office staff and engineering Integrated Product Team (IPT) development.			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding has increase in FY 2019 to fund program management support costs for ERCA			
Title: Training		-	-
Description: Funding is provided for all training efforts on the Extended Range ECP program.			0.860
FY 2019 Plans: Establish procedures for logistical development, production engineering and test.			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding in FY 2019 has increased to fund training for ERCA			
Accomplishments/Planned Programs Subtotals		-	40.784
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks N/A			
D. Acquisition Strategy PdM Self Propelled Howitzer will use available information from the completed Cost Benefits Analysis (CBA) and Market Survey to solidify the acquisition plan and execute contracting activities to award an EMD contract to accomplish development, integration, test and sustainment actions as the program moves forward.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements	Project (Number/Name) FF9 / PIM Improvement Program
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements				Project (Number/Name) FF9 / PIM Improvement Program					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PIM Improvement Program	C/TBD	To Be Determined : To Be Determined	-	-		38.784	Jun 2018	-		-		-	0.000	38.784	-
Extended Range ECP Development - Government	MIPR	ARDEC : Picatinny	-	-		-		21.682	Dec 2018	-		21.682	0.000	21.682	-
Extended Range ECP Development - Contractor	SS/CPFF	BAE Systems : York, PA	-	-		-		13.903	Dec 2018	-		13.903	0.000	13.903	-
Training	MIPR	Various - OGAs : Various	-	-		-		0.860	Dec 2018	-		0.860	0.000	0.860	-
Subtotal			-	-		38.784		36.445		-		36.445	0.000	75.229	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support	MIPR	PM/PEO PIM : Various	-	-		2.000	Dec 2017	4.231	Dec 2018	-		4.231	0.000	6.231	-
Subtotal			-	-		2.000		4.231		-		4.231	0.000	6.231	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		40.784		40.676		-		40.676	0.000	81.460	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements	Project (Number/Name) FF9 / PIM Improvement Program	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
TEMP Development																												
Engineering & Manufacturing Development (EMD)																												
Systems Engineering Plan (SEP)																												
Preliminary Design Review (PDR)																												
Critical Design Review (CDR)																												
CPD Complete																												
Acquisition Development Start																												
TDP Development																												
Prototype Build																												
Life Cycle Sustainment Plan (LCSP) Complete																												
Test																												
System Verification Review (SVR)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements	Project (Number/Name) FF9 / PIM Improvement Program	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TEMP Development	1	2020	3	2020
Engineering & Manufacturing Development (EMD)	1	2019	1	2024
Systems Engineering Plan (SEP)	4	2017	4	2017
Preliminary Design Review (PDR)	2	2019	2	2019
Critical Design Review (CDR)	2	2020	2	2020
CPD Complete	1	2017	1	2017
Acquisition Development Start	2	2018	3	2018
TDP Development	4	2018	2	2020
Prototype Build	4	2019	3	2020
Life Cycle Sustainment Plan (LCSP) Complete	3	2020	3	2020
Test	4	2020	1	2025
System Verification Review (SVR)	4	2022	4	2022

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0203744A I Aircraft Modifications/Product Improvement Programs							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	32.397	39.358	17.706	-	17.706	6.686	4.271	0.220	0.163	0.000	100.801
EB6: MQ-1C Gray Eagle MODS	-	32.397	39.358	17.706	-	17.706	6.686	4.271	0.220	0.163	0.000	100.801

A. Mission Description and Budget Item Justification

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and Hellfire missiles; providing a near all-weather mission 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 MQ-1C Gray Eagle Modification/Product Improvement Program (PIP) funding is required for Global Positioning System (GPS) Denied, an electronic warfare capability, and Ground Based Sense And Avoid (GBSAA) Block II.

The Fiscal Year (FY) 2019 Aircraft Modification/Product Improvement funding of \$17.706 million will support the development required to integrate Alternate Munition, and GPS Denied for the MQ-1C Gray Eagle product. GBSAA RDTE will provide development, integration and testing for Block II. Block II decreases operational and sustainment costs, operator workload, hardware/software costs, increases system safety, and provides full materiel release for Soldier operation.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	35.793	39.358	18.488	-	18.488
Current President's Budget	32.397	39.358	17.706	-	17.706
Total Adjustments	-3.396	0.000	-0.782	-	-0.782
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-2.100	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.280	-			
• Adjustments to Budget Years	-	-	-0.782	-	-0.782
• FFRDC Transfer	-0.016	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203744A / Aircraft Modifications/ Product Improvement Programs				Project (Number/Name) EB6 / MQ-1C Gray Eagle MODS			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EB6: MQ-1C Gray Eagle MODS	-	32.397	39.358	17.706	-	17.706	6.686	4.271	0.220	0.163	0.000	100.801
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission 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 MQ-1C Gray Eagle Modification/Product Improvement Program (PIP) funding is required for the implementation Global Positioning System (GPS) Denied which is an electronic warfare capability and Ground Based Sense And Avoid (GBSAA) Block II.

The Fiscal Year (FY) 2019 Aircraft Modification/Product Improvement funding of \$17.706 million will support the development required to integrate Alternate Munition and GPS Denied. GBSAA RDTE will provide development, integration and testing for Block II. Moving the GBSAA display into the UGCS provides the aircraft operator real-time information for evasive maneuvers. Block II decreases operational and sustainment costs, operator workload, hardware/software costs, increases system safety, and provides full materiel release for Soldier operation.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Global Positioning System (GPS) Denied	2.741	4.313	6.447	-	6.447
Description: GPS Denied					
FY 2018 Plans: Funding supports continued development of an electronic warfare capability that provides the system the ability to continue operations during periods of GPS outage as well as the ability to identify GPS jammer position location. The funding will enable the MQ-1C Gray Eagle to implement all levels of electro-optical countermeasures that will be compatible with other tactical UAS's.					
FY 2019 Base Plans: Funding continues development of an electronic warfare capability that provides the system the ability to continue operations during periods of GPS outage as well as the ability to identify GPS jammer position location.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203744A / Aircraft Modifications/ Product Improvement Programs		Project (Number/Name) EB6 / MQ-1C Gray Eagle MODS		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The funding will enable the MQ-1C Gray Eagle to implement all levels of electro-optical countermeasures that will be compatible with other tactical UAS?s.						
FY 2018 to FY 2019 Increase/Decrease Statement: Development is transition from concept refinement and requirement definition to design and prototype development.						
Title: Universal Ground Control Station (UGCS) Improvement Description: UGCS Improvement FY 2018 Plans: Funding will be used to continue the implementation, training, and documentation updates to correct FOT&E findings and maintain the Net Ready KPP for the MQ-1C Gray Eagle UGCS. FY 2018 to FY 2019 Increase/Decrease Statement: Budget Estimate Submission captured under PE: 0607143A		7.825	9.235	-	-	-
Title: Alternate Munition Integration Description: Alternate Munition Integration FY 2018 Plans: Development of software changes, training, and documentation, ground/flight tests, environmental testing, Electromagnetic Environmental Effects (E3) testing, production prove-out tests, and live-fire tests. This capability will provide reduced collateral damage during weapons engagement, increase munitions inventory without affecting flight endurance, reducing enemy engagement costs and potentially reduce advanced audible and visual signatures. FY 2018 to FY 2019 Increase/Decrease Statement: JAGM integration is anticipated to be completed in FY18.		8.577	9.180	-	-	-
Title: Ground Base Sense and Avoid (GBSAA) Block II Description: GBSAA Block II FY 2018 Plans:		12.851	8.330	6.699	-	6.699

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203744A / Aircraft Modifications/ Product Improvement Programs				Project (Number/Name) EB6 / MQ-1C Gray Eagle MODS				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding supports the development and Integration for Block II to provide GBSAA display moved to Ground Control Station (GCS). Maneuver Recommendation to Aircraft Operator (AO).												
FY 2019 Base Plans: Funding supports the development and Integration for Block II to provide GBSAA display moved to Ground Control Station (GCS). Maneuver Recommendation to Aircraft Operator (AO).												
FY 2018 to FY 2019 Increase/Decrease Statement: Program is entering system test phase.												
Title: Ground Base Sense and Avoid (GBSAA) Test Block II								0.403	-	-	-	-
Description: Ground Base Sense and Avoid (GBSAA) Test Block II												
Title: Survivability								-	8.300	4.560	-	4.560
FY 2018 Plans: Funding for Electronic Attack (EA) survivability requirements for the MQ-1C Gray Eagle will be used to assess vulnerabilities of the current datalink. The Joint System Integration Lab (JSIL) will be funded to research and provide a Datalink Vulnerabilities Improvement Assessment. The prime contractor will be funded to provide survivability solutions for both software and hardware features.												
FY 2019 Base Plans: Funding for Electronic Attack (EA) survivability requirements for the MQ-1C Gray Eagle will be used to develop prototype solutions against known threat vulnerabilities. The Joint System Integration Lab (JSIL) will be funded to research and provide a Datalink Vulnerabilities Improvement Assessment. The prime contractor will be funded to provide survivability solutions for both software and hardware features.												
FY 2018 to FY 2019 Increase/Decrease Statement: Program anticipated to be completed in FY19.												
Accomplishments/Planned Programs Subtotals								32.397	39.358	17.706	-	17.706
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• A00005: MQ-1 Unmanned Aircraft Vehicle (UAV)	249.838	30.206	0.000	-	0.000	-	-	-	-	0.000	280.044	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0203744A / Aircraft Modifications/ Product Improvement Programs				Project (Number/Name) EB6 / MQ-1C Gray Eagle MODS			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• AA6601: MQ-1C Gray Eagle Mods2	-	74.291	98.640	32.000	130.640	34.030	15.970	-	2.263	Continuing	Continuing
• 0305219A: MQ-1C Gray Eagle - Army UAV (MIP)	13.470	9.574	0.000	-	0.000	-	-	-	-	0.000	23.044
Remarks											
D. Acquisition Strategy											
An Extended Range Multi-Purpose (ERMP) Operational Requirement Document (ORD) was approved by the Joint Requirement Oversight Council (JROC) 6 Apr 2005. Milestone B occurred on 20 Apr 2005, and the System Development and Demonstration contract was awarded 8 Aug 2005, as a result of a competitive solicitation which included a vendor system capabilities demonstration. A Capabilities Production Document (CPD) was approved 14 Mar 2009. MQ-1C Gray Eagle completed FOTE 12 Jun 2015. The RDTE funded elements for GPS Denied, UGCS Improvements and Alternate Munition Integration addressed in this submission are planned for award on the Gray Eagle Engineering Services contract as a Sub-Engineering Services Memorandum (SESM) task order, and as Military Interdepartmental Purchase Requisitions (MIPRs) to various other Government Agencies. The purpose of the SESMs is to mature the respective designs to a level that Engineering Change Requests (ECR) are submitted to the Government via the Configuration Control Board (CCB). Following successful completion of the SESM and CCB approval, a contract modification to retrofit and/or cut-in the respective engineering change will be awarded on the appropriate Performance Based Logistics (PBL) or Production contract. The RDTE funded element for GBSAA Block II addressed in this submission are planned for award on various contracts and MIPR actions to other government agencies.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203744A / Aircraft Modifications/ Product Improvement Programs				Project (Number/Name) EB6 / MQ-1C Gray Eagle MODS					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Global Positioning System (GPS) Denied	SS/CPFF	General Atomics/ ASI : San Diego, CA	-	2.741	Jan 2017	4.313	Jan 2018	6.447	Jan 2019	-		6.447	Continuing	Continuing	-
Universal Ground Control Station (UGCS) Improvements	SS/CPFF	General Atomics/ ASI : San Diego, CA	-	7.825	Jan 2017	9.235	Jan 2018	-		-		-	Continuing	Continuing	-
Alternate Munition Integration	MIPR	Various : Various	-	8.577	Jan 2017	9.180	Jan 2018	-		-		-	Continuing	Continuing	-
Ground Base Sense and Avoid Block II	SS/CPFF	Various : Various	-	10.688	Oct 2016	8.330	Oct 2017	6.699	Oct 2018	-		6.699	Continuing	Continuing	-
Survivability	SS/CPIF	GA-ASI : Poway, CA	-	-		6.880	Jan 2018	3.110	Jan 2019	-		3.110	Continuing	Continuing	-
Subtotal			-	29.831		37.938		16.256		-		16.256	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support - MQ-1	MIPR	Various : Various	-	-		1.420	Jan 2018	1.450	Jan 2019	-		1.450	0.000	2.870	-
Engineering Support - GBSAA	MIPR	Various : Various	-	2.163	Mar 2017	-		-		-		-	0.000	2.163	-
Subtotal			-	2.163		1.420		1.450		-		1.450	0.000	5.033	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Testing and Software Testing Block II - GBSAA	MIPR	Various : Various	-	0.403	Mar 2017	-		-		-		-	0.000	0.403	-
Subtotal			-	0.403		-		-		-		-	0.000	0.403	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203744A / Aircraft Modifications/ Product Improvement Programs					Project (Number/Name) EB6 / MQ-1C Gray Eagle MODS					
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	32.397		39.358		17.706		-		17.706	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0203744A / Aircraft Modifications/
Product Improvement Programs

Project (Number/Name)

EB6 / MQ-1C Gray Eagle MODS

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Engineering and Manufacturing Development - GBSAA																												
Alternate Munition Integration																												
Universal Ground Control Station Improvements																												
Global Positioning System Denied																												
Engineering and Software Development - GBSAA																												
Training Development and Software/System Testing - MQ-1 Gray Eagle																												
Critical Design Review - GBSAA																												
Training Development and Software/System Testing- GBSAA																												
Materiel Release - GBSAA																												
Survivability																												
First Unit Equipped - GBSAA																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203744A / Aircraft Modifications/ Product Improvement Programs	Project (Number/Name) EB6 / MQ-1C Gray Eagle MODS	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Engineering and Manufacturing Development - GBSAA	4	2017	2	2018
Alternate Munition Integration	2	2017	4	2018
Universal Ground Control Station Improvements	2	2017	4	2018
Global Positioning System Denied	2	2017	1	2024
Engineering and Software Development - GBSAA	1	2018	1	2019
Training Development and Software/System Testing - MQ-1 Gray Eagle	3	2017	4	2019
Critical Design Review - GBSAA	3	2018	3	2018
Training Development and Software/System Testing- GBSAA	4	2018	4	2019
Materiel Release - GBSAA	4	2018	4	2019
Survivability	2	2018	2	2021
First Unit Equipped - GBSAA	1	2020	1	2020

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0203752A / Aircraft Engine Component Improvement Program

COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.249	0.145	0.146	-	0.146	0.144	0.000	0.000	0.000	0.000	0.684
106: A/C Compon Improv Prog	-	0.249	0.145	0.146	-	0.146	0.144	0.000	0.000	0.000	0.000	0.684

A. Mission Description and Budget Item Justification

Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.259	0.145	0.148	-	0.148
Current President's Budget	0.249	0.145	0.146	-	0.146
Total Adjustments	-0.010	0.000	-0.002	-	-0.002
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.010	-			
• Adjustments to Budget Years	-	-	-0.002	-	-0.002

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203752A / Aircraft Engine Component Improvement Program				Project (Number/Name) 106 / A/C Compon Improv Prog			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
106: A/C Compon Improv Prog	-	0.249	0.145	0.146	-	0.146	0.144	0.000	0.000	0.000	0.000	0.684
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element (PE).												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: T700 Engine									0.037	-	-	
Description: no funds after FY 17. T700 funding is used to address flight safety and readiness problems that arise in the field. This includes programs to improving durability and reliability while reducing cost of ownership.												
Title: UAV Engine									0.125	0.085	0.086	
Description: UAV Gray Eagle Engine Investigation at U.S. Army Research Laboratory (ARL) Vehicle Technology Directorate (VTD) at Aberdeen Proving Ground, MD. Provide research to support airworthiness, reliability and performance improvements of UAV engines. Investigate and research the technology challenges (i.e. engine performance, engine durability, engine life, and engine modifications) for reliable engine operation using JP-8 fuel and readily available MIL-spec lubricants.												
FY 2018 Plans: Continue to research improvements to address service related deficiencies to improve safety and reduce operating and support (O&S) Costs.												
FY 2019 Plans: Will continue to research improvements to address service related deficiencies to improve safety and reduce O&S Costs.												
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 increase reflects inflation adjustment.												
Title: In-House Support									0.087	0.060	0.060	
Description: In-house support for the CIP engineers. Contracting support for CIP contracts.												
FY 2018 Plans:												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / Aircraft Engine Component Improvement Program	Project (Number/Name) 106 / A/C Compon Improv Prog	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018
Continue to provide in-house engineering support for engine CIP programs.			
FY 2019 Plans: Will continue to provide in-house engineering support for engine CIP programs.			
Accomplishments/Planned Programs Subtotals		0.249	0.145
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Improved designs will be implemented via Engineering Change Proposal (ECP) and follow-on procurement or modification to a production contract to introduce the improved hardware.			
E. Performance Metrics N/A			

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203752A / Aircraft Engine Component Improvement Program				Project (Number/Name) 106 / A/C Compon Improv Prog					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Engineering	Allot	US Army AMRDEC : Redstone Arsenal, AL	2.803	0.087	Oct 2016	0.060	Sep 2018	0.060	Oct 2018	-		0.060	Continuing	Continuing	Continuing
Subtotal			2.803	0.087		0.060		0.060		-		0.060	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
T700 Engine	SS/IDIQ	GE-Air : Lynn, MA	61.692	0.037	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
T55 Engine	SS/IDIQ	Honeywell : Phoenix, AZ	30.161	-		-		-		-		-	Continuing	Continuing	Continuing
T62 Auxiliary Power Unit (APU)	C/IDIQ	Redstone Technical Center Redstone Arsenal, AL : ATEC	0.050	-		-		-		-		-	Continuing	Continuing	Continuing
APU's	SS/IDIQ	Air Force : Kelly AFB, TX	13.647	-		-		-		-		-	Continuing	Continuing	Continuing
UAV Engine	Various	ARL-Vehicle Technology Directorate : TBD	0.808	0.125	Aug 2017	0.085	Sep 2018	0.086	Sep 2019	-		0.086	Continuing	Continuing	Continuing
APU's	SS/IDIQ	Air Force : Hill AFB, UT	2.319	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			108.677	0.162		0.085		0.086		-		0.086	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
T-62T-2B Vibration Test	Various	Redstone Technical Text Center : Redstone Arsenal, AL	0.050	-		-		-		-		-	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203752A / Aircraft Engine Component Improvement Program						Project (Number/Name) 106 / A/C Compon Improv Prog		

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.050	-		-		-		-		-	Continuing	Continuing	N/A

Remarks Not Applicable															

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	111.530	0.249		0.145		0.146		-		0.146	Continuing	Continuing	N/A

Remarks													

UNCLASSIFIED

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0203752A / Aircraft Engine Component Improvement Program

Project (Number/Name)	106 / A/C Compon Improv Prog

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / Aircraft Engine Component Improvement Program	Project (Number/Name) 106 / A/C Compon Improv Prog	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UAV Shadow Engine	2	2014	4	2017
T700 CSI Update	1	2017	4	2020

Note

UNCLASSIFIED

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

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					PE 0203758A / Digitization							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	6.234	4.803	6.316	-	6.316	6.020	5.650	5.571	5.681	0.000	40.275
374: HOR Battlefield Digitizn	-	6.234	4.803	6.316	-	6.316	6.020	5.650	5.571	5.681	0.000	40.275

A. Mission Description and Budget Item Justification

Horizontal Battlefield Digitization is a strategy that allows warfighters, from the individual soldier and platform to echelons above corps, to share critical situation awareness (SA) and command and control (C2) information. It conducts analysis and evaluation of new information technologies, concepts, and applications of integrated management activities. Digital information technologies to acquire, exchange, and employ data throughout the operational environment, are used to provide an operational picture for leaders. This timely sharing of information significantly improves the ability to quickly make decisions, synchronize forces and fires, and increase the operational tempo. The major efforts included in the program element are: 1) Integration and synchronization of the Army's interoperability efforts; between joint and multi-national forces, combat material, and training efforts. 2) Systems engineering and integration of hardware and software from a System of Systems (SOS) perspective. 3) Develop Army Equipping Enterprise System (AE2S) integration of the Force Development Investment Information System (FDIIS), Army Flow Model (AFM), and Force Development Knowledge Center (FDKC) programs into a single integrated system.

Digitization efforts are in support of the Army Equipping Strategy, National Defense Authorization Act 804, and OSD reports to Congress.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	6.483	4.803	6.384	-	6.384
Current President's Budget	6.234	4.803	6.316	-	6.316
Total Adjustments	-0.249	0.000	-0.068	-	-0.068
• Congressional General Reductions	-0.003	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.246	-			
• Adjustments to Budget Years	-	-	-0.068	-	-0.068

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203758A / Digitization				Project (Number/Name) 374 / HOR Battlefld Digitizn			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
374: HOR Battlefld Digitizn	-	6.234	4.803	6.316	-	6.316	6.020	5.650	5.571	5.681	0.000	40.275
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds the Army Equipping Enterprise System (AE2S) continued development and integration of the Force Development Investment Information System (FDIIS), Army Flow Model (AFM), and the Force Development Knowledge Center (FDKC) into an improved, single system. Continued development of the suite of the AE2S applications is necessary to create and improve workflow efficiencies amongst various organizations and data base systems, Active and Reserve Component equipment transparency reporting requirements, and Active and Reserve equipment fielding plans to the Solider according to the Army Force Generation (ARFORGEN). Additionally, this program element funds various Federally Funded Research and Development Center (FFRDC) projects that provide system engineering expertise to provide unbiased advice, formulate course of actions, analyze programs and make technical support and process recommendations to create efficiencies and improve systems. Specifically, these FFRDC projects support Army Mission Command and network architecture (operational and systems) development, technical and policy document review in support of planning and acquisition, network and joint integration and interoperability evaluations and assessments, program and database analysis, independent technical analysis, special studies, and acquisition process improvement. In accordance with the National Defense Authorization Act (NDAA) 804 and support of the Office of the Secretary of Defense's (OSD) report to Congress, the Army is poised to implement an incremental approach to software development and hardware/software capability integration. This process will improve effectiveness in the identification, assessment and acquisition of capability solutions for the Army.

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

	FY 2017	FY 2018	FY 2019
Title: Interoperability and Integration	1.054	0.824	1.095
Description: Funds are to be used for the following efforts			
FY 2018 Plans: FFRDC contractor shall conduct independent analyses of Army, joint, and multinational interfaces, adherence to standards, implementation profiles and interoperability baselines			
FY 2019 Plans: FFRDC contractor shall conduct independent analyses of Army, joint, and multinational interfaces, adherence to standards, implementation profiles and interoperability baselines			
FY 2018 to FY 2019 Increase/Decrease Statement: Return to previous level of effort.			
Title: Operational Capability Analysis and Evaluation	1.114	0.871	1.158
Description: Funds are to be used for the following efforts			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203758A / Digitization	Project (Number/Name) 374 / HOR Battlefld Digitizn		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
FFRDC contractor shall conduct iterative capability analyses and assessments consistent with CJCSI 3170 (JCIDS) and 6212 (Net Readiness) to ensure Army and joint program technical and operational requirements are consistent. Efforts support army and joint initiatives. FY 2019 Plans: FFRDC contractor shall conduct iterative capability analyses and assessments consistent with CJCSI 3170 (JCIDS) and 6212 (Net Readiness) to ensure Army and joint program technical and operational requirements are consistent. Efforts support army and joint initiatives. FY 2018 to FY 2019 Increase/Decrease Statement: Return to previous level of effort.				
Title: Systems Architecture Development Description: Funds are to be used for the following efforts FY 2018 Plans: FFRDC contractor shall conduct broad concept studies with emphasis on interoperability and joint/coalition operations. FY 2019 Plans: FFRDC contractor shall conduct broad concept studies with emphasis on interoperability and joint/coalition operations. FY 2018 to FY 2019 Increase/Decrease Statement: Return to previous level of effort.		0.910	0.711	0.945
Title: AE2S Software Description: Procures AE2S software integration and enhancements for the single program language, single platform system that incorporates FDIIS, CEaVa, COP and AFM. FY 2018 Plans: Integrate existing code-base for FDIIS, AFM and FDKC to reduce overall cost and maintenance footprint and incorporate the development of new applications to satisfy Long-Range Investment Requirements Analysis (LIRA), Sustainment Program Evaluation Group (SS PEG), and Equipping PEG (EE PEG) Manpower. FY 2019 Plans: Integrate existing code-base for FDIIS, AFM and FDKC to reduce overall cost and maintenance footprint and incorporate the development of new applications to satisfy Long-Range Investment Requirements Analysis (LIRA), Sustainment Program Evaluation Group (SS PEG), and Equipping PEG (EE PEG) Manpower. FY 2018 to FY 2019 Increase/Decrease Statement:		1.958	1.267	1.684

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203758A / Digitization		Project (Number/Name) 374 / HOR Battlefld Digitizn		
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019
Return to previous level of effort.						
Title: Technical Reviews and Technical Performance Analysis				0.909	0.710	0.944
Description: Funds are to be used for the following efforts						
FY 2018 Plans: FFRDC contractor shall provide technology maturity assessments and prepare technical recommendations in support of Army Transformation and specific technologies of interest to G8. Test and evaluate network systems and infrastructure modeling and simulations.						
FY 2019 Plans: FFRDC contractor shall provide technology maturity assessments and prepare technical recommendations in support of Army Transformation and specific technologies of interest to G8. Test and evaluate network systems and infrastructure modeling and simulations.						
FY 2018 to FY 2019 Increase/Decrease Statement: Return to previous level of effort.						
Title: Academic Research				0.289	0.420	0.490
Description: Apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces.						
FY 2018 Plans: Will apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces.						
FY 2019 Plans: Will apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces.						
FY 2018 to FY 2019 Increase/Decrease Statement: Economic increase.						
Accomplishments/Planned Programs Subtotals				6.234	4.803	6.316
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203758A / Digitization	Project (Number/Name) 374 / HOR Battlefld Digitizn
D. Acquisition Strategy The AE2S development will be done through either a competitive Cost Plus or Fixed Price Incentive contracts that will deliver capabilities in increments, recognizing up front the need for future improvements. The objective of the strategy is to develop and optimize system capabilities while reducing risk and streamlining business and engineering processes. FFRDC requirements will be accomplished by competitive contract. Other efforts will be accomplished by various contract methods and types.		
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203758A / Digitization				Project (Number/Name) 374 / HOR Battlefld Digitizn					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Digitization Technical Integration	Various	Various : Various	5.556	-		-		-		-		-	0.000	5.556	-
Joint & Coalition Interoperability	Various	Various : Various	5.091	-		-		-		-		-	0.000	5.091	-
Subtotal			10.647	-		-		-		-		-	0.000	10.647	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Equipping Enterprise SYstem (AE2S) Software	C/CPFF	TBD : TBD	4.981	1.958		1.451		1.684		-		1.684	Continuing	Continuing	Continuing
Cross-Platform Development	Various	TBD : TBD	3.605	-		-		-		-		-	0.000	3.605	-
Subtotal			8.586	1.958		1.451		1.684		-		1.684	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability and Integration	Various	Various : Various	5.161	1.054	Dec 2016	0.781		1.095		-		1.095	0.000	8.091	-
Operational Capability Analysis and Evaluation	Various	VAR : VAR	4.333	1.114	Aug 2017	0.825		1.158		-		1.158	0.000	7.430	-
Academic Research	Various	Various : Various	2.942	0.289	Aug 2017	0.399		0.490		-		0.490	0.000	4.120	-
Operational CapabilityAnalysis and Evaluation	Various	Various : Various	5.608	-		-		-		-		-	0.000	5.608	-
Systems Architecture Development	Various	VAR : VAR	4.257	0.910	Dec 2016	0.674		0.945		-		0.945	0.000	6.786	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203758A / Digitization				Project (Number/Name) 374 / HOR Battlefld Digitizn					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Reviews and Technical Performance Analysis	Various	VAR : VAR	3.774	0.909	Dec 2016	0.673		0.944		-		0.944	0.000	6.300	-
Subtotal			26.075	4.276		3.352		4.632		-		4.632	0.000	38.335	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			45.308	6.234		4.803		6.316		-		6.316	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203758A / Digitization		Project (Number/Name) 374 / HOR Battlefld Digitizn	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interoperability and Integration																												
Operational Capability Analysis and Evaluation																												
Systems Architecture Development 2.0																												
Systems Architecture Development 3.0																												
Systems Architecture Development 4.0																												
Systems Architecture Development 5.0																												
Army Equipping Enterprise System (AE2S) Software SW 2.0																												
Army Equipping Enterprise System (AE2S) Software SW 3.0																												
Army Equipping Enterprise System (AE2S) Software SW 4.0																												
Army Equipping Enterprise System (AE2S) Software SW 5.0																												
Technical Reviews and Technical Performance Analysis																												
Academic Research																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203758A / <i>Digitization</i>	Project (Number/Name) 374 / <i>HOR Battlefld Digitizn</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Interoperability and Integration	1	2016	4	2021
Operational Capability Analysis and Evaluation	1	2016	4	2021
Systems Architecture Development 1.0	2	2015	2	2016
Systems Architecture Development 2.0	3	2016	3	2017
Systems Architecture Development 3.0	4	2017	4	2018
Systems Architecture Development 4.0	1	2019	1	2020
Systems Architecture Development 5.0	2	2020	4	2021
Army Equipping Enterprise System (AE2S) Software SW 1.0	2	2015	2	2016
Army Equipping Enterprise System (AE2S) Software SW 2.0	3	2016	3	2017
Army Equipping Enterprise System (AE2S) Software SW 3.0	4	2017	4	2018
Army Equipping Enterprise System (AE2S) Software SW 4.0	1	2019	1	2020
Army Equipping Enterprise System (AE2S) Software SW 5.0	2	2020	4	2021
Technical Reviews and Technical Performance Analysis	1	2015	4	2021
Academic Research	3	2015	4	2021

UNCLASSIFIED

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

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					PE 0203801A / Missile/Air Defense Product Improvement Program							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	24.925	17.723	1.643	2.000	3.643	1.287	1.289	0.128	0.000	0.000	48.995
038: Avenger PIP	-	4.925	2.723	1.643	2.000	3.643	1.287	1.289	0.128	0.000	0.000	13.995
DT5: Stinger Product Improvement	-	20.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.000

A. Mission Description and Budget Item Justification

The Avenger Air Defense System is a lightweight, ground-to-air missile and gun weapon system mounted on a High Mobility Multi-purpose Wheeled Vehicle. The Avenger's mission is to protect fixed critical assets and Corps/Echelons above Corps Maneuver forces from Unmanned Aircraft Systems (UAS), Cruise Missiles (CM), and Fixed Wing and Rotary Wing aircraft. Avenger provides day/night adverse weather operations, shoot on the move capability, rapid target engagement, and remote firing capability.

The Avenger Modification - Service Life Extension Program (MOD - SLEP) consists of Project 038: Avenger Production Improvement Program (PIP) and Program Element CE8710: Avenger MODS. Avenger MOD-SLEP ensures that Avenger is viable and sustainable through the end of program life. Avenger MOD-SLEP maintains operational capability of Avenger until replaced by the Indirect Fire Protection Capability Increment 2- Intercept (IFPC Inc 2-I) in the Fiscal Year (FY) 31 timeframe.

The Stinger Block I missile is an advanced, fire-and-forget, short-range, man-portable, air defense weapon system. Stinger's mission is to provide the force with low-altitude air defense against fixed and rotary wing aircraft, unmanned aircraft systems (UAS) and cruise missiles (CM). Stinger is deployable from the shoulder or from a variety of platforms that includes vehicles, helicopters and UAS. The missile is delivered as a certified round and requires no field testing or maintenance.

Funding provided for the Stinger Product Improvement completes design, development, test and integration of the Proximity Fuze (PROX) and addresses obsolescence. This will make PROX available for incorporation into the existing Stinger Block I missile. The PROX will improve effectiveness by eliminating the need for a hit-to-kill against UAS threats. UAS defense is a requirement of the Operational Requirements Document (ORD) for the Stinger Guided Missile System and validated by the Deputy Chief of Staff, G-3/5/7, Current and Future Warfighting Capabilities Division (DAMO-CIC) in a memo dated 28 May 2013.

Also funded under DT5 (Stinger Product Improvement), the Maneuver - Short Range Air Defense (M-SHORAD) demonstration in 4QFY17 assessed available industry solutions for mitigating the M-SHORAD gap in the near term. The intent is to inform requirements and identify what capability could be fielded by FY21 in order to help mitigate this critical air defense gap. This project moved to its own PE, 0604117A (Short Range air Defense(M-SHORAD)), Project FI4 (Maneuver - Short Range Air Defense (M-SHORAD)), starting in FY18.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0203801A / Missile/Air Defense Product Improvement Program

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	53.722	11.173	1.661	-	1.661
Current President's Budget	24.925	17.723	1.643	2.000	3.643
Total Adjustments	-28.797	6.550	-0.018	2.000	1.982
• Congressional General Reductions	-0.002	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.195	-			
• Adjustments to Budget Years	-	6.550	0.000	2.000	2.000
• Amended FY2017 not appropriated	-28.600	-	-	-	-
• Other Adjustments 2	-	-	-0.018	-	-0.018

Change Summary Explanation

The \$28.6M was part of the FY17 Request for Additional Appropriations but was not appropriated. The FY18 \$6.55M is an administrative correction to balance the R-2 with the R-1. The \$2.0M is an OCO increase to support Avenger MOD-SLEP.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203801A / Missile/Air Defense Product Improvement Program				Project (Number/Name) 038 / Avenger PIP			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
038: Avenger PIP	-	4.925	2.723	1.643	2.000	3.643	1.287	1.289	0.128	0.000	0.000	13.995
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Avenger PIP consists of the ongoing Avenger Modification - Service Life Extension Program (MOD-SLEP). Avenger MOD-SLEP provides development and testing of six key Line Replaceable Units (LRUs) to ensure Avenger maintains operational capability through FY31, when the IFPC Inc 2-I system is fielded. The six LRUs are: Targeting Console (TC), .50 Caliber Machine Gun (M3P), Avenger Fire Control Computer - Revised (AFCC-R), Mode 5 Identification Friend or Foe (IFF), Vehicle Internal Communications (VIC-5) and the Environmental Control Unit/Prime Power Unit (ECU/PPU) governor and starter.												
FY2019 Base dollars in the amount of \$1.643 million supports activities to ensure the Avenger is viable and sustainable through FY31, the end of its program life. The funding will contribute to the testing, test support and materiel release package for the AFCC-R, IFF, VIC-5 and ECU/PPU.												
FY2019 OCO dollars in the amount of \$2.000 million supports redesign of Training Aids, Devices, Simulators and Simulations (TADSS) for the European Deterrence Initiative (EDI).												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Avenger MOD-SLEP								4.925	2.723	1.643	2.000	3.643
Description: The Avenger MOD-SLEP consists of development activities for platform integration, software upgrades, and capability enhancements. Develops and executes test requirements and conducts limited contractor and government testing. Performs technical assessments, concept studies, cost reduction, risk reduction and development documentation.												
FY 2018 Plans: Executed test requirements and conducted limited contractor and government testing. Performed technical assessments, concept studies, cost reduction, and risk reduction. The Army Interoperability Certification (AIC) testing ensured that Avenger could properly interface, with other systems, and execute its mission.												
FY 2019 Base Plans: Complete test requirements and initiate materiel release package.												
FY 2019 OCO Plans:												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</i>		Project (Number/Name) 038 / <i>Avenger PIP</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding will be used for redesign of Training Aids, Devices, Simulators and Simulations (TADSS) for EDI.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> FY18 completed development of MOD SLEP Phase II Components. FY19 is for redesign of TADDS for EDI.					
Accomplishments/Planned Programs Subtotals	4.925	2.723	1.643	2.000	3.643

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• CE8710: AVENGER MODS	35.979	62.931	48.670	-	48.670	86.807	165.928	454.994	291.600	0.000	1,146.909

Remarks
The Avenger MODS procures MOD-SLEP LRUs for the Avenger system to ensure that Avenger is viable and sustainable through FY31. This program is an integral part of the Army Air and Missile Defense Modernization strategy.

D. Acquisition Strategy
The Avenger Modification - Service Life Extension Program (MOD-SLEP) addresses obsolescence of key Line Replaceable Units (LRUs) and ensures that Avenger is viable and sustainable through FY31, filling a capability gap to counter Unmanned Aircraft Systems (UAS), Cruise Missiles (CM), and Fixed Wing and Rotary Wing aircraft. The Avenger capability will be permanently filled by the IFPC Inc 2-I. The MOD-SLEP provides new M3P machine guns and TCs. The MOD-SLEP will upgrade the AFCC, IFF, the VIC system and the ECU/PPU governor and starter.

MOD-SLEP Phase II will be installed as a single installation package. MOD-SLEP Phase II components are the Avenger Fire Control Computer- Revised (AFCC-R), the Mode 5 Identification Friend or Foe (IFF) and the Vehicle Internal Communications (VIC-5).

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203801A / Missile/Air Defense Product Improvement Program				Project (Number/Name) 038 / Avenger PIP					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Avenger Modification Management Services	PO	Various : Redstone Arsenal, AL	0.752	0.254	Jun 2017	0.228		0.164	Jan 2019	-		0.164	Continuing	Continuing	-
Subtotal			0.752	0.254		0.228		0.164		-		0.164	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Avenger Modification Product Development	PO	Raytheon, The Boeing Company and others : Aberdeen Proving Grounds, MD and Huntsville, AL	5.140	2.558	Jun 2017	1.424		0.000		2.000	Jun 2019	2.000	Continuing	Continuing	-
Subtotal			5.140	2.558		1.424		0.000		2.000		2.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Avenger Modification Test Support	Various	The Boeing Company, Aviation and Missile Research Development and Engineering Center (AMRDEC) and others : Huntsville, AL and Redstone Arsenal, AL	2.054	2.113	Jun 2017	1.071		1.479	Jun 2019	-		1.479	Continuing	Continuing	-
Subtotal			2.054	2.113		1.071		1.479		-		1.479	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army										Date: February 2018			
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</i>			Project (Number/Name) 038 / <i>Avenger PIP</i>					
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.946	4.925		2.723		1.643		2.000		3.643	Continuing	Continuing	N/A
Remarks													

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</i>		Project (Number/Name) 038 / <i>Avenger PIP</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mode 5 Identification Friend or Foe (IFF) Development																												
Mode 5 IFF Dev																												
Vehicle Internal Communication (VIC-5) Integration																												
VIC-5 Integration																												
Avenger Fire Control Computer-Revised (AFCC-R) Development																												
AFCC-R Dev																												
Integration and Testing (MOD-SLEP Phase II)																												
System Integration and Testing																												
Flight Test Engagement (MOD-SLEP Phase II)																												
Flight Test																												
Maintainability Demo / Logistics Demo (MOD-SLEP Phase II)																												
M Demo / Log Demo																												
Materiel Release (MOD-SLEP Phase II)																												
Materiel Release																												
Future Modifications to Address Evolving Threat																												
Evolving Threat Mods																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</i>	Project (Number/Name) 038 / <i>Avenger PIP</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mode 5 Identification Friend or Foe (IFF) Development	3	2015	3	2017
Vehicle Internal Communication (VIC-5) Integration	4	2015	2	2017
Avenger Fire Control Computer-Revised (AFCC-R) Development	3	2015	2	2017
Integration and Testing (MOD-SLEP Phase II)	2	2018	1	2019
Flight Test Engagement (MOD-SLEP Phase II)	4	2018	1	2019
Maintainability Demo / Logistics Demo (MOD-SLEP Phase II)	1	2019	1	2020
Materiel Release (MOD-SLEP Phase II)	3	2020	3	2020
Future Modifications to Address Evolving Threat	1	2020	4	2022

Note

Modification - Service Life Extension Program (MOD-SLEP) Phase II components are the AFCC-R, IFF and VIC-5.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203801A / Missile/Air Defense Product Improvement Program				Project (Number/Name) DT5 / Stinger Product Improvement			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DT5: Stinger Product Improvement	-	20.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Stinger Block I missile is an advanced, fire-and-forget, short-range, man-portable, air defense weapon system. Stinger's mission is to provide the force with low-altitude air defense against fixed and rotary wing aircraft, Unmanned Aircraft Systems (UAS) and cruise missiles (CM). Stinger is deployable from the shoulder or from a variety of platforms to include vehicles, helicopters and UAS. The missile is delivered as a certified round and requires no field testing or maintenance.

Funding provided for the Stinger Product Improvement completes design, development, test and integration of the Proximity Fuze (PROX) and addresses obsolescence. This will make PROX available for incorporation into the existing Stinger Block I missile. The PROX will improve effectiveness by eliminating the need for a hit-to-kill against UAS threats. UAS defense is a requirement of the Operational Requirements Document (ORD) for the Stinger Guided Missile System and validated by the Deputy Chief of Staff, G-3/5/7, Current and Future Warfighting Capabilities Division (DAMO-CIC) in a memo dated 28 May 2013.

The Stinger Product Improvement also funded the Short Range Air Defense (SHORAD) demonstration in 4QFY17. This assessed available industry solutions for mitigating the Maneuver SHORAD gap in the near term. The intent is to inform requirements and identify what capability could be fielded by FY21 in order to help mitigate this critical air defense gap. Starting in FY18, the Maneuver SHORAD effort has been moved to its own PE, 0604117A, for all future requirements.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Proximity Fuze (PROX) Development and Integration Description: These funds will be used to complete test and integration of the PROX which will be incorporated into existing Stinger Block I missiles during Stinger SLEP. FY 2018 Plans: There are no base dollars. Continued the design, development, test and integration of a PROX fuze into existing Stinger Block 1 missiles. FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY18 to FY19 is due to anticipated completion of the effort.	-	8.450	-	-	-
Title: Obsolescence and Improvements Description: This effort funds the obsolescence and improvements to the Stinger Block I missile.	-	6.550	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</i>			Project (Number/Name) DT5 / <i>Stinger Product Improvement</i>					
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<i>FY 2018 Plans:</i> This effort funds the obsolescence and improvements of Stinger Block I missile and redesign of Training Aids, Devices, Simulators and Simulations (TADSS) for EDI.											
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> This effort does not require FY19 funding.											
<i>Title:</i> M-SHORAD Demonstration <i>Description:</i> This effort funded the M-SHORAD Demonstration that was completed in 4QFY17. The M-SHORAD funding line was moved to its own line (PE 0604117A) beginning in FY18.							20.000	-	-	-	-
Accomplishments/Planned Programs Subtotals							20.000	15.000	-	-	-
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• C21300: <i>STINGER BLK I UPGRADES</i>	6.578	91.090	94.756	-	94.756	81.615	1.457	3.072	-	0.000	278.568
Remarks											
Stinger Block 1 Upgrades program provides for Service Life Extension Program (SLEP) of Stinger Block 1 missiles and the PROX fuze.											
D. Acquisition Strategy											
In Fiscal Year (FY) 12 the Stinger Based Systems (SBS) Product Office utilized Picatinny Arsenal to award a Proximity Fuze (PROX) development contract for the design, development, test and integration of the PROX capability. This capability will be incorporated into the existing Stinger Block I missile SLEP.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</i>						Project (Number/Name) DT5 / <i>Stinger Product Improvement</i>			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgt/Admin	PO	Trident, Intuitive Research and others : Redstone Arsenal, AL	0.981	-		-		-		-		-	0.000	0.981	-
Subtotal			0.981	-		-		-		-		-	0.000	0.981	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PROX Development and Testing	Various	Aviation and Missiles Research Development and Engineering Center, Redstone Test Center and others : Redstone Arsenal, AL	22.977	-		15.000		-		-		-	0.000	37.977	-
M-SHORAD Development	Various	Letterkenny Army Depot, Anniston Army Depot and others : Chambersburg, PA, and Anniston, AL	-	4.938	Feb 2018	-		-		-		-	0.000	4.938	-
Subtotal			22.977	4.938		15.000		-		-		-	0.000	42.915	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
M-SHORAD Support	Various	Trident, Intuitive Research, Aviation and	-	2.305	Jun 2017	-		-		-		-	0.000	2.305	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203801A / Missile/Air Defense Product Improvement Program					Project (Number/Name) DT5 / Stinger Product Improvement					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Missiles Research Development and Engineering Center and others : Huntsville, AL													
Subtotal			-	2.305		-		-		-		-	0.000	2.305	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PROX Test and Evaluation	MIPR	Redstone Test Center and others : Redstone Arsenal, AL and Eglin Air Force Base, FL	5.414	-		-		-		-		-	0.000	5.414	-
M-SHORAD Government Test & Evaluation	Various	White Sands Missile Range (WSMR), Target Manangment Office (PEO STRI) and others : WSMR, NM and Redstone Arsenal, AL	-	5.032	Jun 2017	-		-		-		-	0.000	5.032	-
M-SHORAD Test Support	MIPR	Target Management Office : Fort Belvoir, VA	-	7.725	Jun 2017	-		-		-		-	0.000	7.725	-
Subtotal			5.414	12.757		-		-		-		-	0.000	18.171	N/A
			Prior Years	FY 2017	FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			29.372	20.000	15.000		-		-		-	0.000	64.372	N/A	
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
Appropriation/Budget Activity 2040 / 7								R-1 Program Element (Number/Name) PE 0203801A / Missile/Air Defense Product Improvement Program								Project (Number/Name) DT5 / Stinger Product Improvement												
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PROX Development and Test																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203801A / <i>Missile/Air Defense Product Improvement Program</i>	Project (Number/Name) DT5 / <i>Stinger Product Improvement</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Demonstrations	2	2012	2	2012
Proximity (PROX) Fuze Critical Design Review (CDR)	4	2013	4	2013
Component Level Qualifications (CLQ)	1	2014	2	2014
Proximity Flight Readiness Reviews (PFRR)	2	2014	3	2014
PROX Development and Test	4	2017	4	2018

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0203802A I Other Missile Product Improvement Programs							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	8.283	5.000	4.947	-	4.947	4.943	4.942	4.941	4.940	0.000	37.996
788: ATACMS PIP	-	0.000	5.000	4.947	-	4.947	4.943	4.942	4.941	4.940	0.000	29.713
DZ9: ATACMS Mods	-	7.203	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.203
VT9: Lethal Miniature Aerial Missile System (LMAMS)	-	1.080	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.080
Program MDAP/MAIS Code: PRE												
A. Mission Description and Budget Item Justification												
Army Tactical Missile System (ATACMS) is the United States (U.S.) Army's primary all-weather, surface-to-surface long-range artillery precision guided missile used by Combatant Commanders to shape the battlefield with long-range fires against hard & soft targets in open, complex, and urban environments.												
788: ATACMS Product Improvement Program (PIP) focuses on safety, cost reduction, reliability, deficiency corrections, standardization, and new or improved operational capabilities. FY19 Base funds in the amount of \$4.947 million supports completion of operational testing, corrections of identified deficiencies, and fielding support activities for a Height-of-Burst capability via proximity sensor, GPS M-Code Study & Prototyping, Insensitive Munitions Study and other evolving capabilities. Additional supporting efforts include launcher software and training updates to enable firing for new ATACMS configuration.												
DZ9: Block (BLK) I/IA ATACMS currently have warheads that are non-compliant with the 2008 Department of Defense (DoD) policy on cluster munitions (CM). Starting with a BLK I/IA missile, this modification effort will integrate, test, and qualify an ATACMS configuration to include a policy compliant warhead, obsolescence refresh, and re-grained rocket motors. Performance of a characterization effort will include qualification and flight testing to assess ATACMS performance with inclusion of a proximity sensor. Additional efforts include launcher updates to enable firing of the new ATACMS configuration. There is no funding in FY19.												
VT9: Lethal Miniature Aerial Missile System (LMAMS) develops, integrates, and tests the Switchblade Multi-Pack Launcher (MPL). Multi-Pack Launcher provides the capability to launch up to 6 Switchblade missiles remotely in a Force Protection Environment. The mission for the MPL is to be placed in a Forward Operating Base (FOB) in a constant ready-to-use state to enable Soldiers to remain in the safety of a building while launching Switchblade missiles. There is no funding in FY19. .												

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0203802A I Other Missile Product Improvement Programs			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	8.571	5.000	15.000	-	15.000
Current President's Budget	8.283	5.000	4.947	-	4.947
Total Adjustments	-0.288	0.000	-10.053	-	-10.053
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.284	-			
• Adjustments to Budget Years	-	-	-10.053	-	-10.053
• Sec. 8025: FFRDC Reduction	-0.004	-	-	-	-
Change Summary Explanation					
FY 2017 funding change is due to SBIR/STTR and the Federally Funded Research and Development Center (FFRDC) reduction for ATACMS Mods (Project #: DZ9).					
FY 2019 funding change is due to realignment of funds from ATACMS PIP (PE 0203802A, Project #: 788) to ATACMS BLK II (PE 0604768A, Project #: 688) and Multi-Mode Seeker Development and Test (PE 0604768A, Project #: P01) and revised economic assumptions.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs				Project (Number/Name) 788 / ATACMS PIP			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
788: ATACMS PIP	-	0.000	5.000	4.947	-	4.947	4.943	4.942	4.941	4.940	0.000	29.713
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification ATACMS Product Improvement Program (PIP) focuses on safety, cost reduction, reliability, deficiency corrections, standardization, and new or improved operational capabilities. FY19 Base funds in the amount of \$4.947 million supports completion of operational testing, corrections of identified deficiencies, and fielding support activities for a Height-of-Burst capability via proximity sensor, GPS M-Code Study & Prototyping, Insensitive Munitions Study and other evolving capabilities.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	
Title: Product Improvement Program (PIP) Activities Description: PIP focuses on safety, cost reduction, reliability, deficiency corrections, standardization, and new or improved operational capabilities for ATACMS. FY 2018 Plans: Developed Test & Evaluation Master Plan (TEMP) for Height-of-Burst capability, conducted Operational Test (OT) assuming existing ATACMS test quantities were sufficient, and initiated activities for production cut-in and fielding. FY 2019 Base Plans: Complete Height-of-Burst capability testing and activities for production cut-in and fielding, GPS M-code study and prototyping, Insensitive Munitions study, Cost Reduction study, and flight test support/equipment. FY 2018 to FY 2019 Increase/Decrease Statement: FY18-19 funding decrease due to revised economic assumptions.							-	5.000	4.947	-	4.947	
Accomplishments/Planned Programs Subtotals							-	5.000	4.947	-	4.947	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / <i>Other Missile Product Improvement Programs</i>	Project (Number/Name) 788 / <i>ATACMS PIP</i>
<u>D. Acquisition Strategy</u> After successful OT and DOT&E approval is received for the height-of-burst capability, a proximity sensor will be inserted into the ongoing ATACMS SLEP production. Future improvements, such as M-code and other capabilities, will be inserted into future production once those technologies are matured, tested, and approved for fielding. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs						Project (Number/Name) 788 / ATACMS PIP			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	AMRDEC : RSA	-	-		0.300		0.250	Nov 2019	-		0.250	Continuing	Continuing	Continuing
Subtotal			-	-		0.300		0.250		-		0.250	Continuing	Continuing	N/A
Remarks AMRDEC - U.S Army Research, Development and Engineering Command; RSA - Redstone Arsenal, Alabama															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies	Various	Various : Various	-	-		-		1.483	Nov 2018	-		1.483	0.000	1.483	-
Prototyping	C/CPFF	LMMFC : Dallas, TX	-	-		-		1.881	Mar 2019	-		1.881	0.000	1.881	-
Subtotal			-	-		-		3.364		-		3.364	0.000	3.364	N/A
Remarks LMMFC - Lockheed Martin Missiles and Fire Control															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	Various	Various : Various	-	-		4.700		1.333	Nov 2019	-		1.333	Continuing	Continuing	Continuing
Subtotal			-	-		4.700		1.333		-		1.333	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		5.000		4.947		-		4.947	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs		Project (Number/Name) 788 / ATACMS PIP	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Operational Test Planning & Execution																												
HWIL Models & Simulation																												
Conduct Operational Test Flight Preparations & OT Flight Testing																												
Operational Test Reports																												
Prox Sensor Cut-In Decision																												
Insensitive Munitions Study																												
GPS M-Code Study, Qualification & Integration																												
New Technology Insertion for Cost Reduction & Moving Target Threats																												
GPS M-Code Qualification																												
Flight Test Support/Equipment (HWIL, Flight Termination Systems, Modeling & Sim)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / <i>Other Missile Product Improvement Programs</i>	Project (Number/Name) 788 / <i>ATACMS PIP</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Operational Test Planning & Execution	1	2018	1	2019
HWIL Models & Simulation	2	2018	3	2018
Conduct Operational Test Flight Preparations & OT Flight Testing	2	2018	3	2018
Operational Test Reports	4	2018	4	2018
Prox Sensor Cut-In Decision	2	2019	2	2019
Insensitive Munitions Study	1	2019	4	2019
GPS M-Code Study, Qualification & Integration	1	2019	4	2020
New Technology Insertion for Cost Reduction & Moving Target Threats	1	2019	4	2023
GPS M-Code Qualification	1	2021	4	2022
Flight Test Support/Equipment (HWIL, Flight Termination Systems, Modeling & Sim)	1	2019	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs				Project (Number/Name) DZ9 / ATACMS Mods			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DZ9: ATACMS Mods	-	7.203	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.203
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Army Tactical Missile System (ATACMS) is the United States (U.S.) Army's primary 24/7, all-weather, and surface-to-surface artillery precision missile used by current and future Combatant Commanders to shape the battlefield with long-range fires against hard and soft stationary targets in open, complex, and urban environments. Block (BLK) I/IA ATACMS currently have warheads that are non-compliant with the 2008 Department of Defense (DoD) policy on cluster munitions (CM). Starting with a BLK I/IA missile, this modification effort will integrate, test, and qualify an ATACMS configuration to include a policy compliant warhead, obsolescence refresh, and re-grained rocket motors. Performance of a characterization effort will include qualification and flight testing to assess ATACMS performance with inclusion of a proximity sensor. Additional efforts include launcher updates to enable firing of the new ATACMS configuration.												
There is no FY19 funding.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Conduct Development Engineering, Design Component Testing, and Performance Analysis.								7.203	-	-	-	-
Description: Develop and qualify obsolescence updates, build-up of flight test missiles, perform component and system flight testing, and characterize proximity sensor performance.												
Accomplishments/Planned Programs Subtotals								7.203	-	-	-	-
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• CA6700: ATACMS MODS	165.943	186.040	221.656	225.580	447.236	259.011	332.791	374.310	374.270	0.000	2,139.601	
Remarks												
D. Acquisition Strategy												
The ATACMS MOD program will qualify a new configuration needed to support follow-on production in order to maintain critical inventory levels. Lockheed Martin Missile and Fire Control (LMMFC) will integrate and test ATACMS MOD under a Cost Plus Fixed Fee (CPFF) contract.												
E. Performance Metrics												
N/A												

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs					Project (Number/Name) DZ9 / ATACMS Mods					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	PFRMS Project Office : RSA	12.527	1.243		-		-		-		-	0.000	13.770	-
Subtotal			12.527	1.243		-		-		-		-	0.000	13.770	N/A
Remarks PFRMS-Precision Fires Rocket and Missile Systems; RSA-Redstone Arsenal; MIPR-Military Interdepartmental Purchase Request															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ATACMS Mods Contracts	SS/CPFF	LMMFCS : (Dallas, TX)	108.667	3.866		-		-		-		-	0.000	112.533	-
Other Government Agencies	MIPR	AMCOM/AMRDEC : RSA	7.436	0.093		-		-		-		-	0.000	7.529	-
Subtotal			116.103	3.959		-		-		-		-	0.000	120.062	N/A
Remarks ATACMS-Army Tactical Missile System; Mods-Modifications; CPFF-Cost Plus Fixed Fee; LMMFCS-Lockheed Martin Missile and Fire Control; TX-Texas; MIPR-Military Interdepartmental Purchase Request; AMCOM-Army Materiel Command; AMRDEC-U.S. Army Research, Development and Engineering Command; RSA-Redstone Arsenal, Alabama															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Contract	C/CPFF	Various : Various	2.984	0.549		-		-		-		-	0.000	3.533	-
Subtotal			2.984	0.549		-		-		-		-	0.000	3.533	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs						Project (Number/Name) DZ9 / ATACMS Mods			

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	WSMR, NM : RTC, AL	12.885	1.452		-		-		-		-	0.000	14.337	-
Subtotal			12.885	1.452		-		-		-		-	0.000	14.337	N/A

Remarks
 WSMR, NM-White Sands Missile Range, New Mexico; RTC, AL-Redstone Test Center, Alabama; MIPR-Military Interdepartmental Purchase Request

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	144.499	7.203	0.000	-	-	-	0.000	151.702	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army												Date: February 2018																
Appropriation/Budget Activity 2040 / 7								R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs								Project (Number/Name) DZ9 / ATACMS Mods												
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development Engineering																												
Proximity Sensor Characterization																												
Component Build Up and Performance Analysis																												
Missiles Integration, Assembly, and Deliveries																												
Ground/Flight Tests																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / <i>Other Missile Product Improvement Programs</i>	Project (Number/Name) DZ9 / ATACMS Mods	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Development Engineering	3	2014	4	2017
Conduct Arena Warhead Tests	4	2014	2	2015
Procure Flight Termination Systems	3	2014	2	2016
Proximity Sensor Characterization	4	2014	4	2017
Obsolescence	3	2014	4	2016
Component Build Up and Performance Analysis	1	2015	3	2017
Sub Component Hardware Build Up	1	2015	3	2016
Missiles Integration, Assembly, and Deliveries	3	2016	1	2017
Ground/Flight Tests	3	2016	3	2017

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs				Project (Number/Name) VT9 / Lethal Miniature Aerial Missile System (LMAMS)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
VT9: Lethal Miniature Aerial Missile System (LMAMS)	-	1.080	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.080
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification VT9: Lethal Miniature Aerial Missile System (LMAMS) develops, integrates, and tests the Switchblade Multi-Pack Launcher (MPL). Multi-Pack Launcher provides the capability to launch up to 6 Switchblade missiles remotely in a Force Protection Environment. The mission for the MPL is to be placed in a Forward Operating Base (FOB) in a constant ready-to-use state to enable Soldiers to remain in the safety of a building while launching Switchblade missiles.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	
Title: Develop, Integrate and Test the LMAMS Multi-Pack Launcher							1.080	-	-	-	-	
Description: Development, Integration, and Testing of the Multi-Pack Launcher (MPL). Multi-Pack Launcher provides the capability to launch up to 6 Switchblades remotely in a Force Protection Environment.												
Accomplishments/Planned Programs Subtotals							1.080	-	-	-	-	
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• C88001: LETHAL MINIATURE AERIAL MISSILE SYSTEM (LMAMS)	55.377	8.669	0.000	112.973	112.973	-	-	-	-	0.000	177.019	
Remarks												
D. Acquisition Strategy												
All contractor funds are planned to be awarded via sole source contract to Aerovironment. Remaining funding is planned for CCWS Program Management costs, test facility costs, range costs, and test support personnel.												
E. Performance Metrics												
N/A												

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203802A / Other Missile Product Improvement Programs						Project (Number/Name) VT9 / Lethal Miniature Aerial Missile System (LMAMS)			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	Allot	Close Combat Weapon Systems Project Office : Redstone Arsenal, AL	-	0.046	May 2017	-		-		-		-	0.000	0.046	-
Subtotal			-	0.046		-		-		-		-	0.000	0.046	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Aerovironment : Simi Valley, CA	-	0.449	Jun 2017	-		-		-		-	0.000	0.449	-
Subtotal			-	0.449		-		-		-		-	0.000	0.449	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	MIPR	ATEC : Fort Huachuca, AZ	-	0.585	May 2017	-		-		-		-	0.000	0.585	-
Subtotal			-	0.585		-		-		-		-	0.000	0.585	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	1.080		0.000		-		-		-	0.000	1.080	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0203802A / Other Missile Product
Improvement Programs

Project (Number/Name)

VT9 / Lethal Miniature Aerial Missile System (LMAMS)

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / <i>Other Missile Product Improvement Programs</i>	Project (Number/Name) VT9 / <i>Lethal Miniature Aerial Missile System (LMAMS)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Product Development and Integration	3	2017	3	2018
Testing	4	2017	2	2018
Test Reporting	2	2018	3	2018

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0203808A / <i>TRACTOR CARD</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	20.333	37.883	34.050	-	34.050	21.871	19.005	19.234	19.619	0.000	171.995
DS1: <i>TRACTOR BARN</i>	-	0.000	12.000	13.000	-	13.000	0.000	0.000	0.000	0.000	0.000	25.000
DS2: <i>Tractor Puma</i>	-	4.335	10.532	5.432	-	5.432	3.000	0.000	0.000	0.000	0.000	23.299
E11: <i>DELL</i>	-	15.998	15.351	15.618	-	15.618	18.871	19.005	19.234	19.619	0.000	123.696

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	20.333	37.883	34.050	-	34.050
Current President's Budget	20.333	37.883	34.050	-	34.050
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Change Summary Explanation

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203808A / TRACTOR CARD				Project (Number/Name) DS1 / TRACTOR BARN			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DS1: TRACTOR BARN	-	0.000	12.000	13.000	-	13.000	0.000	0.000	0.000	0.000	0.000	25.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203808A / TRACTOR CARD				Project (Number/Name) DS2 / Tractor Puma			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DS2: Tractor Puma	-	4.335	10.532	5.432	-	5.432	3.000	0.000	0.000	0.000	0.000	23.299
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203808A / TRACTOR CARD				Project (Number/Name) E11 / DELL			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
E11: DELL	-	15.998	15.351	15.618	-	15.618	18.871	19.005	19.234	19.619	0.000	123.696
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

UNCLASSIFIED

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

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

COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	3.450	0.000	0.000	8.000	8.000	0.000	0.000	0.000	0.000	0.000	11.450
EF2: Integrated Base Defense	-	3.450	0.000	0.000	8.000	8.000	0.000	0.000	0.000	0.000	0.000	11.450

Note

PE 0205402A has now been realigned into two separate PEs for Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) and Integrated Ground Security, Surveillance and Response Capability (IGSSR-C). Beginning in FY 2017 Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) funding is under PE0605033A Project EQ3. Beginning in FY 2017 Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) funding is under PE0605029A Project EQ2.

A. Mission Description and Budget Item Justification

GBOSS-E: Ground-Based Operational Surveillance System - Expeditionary (GBOSS-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. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-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. In support of JUONS 0540 to address the Vehicle Borne Improvised Explosive Device (VBIED) threat. Additional capabilities are being developed and integrated to the current Force Protection structure.

Justification: FY 2019 OCO PB Request in the amount of \$8.000 million supports JUONS 0540 to address the Vehicle Borne Improvised Explosive Device (VBIED) threat. Additional capabilities are being developed and integrated to the current Force Protection structure..

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		PE 0205402A / Integrated Base Defense - Operational System Dev			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	3.450	0.000	0.000	-	0.000
Current President's Budget	3.450	0.000	0.000	8.000	8.000
Total Adjustments	0.000	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	-	-			
• Adjustments to Budget Years	-	-	0.000	8.000	8.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205402A / Integrated Base Defense - Operational System Dev				Project (Number/Name) EF2 / Integrated Base Defense			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EF2: Integrated Base Defense	-	3.450	0.000	0.000	8.000	8.000	0.000	0.000	0.000	0.000	0.000	11.450
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note												
PE 0205402A has now been realigned into two separate PEs for Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) and Integrated Ground Security, Surveillance and Response Capability (IGSSR-C). Beginning in FY 2017 Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) funding is under PE0605033A Project EQ3. Beginning in FY 2017 Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) funding is under PE0605029A Project EQ2.												
A. Mission Description and Budget Item Justification												
GBOSS-E: Ground-Based Operational Surveillance System - Expeditionary (GBOSS-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. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-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 is to harvest and refurbish physical security and FP Non-Standard Equipment 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 framework. Additionally, IBD is being updated in response to JUONS 0540 to address the Vehicle Borne Improvised Explosive Device (VBIED) threat. These capabilities are being developed and integrated into the current Force Protection infrastructure.												
Justification: FY 2019 OCO PB Request in the amount of \$8.000 million supports JUONS 0540 to perform system and sensor improvements to counter the Vehicle Borne Improvised Explosive Device (VBIED) threat.												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205402A / Integrated Base Defense - Operational System Dev	Project (Number/Name) EF2 / Integrated Base Defense				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: IBD Test and Evaluation Description: Test and Evaluation of Integrated Base Defense Software Development Efforts in support if Integrated Base Defense Kitting.		1.600	-	-	-	-
Title: IBD Engineering and Management Services Description: Engineering and Managment Services in support of Integrated Base Defense Software Development Efforts for Integrated Base Defense Kitting.		0.100	-	-	-	-
Title: IBD Design and Build		0.750	-	-	-	-
Title: IBD Architecture and Software Development Description: Integrated Base Defense Architecture and Software Development		1.000	-	-	-	-
Title: IBD JUONS 0540 Description: This funding supports JUONS 0540. This funding is OCO. FY 2019 Base Plans: There is no Base FY 2019 PB Request. FY 2019 OCO Plans: This is OCO funding and supports JUONS 0540 to include Hyperspectral sensor system development and testing; Automatic Vehicle Inspection System integration; Vehicle-Scanning System technology; System of systems test and integration. FY 2018 to FY 2019 Increase/Decrease Statement: Increase from FY18 to FY19 supports the capabilities associated with JUONS 0540 to include: Hyperspectral sensor system development and testing, Automatic Vehicle Inspection System integration, Wide Area Motion Imagery sensor integration, and vehicle scanning system technology migration as well as System of systems test and integration.		-	-	0.000	8.000	8.000
Accomplishments/Planned Programs Subtotals		3.450	-	0.000	8.000	8.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0205402A / Integrated Base Defense - Operational System Dev				Project (Number/Name) EF2 / Integrated Base Defense			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• M90115: INTEG BASE DEF NONSTAND EQUIP (IBD NS-E) KITTING	-	3.726	0.000	39.200	39.200	-	-	-	-	0.000	42.926
Remarks											
D. Acquisition Strategy											
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 along with network integration and better mobility utilizing modular configurations. The G-BOSS(E) Capability Design Document (CDD) was approved May 2014. In FY 2014, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funds to conduct pre-milestone B activities. G-BOSS(E) received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015. Pending successful Milestone B decision in FY 2017, the existing United States Marine Corps (USMC) tower's design (Ground Based Operational Surveillance System) (GBOSS) will be leveraged and modified to meet the Army's G-BOSS(E) program requirements. The acquisition strategy for G-BOSS(E) was signed by the Milestone Decision Authority (MDA) on 11 December 2016, which approved plans to leverage the Naval Surface Warfare Center (NSWC) at Crane, Indiana and the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to provide system design, development, and integration support, as well as a Technical Data Package (TDP) to support future procurements. The Heavy Tower Trailer, EO/IR, and RF Sensor which are the main cost drivers for the system will be competitively awarded through the product office and provided to a prime integrator with the TDP to construct future GBOSS-E systems. Milestone C is planned for FY 2020 to align G-BOSS(E), IGSSR-C, and Tactical Security System (TSS) in order to gain programmatic efficiencies.											
The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) provides a layered approach to integrate sensors, sensor systems and unmanned systems. The IGSSR-C Capability Design Document (CDD) was approved September 2013. IGSSR-C is made up of a suite of software that achieves integration, fusion and interoperability in support of the Army Acquisition Executive's Common Operating Environment (COE) Command Post Compute Environment (CPCE) and Sensor CE efforts. In FY 2014, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funds to conduct pre-milestone B activities. IGSSR-C received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015. The acquisition strategy for IGSSR-C was signed by the MDA on 5 December 2016, which approved plans to leverage the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to develop, integrate and test the Initial Capability (IC). Milestone C is planned for FY 2020 to align Ground-Based Operational Surveillance System (Expeditionary) (G-BOSS(E)), Tactical Security System (TSS) and Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) in order to gain programmatic efficiencies.											
The IBD acquisition strategy is to leverage existing IBD-related government organizations and to competitively award multiple contracts in support of IBD objectives for the development of holistic IBD architectures and products to support interoperability of fielded and emerging IBD-related systems.											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205402A / <i>Integrated Base Defense - Operational System Dev</i>	Project (Number/Name) EF2 / <i>Integrated Base Defense</i>
FY19 funding supports IBD JUONS 0540. Product Manager Force Protection Systems is overseeing the integration of both Commercial Off The Shelf and Government developed technologies that will address the identified capability gap to the existing Force Protection structure.		
<u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0205402A / Integrated Base Defense - Operational System Dev				Project (Number/Name) EF2 / Integrated Base Defense					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
G-BOSS(E) Project Management	MIPR	PM EOIR : Fort Belvoir, VA	0.288	-		-		-		-		-	0.000	0.288	-
IGSSR-C Project Management	MIPR	PM EOIR : Fort Belvoir, VA	0.175	-		-		-		-		-	0.000	0.175	-
IBD Engineering and Management Services	Allot	Joint Project Manager Guardian Joint Product Manager Force Protection Services : Fort Belvoir, VA	0.530	0.100	May 2017	-		-		-		-	0.000	0.630	-
JUONS 0540 PMO	TBD	PdM FPS : Fort Belvoir, VA	-	-		-		0.000		0.460		0.460	0.000	0.460	-
Subtotal			0.993	0.100		-		0.000		0.460		0.460	0.000	1.553	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
G-BOSS(E) Design	MIPR	NSWC Crane : Crane, IN	1.985	-		-		-		-		-	0.000	1.985	-
G-BOSS(E) Prototypes	MIPR	RDECOM CERDEC : Fort Belvoir, VA	2.733	-		-		-		-		-	0.000	2.733	-
IGSSR-C Design	C/CPFF	TBD : TBD	2.653	-		-		-		-		-	0.000	2.653	-
IBD Acrhitecture and Software Development	C/CR	AMRDEC : Huntsville, AL	3.985	1.000	May 2017	-		-		-		-	0.000	4.985	-
IBD Design and Build	C/CR	AMRDEC : Huntsville, AL	-	0.750	May 2017	-		-		-		-	0.000	0.750	-
JUONS 0540 integration	C/CR	AMRDEC : Huntsville, AL	-	-		-		0.000		4.040		4.040	0.000	4.040	-
Subtotal			11.356	1.750		-		0.000		4.040		4.040	0.000	17.146	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0205402A / Integrated Base Defense - Operational System Dev						Project (Number/Name) EF2 / Integrated Base Defense					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
G-BOSS(E) Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	0.502	-		-		-		-		-	0.000	0.502	-
IGSSR-C Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	0.547	-		-		-		-		-	0.000	0.547	-
JUONS 0540 Support	MIPR	NVESD/ARL : Fort Belvoir, VA	-	-		-		0.000		0.500		0.500	0.000	0.500	-
Subtotal			1.049	-		-		0.000		0.500		0.500	0.000	1.549	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
IBD Test and Evaluation	MIPR	ATEC : Aberdeen Proving Ground, MD	1.122	1.600	May 2017	-		-		-		-	0.000	2.722	-
JUONS 0540 Test and Evaluation	MIPR	ATEC : Aberdeen Proving Ground, MD	-	-		-		0.000		3.000		3.000	0.000	3.000	-
Subtotal			1.122	1.600		-		0.000		3.000		3.000	0.000	5.722	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			14.520	3.450		0.000		0.000		8.000		8.000	0.000	25.970	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0205402A / <i>Integrated Base Defense - Operational System Dev</i>		Project (Number/Name) EF2 / <i>Integrated Base Defense</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IBD CONOPS & Architecture																												
IBD Development Integration and Testing																												
IBD JUONS 540 Integration																												
IBD JUONS 540 ATEC Testing																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205402A / <i>Integrated Base Defense - Operational System Dev</i>	Project (Number/Name) EF2 / <i>Integrated Base Defense</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IBD CONOPS & Architecture	2	2016	1	2017
IBD Development Integration and Testing	3	2017	1	2018
IBD JUONS 540 Integration	1	2017	3	2019
IBD JUONS 540 ATEC Testing	1	2019	4	2019

UNCLASSIFIED

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

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	PE 0205410A / <i>Materials Handling Equipment</i>											
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.119	1.582	1.464	-	1.464	0.743	0.762	0.691	0.799	Continuing	Continuing
EE9: <i>Material Handling Equipment - Advance Development</i>	-	0.119	1.582	1.464	-	1.464	0.743	0.762	0.691	0.799	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element supports component development and Material Handling Equipment (MHE) prototyping, and stays abreast of emerging and available technologies to be integrated into military MHE to address identified capability gaps and warfighter objectives. This project enables the development of selected technologies and transition to system integration and development or production of MHE products. MHE includes Rough Terrain Forklifts, Rough Terrain Container Handlers (RTCH) and Cranes, as well as ancillary MHE equipment, to support distribution of critical supplies in the theater of operations.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.124	1.582	1.480	-	1.480
Current President's Budget	0.119	1.582	1.464	-	1.464
Total Adjustments	-0.005	0.000	-0.016	-	-0.016
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.005	-			
• Adjustments to Budget Years	-	-	-0.016	-	-0.016

Change Summary Explanation

Funding realigned from 603804A Project G14

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205410A / Materials Handling Equipment				Project (Number/Name) EE9 / Material Handling Equipment - Advance Development			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EE9: Material Handling Equipment - Advance Development	-	0.119	1.582	1.464	-	1.464	0.743	0.762	0.691	0.799	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports component development and Material Handling Equipment (MHE) prototyping and stays abreast of emerging and available technologies to be integrated into military MHE to address identified capability gaps and warfighter objectives. This project enables the development of selected technologies and transition to system integration and development or production of MHE products. MHE includes Rough Terrain Forklifts, Rough Terrain Container Handlers (RTCH) and Cranes, as well as ancillary MHE equipment, to support distribution of critical supplies in the theater of operations.

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

	FY 2017	FY 2018	FY 2019
Title: Material Handling Equipment (MHE) Enhancement	-	0.647	0.677
Description: Integrate and demonstrate Commercial-off-the-Shelf (COTS) technologies to enhance Material Handling Equipment (MHE) operations. System technologies will include obstacle detection, electronic control systems, electric-hydraulic controls, driveline control technology, and work tool automation.			
FY 2018 Plans: Integrate Commercial-off-the-Shelf (COTS) obstacle detectors, similar to collision sensors, to increase situational awareness of MHE operator. Integrate COTS controllers, similar to gaming devices to enable MHE operator to control machine from outside the cab. Research the integration and replacement of levers with joysticks for improved operator efficiency. Research steering and driving control devices which will allow semi or full autonomous control. Research and integrate COTS technology such as self-aligning forks and boom extension for telescoping boom forklift.			
FY 2019 Plans: Integrate Commercial-off-the-Shelf (COTS) obstacle detectors, similar to collision sensors, to increase situational awareness of MHE operator. Integrate COTS controllers, similar to gaming devices to enable MHE operator to control machine from outside the cab. Research the integration and replacement of levers with joysticks for improved operator efficiency. Research steering and driving control devices which will allow semi or full autonomous control. Research and integrate COTS technology such as self-aligning forks and boom extension for telescoping boom forklift.			
FY 2018 to FY 2019 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0205410A / Materials Handling Equipment	Project (Number/Name) EE9 / Material Handling Equipment - Advance Development		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2017	FY 2018	FY 2019
Man-Year Rates are increased for FY19 Reimbursable Labor Costs.					
Title: Operational Energy Technologies Description: Evaluate emerging technologies that can improve machine productivity and efficiency. Baseline fuel efficiency, engine management, efficient lubricants and hydraulic technologies. FY 2018 Plans: Instrument up to three vehicle types (Light Capacity Rough Terrain Forklift, Rough Terrain Container Handler, and All Terrain Lifting Army System), and monitor fuel consumption during operations. Build duty cycle profiles for the classes of equipment and identify areas of inefficiency and language to include in future procurements. FY 2018 to FY 2019 Increase/Decrease Statement: Operational Energy Technologies efforts will be completed in FY2018.			-	0.050	-
Title: System Engineering/Program Management Description: Fund for Material Handling Equipment System Engineering and Program Management. FY 2018 Plans: Provide funding for Material Handling Equipment System Engineering and Program Management. FY 2019 Plans: Fund for Material Handling Equipment System Engineering and Program Management. FY 2018 to FY 2019 Increase/Decrease Statement: Man-Year Rates for reimbursable labor support increased from FY2018 to FY2019.			0.119	0.211	0.217
Title: Driver Assist Description: Research and demonstrate technologies which would enhance operation such as the inclusion of cameras, collision sensors, and lifting aids. FY 2018 Plans: Integrate COTS cameras, similar to backup cameras, to increase situational awareness of MHE operator. Integrate COTS collision warning sensors to increase situational awareness of MHE operator. Integrate discrete lifting aids to assist rough terrain forklifts with non-pallet lift missions. FY 2019 Plans:			-	0.674	0.570

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0205410A / <i>Materials Handling Equipment</i>				Project (Number/Name) EE9 / <i>Material Handling Equipment - Advance Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019	
Integrate COTS cameras, similar to backup cameras, to increase situational awareness of MHE operator. Integrate COTS collision warning sensors to increase situational awareness of MHE operator. Integrate discrete lifting aids to assist rough terrain forklifts with non-pallet lift missions.											
FY 2018 to FY 2019 Increase/Decrease Statement: Man-Year required for FY2019 is reduced.											
Accomplishments/Planned Programs Subtotals								0.119	1.582	1.464	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• G41001: 5K LIGHT CAPABILITY ROUGH TERRAIN (LCRT) FORKLIFT G41002	3.153	9.000	12.901	-	12.901	16.869	15.887	21.772	22.973	Continuing	Continuing
• MA4501: Modification Of In- Svc Equipment (OPA-3) MHE	46.363	26.018	25.201	-	25.201	28.122	26.466	22.310	30.770	Continuing	Continuing
Remarks											
D. Acquisition Strategy Procure prototype component items for engineering tests and demonstrations with subject matter experts. Conduct trades between cost and improved maintainability and environmental risk reduction. Process engineering change proposals, update technical manuals and training materials, and prepare supporting acquisition documents and data to procure new training aids.											
E. Performance Metrics N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0205410A / Materials Handling Equipment				Project (Number/Name) EE9 / Material Handling Equipment - Advance Development					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Upgrade RTCH control systems and on-board diagnostics	Various	Various : Various	0.293	-		-		-		-		-	0.000	0.293	-
Robotic Assist on Material Handling Equipment	MIPR	TARDEC : Warren, MI	0.461	-		0.647		0.677	Mar 2019	-		0.677	Continuing	Continuing	-
Operational Energy Technologies	MIPR	Various : Various	0.143	-		0.050		-		-		-	0.000	0.193	-
Driver Assist	Various	Various : Various	-	-		0.674		0.570	Mar 2019	-		0.570	Continuing	Continuing	-
Subtotal			0.897	-		1.371		1.247		-		1.247	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering/ Program Management	MIPR	TARDEC : Warren, MI	0.121	0.119	Dec 2017	0.211		0.217	Oct 2018	-		0.217	Continuing	Continuing	-
Subtotal			0.121	0.119		0.211		0.217		-		0.217	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Lightweight Armor for ATLAS II	Various	Various : Various	0.170	-		-		-		-		-	0.000	0.170	-
Subtotal			0.170	-		-		-		-		-	0.000	0.170	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1.188	0.119		1.582		1.464		-		1.464	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018																		
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0205410A / Materials Handling Equipment								Project (Number/Name) EE9 / Material Handling Equipment - Advance Development																
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023									
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
Material Handling Equipment Enhancement (Robotic Assist)																																		
Operational Energy Technologies																																		
Driver Assist																																		
System Engineering/Program Management																																		

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205410A / <i>Materials Handling Equipment</i>	Project (Number/Name) EE9 / <i>Material Handling Equipment - Advance Development</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Material Handling Equipment Enhancement (Robotic Assist)	1	2018	4	2023
Operational Energy Technologies	1	2018	4	2018
Driver Assist	2	2018	4	2023
System Engineering/Program Management	1	2019	4	2023

UNCLASSIFIED

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

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					PE 0205412A / Environmental Quality Technology - Operational System Dev							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.195	0.249	-	0.249	0.732	0.259	0.265	0.776	0.000	2.476
EE6: Environmental Information Tech Modernization	-	0.000	0.195	0.249	-	0.249	0.732	0.259	0.265	0.776	0.000	2.476

A. Mission Description and Budget Item Justification

Conducts system enhancements as required to meet data management, cybersecurity risk, and performance requirements for the Defense Environmental Network Information Exchange (DENIX) defense business system, as well as its database and reporting application, the Knowledge Based Corporate Reporting System (KBCRS).

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.195	0.202	-	0.202
Current President's Budget	0.000	0.195	0.249	-	0.249
Total Adjustments	0.000	0.000	0.047	-	0.047
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.047	-	0.047

Change Summary Explanation

Increase in RDTE funding for subsequent years will be allocated to comply with Cybersecurity Service Provider and Risk Management Framework requirements for the system.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205412A / Environmental Quality Technology - Operational System Dev				Project (Number/Name) EE6 / Environmental Information Tech Modernization			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EE6: Environmental Information Tech Modernization	-	0.000	0.195	0.249	-	0.249	0.732	0.259	0.265	0.776	0.000	2.476
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Environmental Information Technology Management (EITM) program includes support for the Defense Environmental Network Information Exchange (DENIX) defense business system, as well as its database and reporting application, the Knowledge Based Corporate Reporting System (KBCRS). This request for research, development, test and evaluation (RTDE) is to enhance the DBS to a net-centric all services transactional system of record and reporting tool set. This also includes upgrades to incorporate ongoing cybersecurity, cloud computing, and other information technology requirements.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Environmental Information Technology Modernization									-	0.195	0.249	
Description: Prototype, develop and implement platform enhanacements as required to meet data management requirements for the Knowledge Based Corporate Reporting System and the Defense Environmental Network Information Exchange.												
FY 2018 Plans: The current architecture of the DENIX platform will be expanded from one Level 4 container (Controlled Unclassified Information) to add a separate Level 2 container (Non-Controlled Unclassified Information) within the cloud infrastructure-as-a-service (IaaS) model.												
FY 2019 Plans: The containerization effort from FY 2018 will continue into FY 2019 and will provide DENIX architecture and bandwidth required to support large scale web conferencing and implement necessary user experience updates to the platform.												
FY 2018 to FY 2019 Increase/Decrease Statement: Increase in funding for subsequent years is driven by and consistent with the Deputy Secretary of Defense's Memorandum "Accelerating Enterprise Cloud Adoption" and the goals and objectives of the Army ESOH Strategy 2025. In order to provide optimized performance that improves cyber security and enhances user functionality for mission support DENIX requires a modernization effort over a five year period aligned with the FYDP.												
Accomplishments/Planned Programs Subtotals									-	0.195	0.249	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0205412A / Environmental Quality Technology - Operational System Dev				Project (Number/Name) EE6 / Environmental Information Tech Modernization			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 432612000: Information Management - Automation	-	-	3.309	-	3.309	0.337	3.443	3.511	3.582	0.000	14.182
Remarks											
This is the associated OMA line that provides daily support for the Defense Environmental Network Information Exchange and associated applications. EITM is managed as a Defense Business System #3180.											
D. Acquisition Strategy											
The Environmental Information Technology Management (EITM) Program is an Office of the Secretary of the Secretary of Defense sponsored program that was assigned to the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health as the Department of Defense (DoD) overarching authority by the Under Secretary of Defense for Acquisition, Technology, and Logistics in 2001. The DoD Directive 4715.1E defined EITM mission is to ensure efficient use of enterprise environment, safety, and occupational health (ESOH) corporate information management processes by providing and sustaining requirement-driven ESOH corporate data management, Congressional-reporting, and public outreach tools to the DoD, and other DoD stakeholders. Funding provided for this program will allow EITM to continue to develop and modernize the system to meet requirements set forth by the DoD's Risk Management Framework (DoDI 8510.01) as well as the Defense Information Systems Agency's Cloud Computing Security Requirements Guide. Prior to funding being committed, DoD ESOH stakeholders, authoritative information technology organizations, and the program's functional sponsor were consulted to determine necessary system interface upgrades to be incorporated. Expanding DENIX's architecture to create a Level 2 container separate from the current Level 4 container will not only provide a more secure, cybersecurity risk-adverse environment, but it will also optimize performance, capabilities, and mandatory reporting for ESOH stakeholders. This phased solution begins in FY 2018 by prototyping of system architecture optimization that improves user experience, enabling web conferencing in FY 2019 and applying machine learning concepts to improve data quality in FY 2020-2022.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0205412A / <i>Environmental Quality Technology - Operational System Dev</i>				Project (Number/Name) EE6 / <i>Environmental Information Tech Modernization</i>					

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System enhancements for required network interfaces to support EITM mission.	C/FFP	Delta Resources : Arlington, VA	0.270	-		0.195		0.249		-		0.249	0.000	0.714	-
Subtotal			0.270	-		0.195		0.249		-		0.249	0.000	0.714	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.270	-	0.195	0.249	-	0.249	0.000	0.714	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0205412A / Environmental Quality Technology - Operational System Dev								Project (Number/Name) EE6 / Environmental Information Tech Modernization										
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Split architecture prototype																												
User experience and containerization																												
Webinars/virtual conferencing prototype and development																												
Machine learning algorithms																												
Machine learning prototype																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205412A / <i>Environmental Quality Technology - Operational System Dev</i>	Project (Number/Name) EE6 / <i>Environmental Information Tech Modernization</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Split architecture prototype	2	2018	2	2019
User experience and containerization	3	2018	3	2020
Webinars/virtual conferencing prototype and development	1	2019	4	2019
Machine learning algorithms	4	2019	4	2021
Machine learning prototype	4	2020	4	2022

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	61.449	78.926	79.283	-	79.283	107.785	111.124	121.376	117.336	Continuing	Continuing
EF9: <i>System Integration and Test</i>	-	61.449	78.926	79.283	-	79.283	107.785	111.124	121.376	117.336	Continuing	Continuing

Program MDAP/MAIS Code: 505

A. Mission Description and Budget Item Justification

The PATRIOT system includes a family of hardware, software, interceptors (PAC-2, Guidance Enhanced Missiles, PAC-3 and PAC-3 Missile Segment Enhancement) 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 (M&S) 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.

Funding supports identification, analysis, design, and test materiel solutions to counter cyber security and electronic warfare shortcomings to all elements of the Lower Tier Battle Space.

FY2019 base dollars in the amount of \$79.283 million supports the continuance of program development with the integration of missile and ground system software and hardware in support of complete Post Deployment Build-8.1 (PDB-8.1). Continues the testing program to support the Test and Evaluation Master Plan (TEMP) and system testing/analysis long lead activities for PDB-8.1 Development Test and Evaluation (DTE) and Limited User Test (LUT).

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		PE 0205456A / Lower Tier Air and Missile Defense (AMD) System			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	73.417	78.926	80.314	-	80.314
Current President's Budget	61.449	78.926	79.283	-	79.283
Total Adjustments	-11.968	0.000	-1.031	-	-1.031
• Congressional General Reductions	-0.031	-			
• Congressional Directed Reductions	-5.528	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.409	-			
• Adjustments to Budget Years	-	-	-1.031	-	-1.031
• Amended FY2017 not appropriated	-4.000	-	-	-	-
Change Summary Explanation					
FY2017: -\$5.528 million due to the availability of prior year execution balances.					
FY2017: Amended PB17 Base request of \$4.0 million was not appropriated.					
FY2019: Base Adjustments to Budget Years: Program Office core employee labor costs moved from RDTE to OMA as part of an OSD auditability directive.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System				Project (Number/Name) EF9 / System Integration and Test			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EF9: System Integration and Test	-	61.449	78.926	79.283	-	79.283	107.785	111.124	121.376	117.336	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The PATRIOT system includes a family of hardware, software, interceptors (PAC-2, Guidance Enhanced Missiles, PAC-3 and PAC-3 Missile Segment Enhancement) 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 Modeling and Simulation as well as satisfying 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.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Program Development, Integration, and Support	27.171	32.144	38.684	-	38.684
Description: Funding is provided for the following effort:					
FY 2018 Plans:					
-Continued program development.					
-Continued integration of missile and ground system hardware and software to complete Post Deployment Build (PDB) -8.1 activities.					
FY 2019 Base Plans:					
-Continues program development.					
-Continues integration of missile and ground system hardware and software to complete PDB-8.1 activities.					
FY 2018 to FY 2019 Increase/Decrease Statement:					
FY18 budget reflects completing PDB-8 testing and initial PDB 8.1 test planning, support, analysis and integration efforts to include significant investments of long-lead target hardware. FY19 budget reflects ramping into PDB 8.1 test support, analysis and integration efforts with lower levels of target hardware investments. The resultant budget is an increase of FY19 budget of \$363K over FY18.					
Title: Testing, Targets, Modeling and Simulation	34.278	46.782	40.599	-	40.599

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018				
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System	Project (Number/Name) EF9 / System Integration and Test				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Funding is provided for the following effort: FY 2018 Plans: -Continued the testing program to include utilization of targets/threat simulators, flight simulator and modeling efforts. -Continued test activities to support the Test & Evaluation Master Plan (TEMP). -Completed (Post Deployment Build) PDB 8.0 Testing -Completed PDB 8.0.5 Testing -Continued system testing/analysis for PDB-8.1 Development Test and Evaluation (DTE) and Limited User Test (LUT). -Began planning, integration and testing of missile and ground system hardware and software to complete PDB 8.1 activities. -Began planning, design, and acquisition of long lead Targets for PDB 8.1 Testing -Continued PATRIOT program Modeling & Simulation (M&S) laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements. FY 2019 Base Plans: -Continues the testing program to include utilization of targets/threat simulators, flight simulator and modeling efforts. -Continues test activities to support the TEMP. -Continues system testing/analysis for PDB-8.1 DTE and LUT. -Continues planning, integration and testing of missile and ground system hardware and software to complete PDB 8.1 activities. -Continues PATRIOT program M&S laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements. -Planning, design, and acquisition of long lead Targets for PDB 8.1 Testing. -Begins Ballistic Missile Defense System (BMDS) Integration Testing. FY 2018 to FY 2019 Increase/Decrease Statement: FY18 budget reflects completing PDB-8 testing and initial PDB 8.1 test planning, support, analysis and integration efforts to include significant investments of long-lead target hardware. FY19 budget reflects ramping							

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System				Project (Number/Name) EF9 / System Integration and Test				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
into PDB 8.1 test support, analysis and integration efforts with lower levels of target hardware investments. The resultant budget is an increase of FY19 budget of \$363K over FY18.												
Accomplishments/Planned Programs Subtotals								61.449	78.926	79.283	-	79.283
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• C53101: MSE Missile	809.201	1,106.040	871.276	260.000	1,131.276	512.775	734.152	727.032	813.280	793.430	6,627.186	
• C50016: Lower Tier Air and Missile Defense (AMD)	126.470	140.826	111.395	-	111.395	130.051	105.044	107.288	106.178	0.000	827.252	
• 0604319A: Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	-	11.303	51.030	-	51.030	146.731	132.361	156.732	21.528	0.000	519.685	
• C62002: IFPC INC 2-I BLOCK 1 SYSTEM	-	-	0.000	-	0.000	175.576	303.422	273.802	388.377	0.000	1,141.177	
• C62001: IFPC Inc 2-I Block 1 Missile	-	57.742	145.636	-	145.636	143.466	99.516	14.472	-	0.000	460.832	
• E10: Sentinel	15.368	32.968	39.338	-	39.338	91.534	96.427	80.394	43.874	0.000	399.903	
• S40: Army Integrated Air and Missile Defense	273.240	336.420	277.607	-	277.607	200.275	130.860	63.741	33.196	0.000	1,315.339	
• BZ5075: IAMD Battle Command System	-	-	0.000	-	0.000	72.307	323.680	428.572	497.974	Continuing	Continuing	
• 0604741A: Air Defense Command, Control and Intelligence - Eng Dev	200.205	28.726	95.172	119.300	214.472	15.577	9.310	2.915	29.489	0.000	500.694	
• AD5070: AIR & MSL Defense Planning & Control Sys	126.539	35.735	33.837	-	33.837	24.983	49.385	68.021	63.273	0.000	401.773	
• EX2: Lower Tier Air Missile Defense (LTAMD) Capability	33.780	76.728	120.374	-	120.374	125.772	376.738	332.322	241.461	0.000	1,307.175	
• EY7: IFPC Increment 2 - Block 1	80.781	175.069	157.710	-	157.710	77.599	32.517	-	-	0.000	523.676	
Remarks												
This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205456A / <i>Lower Tier Air and Missile Defense (AMD) System</i>	Project (Number/Name) EF9 / <i>System Integration and Test</i>
<u>D. Acquisition Strategy</u> The ongoing design and developmental activities enable modeling and simulation infrastructure maintenance and upgrades coupled with end to end testing of the Lower Tier architecture against the evolving threat as an element of an integrated Air and Missile Defense system. This strategy minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. Lower Tier system development efforts enable further improvement of system capabilities against emerging and reactive threats. Developing, fabricating and testing hit to kill surface to air missile and associated ground support equipment provides essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. These state-of-the-art capabilities and enhancements require ongoing demonstration through a series of flight tests and modeling and simulation activities. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System				Project (Number/Name) EF9 / System Integration and Test					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : Huntsville, Alabama	2.308	0.964	Dec 2016	1.156	Dec 2017	1.186	Dec 2018	-		1.186	Continuing	Continuing	-
PAC-3 Product Office	RO	Project Office : Huntsville, AL	1.265	1.051	Oct 2016	1.188	Oct 2017	1.663	Oct 2018	-		1.663	Continuing	Continuing	-
Subtotal			3.573	2.015		2.344		2.849		-		2.849	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Integration MSE LMMFC	Various	Lockheed Martin Missiles and Fire Control (LMMFC) : Dallas, Texas	12.300	14.427	Feb 2017	15.456	Feb 2018	18.207	Feb 2019	-		18.207	Continuing	Continuing	-
MSE/PAC-3 Raytheon	Various	Raytheon : Waltham, Massachusetts	8.250	4.569	Feb 2017	5.598	Feb 2018	6.930	Feb 2019	-		6.930	Continuing	Continuing	-
SETA Contracts	Various	Multiple : Multiple	4.933	0.889	Feb 2017	1.069	Feb 2018	1.096	Feb 2019	-		1.096	Continuing	Continuing	-
U.S. Other Government Agencies (OGAs)	MIPR	Various : Huntsville, Alabama	9.530	7.680	Dec 2016	7.677	Dec 2017	9.602	Dec 2018	-		9.602	Continuing	Continuing	-
Subtotal			35.013	27.565		29.800		35.835		-		35.835	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Targets/Threats Simulators	MIPR	Various : Huntsville, Alabama	47.533	20.591	Feb 2017	33.637	Feb 2018	14.833	Feb 2019	-		14.833	Continuing	Continuing	-
Modeling and Simulation	MIPR	Various : Huntsville, Alabama	6.724	3.065	Jan 2017	3.685	Jan 2018	3.779	Jan 2019	-		3.779	Continuing	Continuing	-
Contractor T&E	Various	Multiple : Multiple	13.377	1.625	Feb 2017	1.953	Feb 2018	2.003	Feb 2019	-		2.003	Continuing	Continuing	-
Other T&E funding	MIPR	Various : WSMR, NM	6.135	2.822	May 2017	3.190	May 2018	3.246	May 2019	-		3.246	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System				Project (Number/Name) EF9 / System Integration and Test					

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost		Cost To Complete	Total Cost	Target Value of Contract
Mobile Flight Mission Simulator (MFMS)	SS/FPIF	Raytheon : Massachusetts	9.900	1.226	Jan 2017	0.948	Jan 2018	1.080	Jan 2019	-		1.080	Continuing	Continuing	-	
PDB-8	MIPR	Various : WSMR, NM	3.231	2.540	Feb 2017	3.369	Feb 2018	15.658	Feb 2019	-		15.658	Continuing	Continuing	-	
PDB-8 DT/OT	MIPR	Various : WSMR, NM	14.887	-		-		-		-		-	0.000	14.887	-	
Subtotal			101.787	31.869		46.782		40.599		-		40.599	Continuing	Continuing	N/A	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	140.373	61.449		78.926		79.283		-		79.283	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System		Project (Number/Name) EF9 / System Integration and Test	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PATRIOT System Testing, Integration and Evaluation																												
Program Development, Integration, and Support																												
Testing, Targets, Modeling and Simulation																												
PDB-8.0.5 Agile Build																												
PDB-8 IOC																												
PDB 8.1																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205456A / <i>Lower Tier Air and Missile Defense (AMD) System</i>	Project (Number/Name) EF9 / <i>System Integration and Test</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
PATRIOT System Testing, Integration and Evaluation	1	2015	4	2023
Program Development, Integration, and Support	1	2015	4	2023
Testing, Targets, Modeling and Simulation	1	2015	4	2023
PDB-8.0.5 Agile Build	1	2017	4	2018
PDB-8 IOC	4	2018	4	2018
PDB 8.1	1	2018	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
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)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	21.196	102.807	154.102	-	154.102	132.594	54.328	64.789	1.993	0.000	531.809
EG2: GMLRS Alternative Warheads*	-	0.000	0.000	0.000	-	0.000	11.566	14.529	24.409	0.000	0.000	50.504
EG3: Guided MLRS	-	21.196	102.807	154.102	-	154.102	121.028	39.799	40.380	1.993	0.000	481.305
Program MDAP/MAIS Code: 260												
*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019												
A. Mission Description and Budget Item Justification												
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 with a cluster compliant warhead.												
The GMLRS Program consists of three variants: GMLRS Dual Purpose Improved Conventional Munition (DPICM) cluster munition to engage area or imprecisely located targets; GMLRS Unitary utilizes a 200 pound 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 entered full rate production in FY 2015. The GMLRS AW rocket is 90% common with the Unitary variant.												
The GMLRS program will continue to leverage ongoing Science & Technology (S&T) efforts to extend range, increase survivability, and develop warhead technologies to meet DOD Cluster Munition Policy requirements. The Extended Range GMLRS variant will be a modification of the current production GMLRS and will be remain approximately 85% common with the current GMLRS. It will carry both the Unitary and AW warheads. It will extend the current GMLRS capability to 150 km and allow for potential future growth capability in the payload section.												
The FY2019 dollars in the amount of \$154.102 million will continue qualification of key rocket obsolescence upgrades (including the M-Code compliant NAVSTRIKEM upgrade); qualify a new rocket pod in support of future GMLRS production; and continue the design, qualification, and testing of an extended range variant of the GMLRS.												
The United States (U.S.) Army has identified funding in FY2021-FY2023 for the technology transition, development and integration of an anti-radiation homing (ARH) future payload into the GMLRS.												

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
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)			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	38.044	102.807	164.015	-	164.015
Current President's Budget	21.196	102.807	154.102	-	154.102
Total Adjustments	-16.848	0.000	-9.913	-	-9.913
• Congressional General Reductions	-0.011	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.837	-			
• Adjustments to Budget Years	-	-	-9.913	-	-9.913
• Amended FY2017 not appropriated	-16.000	-	-	-	-
Change Summary Explanation					
FY 2017 funding reflects an adjustment of \$16.848 million. \$16.000 million was requested in the Request for Additional FY17 Appropriations, but was not appropriated. The remaining \$0.837 and \$0.011 million was for Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) and FFRDC adjustments.					
FY 2019 funding reflects a decrease of \$9.913 million.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205778A / Guided Multiple Launch Rocket System (GMLRS)				Project (Number/Name) EG3 / Guided MLRS			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EG3: Guided MLRS	-	21.196	102.807	154.102	-	154.102	121.028	39.799	40.380	1.993	0.000	481.305
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The United States (U.S.) Army continues to explore ways to enhance Guided Multiple Launch Rocket System (GMLRS) rockets and common components and to mitigate obsolescence issues under the Guided MLRS project code. The Army is requesting funding for the following GMLRS Research, Development, Test and Evaluation (RDT&E) activities: (1) evaluation of enhanced operational capabilities to provide more flexibility across the target set to include increased range, flight performance, and end-game optimization; (2) investigation of potential life cycle cost savings through obsolescence initiatives; (3) development of enhancements to the Multiple Launch Rocket System (MLRS) common test equipment; (4) evaluation and development of technologies to enhance overall product performance and survivability; and (5) Insensitive Munitions (IM) compliance.												
The FY2019 dollars in the amount of \$154.102 million will continue qualification of key rocket obsolescence upgrades (including the M-Code compliant NAVSTRIKE-M upgrade); qualify a new rocket pod in support of future GMLRS production; and continue the design, qualification, and testing of an extended range variant of the GMLRS.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Assess and improve GMLRS rockets.								3.192	4.104	14.850	-	14.850
Description: Funding is provided for the following effort												
FY 2018 Plans: Investigate and assess methods to increase range performance and rocket effectiveness. Evaluate rocket pod improvements, assess rocket reliability, and reduce collateral damage.												
FY 2019 Base Plans: Continue to assess methods to increase range performance and rocket effectiveness. Qualify the design of a new rocket pod to support future GMLRS production, assess rocket reliability, and reduce collateral damage.												
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase from FY18-19 is required to support increased testing effort to assess and improve GMLRS rockets.												
Title: Conduct qualification and testing for Insensitive Munitions (IM) Propulsion System (IMPS).								11.105	8.757	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0205778A / Guided Multiple Launch Rocket System (GMLRS)		Project (Number/Name) EG3 / Guided MLRS		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Funding is provided for the following effort						
FY 2018 Plans: Complete system ground/flight testing and Insensitive Munition Propulsion System (IMPS) qualification.						
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease from FY18-19 is due to completion of IMPS qualification and testing effort.						
Title: Investigate obsolescence cost/cost reduction opportunities/second source suppliers/survivability.		4.379	9.950	20.715	-	20.715
Description: Funding is provided for the following effort (The NAVSTRIKE GPS Receiver provides tightly coupled GPS/INS integration. Rockwell Collins has stopped producing the NAVSTRIKE 3.3).						
FY 2018 Plans: Design and qualification of M-Code compliant NAVSTRIKE-M upgrade. System level integration and qualification of side-mounted proximity sensor.						
FY 2019 Base Plans: Design and qualification of M-Code compliant NAVSTRIKE-M upgrade.						
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase from FY18-19 is required to support increased effort to investigate obsolescence and cost/cost reduction opportunities/second source suppliers/survivability.						
Title: Conduct System Test and Evaluation activities.		2.520	2.590	19.709	-	19.709
Description: Funding is provided for the following effort						
FY 2018 Plans: Ground/Flight testing of side-mounted proximity sensor.						
FY 2019 Base Plans: Ground and qualification tests of a new GMLRS rocket pod in support of current configuration and extended range variant GMLRS production. Begin component and system-level ground testing and complete initial system qualification flight tests for the extended range GMLRS variant.						
FY 2018 to FY 2019 Increase/Decrease Statement:						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0205778A / Guided Multiple Launch Rocket System (GMLRS)			Project (Number/Name) EG3 / Guided MLRS				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding increase from FY18-19 is required to support increased effort to conduct System Test and Evaluation activities.											
Title: Qualification and integration of the GMLRS extended range effort.							-	77.406	98.828	-	98.828
Description: Funding is provided for the following effort											
FY 2018 Plans: Define system performance requirements, select component suppliers, conduct facilitization planning, conduct preliminary design review, and conduct a flight demonstration.											
FY 2019 Base Plans: Will conduct component and system-level design reviews and the system-level software design review. Will complete Cooperative Vulnerability Identification. Will conduct facilitation planning, and conduct a proof of concept flight demonstration.											
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase from FY18-19 is required to support increased effort to qualify and integrate the GMLRS extended range effort.											
Accomplishments/Planned Programs Subtotals							21.196	102.807	154.102	-	154.102
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• C64400: Guided MLRS Rocket (GMLRS)	408.842	786.704	359.613	624.500	984.113	598.977	655.304	718.791	875.675	Continuing	Continuing
• EG2: GMLRS Alternative Warheads	-	-	0.000	-	0.000	11.566	14.529	24.409	-	0.000	50.504
• C57701: GMLRS MOD	0.395	0.531	0.266	-	0.266	15.394	52.714	100.958	69.154	Continuing	Continuing
Remarks GMLRS Procurement funding includes C65404 and C65406.											
D. Acquisition Strategy Project EG3 is intended to support, investigate, and develop alternative material changes to improve the GMLRS family of munitions as they are identified by the material developer or combat developer. This project also supports IM activities to improve the overall posture of the system down to component level. Two Insensitive											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / <i>Guided Multiple Launch Rocket System (GMLRS)</i>	Project (Number/Name) EG3 / <i>Guided MLRS</i>
Munition Propulsion Systems (Rocket Motor and Ignition Safety Device) suppliers will complete design and qualification, and the IMPS will be integrated into the GMLRS rocket. Design, development, and qualification of a side-mounted proximity sensor will provide a cost reduction initiative and improved area munition lethality. The GMLRS extended range effort is pursuing a strategy of modifying the current system in order to increase its range. It will be a 36 month development and qualification effort leveraging existing contract vehicles where practicable. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0205778A / Guided Multiple Launch Rocket System (GMLRS)				Project (Number/Name) EG3 / Guided MLRS					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : RSA	2.154	2.721	Oct 2016	5.425	Oct 2017	5.959	Oct 2018	-		5.959	Continuing	Continuing	Continuing
Subtotal			2.154	2.721		5.425		5.959		-		5.959	Continuing	Continuing	N/A
Remarks RSA-Redstone Arsenal, Alabama															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Unitary Contracts/Multiple	SS/FPIF	LMMFCS : Dallas, TX	17.285	4.850	Jan 2017	8.629	Jan 2018	29.606	Jan 2019	-		29.606	Continuing	Continuing	Continuing
IM Qualification Contracts/ Multiple	C/FPIF	Orbital ATK, Aerojet Rocketdyne : Rocket Center, WV; Bristow, VA	16.518	11.105	Jan 2017	8.757	Jan 2018	-		-		-	0.000	36.380	-
GMLRS Extended Range	SS/TBD	TBD : TBD	-	-		77.406	Jan 2018	98.828	Jan 2019	-		98.828	Continuing	Continuing	Continuing
Subtotal			33.803	15.955		94.792		128.434		-		128.434	Continuing	Continuing	N/A
Remarks SS/FPIF-Sole Source/Fixed-Price Incentive Firm; LMMFCS - Lockheed Martin Missile and Fire Control System; TX - Texas; C/FPIF - Competitive/Fixed-Price Incentive Firm; WV - West Virginia; VA - Virginia; TBD - To Be Determined															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	WSMR, : NM	10.806	2.520	Oct 2016	2.590	Oct 2017	19.709	Oct 2018	-		19.709	Continuing	Continuing	Continuing
Subtotal			10.806	2.520		2.590		19.709		-		19.709	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205778A / <i>Guided Multiple Launch Rocket System (GMLRS)</i>					Project (Number/Name) EG3 / <i>Guided MLRS</i>				

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks WSMR, NM-White Sands Missile Range, New Mexico															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			46.763	21.196		102.807		154.102		-		154.102	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0205778A / <i>Guided Multiple Launch Rocket System (GMLRS)</i>		Project (Number/Name) EG3 / <i>Guided MLRS</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Assess and improve GMLRS rockets																												
Obsolescence/Cost Reduction Opportunities and Second Source S																												
NAVSTRIKE 3.7 Qualification																												
M-Code/NAVSTRIKE-M Qualification																												
System Qual and testing of Side Mounted Proximity Sensor																												
Conduct qualification and testing for IMPS program																												
Conduct System Test and Evaluation activities																												
Qualification and Integration of GMLRS extended range effort																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / <i>Guided Multiple Launch Rocket System (GMLRS)</i>	Project (Number/Name) EG3 / <i>Guided MLRS</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Assess and improve GMLRS rockets	1	2015	4	2023
Obsolescence/Cost Reduction Opportunities and Second Source Suppliers	1	2015	4	2023
NAVSTRIKE 3.7 Qualification	1	2016	2	2017
M-Code/NAVSTRIKE-M Qualification	3	2018	4	2020
System Qual and testing of Side Mounted Proximity Sensor	1	2018	3	2018
Conduct qualification and testing for IMPS program	1	2015	3	2018
Conduct System Test and Evaluation activities	4	2015	3	2018
Qualification and Integration of GMLRS extended range effort	2	2018	1	2021

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0208053A I Joint Tactical Ground System							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	12.649	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.649
635: Joint Tact Grd Station-P3I(MIP)	-	12.649	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.649

Note

FY 2018 and out funding moved from PE 0208053A to PE 1208053A as directed by OSD to better track Space Programs

A. Mission Description and Budget Item Justification

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity.

The JTAGS Program Element (PE) supports development and test to meet JTAGS ORD thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. JTAGS P3I Block II Phase 1 and Block II Phase 2 Spiral 1 efforts are included under PE 0208053A. JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development		PE 0208053A I Joint Tactical Ground System			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	12.649	0.000	0.000	-	0.000
Current President's Budget	12.649	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0208053A / Joint Tactical Ground System				Project (Number/Name) 635 / Joint Tact Grd Station-P3I(MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
635: Joint Tact Grd Station-P3I(MIP)	-	12.649	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.649
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 and out funding moved from PE 0208053A to PE 1208053A as directed by OSD to better track Space Programs

A. Mission Description and Budget Item Justification

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity.

The JTAGS Program Element (PE) supports development and test to meet JTAGS ORD thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. JTAGS Block II Phase 1 and Block II Phase 2 Spiral 1 efforts are included under PE 0208053A. JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

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

	FY 2017	FY 2018	FY 2019
Title: JTAGS Test and Evaluation Support	1.778	-	-
Description: Effort covered the Limited User Test for JTAGS Block II Phase 1			
Title: JTAGS P3I Block II Phase 2 Development	10.871	-	-
Description: JTAGS Block II Phase 2 activities include a three spiral approach which will provide stereo SBIRS GEO starrer sensor data and Net Centric capabilities, per JROC Memos 197-12 and 113-13.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0208053A / <i>Joint Tactical Ground System</i>	Project (Number/Name) 635 / <i>Joint Tact Grd Station-P3I(MIP)</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Accomplishments/Planned Programs Subtotals	12.649	-	-

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• BZ8420: <i>JOINT TACTICAL GROUND STATION MODS (JTAGS)</i>	4.417	-	5.434	-	5.434	-	-	-	6.393	0.000	16.244
• 1208053A: <i>Joint Tactical Ground System</i>	-	10.228	7.400	-	7.400	9.282	9.529	11.209	11.658	0.000	59.306

Remarks

D. Acquisition Strategy

Under this program element, critical improvements will be developed making maximum use of Non-Developmental Items (NDI)/Commercial Off-The-Shelf (COTS) components. After design and integration, the system will be subject to thorough developmental and validation/verification testing to verify performance, operational effectiveness and suitability. P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, improving warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2, is further divided into three spirals to facilitate delivering critical capabilities to the fielded units faster. JTAGS Block II Phase 1 and JTAGS Block II Phase 2 Spiral 1 efforts will be completed under PE 0208053A. JROC-Memos 197-12 and 113-13 direct fielding of JTAGS Block II capabilities as soon as possible.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0208053A / Joint Tactical Ground System				Project (Number/Name) 635 / Joint Tact Grd Station-P3I(MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Allot	MDSS Project Office : Redstone Arsenal, AL	59.453	2.653	Oct 2015	-		-		-		-	0.000	62.106	-
Subtotal			59.453	2.653		-		-		-		-	0.000	62.106	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JTAGS Block I Engineering Services Hardware/Software	SS/CPFF	Northrop Grumman : Colorado Springs, CO	39.882	-		-		-		-		-	0.000	39.882	-
P3I Block II Phase 1 Development	SS/CPIF	Northrop Grumman : Colorado Springs, CO	56.928	-		-		-		-		-	0.000	56.928	49.578
P3I Block II Phase 2 Development	SS/CPIF	Northrop Grumman : Colorado Springs, CO	18.500	6.907	Dec 2016	-		-		-		-	0.000	25.407	-
Government Furnished Equipment	TBD	Various : Various	1.510	-		-		-		-		-	0.000	1.510	-
Subtotal			116.820	6.907		-		-		-		-	0.000	123.727	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	Sigmattech, Inc : Huntsville AL	32.325	1.311	Feb 2017	-		-		-		-	0.000	33.636	-
Subtotal			32.325	1.311		-		-		-		-	0.000	33.636	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0208053A / Joint Tactical Ground System				Project (Number/Name) 635 / Joint Tact Grd Station-P3I(MIP)					

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support (ATEC/JITC/ETC)	Various	Various : Various	11.116	1.778	Oct 2016	-		-		-		-	0.000	12.894	-
Subtotal			11.116	1.778		-		-		-		-	0.000	12.894	N/A

Remarks N/A-Not Applicable															

			Prior Years	FY 2017	FY 2018	FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			219.714	12.649	0.000	-		-		-	0.000	232.363	N/A

Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0208053A / <i>Joint Tactical Ground System</i>		Project (Number/Name) 635 / <i>Joint Tact Grd Station-P3I(MIP)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JTAGS P3I Block II																												
JTAGS P3I Block II Upgrade																												
P3I Block II Phase 1 (Deshelterization and Geosynchronous (GE																												
JTAGS P3I Block II Phase 1 Hardware/Software																												
P3I Block II Phase 2 Spiral 1 (GEO Starer and Net Centric Upgra																												
JTAGS P3I Block II Phase 2 Spiral 1																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0208053A / <i>Joint Tactical Ground System</i>	Project (Number/Name) 635 / <i>Joint Tact Grd Station-P3I(MIP)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JTAGS P3I Block II	3	2012	2	2018
P3I Block II Phase 1 (Deshelterization and Geosynchronous (GEO) Scanner)	4	2012	2	2017
P3I Block II Phase 2 Spiral 1 (GEO Starer and Net Centric Upgrade)	4	2015	2	2018

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	15.719	13.807	12.280	23.199	35.479	14.024	14.764	14.636	14.889	0.000	123.318
FG2: Counterintelligence & Human Intel Modernization	-	0.000	1.825	2.264	0.799	3.063	1.779	2.280	1.779	1.778	0.000	12.504
H13: Information Dominance Center (IDC) - Tiara	-	15.719	11.982	10.016	22.400	32.416	12.245	12.484	12.857	13.111	0.000	110.814

Note

In FY 2019 \$2.636 million for Counter Intel and Human Intel Modernization transfers from this line to 0606003 FI9.

A. Mission Description and Budget Item Justification

The U.S. Army Intelligence and Security Command's (INSCOM) RDTE program provides the Army with low-density, high-demand, extremely advanced offensive cyberspace technologies designed to degrade, deny, disrupt, or destroy adversary Command, Control, Communications, Computers and Intelligence (C4I) and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, National Security Presidential Directive (NSPD)-38, NSPD-54 and Homeland Security Presidential Directive (HSPD)-23.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	11.619	13.807	13.407	-	13.407
Current President's Budget	15.719	13.807	12.280	23.199	35.479
Total Adjustments	4.100	0.000	-1.127	23.199	22.072
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.127	23.199	22.072
• RAA Appropriated	4.100	-	-	-	-

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI	
Change Summary Explanation FY 2017 base funding in the amount of \$4.1 million was appropriated from the Request for Additional Appropriations (RAA). FY 2019 base funding in the amount of \$1.026 million was increased with the addition of Insider Threat CE Support and Identity Intelligence requirements.		

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI				Project (Number/Name) FG2 / Counterintelligence & Human Intel Modernization			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FG2: Counterintelligence & Human Intel Modernization	-	0.000	1.825	2.264	0.799	3.063	1.779	2.280	1.779	1.778	0.000	12.504
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019 \$2.636 million for Counter Intel and Human Intel Modernization transfers from this line to 0606003 FI9.

A. Mission Description and Budget Item Justification

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

This project provides the Army with a new capability to communicate near-real-time (NRT) updates from advanced sensors to elements in theater who can prosecute the adversary. This capability greatly enhances the ground commander's battlespace awareness by integrating additional Intelligence, Surveillance, and Reconnaissance (ISR) platforms with Army Mission Command Systems (MCS) during the find, fix, and finish process. The increased battlespace awareness contributes to more effective and efficient use of fire support platforms like artillery. NRT updates to the intelligence picture allows forces to rapidly tailor fire support plans to make better use of existing assets. Providing NRT updates aids weapon and ammunition selection decisions based on current enemy disposition. FY 2019 request includes \$0.799 million for these activities in support of Operation Inherent Resolve for ISIL.

This capability supports operational gaps and supports documented Army requirements. This funding provides resources to complete integration efforts into Army MCS. Initial integration testing is complete and shows the ability to produce the desired end state of passing intelligence data to the end user. Development efforts include interface refinement and measurement of message latency under a variety of realistic environments, which culminates in participation in live fire events. During the ongoing development of this capability, the project will receive and respond to feedback from the warfighter to ensure that the capability meets the warfighter's needs.

HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel.

The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Project supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat the foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions. Funding will transfer to 0606003 FI9 Counter Intel and Human Intel Modernization in FY 2019.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI		Project (Number/Name) FG2 / Counterintelligence & Human Intel Modernization		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Classified Description: Classified FY 2019 Base Plans: Not Applicable FY 2019 OCO Plans: Refines existing messaging framework and test the concept beyond the lab through integration in warfighter exercises. Publishes tactics, techniques, and procedures for utilization. Educates the intelligence and maneuver communities on the capability and enhance the capability based on warfighter input. FY 2018 to FY 2019 Increase/Decrease Statement: FY19 OCO funding to support MIP-GEOINT Enterprise TPED Service.		-	-	0.000	0.799	0.799
Title: Insider Threat CE Support Description: HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel. FY 2019 Base Plans: Funding supports personnel security- related capabilities for identifying, reporting and responding to potential personnel security information of concern. These tools are key enablers of the Army Insider Threat Program. These tools provide statistical models to assess risk, centralized analysis, reporting and response capabilities, and reporting mechanisms for relevant insider threat data. FY 2018 to FY 2019 Increase/Decrease Statement: New effort in FY19.		-	-	1.800	-	1.800
Title: Identity Intelligence Description: RDT&E funding supports the development of new software code and associated testing necessary to update an instance of the Identity Intelligence Repository (I2AR) -the unique software-based analytic production system used by intelligence analysts and the National Ground Intelligence Center (NGIC) specifically to create the Biometric Enabled Watchlist for worldwide missions.		-	-	0.464	-	0.464

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI		Project (Number/Name) FG2 / Counterintelligence & Human Intel Modernization		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<i>FY 2019 Base Plans:</i> The developed updates will provide capable to facilitate automated information exchange with complimentary DoD and Intelligence Community programs resident on the IC ITE C2S cloud to facilitate automated linkage of information and intelligence to persons of interest. Specific efforts include the development of Extensible Markup Language (XML) that supports transactional interface between exploitation system, data repositories and, analytic tools.						
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> New effort in FY19.						
<i>Title:</i> Counterintelligence Activities <i>Description:</i> The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Project supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat the foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions.		-	1.825	-	-	-
<i>FY 2018 Plans:</i> Funding supports development & testing of software code integrating existing and new algorithms to analyze multiple data source to record, identify, sort, and prioritize behaviors indicative of espionage, national security compromises, and other foreign and insider threats. The new, more capable software sets will facility counterintelligence analysis, insider threat detection, counterintelligence investigative focus, and automated exchange and display of critical counterintelligence information.						
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Effort concludes in FY18.						
Accomplishments/Planned Programs Subtotals		-	1.825	2.264	0.799	3.063
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI	Project (Number/Name) FG2 / Counterintelligence & Human Intel Modernization
D. Acquisition Strategy Classified		
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI				Project (Number/Name) FG2 / Counterintelligence & Human Intel Modernization					

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	Various	To Be Determined : To Be Determined	-	-		1.825		0.000		0.799		0.799	0.000	2.624	-
Insider Threat CE Support	TBD	To Be Determined : To Be Determined	-	-		-		0.828		-		0.828	0.000	0.828	-
Identity Intelligence	TBD	To Be Determined : To Be Determined	-	-		-		0.224		-		0.224	0.000	0.224	-
Counterintelligence Activities	TBD	To Be Determined : To Be Determined	-	-		-		1.212		-		1.212	0.000	1.212	-
Subtotal			-	-		1.825		2.264		0.799		3.063	0.000	4.888	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	1.825	2.264	0.799	3.063	0.000	4.888	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI		Project (Number/Name) FG2 / Counterintelligence & Human Intel Modernization	

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

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI	Project (Number/Name) FG2 / Counterintelligence & Human Intel Modernization

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Classified	1	2018	1	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI				Project (Number/Name) H13 / Information Dominance Center (IDC) - Tiara			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
H13: Information Dominance Center (IDC) - Tiara	-	15.719	11.982	10.016	22.400	32.416	12.245	12.484	12.857	13.111	0.000	110.814
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019 \$2.636 million for Counter Intel and Human Intel Modernization transfers from this line to 0606003 FI9.

A. Mission Description and Budget Item Justification

INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced offensive cyberspace technologies designed to degrade, deny, disrupt, or destroy adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, NSPD-38, NSPD-54 and HSPD-23. FY 2019 request includes \$22.4 million for these activities in support of Operation Inherent Resolve for ISIL.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Cyberspace technologies	15.719	11.982	10.016	22.400	32.416
Description: INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced offensive cyberspace technologies designed to degrade, deny, disrupt, or destroy adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.					
FY 2018 Plans: Continue to develop and support leading-edge Cyberspace technologies designed to exploit, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI		Project (Number/Name) H13 / Information Dominance Center (IDC) - Tiara		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept. FY 2019 Base Plans: Continue to develop and support leading-edge Cyberspace technologies designed to exploit, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept. FY 2019 OCO Plans: Continue to develop and support leading-edge Cyberspace technologies designed to exploit, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept. FY 2018 to FY 2019 Increase/Decrease Statement: Economic adjustment.						
Accomplishments/Planned Programs Subtotals		15.719	11.982	10.016	22.400	32.416
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
classified						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI	Project (Number/Name) H13 / Information Dominance Center (IDC) - Tiara

E. Performance Metrics
classified

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI				Project (Number/Name) H13 / Information Dominance Center (IDC) - Tiara					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Mobile Objects/ PHAEDRUS	C/Various	Multiple : Multiple	-	4.100		-		-		-		-	0.000	4.100	-
Subtotal			-	4.100		-		-		-		-	0.000	4.100	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CYBER PLATFORM/ WEAPONS DEVELOPMENT	Various	TBD : TBD	60.159	11.619		11.982		10.016		22.400		32.416	Continuing	Continuing	Continuing
Subtotal			60.159	11.619		11.982		10.016		22.400		32.416	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			60.159	15.719		11.982		10.016		22.400		32.416	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI		Project (Number/Name) H13 / Information Dominance Center (IDC) - Tiara	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IP-Based Cyber Operations Platforms																												
Aerial/Ground-Based Cyber Operations Platforms																												
Remote Access Capabilities																												
Close Access Capabilities																												
Platform C2 and Visualization Capabilities																												
Testing and Evaluation Support of Cyberspace RDTE Capabilities																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / INTEL SPT TO FORCE XXI	Project (Number/Name) H13 / Information Dominance Center (IDC) - Tiara	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IP-Based Cyber Operations Platforms	1	2018	1	2020
Aerial/Ground-Based Cyber Operations Platforms	1	2018	1	2020
Remote Access Capabilities	1	2018	1	2020
Close Access Capabilities	1	2018	1	2020
Platform C2 and Visualization Capabilities	1	2018	1	2020
Testing and Evaluation Support of Cyberspace RDTE Capabilities	1	2018	1	2020

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	36.892	132.438	68.533	-	68.533	54.714	24.486	23.236	22.267	0.000	362.566
491: Information Assurance Development	-	7.145	10.194	10.172	-	10.172	10.668	11.317	10.104	10.245	0.000	69.845
DV4: Key Management Infrastructure (KMI)	-	4.518	4.696	2.702	-	2.702	3.265	3.543	3.415	0.000	0.000	22.139
DV5: Crypto Modernization (Crypto Mod)	-	20.820	27.047	25.831	-	25.831	24.824	8.580	8.646	10.936	0.000	126.684
ET9: Embedded Crypto Modernization (CRYPTO MOD)	-	4.409	88.949	28.857	-	28.857	14.974	0.000	0.000	0.000	0.000	137.189
FF8: Unit Activity Monitoring (UAM)	-	0.000	1.552	0.971	-	0.971	0.983	1.046	1.071	1.086	0.000	6.709

A. Mission Description and Budget Item Justification

Information Assurance Development supports the implementation of the National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army by providing COMSEC system capabilities through encryption, trusted software or standard operating procedures, and integrating these mechanisms into specific systems in support of securing the Army Tactical and Enterprise Networks. This entails architecture studies, system integration and testing, developing installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates Cyber Security (CS)/COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camp and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan.

Information Assurance Development funding implements and establishes functional and technical boundaries of cryptographic, key management and Information Assurance (IA) capabilities in coordination with the NSA, the Defense Information Systems Agency (DISA), and Joint Services, to secure National Security Systems (NSS), and National Security Information (NSI). Technical evaluations assess the security, operational effectiveness and network interoperability of advanced concept technologies to develop policies, standards, and fundamental building blocks for Army COMSEC capabilities that reduce the risk of future material solutions that could underperform and disrupt classified operations. Develop and publish the COMSEC Implementation Planning Guidance to identify, standardize, and govern the insertion of CS capabilities to bridge operational gaps and support the Department of Defense (DoD) and NSA mandated requirements to enhance network capacity while providing for secure information exchange of voice, video, and data in accordance with the Army Network Campaign Plan. This will be accomplished by interoperability evaluation, standards testing, and CS, System of System Network Vulnerability Assessments (SoS NVA) for Army Capability Sets for CS/COMSEC capabilities that provide protections for tactical and fixed infrastructure post, camp, and station networks.

The Defensive Cyberspace Operations (DCO) program provides initial capabilities that enable passive and active cyberspace defense operations to preserve friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems. Big Data Pilot provides an advanced analytics capability

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0303140A I Communications Security (COMSEC) Equipment
capable of ingesting structured, semi-structured, and unstructured data from multiple data sources (e.g., Joint Regional Security Stacks (JRSS), intrusion detection systems, intrusion prevention systems, network device log files, trouble tickets, firewalls, proxies, web and applications server log files, etc) and proves situational awareness of cyberspace battlefield. It provides the computer network defense provider with common analytic platform which informs and reduces risk associated with future material solutions and forms a blueprint for future Big Data Analytics. Big Data (analysis-of-all DoD Information Network sensor data) provides two optimized and accredited clusters deployed in support of JRSS and Defense Research and Engineering Network (DREN) with a tools suite accessible to Cyber Mission Forces via secure remote access. The Army's DCO activities are a construct of active cyberspace defenses which provide synchronized, real-time capability to discover, detect, analyze, and mitigate threats to and vulnerability of DoD networks and systems. The Army Key Management Infrastructure (AKMI) is the Army's implementation of the NSA KMI ACAT IAM program, automating the functions of COMSEC electronic key management, control, planning, and distribution. AKMI supports the Army's ability to communicate and distribute Cryptographic data on the Army's tactical and strategic networks by limiting adversarial access to, and reducing the vulnerability of, Army Command, Control, Communications, Computers, Intelligence (C4I) systems. The AKMI System of Systems (SoS) systems components are the Management Client (MGC), Automated Communications Engineering Software (ACES) and Next Generation Load Device Family of fill devices. The NSA Key Management Infrastructure (KMI) Program replaced NSA EKMS program. AKMI has replaced Army Key Management System. The transition from AKMS to AKMI started in FY12. The AKMS System of Systems (SoS) systems components are the Local COMSEC Management Software (LCMS), Automated Communications Engineering Software (ACES) and Simple Key Loader (SKL). The Army COMSEC program supports using NSA developed COMSEC technologies within the Army providing encryption, trusted software, or standard operating procedures, and integrating these mechanisms into specified systems in support of securing the Army network (which is made up of tactical and enterprise networks). This entails architecture studies, system integration and testing, developing installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates emerging COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camp, and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan. Embedded Cryptographic Modernization Initiative (ECMI) is an upgrade activity that will ensure Army radios remain secure by operating with modern cryptographic algorithms. Tactical radios using legacy embedded cryptographic systems will no longer be able to communicate securely after cease key dates documented in the Chairman of the Joint Chiefs Staff instruction (CJCSI) 6510. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army tactical radios are required to support modern cryptographic capabilities by implementing modern algorithms. If cease key dates are not met, the Army will be forced to communicate at risk. User activity monitoring (UAM) automation/analytics will provide technical capability to enhance Army UAM analysis effectiveness and efficiency. The UAM mission is to observe and record the actions and activities of an individual, at any time, on any device accessing Army information on classified networks in order to detect insider threats and to support authorized investigations. Army UAM is a component of the Army Insider Threat (InT) Program. Army's InT Program and UAM are conducted in accordance with the National Defense Authorization Act for Fiscal Year 2012, section 922., Insider Threat Detection; Presidential Memorandum, National Insider Threat Policy and Minimum Standards for Executive Branch Insider Threat Programs, dated 21 November 2012; Executive Order 13587, Structural Reforms to Improve the Security of Classified Networks and the Responsible Sharing and Safeguarding of Classified Information, (Reference b) dated 7 October 2011, and Army Directive 2013-18 (Army Insider Threat Program), 31 July 2013. Innovative enhancements are required to improve UAM analysis productivity, data visualization, and workflow		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development		PE 0303140A I Communications Security (COMSEC) Equipment				
management. The analysis productivity objective is to develop and implement user behavior models that use UAM and other network data to identify anomalous user behavior over time, and to integrated new data sources into the UAM analytical data store and processing system. Data visualization advances will present UAM analysts behavior model processing results in an intuitive format that reduce the time required to review the results. Workflow management improvements will add new capabilities to the UAM workflow management system with the objective of enhancing analysis reporting productivity and metrics collection.						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		38.280	132.438	90.008	-	90.008
Current President's Budget		36.892	132.438	68.533	-	68.533
Total Adjustments		-1.388	0.000	-21.475	-	-21.475
• Congressional General Reductions		-0.017	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-1.371	-			
• Adjustments to Budget Years		-	-	-21.475	-	-21.475
Change Summary Explanation						
FY 2017 decrease of \$1.388 million for FFRDC and SBIR/STTR adjustments.						
FY 2019 decrease of \$21.475 million based on requirement adjustments.						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) 491 / Information Assurance Development			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
491: Information Assurance Development	-	7.145	10.194	10.172	-	10.172	10.668	11.317	10.104	10.245	0.000	69.845
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 0303140A, project 491 includes funding for the Army CIO/G6, Project Lead (PL) Network Enablers (Net E), and Project Lead (PL) Enterprise Services (ES).

A. Mission Description and Budget Item Justification

This program supports the implementation of National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army by providing COMSEC system capabilities through encryption, trusted software, or standard operating procedures; integrating these mechanisms into specified systems in support of securing the Army Tactical and Enterprise Network.

This entails architecture studies, system integration and testing, developing, installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates Cyber Security (CS)/COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camps and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization Strategy Plan.

Implement, establish functional and technical boundaries of cryptographic, key management and Information Assurance (IA) capabilities In Coordination With (ICW) the NSA, the Defense Information Systems Agency (DISA), and Joint Services, to secure National Security Systems (NSS), and National Security Information (NSI). Technical evaluations assess the security, operational effectiveness and network interoperability of advanced concept technologies to develop policies, standards, and fundamental building blocks for Army COMSEC capabilities that reduce the risk of future materiel solutions that could underperform and disrupt classified operations.

Develop and publish the COMSEC Implementation Planning Guidance to identify, standardize, and govern the insertion of IA capabilities that will bridge operational gaps and support the DoD and NSA mandated requirements to enhance network capacity while providing secure information exchange of voice, video, and data IAW the Army Network Campaign Plan. This will be accomplished by interoperability evaluation, standards testing, and CS System of System Network Vulnerability Assessments (SoS NVA) Army Capability Sets for CS/COMSEC capabilities that provide protections for the tactical and fixed infrastructure post, camps, and station networks.

The Defensive Cyberspace Operations (DCO) program provides initial capabilities that enable passive and active cyberspace defense operations to preserve friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems. Big Data Pilot provides an advanced analytics capability capable of ingesting structured, semi-structured, and unstructured data from multiple data sources (e.g., Joint Regional Security Stacks (JRSS), intrusion detection systems, intrusion prevention systems, network device log files, trouble tickets, firewalls, proxies, web and applications server log files, etc) and provides situational awareness of the cyberspace battlefield. It provides the computer network defense provider with a common analytic platform which informs and reduces risk associated with future materiel solutions and forms a blueprint for future Big Data Analytics. Big Data (analysis-of-all DoD Information Network sensor data) provides two optimized

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018				
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment	Project (Number/Name) 491 / Information Assurance Development				
and accredited clusters deployed in support of JRSS and Defense Research and Engineering Network (DREN) with a tools suite accessible to Cyber Mission Forces via secure remote access. The Army's DCO activities are a construct of active cyberspace defenses which provide synchronized, real-time capability to discover, detect, analyze, and mitigate threats to and vulnerability of DoD networks and systems.							
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Assessing emerging COMSEC hardware and software systems and products (PL Net E) Description: Conduct research and analyses as well as basic testing for meeting specific focused goals that will enhance the functions and support of cryptographic systems improving the security and usability of the Army tactical and enterprise networks. (PL Net E) FY 2018 Plans: As the Army implements new network technology, Secure Voice (SV) and In-line Network Encryption (INE) devices must continue to be identified and tested for effectiveness and suitability. Key areas of investigation include cyber security, interoperability, and standards compliance. (PL Net E) FY 2018 to FY 2019 Increase/Decrease Statement: No funding allocated in FY19 and outyears			1.170	1.466	-	-	-
Title: Oversight and implementation guidance of emerging Cryptographic and CS capabilities to ensure interoperability to maintain compliance with DoD, NSA, and Army policies and regulations. (CIO/G6) Description: The program provides oversight and guidance for technical research and evaluation of Cryptographic Modernization (CM) and Key Management (KM) capabilities to ensure IA compliance and interoperability. This effort improves operational effectiveness, ensures efficient implementation, and enhances network performance by deploying standardized COMSEC capabilities that are interoperable and supportable in Army, coalition and Joint operating environments. This program enables the Army to collaborate and participate in Joint and Army Capability Technology Demonstrations to define, improve, develop and publish Cyber Security (CS) standards for new/modernized technology insertion to support the LWN 2025 and Beyond. This effort assesses and defines risk mitigation of CS network vulnerabilities in end-to-end Army network operations and Common Operating Environment. (CIO/G6) FY 2018 Plans: Oversee execution of the Army's COMSEC Modernization initiative by identifying and developing new security baseline for implementation of Army CM and KM initiatives. Assess, review and validate Army operational needs. Test and evaluate CM and KM technologies to determine the maturity and viability for Army use to protect and strengthen the Network posture. Identify fundamental building blocks for IA solutions, perform risk			5.975	8.728	10.172	-	10.172

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>				Project (Number/Name) 491 / <i>Information Assurance Development</i>				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
reduction testing of commercial products prior to insertion into Army for use to increase operational availability with documented operational value and rapid integration. Collaborate with the NSA, DoD and Joint Staff to define new ACC standards (security and interoperability) for the tactical and operational environment. Provide continuous test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Participate in operational assessment of NSA, DoD, Joint Staff and Service led Joint Capability Technology Demonstrations to align new technologies to documented Army and Service capability gaps for protecting National Security Systems and National Information. Develop strategies and policies that leverage emerging cryptographic and key management tools and services. (CIO/G6)											
FY 2019 Base Plans: Oversee executions of the Army's COMSEC Modernization initiatives. Identify and develop new security baseline for Army implementation in the areas of CM and KM. Develop end-to-end, tactical-to-strategic COMSEC standardization to meet Army?s operational needs and requirements. Test and evaluate CM and KM technologies to determine the maturity and viability for Army use to protect and strengthen the Army Network posture. Document new fundamental building blocks for IA solutions, perform risk reduction testing of commercial products prior to insertion into Army for use to increase operational availability with documented operational value and rapid integration. Collaborate with the NSA, DoD and Joint Staff to continue to define the second phase of ACC standards (security and interoperability) for the tactical and operational environment. Provide timely test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Participate in operational assessment of NSA, DoD, Joint Staff and Service led Joint Capability Technology Demonstrations to align new technologies to documented Army and Service capability gaps and requirements for protecting National Security Systems and National Security Information. Develop strategies and policies to posture Army?s operations to implement innovative cryptographic and key management tools and services.											
FY 2018 to FY 2019 Increase/Decrease Statement: Economic adjustment.											
Accomplishments/Planned Programs Subtotals							7.145	10.194	10.172	-	10.172
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• DV5: <i>Crypto Modernization</i>	20.820	27.047	25.831	-	25.831	24.824	8.580	8.646	10.936	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) 491 / Information Assurance Development			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• ET9: Embedded Crypto Modernization	4.409	88.949	28.857	-	28.857	14.974	-	-	-	0.000	137.189
• B96002: Cryptographic Systems	66.692	49.441	49.107	0.003	49.110	104.421	106.898	103.106	109.001	Continuing	Continuing
• B96006: Embedded Cryptographic Modernization	3.014	-	3.520	-	3.520	97.959	157.904	48.382	5.013	Continuing	Continuing
• BS9716: NON PEO-SPARES	2.545	3.135	3.131	-	3.131	4.857	4.901	4.939	4.940	Continuing	Continuing
Remarks											
Line Item and Title: DV5 - Crypto Modernization - RDTE ET9 - Embedded Crypto Modernization - RDTE B96002 - Cryptographic Systems - OPA2 B96006 - Embedded Cryptographic Modernization - OPA2 BS9716 - NON PEO-SPARES - OPA4											
D. Acquisition Strategy											
The objective of the Cryptographic Systems program is to provide adaptive, flexible, and programmable cryptographic solutions using best practices, lessons learned and programmatic management to meet the challenge of modernizing the Army's aging cryptographic systems. Associated documents include CDD, approved by CIO/ G6, 15 Jul 10; ICD, approved by JROC, 25 Mar 11; AAO; approved by G3, 15 Dec 11 and revised and approved, 19 Jun 15.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>				Project (Number/Name) 491 / <i>Information Assurance Development</i>					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering (PL Net E)	SS/LH	CECOM RDEC : CECOM RDEC APG, MD	79.147	1.170		1.466		-		-		-	0.000	81.783	-
Big Data Pilot (PL ES-CYBER)	TBD	TBD : FT BELVOIR, VA	9.725	-		-		-		-		-	0.000	9.725	-
Information Assurance System Engineering Support (PL Net E)	C/FFP	DSCI Consulting : APG, MD	7.106	-		-		-		-		-	0.000	7.106	-
Engineering Support (PL Net E)	C/CPFF	CACI : APG, MD	5.018	-		-		-		-		-	0.000	5.018	-
Engineering Support (PL Net E)	C/CPFF	Booz Allen Hamilton : APG, MD	3.408	-		-		-		-		-	0.000	3.408	-
Engineering Support (PL Net E)	C/FP	CSC : APG, MD	16.448	-		-		-		-		-	0.000	16.448	-
Subtotal			120.852	1.170		1.466		-		-		-	0.000	123.488	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support (PL Net E)	C/CPFF	TBD : TBD	1.598	-		-		-		-		-	0.000	1.598	-
Engineering Support (CIO/G-6)	C/FP	CACI : APG, MD	5.124	1.309		2.196		2.496		-		2.496	Continuing	Continuing	-
System Engineering (CIO/G-6)	SS/LH	CECOM RDEC : APG, MD	3.771	1.086		1.496		2.196		-		2.196	Continuing	Continuing	-
Engineering Support (CIO/G-6)	C/CPFF	Booz Allen Hamilton : APG, MD	6.188	1.261		1.737		1.897		-		1.897	Continuing	Continuing	-
Engineering Support (CIO/G-6)	C/FFP	AASKI : Edgewood, MD	2.111	1.316		1.813		2.372		-		2.372	Continuing	Continuing	-
Service (CIO-G-6)	SS/LH	ARL/SLAD : White Sand Missile Range (WSMR)	4.969	1.003		1.486		1.211		-		1.211	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>				Project (Number/Name) 491 / <i>Information Assurance Development</i>				

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			23.761	5.975		8.728		10.172		-		10.172	Continuing	Continuing	N/A

Remarks Not Applicable															

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	144.613	7.145		10.194		10.172		-		10.172	Continuing	Continuing	N/A

Remarks													

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>	Project (Number/Name) 491 / <i>Information Assurance Development</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
TEST OF INE AND WIRELESS SOLUTION (PL Net E)																												
TECHNOLOGY TEST & EVALUATION (CIO/G6)																												
DEFINE SECURITY & INTEROPERABILITY STANDARDS (CIO/G6)																												
COMSEC STRATEGY & CRYPTO TECHNOLOGY ROADMAP (CIO/G6)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>	Project (Number/Name) 491 / <i>Information Assurance Development</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TEST & EVALUATION OF CRYPTOGRAPHIC SYSTEMS (PL Net E)	1	2014	4	2014
STUDY OF CURRENT AND EMERGING CRYPTO ALGORITHMS AND TECHNOLOGIES (PL Net E)	1	2015	2	2015
TEST OF INE AND WIRELESS SOLUTION (PL Net E)	1	2016	4	2018
BIG DATA PILOT (PD ES-CYBER)	1	2016	4	2016
TECHNOLOGY TEST & EVALUATION (CIO/G6)	1	2017	4	2023
DEFINE SECURITY & INTEROPERABILITY STANDARDS (CIO/G6)	1	2017	4	2023
COMSEC STRATEGY & CRYPTO TECHNOLOGY ROADMAP (CIO/G6)	1	2014	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) DV4 / Key Management Infrastructure (KMI)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DV4: Key Management Infrastructure (KMI)	-	4.518	4.696	2.702	-	2.702	3.265	3.543	3.415	0.000	0.000	22.139
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Key Management Infrastructure (KMI) funding line DV4 was established in FY2014. Army Key Management System (AKMS) funding line 501 realigned to KMI funding line DV4 in FY2017. AKMI supports infrastructure requirements in support of Key Management.

A. Mission Description and Budget Item Justification

The Army Key Management Infrastructure (AKMI) is the Army's implementation of the National Security Agency's (NSA) Key Management Infrastructure (KMI) ACAT IAM program. AKMI supports Department of Defense (DoD) Global Information Grid (GIG) Net Centric and Cryptographic Modernization Initiatives (CMI) and supports emerging requirements transitioned from the Army Key Management System (AKMS). AKMI automates the functions of Communications Security (COMSEC) electronic key management, control, planning, and distribution. AKMI supports the Army's ability to communicate and distribute data on the Army's tactical and strategic networks by limiting adversarial access to, and reducing the vulnerability of, Army Command, Control, Communications, Computers, Intelligence (C4I) systems.

The AKMI Program includes the Management Clients (MGC) nodes, Automated Communications Engineering Software (ACES) and Next Generation Load Device (NGLD) Family of devices to include the NGLD Small and Medium. AKMI provides an integrated, operational environment that brings essential key management functions in-band. Objective AKMI will leverage NSA KMI program to provide secure software provisioning, will support legacy and modern End Crypto Units (ECU)s, simplifies all aspects of key provisioning and ECU management with traceability to individuals, expands operations to DoD unclassified networks, North Atlantic Treaty Organization (NATO) and Coalition users, automates manual business processes to increase Soldier efficiency, transforms key delivery from manual to an automate enterprise service and will provide an Over the Network Keying (OTNK) capability to support CMI.

One of the major enhancement in the AKMI architecture is the ability to leverage the various capabilities and services from NSA KMI. The end state for the Army is to leverage AKMI capabilities (OTNK, Mission Plan/Mission Support System (MP/MSS), Delivery Only Client (DOC), Client Host Only (CHO)) to increase automation, reduce soldier oversight, manage, and deliver key products to the tactical edge up through strategic ECU's. The objective AKMI capabilities will be found in all of the products across the AKMI product line to include MGC, ACES and NGLD family of fill devices. NGLD family will be an enduring solution to bridge the gap until legacy ECUs are fully modernized.

The NGLD Medium is reliant on the Reprogrammable Single Chip Universal Encryptor (RESCUE), a new KMI compliant cryptographic engine that is currently being developed. The KOV-21 card currently used in Army Simple Key Loader (SKL) fill devices has hardware obsolescence issues and does not support OTNK. Redesign and developmental efforts using modern and readily available components for use in the Army's SKL devices have been initiated under the RESCUE program. The current KOV-21 card is referred to as the KOV-21 Replacement and is an extension of the RESCUE program as a technology insertion. The follow-on RESCUE technology development will start in FY2018.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>		Project (Number/Name) DV4 / <i>Key Management Infrastructure (KMI)</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Key Management Infrastructure (KMI) Awareness (RESCUE / KOV-21 Replacement Effort) Description: KMI Awareness initiative creates a secure, highly automated interface in providing future Over the Network Keying (OTNK) capability to legacy End Crypto Units (ECU)s. This initiative will allow ECUs to receive, authenticate, and decrypt OTNK messages and increases WarFighter survivability by minimizing the need for Soldiers to travel to obtain keys. The KOV 21 card, previously in production through NSA for use in the Simple Key Loader (SKL) and the Secure DTD 2000 System (SDS), is nearing the end of life due to unavailability of parts. Redesigning and developmental efforts using modern and readily available components for use in the Army's SKL and Next Generation Load Devices (NGLDs) are currently underway. The redesign of the current KOV 21 card is referred to as the KOV 21 Replacement and is an extension of the KOV 21 card as a technology insertion. The KOV 21 Replacement will also address requirements codified in the NGLD CPD and the AKMI CPD that were technologically unachievable with the KOV 21 card. FY 2018 Plans: The RESCUE technology development will complete in FY2018. RESCUE development will provide the ability to upgrade legacy ECUs, enabling a KMI aware fully developed PDE-enabled ECU fleet. The KOV-21 Replacement effort lays the foundation for AKMI capabilities that can be inserted into the SKL to make it an NGLD Medium. FY 2019 Base Plans: The follow-on RESCUE technology will continue in FY2019. FY 2018 to FY 2019 Increase/Decrease Statement: The follow-on RESCUE technology will continue in FY2019.	4.518	4.696	2.702	-	2.702
Accomplishments/Planned Programs Subtotals	4.518	4.696	2.702	-	2.702

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• B96004: Key Management Infrastructure	63.578	58.363	35.710	-	35.710	97.061	99.098	89.919	115.498	Continuing	Continuing
• 432140: ISSP (TSEC-AKMS)	7.966	8.319	8.682	-	8.682	3.950	4.048	4.124	4.194	Continuing	Continuing
Remarks											
Line Item & Title:											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>	Project (Number/Name) DV4 / <i>Key Management Infrastructure (KMI)</i>	

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
B96004: Key Management Infrastructure (OPA2)											
432140: ISSP (TSEC-AKMS) (OMA)											

D. Acquisition Strategy

Army Key Management Infrastructure (AKMI) is a Non Program of Record (POR) under Project Lead Network Enablers (PL Net E). AKMI is the Army's implementation of the National Security Agency (NSA) Key Management Infrastructure (KMI) ACAT IAM Program of Record. The AKMI will allow the Army to manage, control, plan, and distribute electronic key for the ~1.5M End Cryptographic Units (ECU)s necessary to communicate and distribute data on the Army's tactical and strategic networks.

AKMI initial Army Acquisition Program Baseline (APB) was approved 2QFY12. The AKMI Program will include the Management Clients (MGC) nodes, Automated Communications Engineering Software (ACES) and Next Generation Load Device (NGLD) Family. Each component of the AKMI Program is in a different phase of the acquisition cycle.

The NSA KMI Program is replacing the NSA Electronic Key Management System (EKMS) program. As the DoD Key Management Lead, NSA is dictating the change from EKMS to KMI by a sunset date of December 2017. Components of the AKMI Program will be retained and adapted from the legacy AKMS program while others will be developed and fielded to meet AKMI requirements.

The NGLD family of devices will become the primary Army fill devices and Tier 3 component of the AKMI Program. The NGLD Capability Production Document (CPD) was signed 4QFY13. The NGLD CPD calls for a family of 2 devices (small and medium) to meet the AKMI requirements. The AKMI program has partnered with RDECOM CERDEC to develop a KMI compliant cryptographic engine, the Reprogrammable Single Chip Universal Encryptor (RESCUE). The Army will gain the NGLD Medium capability through the SKL v3.1 in combination with a new KMI compliant cryptographic engine, the RESCUE, the first iteration of the RESCUE being the KOV-21 Replacement. The redesign of the current SKL cryptographic engine, the KOV-21 card, is required due to parts obsolescence and inability to be KMI Aware. The KOV-21 Replacement is an extension of the RESCUE program as a technology insertion into the SKL v3.1 which in turn meets the NGLD Medium CPD requirements. The NGLD Medium will be available in FY19. The follow-on RESCUE technology development will start in FY2019.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) DV4 / Key Management Infrastructure (KMI)					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
KMI Awareness (RESCUE / KOV-21 Replacement Effort)	C/CPFF	Dynamics Research Corporation/Engility : APG, MD	4.011	4.518	Jul 2017	4.696	Jul 2018	-		-		-	Continuing	Continuing	Continuing
KMI Awareness	C/CPFF	CERDEC, S&TCD : APG, MD	1.451	-		-		-		-		-	0.000	1.451	-
RESCUE Embedment	C/TBD	CERDEC STCD : APG, MD	-	-		-		2.702	Dec 2018	-		2.702	Continuing	Continuing	Continuing
Subtotal			5.462	4.518		4.696		2.702		-		2.702	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			5.462	4.518		4.696		2.702		-		2.702	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment		Project (Number/Name) DV4 / Key Management Infrastructure (KMI)	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
KMI AWARENESS (RESCUE / KOV-21 REPLACEMENT EFFORT)																												
RESCUE																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment	Project (Number/Name) DV4 / Key Management Infrastructure (KMI)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
KMI AWARENESS (RESCUE / KOV-21 REPLACEMENT EFFORT)	4	2015	3	2018
RESCUE	1	2019	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) DV5 / Crypto Modernization (Crypto Mod)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DV5: Crypto Modernization (Crypto Mod)	-	20.820	27.047	25.831	-	25.831	24.824	8.580	8.646	10.936	0.000	126.684
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

DV5 - The Crypto Modernization line was established in Sept 2012.

A. Mission Description and Budget Item Justification

This program supports using National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army providing encryption, trusted software, or standard operating procedures, and integrating these mechanisms into specified systems in support of securing the Army Tactical and Enterprise Networks.

This entails architecture studies, system integration and testing, developing installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates emerging Information Assurance (IA)/COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camp, and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan.

The Embedded Cryptographic Modernization Initiative (ECMI) is designed to investigate Courses Of Action, conduct a Material Solution Analysis, and execute upgrade activities to ensure all enduring Army communications and data equipment that employ embedded cryptographic hardware will utilize modern cryptographic algorithms and keys.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: VINSON/ANDVT (Advanced Narrowband Digital Voice Terminal) Cryptograph Modernization (VACM) program	0.919	0.600	1.059	-	1.059
Description: This program researches, assesses, tests, plans and works to integrate VACM products for the Army. The VACM program is a NSA mandated program established to replace legacy external cryptographic devices such as the KY-57, KY-99A, KY-58, KY-100 and CV- 3591 / KYV-5. In order to ensure the confidentiality, integrity and availability of classified communications, the cryptographic modules must be tested for interoperability and form fit to ensure a successful fielding. Each software release will require testing to insure comparability and interoperability.					
FY 2018 Plans:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment		Project (Number/Name) DV5 / Crypto Modernization (Crypto Mod)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The program will continue to test and evaluate engineering changes to Full Rate Production (FRP) of VACM devices to confirm continued capability and interoperability on Army networks and tactical systems as well as identifying new risk areas for compliance with COMSEC regulations and procedures. The program will begin fielding, performing site surveys and installing at both CONUS and OCONUS locations. FY 2019 Base Plans: The program will continue to test and evaluate any engineering changes to Full Rate Production (FRP) of VACM devices to confirm continued capability and interoperability on Army networks and tactical systems as well as identifying new risk areas for compliance with COMSEC regulations and procedures. The program will continue fielding, performing site surveys and installing at both CONUS and OCONUS locations. FY 2018 to FY 2019 Increase/Decrease Statement: Additional test and evaluation required for FRP VACM Devices.						
Title: Cryptographic Systems Test and Evaluation Description: This program supports the Army Cryptographic Modernization Transformational Initiative. This is accomplished by providing test and evaluation capabilities to the COMSEC community in order to assess emerging technologies before being released and approved for Army use; testing will be performed on hardware, software and network systems. FY 2018 Plans: The program continues testing and evaluation of COMSEC devices to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures. The program will test and evaluate Crypto Systems compliant devices, Suite B IPsec devices built on commercial standards, CHVP, CSfC- Guidance, and new software releases to HAIPE 4.X devices in accordance with AR 700-142 Rapid Action Revision dated October 16, 2008. The program tests interoperability and provides ways to insert data at rest (DAR) and data in transit (DIT) technology within the existing and future network infrastructure. Additionally, this program evaluates performance of technologies and provides direction to ensure the lowest impact on performance while providing the greatest protection from loss of sensitive data. FY 2019 Base Plans: The program continues testing and evaluation of COMSEC devices to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures. The program will test and evaluate Crypto Systems compliant devices, Suite B IPsec devices built on commercial standards, CHVP, CSfC Guidance, and new software releases to HAIPE 4.X devices in		4.303	5.450	5.938	-	5.938

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment		Project (Number/Name) DV5 / Crypto Modernization (Crypto Mod)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
accordance with AR 700-142 Rapid Action Revision dated October 16, 2008. The program tests interoperability and provides ways to insert data at rest (DAR) and data in transit (DIT) technology within the existing and future network infrastructure. Additionally, this program evaluates performance of technologies and provides direction to ensure the lowest impact on performance while providing the greatest protection from loss of sensitive data. FY 2018 to FY 2019 Increase/Decrease Statement: Increase in CTR support.						
Title: High Assurance Internet Protocol Encryption (HAIZE) extension manager Description: A management tool to configure the new extensions to the HAIZE standard and process the resulting data to provide early indications of cyber attacks. FY 2018 Plans: Continue software development efforts that will provide configuration and management of the HAIZE extensions and the user interface for collecting and analyzing the data that results from implementation of these HAIZE extensions. This will facilitate the upgrade of the Army HAIZES to include new cyber-sensor functionality for the tactical cyber cell. FY 2019 Base Plans: Continue software development efforts that will provide configuration and management of the HAIZE extensions and the user interface for collecting and analyzing the data that results from implementation of these HAIZE extensions. This will facilitate the upgrade of the Army HAIZES to include new cyber sensor functionality for the tactical cell. FY 2018 to FY 2019 Increase/Decrease Statement: Decrease in Matrix and SETA manpower costs.		1.095	1.748	0.946	-	0.946
Title: Embedded Cryptographic Modernization Initiative (ECMI) Description: The ECMI is an upgrade activity that will ensure enduring Army radios remain secure by operating with modern cryptographic algorithms and keys. Funding secured in DV5 line to support ECMI Non Recurring Engineering (NRE) efforts to comply with cease key dates mandated by CJCSI 6510. FY 2018 Plans: Continue execution of NRE efforts to develop, design, test/evaluate, and certify cryptographic hardware and software embedded in tactical radios to ensure these radios remain secure. System engineering activities		14.503	19.249	17.888	-	17.888

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>				Project (Number/Name) DV5 / <i>Crypto Modernization (Crypto Mod)</i>				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
including detailed requirements decomposition, functional allocation, design of modern reprogrammable cryptographic modules, and detailed hardware design and software coding. FY 2019 Base Plans: Continue execution of NRE efforts to develop, design, test/evaluate, and certify cryptographic hardware and software embedded in tactical radios to ensure these radios remain secure. System engineering activities including detailed requirements decomposition, functional allocation, design of modern reprogrammable cryptographic modules, and detailed hardware design and software coding. FY 2018 to FY 2019 Increase/Decrease Statement: ECMI R&D efforts will be entering the final stages in FY19 and beyond. Future efforts will be funded using OPA dollars.												
Accomplishments/Planned Programs Subtotals								20.820	27.047	25.831	-	25.831
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• 491: <i>Information Assurance Development</i>	7.145	10.194	10.172	-	10.172	10.668	11.317	10.104	10.245	Continuing	Continuing	
• ET9: <i>Embedded Crypto Modernization</i>	4.409	88.949	28.857	-	28.857	14.974	-	-	-	0.000	137.189	
• B96002: <i>Cryptographic Systems</i>	66.692	49.441	49.107	0.003	49.110	104.421	106.898	103.106	109.001	Continuing	Continuing	
• B96006: <i>Embedded Cryptographic Modernization</i>	3.014	-	3.520	-	3.520	97.959	157.904	48.382	5.013	Continuing	Continuing	
• BS9716: <i>NON PEO-SPARES</i>	2.545	3.135	3.131	-	3.131	4.857	4.901	4.939	4.940	Continuing	Continuing	
Remarks												
Line Item & Title: 491 - Information Assurance Development - RDTE - funding executed by PL Net E, CIO/G6 and PL ES-CYBER ET9 - Embedded Crypto Modernization - RDTE B96002 - Cryptographic Systems - OPA2 B96006 - Embedded Cryptographic Modernization - OPA2												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) DV5 / Crypto Modernization (Crypto Mod)			
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
BS9716 - NON PEO-SPARES - OPA4											
D. Acquisition Strategy											
The objective of this program is to integrate and validate hardware and software solutions to provide COMSEC superiority in order to protect against threats, increase battlefield survivability/lethality, and enable critical Mission Command activities. The objective of the Cryptographic Systems program is to provide adaptive, flexible, and programmable cryptographic systems using best practices, lessons learned and programmatic management to meet the challenge of modernizing the Army's aging cryptographic systems. The effort will support the network operations from end-to-end throughout the force and the Common Operating Environment (COE) thus mitigating networked vulnerabilities to Army information security systems. CDD, approved by CIO/G6, 15 Jul 10; ICD, approved by JROC, 25 Mar 11; AAO; approved by G3, 15 Dec 11 and revised and approved, 19 Jun 15.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) DV5 / Crypto Modernization (Crypto Mod)					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	SS/LH	CECOM RDEC : APG, MD	2.237	1.450		1.796		1.809		-		1.809	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	CACI : Aberdeen Maryland	3.583	1.297	Apr 2017	1.641		1.750	Apr 2019	-		1.750	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	Booz Allen Hamilton (BAH) : APG, MD	0.695	1.641	Sep 2016	1.996		2.034	Sep 2018	-		2.034	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	AASKI : Edgewood, Maryland	1.596	1.728	Sep 2016	1.982		1.959	Sep 2018	-		1.959	Continuing	Continuing	Continuing
Information Assurance System Engineering Support	C/CPFF	Envision : Aberdeen, Maryland	0.382	0.201	Jun 2016	0.383		0.391	Jun 2018	-		0.391	Continuing	Continuing	Continuing
Embedded Crypto Modernization Support	C/LH	TBD : TBD	5.230	14.503		19.249		17.888		-		17.888	Continuing	Continuing	Continuing
Subtotal			13.723	20.820		27.047		25.831		-		25.831	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			13.723	20.820		27.047		25.831		-		25.831	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>		Project (Number/Name) DV5 / <i>Crypto Modernization (Crypto Mod)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
VACM INTEROPERABILITY																												
TEST AND EVALUATION OF LINK/TRUNK ENCRYPTORS SW																												
TEST AND EVALUATION OF SECURE VOICE SW & HW																												
TEST AND EVALUATION OF INE SW & HW																												
HAPE EXTENSION MANAGER																												
ECMI DEVELOPMENT																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>	Project (Number/Name) DV5 / <i>Crypto Modernization (Crypto Mod)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
VACM INTEROPERABILITY	1	2016	4	2018
TEST AND EVALUATION OF LINK/TRUNK ENCRYPTORS SW	1	2016	4	2019
TEST AND EVALUATION OF SECURE VOICE SW & HW	4	2013	4	2023
TEST AND EVALUATION OF INE SW & HW	1	2017	4	2023
HAIPE EXTENSION MANAGER	1	2017	4	2022
ECMI DEVELOPMENT	1	2017	4	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) ET9 / Embedded Crypto Modernization (CRYPTO MOD)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ET9: Embedded Crypto Modernization (CRYPTO MOD)	-	4.409	88.949	28.857	-	28.857	14.974	0.000	0.000	0.000	0.000	137.189
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
ET9 - The Embedded Crypto Modernization Initiative (ECMI) line was established in July 2015

A. Mission Description and Budget Item Justification

Embedded Cryptographic Modernization Initiative (ECMI) is an upgrade activity that will ensure Army radios remain secure by operating with modern cryptographic algorithms. Tactical radios using legacy embedded cryptographic systems will no longer be able to communicate securely after cease key dates documented in the Chairman of the Joint Chiefs Staff instruction (CJCSI) 6510. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army tactical radios are required to support modern cryptographic capabilities by implementing modern algorithms. If cease key dates are not met, the Army will be forced to communicate at risk.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Embedded Cryptographic Modernization Initiative (ECMI) Development Contracts	4.409	88.949	28.857	-	28.857
Description: ECMI Non Recurring Engineering (NRE) Contract Prep Work and Execution					
FY 2018 Plans: Support NRE development of ECMI efforts for vendor developmental and production contracts which supports NSA mandated Cease Key Date IAW CJCSI 6510.02E. This capability will ensure Army tactical radios operate with the latest cryptographic solutions.					
FY 2019 Base Plans: Support NRE development of ECMI efforts for vendor developmental and production contracts which supports NSA mandated Cease Key Date IAW CJCSI 6510.02E. This capability will ensure Army tactical radios operate with the latest cryptographic solutions.					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding in FY19 was realigned by HQDA in order to fund other priority requirements.					
Accomplishments/Planned Programs Subtotals	4.409	88.949	28.857	-	28.857

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment			Project (Number/Name) ET9 / Embedded Crypto Modernization (CRYPTO MOD)				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 491: Information Assurance Development	7.145	10.194	10.172	-	10.172	10.668	11.317	10.104	10.245	Continuing	Continuing
• DV5: Crypto Modernization	20.820	27.047	25.831	-	25.831	24.824	8.580	8.646	10.936	Continuing	Continuing
• B96002: Cryptographic Systems	66.692	49.441	49.107	0.003	49.110	104.421	106.898	103.106	109.001	Continuing	Continuing
• B96006: Embedded Cryptographic Modernization	3.014	-	3.520	-	3.520	97.959	157.904	48.382	5.013	Continuing	Continuing
• BS9716: NON PEO-SPARES	2.545	3.135	3.131	-	3.131	4.857	4.901	4.939	4.940	Continuing	Continuing
Remarks											
Line Item & Title: 491 - Information Assurance Development - RDTE - funding executed by PL Net E, CIO/G6 and PL ES-CYBER DV5 - Crypto Modernization - RDTE B96002 - Cryptographic Systems - OPA2 B96006 - Embedded Cryptographic Modernization - OPA2 BS9716 - NON PEO-SPARES - OPA4											
D. Acquisition Strategy											
The objective of the ECMI program is to provide adaptive, flexible, and programmable embedded cryptographic solutions using best practices, lessons learned and programmatic management to meet the challenge of modernizing the Army's aging cryptographic tactical radios. ECMI will design, develop, and execute upgrade activities to ensure non modernized Army tactical radios will be able to accept and utilize modern cryptographic algorithms.											
Applicable documents affecting Tactical Radio ONS, ORD, & CPDs requiring crypto: CDD for Cryptographic Equipment and Services Modernization, Increment 1, dated March 2010. CJCSI 6510.02E - "Cryptographic Modernization Planning", 01 April 2014. CNSSP-15 - "National Information Assurance Policy on the Use of Public Standards for the Secure Sharing of Information Among National Security Systems", 01 October 2012. NSA CSS 3-9 - "Cryptographic Modernization Initiative Requirements for Type 1 Cryptographic Products", dated 28 March 2013. Memorandum from Army Acquisition Executive with subject "Management and Procurement of Communications Security (COMSEC) Capability, dated 28 Feb 2012.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) ET9 / Embedded Crypto Modernization (CRYPTO MOD)					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PL NET E Program Mgmt Personnel	C/CPFF	TBD : Aberdeen, MD	-	2.663		4.968		1.612		-		1.612	Continuing	Continuing	Continuing
PM TR Program Mgmt Personnel	C/CPFF	BAH : Aberdeen, MD	-	1.424		-		-		-		-	Continuing	Continuing	Continuing
PM TR Program Mgmt Personnel	C/CPFF	TBD : Aberdeen, MD	-	0.322		-		-		-		-	Continuing	Continuing	Continuing
ECMI Development Contracts	C/CPFF	TBD : TBD	-	-		83.981		27.245		-		27.245	Continuing	Continuing	Continuing
Subtotal			-	4.409		88.949		28.857		-		28.857	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	4.409		88.949		28.857		-		28.857	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

[illegible]

2040 / 7

R-1 Program Element (Number/Name)

PE 0303140A / Communications Security
(COMSEC) Equipment

Project (Number/Name)	Start Date	End Date	Duration (Days)	Project Manager	Status	Notes
101	2023-01-01	2023-01-15	14	John Doe	Completed	Project completed successfully.
102	2023-01-16	2023-02-01	16	Jane Smith	In Progress	Project is currently in progress.
103	2023-02-02	2023-02-15	13	John Doe	Completed	Project completed successfully.
104	2023-02-16	2023-03-01	15	Jane Smith	In Progress	Project is currently in progress.
105	2023-03-02	2023-03-15	13	John Doe	Completed	Project completed successfully.
106	2023-03-16	2023-03-31	15	Jane Smith	In Progress	Project is currently in progress.
107	2023-04-01	2023-04-15	14	John Doe	Completed	Project completed successfully.
108	2023-04-16	2023-05-01	15	Jane Smith	In Progress	Project is currently in progress.
109	2023-05-02	2023-05-15	13	John Doe	Completed	Project completed successfully.
110	2023-05-16	2023-05-31	15	Jane Smith	In Progress	Project is currently in progress.

ET9 / Embedded Crypto Modernization
(CRYPTO MOD)[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>	Project (Number/Name) ET9 / <i>Embedded Crypto Modernization (CRYPTO MOD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ECMI DEVELOPMENT	1	2017	4	2020
ECMI DEVELOPMENT CONTRACT AWARDS	3	2018	4	2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) FF8 / Unit Activity Monitoring (UAM)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FF8: Unit Activity Monitoring (UAM)	-	0.000	1.552	0.971	-	0.971	0.983	1.046	1.071	1.086	0.000	6.709
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

User activity monitoring (UAM) automation/analytics will provide technical capability to enhance Army UAM analysis effectiveness and efficiency. The UAM mission is to observe and record the actions and activities of an individual, at any time, on any device accessing Army information on classified networks in order to detect insider threats and to support authorized investigations. Army UAM is a component of the Army Insider Threat (InT) Program. Army's InT Program and UAM are conducted in accordance with the National Defense Authorization Act for Fiscal Year 2012, section 922., Insider Threat Detection; Presidential Memorandum, National Insider Threat Policy and Minimum Standards for Executive Branch Insider Threat Programs, dated 21 November 2012; Executive Order 13587, Structural Reforms to Improve the Security of Classified Networks and the Responsible Sharing and Safeguarding of Classified Information, (Reference b) dated 7 October 2011, and Army Directive 2013-18 (Army Insider Threat Program), 31 July 2013. Innovative enhancements are required to improve UAM analysis productivity, data visualization, and workflow management. The analysis productivity objective is to develop and implement user behavior models that use UAM and other network data to identify anomalous user behavior over time, and to integrated new data sources into the UAM analytical data store and processing system. Data visualization advances will present UAM analysts behavior model processing results in an intuitive format that reduce the time required to review the results. Workflow management improvements will add new capabilities to the UAM workflow management system with the objective of enhancing analysis reporting productivity and metrics collection.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Unit Activity Monitoring	-	1.552	0.971	-	0.971
Description: FY 2019 Base funds in the total amount of \$.971 million are provided for software engineering development and testing resources to enhance the Army's UAM data processing, analysis, and data visualization capabilities, and its workflow management system, plus the integration of new data sources into the data processing component. All work is focused on the development of new capabilities.					
The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).					
FY 2018 Plans: Unit Activity Monitoring					
FY 2019 Base Plans: Unit Activity Monitoring					
FY 2018 to FY 2019 Increase/Decrease Statement:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>		Project (Number/Name) FF8 / <i>Unit Activity Monitoring (UAM)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018
				FY 2019 Base	FY 2019 OCO
				FY 2019 Total	
Requirement decrease from FY18 to FY19.					
Accomplishments/Planned Programs Subtotals				-	1.552
				0.971	-
				0.971	
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
FY 2019: The planned acquisition strategy to acquire UAM Automation/Analytics software engineering services is to award through the use of competitive acquisition, a Base plus three-option year firm-fixed price contract.					
FY 2019: The planned acquisition is to exercise next option year of the software engineering services contract.					
E. Performance Metrics					
N/A					

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment				Project (Number/Name) FF8 / Unit Activity Monitoring (UAM)					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Engineering Development	C/TBD	TBD : TBD	-	-		1.552	Jun 2018	0.971	Jun 2019	-		0.971	0.000	2.523	Continuing
Subtotal			-	-		1.552		0.971		-		0.971	0.000	2.523	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		1.552		0.971		-		0.971	0.000	2.523	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018					
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0303140A / <i>Communications Security (COMSEC) Equipment</i>								Project (Number/Name) FF8 / <i>Unit Activity Monitoring (UAM)</i>			

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Contract Award					1																							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / Communications Security (COMSEC) Equipment	Project (Number/Name) FF8 / Unit Activity Monitoring (UAM)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Contract Award	3	2018	3	2018

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	26.176	64.370	68.619	-	68.619	33.630	29.372	25.288	28.575	0.000	276.030
083: Global Combat Support Sys - Army	-	1.084	0.307	1.299	-	1.299	1.309	1.317	1.341	1.225	0.000	7.882
08A: Army Enterprise System Integration Program	-	0.862	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.862
EK2: GCSS-A Increment 2	-	24.230	64.063	67.320	-	67.320	32.321	28.055	19.006	24.485	0.000	259.480
EK3: AESIP Increment 2*	-	0.000	0.000	0.000	-	0.000	0.000	0.000	4.941	2.865	0.000	7.806
*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019												
Note Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to Global Combat Support System. This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."												
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 soldier 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. Building on the foundation of GCSS-Army Increment 1, Increment 2 will provide the Army Enterprise Aviation maintenance, enhanced Business Intelligence / Business Warehouse (BI/BW) and Army Pre-Positioned Stock (APS) functional capabilities to deliver greater efficiencies and to improve information flow and accuracy in real time to decision makers. Upon the completion of Increment 2, the Unit Level Logistics System-Aviation (Enhanced) (ULLS-A(E)), Unmanned Aircraft System-Initiative (UAS-I), and Army War Reserve Deployment System (AWRDS) will be eligible for retirement since the necessary functionality will have been replaced by GCSS-Army increments. GCSS-Army will provide the Army sustainment support for the warfighter with a seamless flow of timely, accurate, accessible and secure management information that gives combat forces a decisive edge.												

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	28.667	64.370	74.484	-	74.484
Current President's Budget	26.176	64.370	68.619	-	68.619
Total Adjustments	-2.491	0.000	-5.865	-	-5.865
• Congressional General Reductions	-0.013	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.034	-			
• Adjustments to Budget Years	-	-	-5.865	-	-5.865
• RAA Not Appropriated	-1.444	-	-	-	-
Change Summary Explanation					
FY19 -\$5.865 adjustment to 0303141: \$6.847 reduction adjustment to Project EK2; +\$982 increase to Project 083.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System				Project (Number/Name) 083 / Global Combat Support Sys - Army			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
083: Global Combat Support Sys - Army	-	1.084	0.307	1.299	-	1.299	1.309	1.317	1.341	1.225	0.000	7.882
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GCSS-Army is the tactical unit / installation logistics and financial system for the U.S. Army. GCSS-Army is an Enterprise Resource Planning (ERP) solution that will track supplies, spare parts and organizational equipment. It will track unit maintenance, total cost of ownership and other financial transactions related to logistics for all Army units. This modernized application will subsume outdated Standard Army Management Information Systems (STAMIS) that are not financially compliant and integrate numerous local supply and logistics databases into a single, enterprise-wide authoritative system. GCSS-Army will be financially compliant and is a key component for the Army Enterprise strategy to be financially auditable. When fully deployed, GCSS-Army will affect every supply room, motor pool, direct support repair shop, warehouse, Logistics Readiness Centers (LRCs) and property book office in the Army.

GCSS-Army will modernize automated logistics by implementing best business practices to streamline supply operations, maintenance operations, property accountability, and tactical logistics and financial management and integration procedures in support of the Future Force transition path of the Army Campaign Plan. GCSS-Army is a key component of the Federated ERP Integration solution that will optimize tactical logistics and finance domain business processes into a single federated approach. Delivering GCSS-Army will eliminate the need for extensive maintenance and modification of aging, diverse software systems that are not cyber compliant, resulting in improved and efficient change control and configuration management through implementation of an enterprise system.

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

	FY 2017	FY 2018	FY 2019
Title: Government System Test and Evaluation	1.084	0.307	-
Description: Plans, conducts and reports on developmental tests and assists in planning, conducting, and reporting of operational and interoperability tests, assessments, and experiments in order to provide essential information for the acquisition and fielding of warfighting systems.			
FY 2018 Plans: The program finishes Increment 1, Wave 2 fielding. Funding will be utilized to perform regression testing to ensure proper interfaces remain interoperable with system and technology upgrades and modifications.			
FY 2018 to FY 2019 Increase/Decrease Statement: Final testing completed, no FY19 funds.			
Title: Product Development	-	-	1.299

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System				Project (Number/Name) 083 / Global Combat Support Sys - Army				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019		
Description: Funds have been added to the Increment 1 RDTE line for continuous improvement. After transition to sustainment, RDT&E funding would be used to execute system change requests to enhance sustainment activities, accountability, auditability, and calculations of total cost of ownership.											
FY 2019 Plans: After transition to sustainment, RDT&E funding of \$1.313 Million would be used to execute system change requests (SCRs) to enhance sustainment activities, accountability, auditability, and calculations of total cost of ownership. Implementation of SCRs enhance sustainment and effectiveness by synchronizing system data and utilizing enterprise interface tools to eliminate input errors.											
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 RDTE funds increased for system change requests and baseline modernization.											
Accomplishments/Planned Programs Subtotals							1.084	0.307	1.299		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• W00800: GCSS-Army Increment 1	131.434	30.637	7.085	-	7.085	6.944	0.068	0.024	-	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
GCSS-Army has an evolutionary acquisition strategy as defined in DoD Directive 5000.01 and DoD Instruction 5000.02 and will define, develop, and deploy an initial operational capability based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities. Increment 1 will be a viable stand alone capability.											
GCSS-Army Increment I was implemented in two waves:											
Wave 1 contains the retail supply and associated financial functions and completed fielding in Nov 2015.											
Wave 2 contains the property book and maintenance and associated financial functions. Fielding was completed in Dec 2017.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>						Project (Number/Name) 083 / <i>Global Combat Support Sys - Army</i>			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. PM GCSS-Army- PMO Operations	Various	PM GCSS-Army : Fort Lee, VA 23805	103.931	-		-		-		-		-	0.000	103.931	62.385
Subtotal			103.931	-		-		-		-		-	0.000	103.931	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. Enterprise Resource Planning (ERP) design and development	C/FPAF	Northrop Grumman Information Systems : Chester, VA 23836	465.845	-		-		1.299		-		1.299	0.000	467.144	453.329
Government Developer Subject Matter Experts	IA	ASA (FM&C), CASCOC and GFEB : Various Locations	22.315	-		-		-		-		-	Continuing	Continuing	19.730
Subtotal			488.160	-		-		1.299		-		1.299	Continuing	Continuing	N/A
Remarks															
FY19 \$1.299 Million RDTE will be used for continuing baseline modernization.															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. PM Support - Independent Verification and Validation (IV&V)	C/T&M	CAP Gemini : 2250 Corporate Park Dr, Herndon, VA 20171	1.031	-		-		-		-		-	0.000	1.031	1.031
2. PM Support - Program Management Support Services A	C/T&M	Engility Corporation : 3750 Centerview Drive Chantilly, VA 20151	1.386	-		-		-		-		-	0.000	1.386	25.580

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System					Project (Number/Name) 083 / Global Combat Support Sys - Army					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
3. PM Support - Program Management Support Services B	C/T&M	Logistics Management Institute : Colonial Heights, VA 23834	42.101	-		-		-		-		-	0.000	42.101	34.531
Subtotal			44.518	-		-		-		-		-	0.000	44.518	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. Test and Evaluation - Test and Evaluation	IA	AEC, ATEC, OTC and JITC : Various Locations	38.309	1.084		0.307		-		-		-	Continuing	Continuing	-
Subtotal			38.309	1.084		0.307		-		-		-	Continuing	Continuing	N/A
Remarks															
The program finishes Increment 1, Wave 2 Fielding, fixing any major issues in the ERP solution that are identified during the fielding to make necessary updates to the software baseline to meet operational requirements. Perform regression testing to ensure partner interfaces remain interoperational with system and technology upgrades and modifications.															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			674.918	1.084		0.307		1.299		-		1.299	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0303141A / *Global Combat Support System*

Project (Number/Name)	083 / Global Combat Support Sys - Army

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>	Project (Number/Name) 083 / <i>Global Combat Support Sys - Army</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Seg 2 Contract Award	1	2008	1	2008
Increment 1 - Acquisition Review	2	2008	2	2008
Increment 1/Segment 1 Operational Assessment	1	2008	3	2010
Increment 1/Release 1.1 DTOE	3	2010	4	2010
GCSS-Army Release 1.1 Design, Build, Test & Stabilize	1	2011	3	2011
Release 1.1 Initial Operational Test and Evaluation (IOT&E)	1	2012	1	2012
Release 1.1 Stabilization	2	2011	1	2013
Field Wave 1	1	2013	1	2016
GCSS-Army Release 1.2 (Wave 2) Plan, Analyze, Design, Build & Test	3	2011	4	2015
Field Release 1.2 (Wave 2)	1	2015	1	2018
Continuous Improvements	1	2018	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System				Project (Number/Name) 08A / Army Enterprise System Integration Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
08A: Army Enterprise System Integration Program	-	0.862	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.862
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

Army Enterprise Systems Integration Program (AESIP), mission is to integrate Army business processes by providing a single source for enterprise hub services, centralized master data management, and business intelligence and analytics. AESIP is the principle GCSS-Army Business Intelligence system and will aggregate data for enterprise reporting. AESIP will support the Army's federated approach and enable the integration of end-to-end logistical and financial processes. The Army has successfully addressed concerns about the lack of integration of ERPs by leveraging AESIP core capabilities and expanding those benefits across the Army enterprise. AESIP will be an Army specific commercial off-the-shelf (COTS) web portal implementation via the NetWeaver Platform from developer Systems Applications and Products (SAP) American Group to support Army process scenarios and requirements that will provide core competencies:

Enterprise Service Bus (Hub Services) - For a Service oriented, Single Point of Entry to connect, mediate, and control the exchange of data.

Enterprise Business Intelligence/Business Warehouse - Aggregates data from ERP and non-ERP systems to provide flexible Enterprise level reporting.

Enterprise Master Data Management - For a single source of authoritative data and improved workflow and business processes.

The AESIP solution establishes a framework for a fully integrated ERP centric environment that will ultimately provide Commanders Total Visibility from Factory to Battlefield thereby ensuring delivery of the right equipment to the right unit at the right time, while reducing backlogs of material on the battlefield.

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

	FY 2017	FY 2018	FY 2019
Title: Production & Full Deployment Phases Contract Activity	0.862	-	-
Description: Manage Government contracts associated with work relating to acquisition, engineering, planning and integration activities supporting Army Enterprise Systems Integration Program (AESIP).			
Accomplishments/Planned Programs Subtotals	0.862	-	-

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• W11001: <i>AESIP Increment 1</i>	0.405	2.697	1.238	-	1.238	5.034	3.333	2.589	-	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>				Project (Number/Name) 08A / <i>Army Enterprise System Integration Program</i>			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Complete</u>	<u>Total Cost</u>
Remarks											
D. Acquisition Strategy											
As the technical component of GCSS-Army, AESIP employs an evolutionary acquisition strategy as defined in DoD Directive 5000.01 and DoD Instruction 5000.02, and will define, develop, and deploy an initial operational capability based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities. The system will be developed in multiple releases then integrated and synchronized with related systems.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>						Project (Number/Name) 08A / <i>Army Enterprise System Integration Program</i>			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. PM AESIP- PMO Operations	Various	PM AESIP : 5911 Kingstowne Village Pkwy, Alexandria, VA 22315	26.090	-		-		-		-		-	0.000	26.090	26.090
Subtotal			26.090	-		-		-		-		-	0.000	26.090	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. Enterprise Resource Planning (ERP) Implementation Systems Integration	C/T&M	Computer Sciences Corporation (CSC) : 3160 Fairview Park Drive, Falls Church, VA 22042	118.445	-		-		-		-		-	0.000	118.445	118.445
2. Enterprise Resource Planning (ERP) Implementation - Technical Support Services	FFRDC	MITRE Corporation : 7615 Colshire Drive, McLean, VA 22102	7.179	-		-		-		-		-	0.000	7.179	7.179
3. Enterprise Resource Planning (ERP) - Government Lead Systems Integrator	IA	US Army ARDEC : Picatinny Arsenal, NJ 08706	49.500	-		-		-		-		-	Continuing	Continuing	Continuing
4. Enterprise Resource Planning (ERP) - Technical Support Services	C/T&M	Systems Applications and Services (SAP) : 1300 Pennsylvania Ave, Washington, DC 20004	16.205	-		-		-		-		-	Continuing	Continuing	Continuing
5. Enterprise Resource Planning (ERP) - ERP/ SAP Technical and Management Support Services	C/T&M	iLuMina Solution Inc. : 23330 Cottonwood, California, MD 20619	5.313	-		-		-		-		-	0.000	5.313	5.313

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>						Project (Number/Name) 08A / <i>Army Enterprise System Integration Program</i>			
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
6. Enterprise Resource Planning (ERP) - Enterprise Application Services A	C/T&M	Attain, LLC : 8000 Towers Crescent Dr., Vienna, VA 22182	8.931	-		-		-		-		-	Continuing	Continuing	Continuing
7. Enterprise Resource Planning (ERP) - Enterprise Application Services B	C/T&M	Insap Services Inc. : 12000 Lincoln Dr. Marlton, NJ 08053	0.020	-		-		-		-		-	Continuing	Continuing	Continuing
8. Enterprise Resource Planning (ERP) - Enterprise Application Services C	C/T&M	Oakland Consulting Group Inc : 9501 Sheridan, Lanham, MD 20706	11.897	0.862		-		-		-		-	Continuing	Continuing	Continuing
Enterprise Resource Planning (ERP) - Enterprise Application Services D	C/T&M	VARIOUS : VARIOUS	18.032	-		-		-		-		-	0.000	18.032	-
9. Enterprise Resource Planning (ERP) - Enterprise Integration Services	C/T&M	EDC Consulting LLC : 1104 Good Hope Rd SE, Washington, DC 20020	1.364	-		-		-		-		-	Continuing	Continuing	Continuing
10. Enterprise Resource Planning (ERP) - Infrastructure Services	C/T&M	TBD : TBD	0.100	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			236.986	0.862		-		-		-		-	Continuing	Continuing	N/A
Remarks Special FY17 Appropriations request for \$1.444M FY17 was not allocated. Funds will be used to develop Business Intelligence (BI)/Business Warehouse technology application to AESIP.															

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>						Project (Number/Name) 08A / <i>Army Enterprise System Integration Program</i>			
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. PM Support - Program Management Support Services A	C/FFP	L3 Services Inc. (MPRI Division) : 1320 Braddock PL, Alexandria, VA 22314	6.940	-		-		-		-		-	0.000	6.940	6.940
2. PM Support - Program Management Support Services B	C/T&M	LMI Government Consulting : 2000 Corporate Ridge, McLean, VA 22102	26.208	-		-		-		-		-	0.000	26.208	26.208
3. PM Support - Program Management Support Services C	C/T&M	Science Applications Internation Corporation (SAIC) : 1710 SAIC Dr., McLean, VA 22102	7.020	-		-		-		-		-	0.000	7.020	7.020
4. PM Support - Indepent Verification and Validation (IV&V)	C/T&M	CAP Gemini : 2250 Corporate Park Dr, Herndon, VA 20171	2.104	-		-		-		-		-	0.000	2.104	2.104
Subtotal			42.272	-		-		-		-		-	0.000	42.272	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1. Test and Evaluation - Test and Evaluation	IA	AEC, ATEC, OTC and JITC : Various Locations	4.042	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			4.042	-		-		-		-		-	Continuing	Continuing	N/A
Remarks No funding in FY18.															

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army										Date: February 2018			
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>					Project (Number/Name) 08A / <i>Army Enterprise System Integration Program</i>			
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	309.390	0.862		0.000		-		-		-	Continuing	Continuing	N/A
Remarks													

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
Appropriation/Budget Activity 2040 / 7									R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System								Project (Number/Name) 08A / Army Enterprise System Integration Program											
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Increment 1 Enterprise Service Bus (Hub Services)																												
Increment 1 Enterprise Master Data Management																												
Increment 1 - Enterprise Business Intelligence/Business Warehouse																												
GCSS-Army Wave 2 - Fielding																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>	Project (Number/Name) 08A / <i>Army Enterprise System Integration Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Increment 1 Enterprise Service Bus (Hub Services)	4	2008	4	2017
Increment 1 Enterprise Master Data Management	4	2008	4	2017
Increment 1 - Enterprise Business Intelligence/Business Warehouse	4	2008	4	2017
Material Master (MM) Release 3.3	4	2012	4	2015
MM Release 3.4	1	2013	3	2014
MM Release 3.5	4	2012	2	2015
GCSS-Army Release 1.1 (Wave 1) - Fielding	1	2013	1	2016
Customer Vender Solution 2.0	2	2013	4	2016
GCSS-Army Release 1.2 (Wave 2) Plan, Analyze, Design, Build & Test	3	2011	4	2015
GCSS-Army Wave 2 - Fielding	1	2015	1	2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System				Project (Number/Name) EK2 / GCSS-A Increment 2			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EK2: GCSS-A Increment 2	-	24.230	64.063	67.320	-	67.320	32.321	28.055	19.006	24.485	0.000	259.480
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
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 currently provides provide key enabling support to the transformation of the Army into a network-centric, knowledge-based future force. Building on the foundation of GCSS-Army Increment 1, Increment 2 will provide the Army Enterprise Aviation maintenance, enhanced Business Intelligence / Business Warehouse (BI/BW) and Army Pre-Positioned Stock (APS) functional capabilities to deliver greater efficiencies and to improve information flow and accuracy in real time to decision makers. Upon the completion of Increment 2, the Unit Level Logistics System-Aviation (Enhanced) (ULLS-A(E)), Unmanned Aircraft System-Initiative (UAS-I), and Army War Reserve Deployment System (AWRDS) will be eligible for retirement since the necessary functionality will have been replaced by GCSS-Army increments. GCSS-Army will provide the Army sustainment support for the warfighter with a seamless flow of timely, accurate, accessible and secure management information that gives combat forces a decisive edge.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Technology Maturation and Risk Reduction Phase Description: During the Technology Maturation and Risk Reduction (TMRR) phase, the program develops and demonstrates prototype designs to reduce technical risk, validate design approaches, validate cost estimates, and refine requirements. TMRR is an iterative process of maturing technologies and refining user performance parameters to ensure an affordable and executable production program. FY 2018 Plans: Complete analysis to assess risk, affordability, and feasibility. Continue fit/gap analysis and blueprinting of stakeholder requirements.Efforts are intended to reduce the specific risks (e.g. technology, engineering, integration and life-cycle risk) associated with the incremental development of the GCSS-Army system. FY 2018 to FY 2019 Increase/Decrease Statement: TMMR phase ends in FY18 as program proceeds in EMD.									23.310	20.573	-	
Title: System Design, Develop and Build Description: The purpose of this phase is to begin the system development for an incremental capability that is affordable and executable to satisfy the Key Performance Parameters and Key System Attributes .									-	42.550	60.585	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System	Project (Number/Name) EK2 / GCSS-A Increment 2		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
FY 2018 Plans: Finish design phase and begin the development and build of Increment 2. Develop test plans preparatory to begin testing. Verify achievement of critical technical parameters and the ability to achieve key performance parameters, and assess progress toward achievement of critical operational issues. Validate system functionality. Identify system capabilities, limitations, and deficiencies. Assess system specification compliance, system safety, and compatibility with relational database management systems.				
FY 2019 Plans: Engineering and Manufacturing Development of Increment 2, to include design, development, and build. Complete all needed hardware and software detailed design; retire any open risks; build and test prototypes or first articles to verify compliance with capability requirements; and establish initial product baseline for all configuration items. Perform design reviews prior to test article fabrication and/or software build or increment coding.				
FY 2018 to FY 2019 Increase/Decrease Statement: Development efforts increase as program proceeds in Full Development phase				
Title: PMO Operations Description: Program Management operations to support engineering and manufacturing development.		0.920	0.940	-
FY 2018 Plans: Program Management operations to support engineering and manufacturing development.				
FY 2018 to FY 2019 Increase/Decrease Statement: PMO operations funding moved to OMA in FY19.				
Title: Government System Test and Evaluation FY 2019 Plans: FY 2019 Plans: Begin test and evaluation of Increment 2. Build and test prototypes or first articles to verify compliance with capability requirements; and establish initial product baseline for all configuration items. Perform design reviews prior to test article fabrication and/or software build or increment coding. Preparations for Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E). FY 2018 to FY 2019 Increase/Decrease Statement: Testing efforts accelerate during Development phase in FY19.		-	-	6.735
Accomplishments/Planned Programs Subtotals		24.230	64.063	67.320

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System				Project (Number/Name) EK2 / GCSS-A Increment 2			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• W11011: GCSS-Army Increment 2 Other Procurement (SSN W11011)	-	3.867	6.841	-	6.841	21.461	34.653	11.796	38.022	0.000	116.640
Remarks											
D. Acquisition Strategy											
GCSS-Army Increment 2 continues the evolutionary acquisition strategy of Increment 1 and will define, develop, and deploy additional and enhanced capabilities to GCSS-Army based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities.											
GCSS-Army Increment 2 is being implemented in three waves:											
Wave 1 provides the Army Enterprise Aviation maintenance capability.											
Wave 2 provides the enhanced Business Intelligence/Business Warehouse (BI/BW) capability.											
Wave 3 provides the Army Pre-Positioned Stock (APS) capability											
Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to Global Combat Support System. This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System						Project (Number/Name) EK2 / GCSS-A Increment 2			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Operations	TBD	PMO : Huntsville AL	-	0.920		0.940		-		-		-	2.920	4.780	-
Subtotal			-	0.920		0.940		-		-		-	2.920	4.780	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Maturization and Risk Reduction	C/IDIQ	Various : Various	22.097	23.310	Feb 2017	20.573	Feb 2018	-		-		-	0.000	65.980	-
System Design, Develop and Build	C/CPFF	TBD : TBD	-	-		42.550	May 2018	57.997	May 2019	-		57.997	72.847	173.394	115.397
Subtotal			22.097	23.310		63.123		57.997		-		57.997	72.847	239.374	N/A
Remarks															
Finish Design and begin development (FY17-FY18) and build of Increment 2. Verify achievement of critical technical parameters and the ability to achieve key performance parameters, and assess progress toward achievement of critical operational issues. Validate system functionality. Identify system capabilities, limitations, and deficiencies. Assess system specification compliance, system safety, and compatibility.															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/Various	TBD : TBD	-	-		-		9.323	Nov 2018	-		9.323	39.916	49.239	39.916
Subtotal			-	-		-		9.323		-		9.323	39.916	49.239	N/A
Remarks															
Test and evaluation efforts anticipated to begin FY19. Includes Developmental Testing, Operational Testing, ATEC and JTIC tests, and various other tests as required by regulation.															

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System					Project (Number/Name) EK2 / GCSS-A Increment 2					
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			22.097	24.230		64.063		67.320		-		67.320	115.683	293.393	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018																					
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0303141A / Global Combat Support System										Project (Number/Name) EK2 / GCSS-A Increment 2																	
Event Name										FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Preliminary Design, RFP, Source Selection, Prototyping, Requirements																																					
Acquisition ATP																																					
Release Deployment Decision ATP																																					
Capability Support ATP																																					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / <i>Global Combat Support System</i>	Project (Number/Name) EK2 / <i>GCSS-A Increment 2</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Preliminary Design, RFP, Source Selection, Prototyping, Requirements Analysis	1	2016	2	2018
Acquisition ATP	3	2018	3	2018
Release Deployment Decision ATP	2	2021	2	2021
Capability Support ATP	4	2023	4	2023

Note

The schedule for GCSS-Army Increment 2 is based upon the Army Acquisition Executive (AAE) decision to utilize the Government System Integrator

Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to Global Combat Support System. This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0303142A I SATCOM Ground Environment (SPACE)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	18.761	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.761
253: Dscs-Dcs (Phase II)	-	5.008	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.008
456: MILSATCOM System Engineering	-	5.750	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.750
EA3: Transportable Tactical Cmd Comms (T2C2)	-	3.511	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.511
EK8: Enroute Mission Command	-	4.492	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.492

Note

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

A. Mission Description and Budget Item Justification

Military Satellite Communication (MILSATCOM) systems are joint program/project efforts to satisfy ground mobile requirements for each Service, the Joint Chiefs of Staff (JCS), the National Command Authority, the combatant commanders, the Office of the Secretary of Defense, and other governmental, non-DoD users. The worldwide MILSATCOM systems are: the Super High Frequency (SHF) Defense Satellite Communications System (DSCS); the Wideband Global SATCOM (WGS); the MILSTAR Extremely High Frequency (EHF) Low Data Rate (LDR) and Medium Data Rate (MDR); the Advanced Extremely High Frequency (AEHF); and future MILSATCOM capabilities. All of these systems are required to support legacy, interim and emerging communication space architectures and Future Force requirements. The Army is responsible for materiel development, acquisition, product improvement, testing, fielding and integrated logistics support of ground satellite terminals and SATCOM control subsystems and all associated equipment used to provide range extension of Mission Command Networks and Systems. The Army also participates in the development of MILSATCOM programs, including architectures, payloads, waveforms, antennas and terminal developments to ensure US Army equities are appropriately addressed with our sister services. This includes technology assessment efforts associated with the integration of MILSATCOM components to US Army LandWarNet. This responsibility also includes maintaining the life cycle logistics support required to achieve end-to-end connectivity and interoperability, satisfying JCS network operations in support of the President, JCS, combatant commanders, Military Departments, Department of State, and other government Departments and Agencies. EMC supports Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forcible entry operations with the ability to conduct mission command.

This program is designated as a DoD Space Program.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	18.815	0.000	0.000	-	0.000
Current President's Budget	18.761	0.000	0.000	-	0.000
Total Adjustments	-0.054	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-0.054	-	-	-	-
Change Summary Explanation					
FY18 funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) 253 / Dscs-Dcs (Phase II)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
253: Dscs-Dcs (Phase II)	-	5.008	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.008
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.												
A. Mission Description and Budget Item Justification This project provides funds to develop Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future Force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SATCOM Terminal Digital IF Implementation Analysis								3.801	-	-	-	-
Description: SATCOM Terminal Digital IF Implementation Analysis												
Title: Electromagnetic Interference Mitigation Analysis								1.207	-	-	-	-
Description: Electromagnetic Interference Mitigation Analysis												
Accomplishments/Planned Programs Subtotals								5.008	-	-	-	-
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• BB8500: Defense Enterprise Wideband SATCOM Systems (DEWSS) (BB8500)	143.805	161.383	108.133	-	108.133	111.000	99.480	118.628	108.253	Continuing	Continuing	
Remarks												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) 253 / Dscs-Dcs (Phase II)
<u>D. Acquisition Strategy</u> As result of the new Major Force Program 12 (MFP12) Space Configuration, OSD directed this funding line transition to OSD PE 1203142/FE1 in FY 2018 and beyond. This effort finances Project Manager, Defense Communications and Army Transmission Systems (PM DCATS) Netcentric systems engineering, modem risk mitigation, and DoD Information Assurance Certification Accreditation Process (DIACAP) support. Funding provides for SATCOM terminal upgrades, enhancement of baseband throughput capabilities, technology insertion and upgrades which enhance decision support capabilities, allowing for full utilization of Wideband Global SATCOM (WGS) capabilities. Both the Wideband SATCOM Operational Management System (WSOMS) and the Enterprise Wideband SATCOM Terminal System (EWSTS) Capability Production Documents (CPDs) contain Netcentric-Ready Key Performance Parameters (NR-KPPs) as required by CJCSI 6212.01C. Netcentric efforts are required to facilitate the migration from the current trunk-based communications systems to Internet Protocol (IP) based systems and to engineer, test and integrate IP based capabilities into EWSTS and WSOMS systems. Studies, risk mitigation, system integration and advanced demonstrations for Netcentric baseband and policy based control will accommodate technology insertion, data sharing, remote operations, architecture efforts and use of commercial technology, thus ensuring the life of the Defense Enterprise Wideband System (DEWSS) terminal family beyond 2025 and reducing lifecycle costs and enterprise requirements on the WGS and Defense Satellite Communication System (DSCS) satellites in the future. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) 253 / Dscs-Dcs (Phase II)					

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SATCOM Terminal Digital IF Implementation Analysis	MIPR	CERDEC : APG, MD	6.730	2.503		-		-		-		-	Continuing	Continuing	Continuing
Electromagnetic Interference Mitigation Analysis	MIPR	CERDEC : APG, MD	4.946	1.207		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			11.676	3.710		-		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
In house Support	Allot	PdM WESS : Ft. Belvoir, VA	1.699	0.600		-		-		-		-	Continuing	Continuing	Continuing
Contractor Support	C/CPFF	ACC-APG : APG, MD	3.247	0.698	Mar 2017	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			4.946	1.298		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.622	5.008	0.000	-	-	-	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0303142A / SATCOM Ground
Environment (SPACE)

Project (Number/Name)
253 / Dscs-Dcs (Phase II)

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) 253 / Dscs-Dcs (Phase II)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SATCOM Terminal Digital IF Implementation Analysis	1	2016	4	2022
Electromagnetic Interface Mitigation Analysis	1	2016	4	2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) 456 / MILSATCOM System Engineering			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
456: MILSATCOM System Engineering	-	5.750	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.750
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

A. Mission Description and Budget Item Justification

Military Satellite Communications (MILSATCOM)System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts, performed by MILSATCOM SE, lead to savings for the overall Army in the out years.

FY 2017 funds support the continued systems engineering required to support technology maturation, systems analysis, and planning associated with joint SATCOM development efforts including complying with the outcome of the Protected SATCOM communications Systems (PSCS) Analysis of Alternatives (AoA), the follow-on Wideband AoA, and other efforts that have impact on tactical Army use of military and commercial satellite constellations. These efforts have a direct impact in reducing technical and programmatic risk for the acquisition efforts for tactical Army SATCOM systems using these constellations.

FY 2018 and out funding will be realigned to 1203142A/FE2 to reflect the new Major Force Program 12 (MFP12) Space configuration.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Protected Communications System Engineering Description: Protected Communications System Engineering	2.207	-	-	-	-
Title: Wideband Global SATCOM (WGS) Communications System Engineering Description: WGS Communications System Engineering	1.833	-	-	-	-
Title: Experimentation, development, testing and certification of critical SATCOM and Satellite-On-The-Move (SOTM) communication and network technologies. Description: Experimentation, development, testing and certification of critical SATCOM and SOTM communication and network technologies.	0.100	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)		Project (Number/Name) 456 / MILSATCOM System Engineering	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO
Title: Data Rights		1.610	-	-	-
Accomplishments/Planned Programs Subtotals		5.750	-	-	-
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks FY 2018 and out funding will be realigned to 1203142A/FE2 to reflect the new Major Force Program 12 (MFP12) Space configuration.					
D. Acquisition Strategy This project funds advanced systems engineering, research, development, test and evaluation of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation of the technology will transition to WIN-T and related PoRs.					
E. Performance Metrics N/A					

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)						Project (Number/Name) 456 / MILSATCOM System Engineering			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Oversight	MIPR	PM WIN T : PEO C3T	3.014	-		-		-		-		-	0.000	3.014	-
Advanced Architecture/ Advanced Wideband System Architecture	MIPR	MIT Lincoln Labs : Lexington , MA	11.474	-		-		-		-		-	0.000	11.474	-
Subtotal			14.488	-		-		-		-		-	0.000	14.488	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Protected Communications and WGS Communications SE	TBD	Various : APG, MD	74.531	1.151		-		-		-		-	Continuing	Continuing	Continuing
FCC/ITU SOTM Regulatory Proposals/ Analyses/Modifications	MIPR	John Hopkins Universtiy Applied Physics Lab : Laurel, MD	2.655	-		-		-		-		-	Continuing	Continuing	Continuing
T2C2 Development Analysis of AoA activity, market research, MS C	TBD	PEO C3T PM WIN- T : APG, MD	2.444	-		-		-		-		-	Continuing	Continuing	Continuing
Software Data Rights	MIPR	Contractor : Md	-	1.463		-		-		-		-	1.463	2.926	1.463
Subtotal			79.630	2.614		-		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering (In House)	MIPR	PM WIN T : APG, MD	28.508	1.200	Nov 2016	-		-		-		-	Continuing	Continuing	Continuing
Engineering Contractors Support	C/CPFF	PM WIN-T : APG, MD	40.043	1.136	Mar 2017	-		-		-		-	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)						Project (Number/Name) 456 / MILSATCOM System Engineering			
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Architecture & Analysis	Various	CERDEC PM WIN-T : APG, MD	17.501	0.200	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
T2C2 preparation for Milestone C; Request for Proposal and solicitation preparation	TBD	PEO C3T PM WIN T : APG, MD	0.500	-		-		-		-		-	0.000	0.500	-
Subtotal			86.552	2.536		-		-		-		-	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Terminal Testing and Evaluation System Engineering	FFRDC	PEO C3T WIN T : TBD	2.504	0.200	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
Test Support	MIPR	MATRIX : PM WIN T	22.587	0.200	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
Testing, Certification	MIPR	Support Technical Testing : PM WIN T	7.001	0.200	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
Test support to study the feasibility of moving small terminal activity from COMSATCOM to MILSATCOM	C/CPFF	PEO C3T : PM WIN-T	0.400	-		-		-		-		-	0.000	0.400	-
T2C2 complete Initial Operational Test and Evaluation	TBD	PEO C3T : PM WIN-T	1.960	-		-		-		-		-	0.000	1.960	-
Subtotal			34.452	0.600		-		-		-		-	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			215.122	5.750		0.000		-		-		-	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018			
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)			Project (Number/Name) 456 / MILSATCOM System Engineering				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)		Project (Number/Name) 456 / MILSATCOM System Engineering	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Wideband AoA																												
Wideband AoA																												
PTSFD Modem Testing																												
PTSFD Modem Testing																												
Protected Tactical Service Field Demo																												
PTSFD Demo																												
NCW Tool Development and Testing																												
NCW Dev and Testing																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) 456 / MILSATCOM System Engineering	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Wideband AoA	4	2016	4	2017
PTSFD Modem Testing	1	2017	4	2017
Protected Tactical Service Field Demo	4	2015	4	2017
NCW Tool Development and Testing	1	2015	4	2017

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) EA3 / Transportable Tactical Cmd Comms (T2C2)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EA3: Transportable Tactical Cmd Comms (T2C2)	-	3.511	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.511
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

A. Mission Description and Budget Item Justification

Transportable Tactical Command Communications (T2C2) extends the Warfighter Information Network Tactical (WIN-T) network to small company and team sized early entry units. The T2C2 system is based on combat proven capabilities and provides robust voice and data communication capabilities. The T2C2 systems will also integrate users into the higher capacity WIN-T network and extend that network to the tactical edge; T2C2 also enables warfighters in select small Command Posts (CP) (typically Company level) and select Army teams to send and receive time sensitive Situational Awareness (SA), Intelligence, and Mission Command (MC) information while At-the-Halt (ATH) in support of all Joint determined and defined operational phases. These phases span from the initial Shaping Phase, designed to dissuade or deter adversaries and assure mission friends, to Deterrence, Initiative Seizure and Domination phases culminating with post maneuver Stabilization and Enabling of Civil Authorities enabling legitimate civil governance in safe and secure environment. FY17 funds are in support of T2C2 systems (Light and Heavy) Initial Operational Test & Evaluation (IOT&E) to inform a Full Rate Production (FRP) decision scheduled for 4Q FY17 (on track).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: T2C2 Testing	3.511	-	-	-	-
Description: Testing requirements to achieve FRP.					
Accomplishments/Planned Programs Subtotals	3.511	-	-	-	-

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B85800: Transportable Tactical Command Communications (T2C2)	36.580	62.600	56.737	7.100	63.837	77.680	73.146	74.625	75.551	Continuing	Continuing

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) EA3 / Transportable Tactical Cmd Comms (T2C2)

D. Acquisition Strategy

The Transportable Tactical Command Communications (T2C2) program Acquisition Strategy (AS) is based on integration of existing Commercial-Off-the-Shelf (COTS)/Non-Developmental Items (NDI) into new integrated systems fielded in the needed configuration for small teams or small unit Command Posts (CP) to allow these units to receive and transmit data. T2C2 will provide a high bandwidth tactical network extension for small unit CPs operating beyond line-of-sight from their higher headquarters and for teams operating outside the full tactical network architecture. The acquisition strategy leverages an existing Small Business Innovation Research (SBIR) Phase III Indefinite Delivery Indefinite Quantity (IDIQ) contract supporting the commercialization of the preceding SBIR efforts. T2C2 will utilize a two-level maintenance concept, will be Soldier-maintained, and initially supported by Interim Contractor Support. An analysis will be conducted to determine the ultimate supportability path. This strategy will allow a capability to be integrated and delivered quickly to support a limited deployment of Low Rate Initial Production (LRIP) units in FY17 required for Production Verification and the Initial Operational Test and Evaluation (IOT&E), with Full-Rate Production (FRP) planned for 4Q FY17.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)						Project (Number/Name) EA3 / Transportable Tactical Cmd Comms (T2C2)			

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
T2C2 Testing	TBD	Various : Various	4.894	3.511	Oct 2016	-		-		-		-	0.000	8.405	-
T2C2 Testing Articles and Transportation	TBD	Various : Various	0.309	-		-		-		-		-	0.000	0.309	-
Subtotal			5.203	3.511		-		-		-		-	0.000	8.714	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.203	3.511	0.000	-	-	-	0.000	8.714	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)		Project (Number/Name) EA3 / Transportable Tactical Cmd Comms (T2C2)	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
T2C2 Product Verification, Logistics Demonstration, Operational Testing																												
T2C2 Initial Operational Test & Evaluation																												
T2C2 IOT&E Event																												
T2C2 Full Rate Production Decision Review																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) EA3 / Transportable Tactical Cmd Comms (T2C2)	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone C Preparation	3	2014	1	2016
T2C2 Product Verification, Logistics Demonstration, Operational Test & Reports	4	2016	4	2017
T2C2 Initial Operational Test & Evaluation	2	2017	2	2017
T2C2 Full Rate Production Decision Review	4	2017	4	2017

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) EK8 / Enroute Mission Command			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EK8: Enroute Mission Command	-	4.492	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.492
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

A. Mission Description and Budget Item Justification
Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.

FY17 funding will support test by the Army Test and Evaluation Command (ATEC) during Operational Assessment (OA). The OA supports the Milestone Decision Authority (MDA) Disposition Decision (FY18) to continue procurement and fielding.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: EMC Testing	4.492	-	-	-	-
Description: EMI/EMC, Flight Test and Operational Assessment					
Accomplishments/Planned Programs Subtotals	4.492	-	-	-	-

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B08400: Enroute Mission Command	-	21.667	37.401	-	37.401	8.653	-	-	-	0.000	67.721

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) EK8 / Enroute Mission Command
<u>D. Acquisition Strategy</u> The continued procurement of the EMC full operational capability follows DoDI 5000.02, 7 Jan 2015, Enclosure 13, Rapid Fielding of Capabilities. The Milestone Decision Authority (MDA) and project manager will tailor and streamline program strategy based on the required timelines to meet urgent need capability requirements. The Army Executive Agent signed an Acquisition Decision Memorandum (ADM) on 27 April 2015 delegating MDA to PEO C3T. The MDA signed an ADM on 11 May 2015 selecting the KuKa Antenna and Radome for the Full Operational Capability (FOC). An ADM was signed on 20 May 2015 granting approval to enter into production and deployment phase. Due to rephasing of FY17 OPA funding into FY18/19, program has been restructured. Initial Operational Capability met in May 2015 with modification of five C-17s with satellite antennae and installation kits, and roll-on/roll-off, battalion level, Key Leader Node (KEN). Full Operational Capability (FOC) is 35 C-17s, seven KENs and 21 company level Dependent Airborne Nodes (DAN) and an airborne command post suite (CASPER). FOC is currently projected for FY20. Planning to field an interim capability and conduct an Operational Assessment in FY17. FY17 RDT&E funding supports test by the Army Test and Evaluation Command (ATEC) during Operational Assessment (OA). The OA supports the Milestone Decision Authority (MA) Disposition Decision (FY18) to continue procurement and fielding. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)						Project (Number/Name) EK8 / Enroute Mission Command			

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EMC Testing	MIPR	Aberdeen Proving Ground, MD : ATEC	1.361	4.492		-		-		-		-	0.000	5.853	-
Subtotal			1.361	4.492		-		-		-		-	0.000	5.853	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.361	4.492	0.000	-	-	-	0.000	5.853	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
Appropriation/Budget Activity 2040 / 7								R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)								Project (Number/Name) EK8 / Enroute Mission Command												
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Operational Assessment	 Operational Assessment				 Disposition Decision																							
Disposition Decision																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) EK8 / Enroute Mission Command	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMI/EMC Test	2	2016	2	2016
Flight Test	4	2016	4	2016
Operational Assessment	3	2017	3	2017
Disposition Decision	1	2018	1	2018

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0303150A / <i>Army Global Command & Control System</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.536	10.475	2.034	-	2.034	2.073	2.110	2.157	2.198	Continuing	Continuing
C86: <i>Army Global C2 System</i>	-	0.449	6.028	2.034	-	2.034	2.073	2.110	2.157	2.198	Continuing	Continuing
EA5: <i>Strategic and Joint Mission Command</i>	-	4.087	4.447	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.534

A. Mission Description and Budget Item Justification

Global Command and Control System-Army (GCCS-A): This project is the Army component system that directly supports the implementation of the Global Command and Control System Family of Systems. GCCS-A provides automated command and control tools for Army Strategic and Operational Theater Commanders to enhance warfighter capabilities throughout the spectrum of conflict during joint and combined operations in support of National Security. The GCCS-A developed software systems dramatically improves the Army's ability to analyze courses of action; develop and manage Army Forces; and ensure feasibility of war plans. In accordance with Army Command Post Computing Environment and Joint Command and Control objectives, GCCS-A was re-architected away from a scalable process architecture based server - thick client architecture to a virtualized server - web client architecture hosted on Battle Command Common Services (BCCS)/Tactical Server Infrastructure (TSI) and Mission Command Workstation. GCCS-A strategic tools for readiness reporting have been modernized and replaced with the Defense Readiness Reporting System - Army (DRRS-A), a suite of web based applications for Army Readiness, Force Registration and Force Projection.

Army Joint and Strategic Command and Control (AJaSC2) is a modernization development effort for the Army's joint and strategic C2 capabilities. AJaSC2 provides the materiel solution in response to the Army Mission Command for Unified Action Capability Definition Package (AMCUA CDP). AJaSC2 enables Army operational headquarters to integrate with the Joint Force Commands and Unified Action Partners (UAP). AJaSC2 provides Army leaders: Joint Common Operating Picture (COP); Adaptive planning and execution capabilities for distributed, synchronous and asynchronous collaboration services to develop, revise, and execute their warfighting plans supported by theaterwide analytics; strategic Situational Awareness (SA) to coalition operations and other mission partners and Coordination and synchronization of Joint Execution Mission Management.

GCCS-A will transition into sustainment in FY19.

Fiscal Year 2019 base funding will support the Defense Readiness Reporting System - Army (DRRS-A), the Army's capability for unit readiness reporting, unit registration and force planning and projection activities that enables Title 10 reporting to Congress. Specifically the funding will provide program oversight and technical development, testing and training support to enable the readiness and force projection capabilities.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.718	10.475	4.554	-	4.554
Current President's Budget	4.536	10.475	2.034	-	2.034
Total Adjustments	-0.182	0.000	-2.520	-	-2.520
• Congressional General Reductions	-0.002	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.180	-			
• Adjustments to Budget Years	-	-	-2.520	-	-2.520
Change Summary Explanation					
Fiscal Year 2019 base funding will support DRRS-A. The Army's capability for unit readiness reporting, unit registration and force planning and projection activities that enable Title 10 reporting to Congress. Specifically the funding will provide program oversight, technical development, testing and training support to enable the readiness and force projection capabilities.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System				Project (Number/Name) C86 / Army Global C2 System			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
C86: Army Global C2 System	-	0.449	6.028	2.034	-	2.034	2.073	2.110	2.157	2.198	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Global Command and Control System-Army (GCCS-A): This project is the Army component of the Global Command and Control System (GCCS) Family of Systems (FoS). GCCS-A provides automated command and control tools, including Force readiness, planning and movement, and situational awareness, for Army Strategic and Operational Theater commanders to enhance warfighter capabilities throughout the spectrum of conflict during Joint and combined operations in support of National Security. GCCS-A dramatically improves the Army's ability to analyze courses of action, develop and manage Army forces and execute war plans. GCCS-A links the GCCS-Joint Common Operating Picture with the Army Mission Command systems. In accordance with Army Command Post Computing Environment and Joint Command and Control objectives, GCCS-A is being re-architected away from a scalable process architecture based server - thick client architecture to a virtualized server - Battle Command Common Services (BCCS)/Tactical Server Infrastructure (TSI) and Mission Command Workstation.												
GCCS-A will transition into sustainment in FY19.												
The Defense Readiness Reporting System- Army (DRRS-A) is the Army's Authoritative Readiness Reporting System. This information technology system provides unit readiness reporting, unit registration and force planning and projection activities to enable Title 10 reporting to Congress. All Fiscal Year 2019 base funding will support DRRS-A. Specifically this funding will provide additional system enhancements and testing to support emerging developmental requirements to satisfy the Army's and Joint readiness reporting capabilities along with ensuring interoperability of Army and Joint Systems. DRRS-A is the Army's critical enabler which directly enables the Quarterly Readiness report to Congress.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Software and System Engineering (GCCS-A)									0.162	-	-	
Description: Software and System Engineering for GCCS-A and DRRS-A Modernization												
Title: Synchronize with Joint C2 objective Architecture (GCCS-A)									0.047	-	-	
Description: Software ehancement efforts required to synchronize with Joint C2 objective Architecture												
Title: Test and Evaluation (GCCS-A)									0.110	-	-	
Description: Test and Evaluation for GCCS-A												
Title: Program Support and Management (GCCS-A)									0.130	0.150	-	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System	Project (Number/Name) C86 / Army Global C2 System		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs FY 2018 Plans: Program Support and Management for GCCS-A FY 2018 to FY 2019 Increase/Decrease Statement: GCCS-A C86 line will be transitioning into sustainment in FY19.				
Title: Program Support and Management for Readiness Capabilities (GCCS-A) Description: Provides program management and acquisition oversight functions to enable the Army's readiness capabilities. FY 2018 Plans: Provide program management and acquisition oversight functions to enable the Army's readiness capabilities. FY 2018 to FY 2019 Increase/Decrease Statement: GCCS-A C86 line will be transitioning into sustainment in FY19.		-	0.166	-
Title: Defense Readiness Reporting System (DRRS-A) - Software Enhancements (Design/Develop) Description: Support to design, develop, and deploy emerging requirements into the Army's authoritative readiness reporting system to include: Software enhancements to support evolving DoD and Army readiness policies, processes, technical standards and new interace and interoperability requirements needed to share Army authoritative readiness data with Joint and Army data sharing partners. FY 2018 Plans: Software enhancements for the Army's authoritative readiness reporting system. FY 2019 Plans: Software enhancements for the Army's authoritative readiness reporting system. FY 2018 to FY 2019 Increase/Decrease Statement: Initial year incorporated start up costs		-	4.845	1.726
Title: Defense Readiness Reporting Sytem (DRRS-A) - Test and Integration Description: Support for developmental and interoperability testing required for the Army's authoritative readiness reporting system.		-	0.867	0.308

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System			Project (Number/Name) C86 / Army Global C2 System				

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
FY 2018 Plans: Support for developmental and interoperability testing required for the Army's authoritative readiness reporting system.			
FY 2019 Plans: Developmental and interoperability testing.			
FY 2018 to FY 2019 Increase/Decrease Statement: Initial year incorporated start up costs			
Accomplishments/Planned Programs Subtotals	0.449	6.028	2.034

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• BA8250: BA8250 Army Global Cmd & Control Sys (AGCCS) - OPA	2.530	2.658	0.000	-	0.000	-	-	-	-	0.000	5.188
Remarks											
D. Acquisition Strategy The GCCS-A Modernization Strategy consists of two separate program efforts. (1) A Bridge effort, Acquisition Category (ACAT) III level and (2) a Modernization development effort for the Army's Joint and Strategic command and Control capabilities infrastructure software products. The GCCS-A modernization development effort will be in compliance with Joint Command and Control Capability Development Document (JC2 CDD) and Army Mission Command for Unified Action Capability Definition Package (AMCUA CDP). DRRS-A will continue to satisfy readiness reporting requirements from Army Readiness Division (DAMO-ODR). The Bridge Effort's acquisition approach consists of a support agreement with CECOM LCMC SEC as the prime software developer utilizing a mix of government and contractor support. The DRRS-A development effort in FY19 is accomplished through an existing Cost Plus Fixed Fee contract with Sotera Defense Solutions Inc. and testing is managed at the Army Software Engineering Center at Aberdeen Proving Grounds, Maryland.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System						Project (Number/Name) C86 / Army Global C2 System			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Management (GCCS-A)	Various	Various : Various Locations	15.808	0.130		0.150		-		-		-	0.000	16.088	Continuing
Subtotal			15.808	0.130		0.150		-		-		-	0.000	16.088	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Readiness Reporting System-Army Software Development	Option/ CPFF	Software Engineering Center : APG, MD	10.217	-		4.845	Sep 2018	1.726	Mar 2019	-		1.726	0.000	16.788	10.217
GCCS-A/DRRS-A Bridge Effort Software Development (GCCS-A)	MIPR	Software Engineering Center : APG, MD	17.636	0.209		-		-		-		-	0.000	17.845	4.893
Subtotal			27.853	0.209		4.845		1.726		-		1.726	0.000	34.633	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Contractors (GCSS-A)	C/FP	Various : Various	17.333	-		0.166		-		-		-	0.000	17.499	17.333
Subtotal			17.333	-		0.166		-		-		-	0.000	17.499	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC/JTIC/CTSF/ SEC(GCCS-A)	MIPR	Various : Various	5.938	0.110		-		-		-		-	0.000	6.048	6.878

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System				Project (Number/Name) C86 / Army Global C2 System					

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Readiness Reporting System - Army (DRRS-A)	IA	Army Software Engineering Center : Aberdeen Proving Grounds, MD	-	-		0.867	Sep 2018	0.308	Mar 2019	-		0.308	0.000	1.175	-
Subtotal			5.938	0.110		0.867		0.308		-		0.308	0.000	7.223	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	66.932	0.449		6.028		2.034		-		2.034	0.000	75.443	N/A

Remarks

UNCLASSIFIED

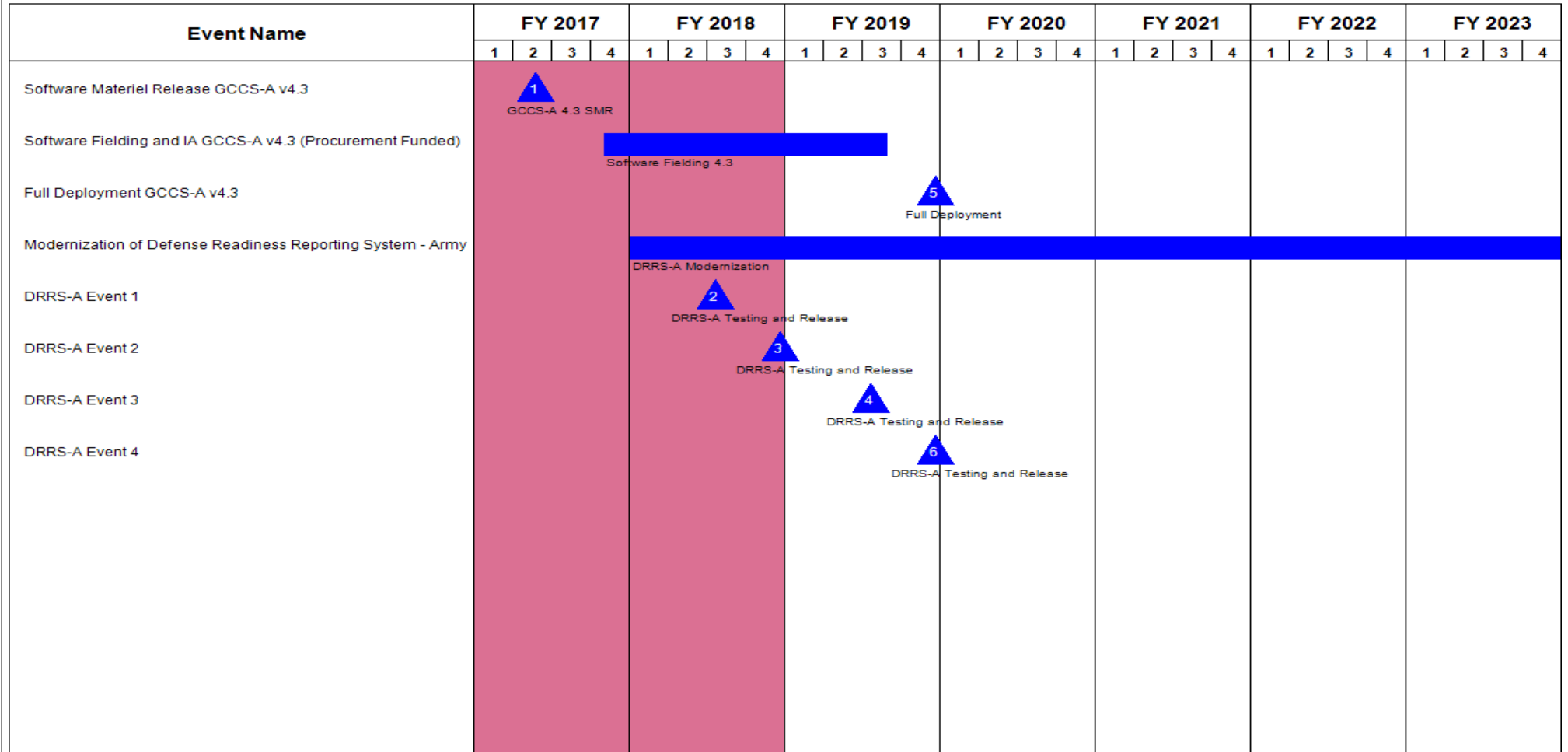
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0303150A / Army Global Command & Control System

Project (Number/Name)
C86 / Army Global C2 System



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303150A / <i>Army Global Command & Control System</i>	Project (Number/Name) C86 / <i>Army Global C2 System</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Materiel Release GCCS-A v4.3	2	2017	2	2017
Software Fielding and IA GCCS-A v4.3 (Procurement Funded)	4	2017	3	2019
Full Deployment GCCS-A v4.3	4	2019	4	2019
Modernization of Defense Readiness Reporting System - Army	1	2018	4	2023
DRRS-A Event 1	3	2018	3	2018
DRRS-A Event 2	4	2018	4	2018
DRRS-A Event 3	3	2019	3	2019
DRRS-A Event 4	4	2019	4	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System				Project (Number/Name) EA5 / Strategic and Joint Mission Command			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EA5: Strategic and Joint Mission Command	-	4.087	4.447	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.534
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Army Joint and Strategic Command and Control (AJaSC2) is a modernization development effort for the Army's joint and strategic C2 capabilities. AJaSC2 provides the materiel solution in response to the Army Mission Command for Unified Action Capability Definition Package (AMCUA CDP). AJaSC2 enables Army operational headquarters to integrate with the Joint Force Commands and Unified Action Partners (UAP). AJaSC2 is a software only implementation of strategic applications and interoperability services that leverage the unified software architecture design (core infrastructure and selected common applications being implemented in the CPCE) that provides Army leaders: Joint Common Operating Picture (COP); Adaptive planning and execution capabilities for distributed, synchronous and asynchronous collaboration services to develop, revise, and execute their warfighting plans supported by theaterwide analytics; strategic Situational Awareness (SA) to coalition operations and other mission partners and coordination and synchronization of Joint Execution Mission Management. Capability Packages enabled by AJaSC2 are providing Force Employment, Joint Force Synchronization, and Total Force Analysis. The operational payoff providing the Joint Force Commander a linkage between Army Mission Command and Unified Action Partners, enabling Unified Action through integration with existing and future applications (including CPCE and MCE) and contributes to achieving Shared Understanding during Unified Land Operations (ULO) facilitating effective Mission Command.

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

	FY 2017	FY 2018	FY 2019
Title: Software Design and Systems Engineering (Pre Milestone B)	3.177	1.853	-
Description: Software Development and Systems Engineering of Capability Packages (Common Operating Environment (COE) System Engineering)			
FY 2018 Plans: Finalize Capability Package designs and required specifications/standards. Conduct research and analysis and systems engineering in coordination with other Joint Programs with an interdependency and with the Army Command Post and Mounted Computing Environments.			
FY 2018 to FY 2019 Increase/Decrease Statement: Requirement to be completed in FY18.			
Title: Synchronization with COE and Command Post Computing Environment (CP CE) and Joint C2 objective Architecture	0.510	-	-
Description: Software enhancement efforts required to sync with COE/CPCE and Joint C2 objective architecture			
Title: Program Support and Management	0.400	1.315	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System			Project (Number/Name) EA5 / Strategic and Joint Mission Command					
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019		
Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs FY 2018 Plans: Develop technical requirements for the three Capability Packages and synchronize those requirements with CPCE and the Joint community to ensure requirements supporting the Joint C2 objective Architecture are fully accounted for. FY 2018 to FY 2019 Increase/Decrease Statement: Requirement to be completed in FY18.											
Title: Joint Requirements Validation Process Description: Synchronization and Systems Engineering efforts with COE and Command Post Computing Environment (CPCE) and Joint C2 objective Architecture for CP 3, 4 and 5. FY 2018 Plans: Develop technical requirements for the three Capability Packages and synchronize those requirements with CPCE and the Joint community to ensure requirements supporting the Joint C2 objective Architecture are fully accounted for. FY 2018 to FY 2019 Increase/Decrease Statement: Requirement to be completed in FY18.							-	1.279	-		
Accomplishments/Planned Programs Subtotals							4.087	4.447	-		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• BA8250: BA8250 Army Global Cmd & Control Sys (AGCCS) - OPA	2.530	2.658	2.643	-	2.643	3.688	2.848	-	-	0.000	14.367
Remarks											
D. Acquisition Strategy											
In accordance with the Army Mission Command for Unified Action (AMCUA) CDP approved December of 2014. The AMCUA CDP provides an overarching structure for future Army Mission Command systems. The AMCUA initiative will meet the requirements to enable planning and share situational awareness within an interdependent enterprise services network comprised of Unified Action Partners (UAP) and sister service components to achieve integrated mission operations. The AMCUA CDP defines the Land Component-unique Mission Command (MC) capabilities that the Army will develop to enable unified action through integration with existing and future											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303150A / <i>Army Global Command & Control System</i>	Project (Number/Name) EA5 / <i>Strategic and Joint Mission Command</i>
Joint and Service command and control applications. MC capability contributions will enable Joint Forces Land Component Command (JFLCC) Commanders to gain and maintain Situational Awareness (SA), make decisions, and exercise authority and direction via a flexible, distributive and seamless system. The acquisition strategy for AJaSC2 consists of the development, testing and fielding of Capability Packages implemented over time and synchronized with Command Post Computing Environment infrastructure. AJaSC2 will utilize the "Information Technology (IT) Box" construct. As such, evolutionary development of the software will continue as defined Capability Packages to meet emerging requirements that fall within the bounds of the approved IT Box. AJaSC2 strategy will consist of agile application development which will utilize and leverage existing and emerging technologies from Programs of Record and Common Operating Environment (COE) infrastructure. The product development under this R-Form will be accomplished in part under a Project Manager, Mission Command engineering services contract approach which will consist of multiple prime contractors competitively bidding on development efforts. <u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0303150A / Army Global Command & Control System				Project (Number/Name) EA5 / Strategic and Joint Mission Command					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Management	Various	APG, MD : APG, MD	-	0.400		1.315		-		-		-	0.000	1.715	-
Subtotal			-	0.400		1.315		-		-		-	0.000	1.715	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development and Systems Engineering	TBD	TBD : TBD	-	3.177		1.853		-		-		-	0.000	5.030	-
Synchronization with COE, CP CE, and Joint C2	TBD	TBD : TBD	-	0.510		1.279		-		-		-	0.000	1.789	-
Subtotal			-	3.687		3.132		-		-		-	0.000	6.819	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	4.087		4.447		-		-		-	0.000	8.534	N/A
Remarks															

UNCLASSIFIED

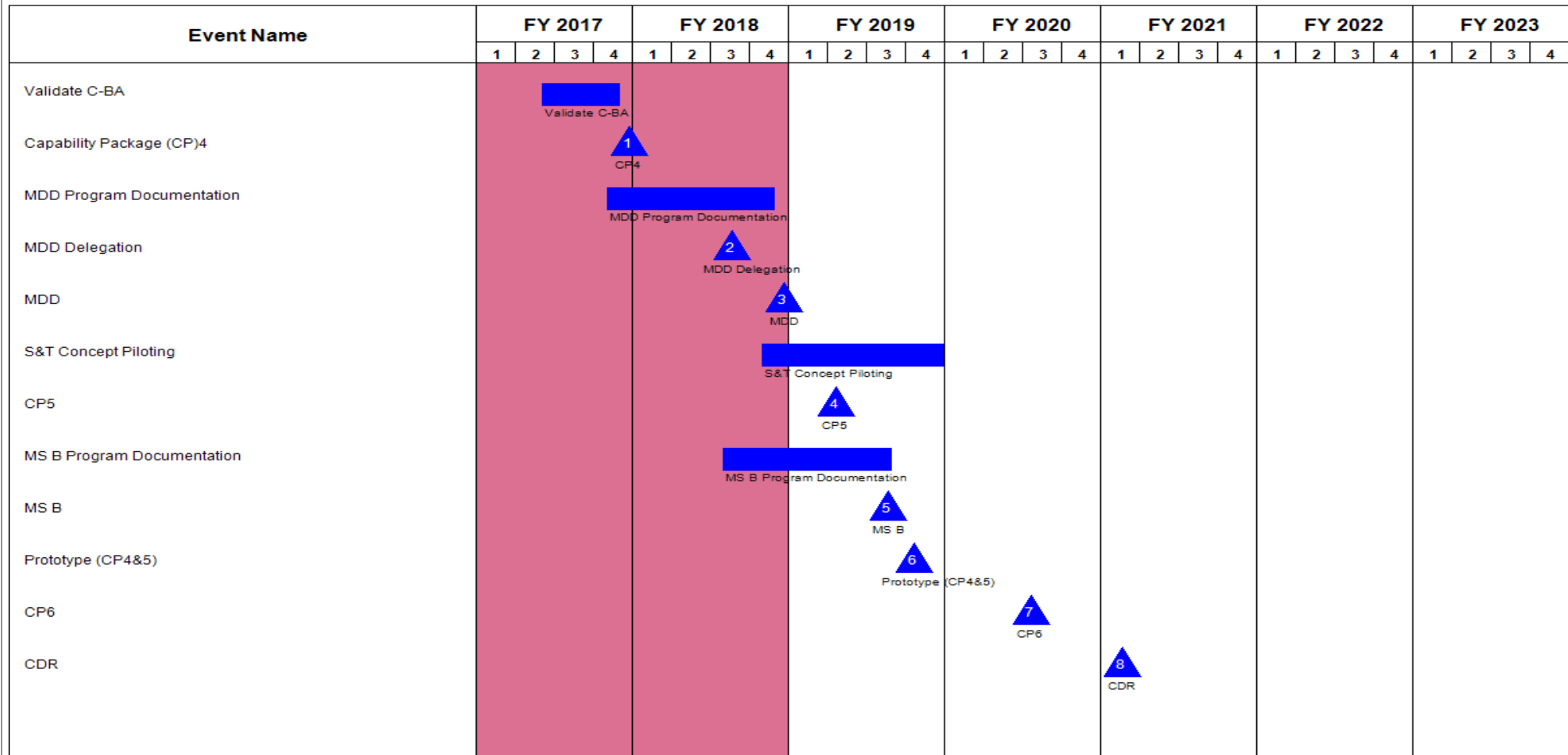
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0303150A / Army Global Command & Control System

Project (Number/Name)
EA5 / Strategic and Joint Mission Command



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303150A / <i>Army Global Command & Control System</i>	Project (Number/Name) EA5 / <i>Strategic and Joint Mission Command</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Validate C-BA	2	2017	4	2017
Capability Package (CP)4	4	2017	4	2017
MDD Program Documentation	4	2017	4	2018
MDD Delegation	3	2018	3	2018
MDD	4	2018	4	2018
S&T Concept Piloting	4	2018	4	2019
CP5	2	2019	2	2019
MS B Program Documentation	3	2018	3	2019
MS B	3	2019	3	2019
Prototype (CP4&5)	4	2019	4	2019
CP6	3	2020	3	2020
CDR	1	2021	1	2021

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0305172A / <i>Combined Advanced Applications</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	1.100	1.500	-	1.500	1.500	1.500	1.500	1.500	0.000	8.600
XT9: <i>COMBINED ADVANCED APPLICATIONS</i>	-	0.000	1.100	1.500	-	1.500	1.500	1.500	1.500	1.500	0.000	8.600

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)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	1.100	1.500	-	1.500
Current President's Budget	0.000	1.100	1.500	-	1.500
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305179A I Integrated Broadcast Service (IBS)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.450	-	0.450	0.459	0.467	0.500	0.000	0.000	1.876
EF4: Integrated Broadcast System	-	0.000	0.000	0.450	-	0.450	0.459	0.467	0.500	0.000	0.000	1.876

Note

Integrated Broadcast Service is a new start effort in FY 2019. This project last received funding in FY 2016.

A. Mission Description and Budget Item Justification

The Joint Program Office (JPO) for Integrated Broadcast Service (IBS) Terminals supports the Joint Services and the Special Operations Command (SOCOM). The IBS transmits worldwide time-sensitive tactical and strategic intelligence and targeting data to all echelons of Joint Service operational users. The JPO is responsible for coordinating modernization and sustainment of IBS terminals compatible with the UHF SATCOM IBS broadcasts. The JPO is pursuing a next generation non-developmental item to replace the existing Joint Tactical Terminals (JTT). The transmit/receive-capable JTT systems currently consist of the JTT-Senior and JTT-IBS configurations, and they satisfy the radio communication Key Performance Parameters for the IBS Program. The JTT is the official IBS producer system, and ensures continued IBS interoperability to a variety of tactical producers/consumers across the Joint Services.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.450	-	0.450
Current President's Budget	0.000	0.000	0.450	-	0.450
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305179A / Integrated Broadcast Service (IBS)				Project (Number/Name) EF4 / Integrated Broadcast System			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EF4: Integrated Broadcast System	-	0.000	0.000	0.450	-	0.450	0.459	0.467	0.500	0.000	0.000	1.876
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Integrated Broadcast Service is a new start effort in FY 2019. This project last received funding in FY 2016.

A. Mission Description and Budget Item Justification

The Joint Program Office (JPO) for Integrated Broadcast Service (IBS) Terminals supports the Joint Services and the Special Operations Command (SOCOM). The IBS transmits worldwide time-sensitive tactical and strategic intelligence and targeting data to all echelons of Joint Service operational users. The JPO is responsible for coordinating modernization and sustainment of IBS terminals compatible with the UHF SATCOM IBS broadcasts. The JPO is pursuing a next generation non-developmental item to replace the existing Joint Tactical Terminals (JTT) and performs JTT life cycle program management and technical fixes. The IBS network uses Type-1 encryption, Common Interactive Broadcast (CIB), and Common Message Format (CMF). Funds support acquisition related technical development, requirements, testing and integration of next generation JTT systems and components.

FY 2019 funds in the amount of \$0.450 million will be used for testing and certification for the next generation JTT and engineering services to support the program office.

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

	FY 2017	FY 2018	FY 2019
Title: Support Costs and Management Services	-	-	0.450
Description: Engineering Support			
FY 2019 Plans: Initiate system engineering support.			
FY 2018 to FY 2019 Increase/Decrease Statement: New start - Market research for next generation JTT efforts.			
Accomplishments/Planned Programs Subtotals	-	-	0.450

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• V29600: <i>JTT/CIBS-M</i>	5.337	12.154	10.268	-	10.268	7.714	5.338	5.511	1.837	0.000	48.159

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305179A / <i>Integrated Broadcast Service (IBS)</i>	Project (Number/Name) EF4 / <i>Integrated Broadcast System</i>	

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>

Remarks
FY 2019 funds start support of the next generation JTT acquisition. FY 2017 and FY 2018 funds support fielding support efforts for JTT IBS.

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305179A / Integrated Broadcast Service (IBS)						Project (Number/Name) EF4 / Integrated Broadcast System					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
User Support	MIPR	ICOE : Fort Huachuca, AZ	0.046	-		-		-		-		-	0.000	0.046	-
Project Management Support	Allot	PM DCGS-A : APG, MD; Fort Huachuca, AZ	0.075	-		-		-		-		-	0.000	0.075	-
Subtotal			0.121	-		-		-		-		-	0.000	0.121	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration and Testing of JTT fleet Modernization	MIPR	JITC : Fort Huachuca, AZ; APG,MD	0.629	-		-		0.450		-		0.450	0.000	1.079	-
Subtotal			0.629	-		-		0.450		-		0.450	0.000	1.079	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.750	-		0.000		0.450		-		0.450	0.000	1.200	N/A
Remarks															

UNCLASSIFIED

PE 0305179A: *Integrated Broadcast Service (IBS)*
Army

495

R-1 Program Element (Number/Name)
PE 0305179A / *Integrated Broadcast Service (IBS)*

Project (Number/Name)
EF4 / *Integrated Broadcast System*

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IBS Terminals Integration and Test																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305179A / Integrated Broadcast Service (IBS)	Project (Number/Name) EF4 / Integrated Broadcast System

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IBS Terminals Integration and Test	2	2019	1	2023

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	8.218	16.925	6.000	-	6.000	5.099	5.249	5.231	8.223	0.000	54.945
11A: <i>Advanced Payload Develop & Spt (MIP)</i>	-	1.975	10.733	1.252	-	1.252	0.145	0.148	0.000	7.223	0.000	21.476
11B: <i>Tsp Development (MIP)</i>	-	2.301	1.480	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.781
123: <i>Joint Technology Center System Integration</i>	-	3.942	4.712	4.748	-	4.748	4.954	5.101	5.231	1.000	0.000	29.688

Note

The FY2018 funding of \$4,700,000 was re-aligned in accordance to Project 11B scheduled Test Event of the desired Signal of Interest in FY19 on the UAS Grey Eagle platform and MQ-1C (ER).

A. Mission Description and Budget Item Justification

Project 11A: The Advanced Payloads Development project line is a shared funding line between multiple Payload programs. These Payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Small Tactical Radar - Lightweight (STARLite) Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI) is a lightweight, high performance, all weather, multi-functional radar system for the Gray Eagle UAS. The STARLite system provides wide area, near real time Reconnaissance, Surveillance and Target Acquisition (RSTA) capabilities. It operates throughout the UAS flight mission profile in adverse weather and through battlefield obscurants. The Synthetic Aperture Radar (SAR) mode generates quality images for the battlefield commander for detection, classification and location of stationary commercial wheeled vehicle-size targets. The MTI mode detects moving ground targets, to include man-sized detection, and provides location information and performs cross-cue with the Electro-Optic/Infrared (EO/IR) sensors. STARLite is increasing its software capabilities based on Initial Operational Test and Evaluation (IOT&E) results which will increase automation and upgrade to a common Graphical User Interface (GUI) to align with the Common Operating Environment (COE) requirement to enable Sensor Processing and Exploitation (SPE). The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness.

Common Sensor Payload (CSP) - Electro Optical / Infrared / Laser Designator (EO/IR/LD) provides High Definition (HD) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums with day/night capability to collect and display continuous imagery and the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for the Gray Eagle UAS which supports force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities. Additional initiatives will continue to focus on the transition of technologies directly supporting emerging requirements and the Army's Current and Future Force.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				
Project 11B: The Tactical Signals Intelligence (SIGINT) Payload (TSP) is a SIGINT sensor for the Gray Eagle that detects radio frequency (RF) emitters. The TSP system will provide a SIGINT capability to the tactical commander. The TSP system will be a modular, scalable payload using an architecture that is software reconfigurable to allow for growth and flexibility as technology, and as the adversaries use of technology, changes. This flexible architecture allows for third party software applications to be integrated into the TSP system. The TSP system processing, control and data dissemination is integrated into the Distributed Common Ground System - Army (DCGS-A) via the Operational Ground Station. It supports Manned/Unmanned (MUM) teaming with Brigade Combat Team ground SIGINT Terminal Guidance (STG) teams and manned airborne assets. The TSP system improves situational awareness and shortens the targeting cycle by detecting and identifying emitters associated with high value targets (HVTs). The TSP system is capable of processing conventional signals, standard military signals, and modern signals of interest. This includes detection, recognition, identification, direction finding, and high confidence geo-location. Project 123: The UAS Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a Joint facility that develops, integrates, and supports the enhancement of its Multiple Unified Simulation Environment (MUSE) capability for Army systems and operational concepts. The JTC/SIL conducts prototype hardware and software development, builds the UAS Institutional Mission Simulator (IMS) trainers for the Shadow, Hunter, and Gray Eagle programs, and provides modeling and simulation support. The MUSE is a real-time, operator in-the-loop simulation that may be integrated with larger simulations in support of Army and Joint training and exercises. The MUSE is also employed as a Mission Rehearsal Tool for ongoing combat operations. This project funds the management of the JTC/SIL and MUSE enhancements. This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		8.218	16.925	12.657	-	12.657
Current President's Budget		8.218	16.925	6.000	-	6.000
Total Adjustments		0.000	0.000	-6.657	-	-6.657
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• Adjustments to Budget Years		-	-	-6.657	-	-6.657
Change Summary Explanation						
The FY2019-FY23 funding profile in accordance to Project 11B Fiscal Year (FY) 2019 Army has ceased investment (FY19-FY23) for TSP POR in support of acquisition strategy of QRCs towards a Family of Systems to meet the critical SIGINT capability need with the desired Signals of Interest on the UAS Grey Eagle Platform and the MQ-1C (ER).						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 11A / Advanced Payload Develop & Spt (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
11A: Advanced Payload Develop & Spt (MIP)	-	1.975	10.733	1.252	-	1.252	0.145	0.148	0.000	7.223	0.000	21.476
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Payloads Development project is a shared funding line between multiple Payload programs. These Payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Small Tactical Radar - Lightweight (STARLite) ACAT III - Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI) is a lightweight, high performance, all weather, multi-functional radar system for the Gray Eagle UAS. The STARLite system provides wide area, near real time RSTA capabilities. It operates throughout the UAS flight mission profile in adverse weather and through battlefield obscurants. The Synthetic Aperture Radar (SAR) mode generates quality images for the battlefield commander for detection, classification and location of stationary commercial wheeled vehicle-size targets. The MTI mode detects moving ground targets, to include man-sized detection, and provides location information and performs cross-cue with the Electro-Optic/Infrared (EO/IR) sensors. STARLite is increasing its software capabilities based on Initial Operational Test and Evaluation (IOT&E) results which will increase automation and upgrade to a common Graphical User Interface (GUI) to align with the Common Operating Environment (COE) requirement to enable Sensor Processing and Exploitation (SPE). The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness.

Common Sensor Payload (CSP) - ACAT III - Electro Optical / Infrared / Laser Designator (EO/IR/LD) provides Standard Definition (SD) or High Definition (HD) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums. These systems provide day/night capability to collect and display continuous imagery and the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for the Gray Eagle UAS which supports intelligence gathering, force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities. Additional updates to enhance CSP usability include Target Location Accuracy (TLA) and Target Awareness Improvement (TAI). These initiatives develop the CSP into a metric sensor capable of providing rapid and enhanced targeting and reducing cognitive burden by providing improved situational awareness and multiple fields of view in a simplified manner through Hardware (H/W) and Software (S/W) improvements.

Fiscal Year (FY) 2019 base dollars in the amount of \$1.252 million is for STARLite Sensor CE Development and enhanced CSP to reduce cognitive burden on the Warfighter.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: STARLite SPE	0.560	1.620	0.626	-	0.626

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 11A / Advanced Payload Develop & Spt (MIP)			
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Software Development to improve STARLite SPE Development, Testing and Integration.											
FY 2018 Plans: Complete test and integration of SPE (v.501) Software improvements onto Gray Eagle											
FY 2019 Base Plans: STARLite Sensor CE Development											
FY 2018 to FY 2019 Increase/Decrease Statement: STARLite Sensor CE Development											
Title: CSP Increased Usability							1.415	9.113	0.626	-	0.626
Description: S/W development to increase the usability of the CSP. Development to increase the usability of the CSP while reducing cognitive burden on the Warfighter.											
FY 2018 Plans: H/W and S/W enhancements to reduce cognitive burden on the Warfighter and program office management support.											
FY 2019 Base Plans: Develop Tactical Awareness Improvements for increased operator situational awareness and program office management support											
FY 2018 to FY 2019 Increase/Decrease Statement: Program focus shift from TLA to TAI.											
Accomplishments/Planned Programs Subtotals							1.975	10.733	1.252	-	1.252
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• A01003: SAR/MTI (MIP) - A01003	15.724	19.000	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• A01005: CSP FMV (MIP) - A01005	58.129	26.810	0.000	11.400	11.400	-	-	-	-	Continuing	Continuing
Remarks											
MQ-1 PAYLOAD - UAS - A00020 was a shared Aircraft Procurement, Army (APA) funding line for CSP, STARLite and Tactical Signals Intelligence (SIGINT) Payload (TSP).											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 11A / Advanced Payload Develop & Spt (MIP)			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
STARLite (A01003), and CSP (A01005) are broken into individual lines within MQ-1Payload (MIP) (A01001).											
SAR/MTI (MIP) - A01003: Procurement funding line for STARLite											
CSP FMV (MIP) - A01005: Procurement funding line for CSP											
D. Acquisition Strategy											
STARLite SAR/MTI is a threshold requirement for the Gray Eagle UAS. The acquisition strategy for STARLite program was based on a full and open competition for the Army. Full Rate Production (FRP) was successfully achieved in June 2013. A follow-on production contract was awarded in April 2014 to procure all remaining STARLite Payloads required for the Gray Eagle platform. Based on Initial Operational test and Evaluation (IOT&E) results, STARLite is increasing its software capabilities to increase automation and upgrade to a common Graphical User Interface (GUI) and aligns SPE with the COE requirements. The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness. A competitive Research, Development, Test, and Evaluation (RDTE) funded contract was awarded to Northrop Grumman in October 2013 to perform trade studies and begin the development of the software improvements. Integration onto the Gray Eagle will be done via a sole source cost-plus fixed fee contract with the UAS prime contractor, General Atomics ASI.											
Common Sensor Payload (CSP) EO/IR/LD enables the Gray Eagle to meet a KPP (Key Performance Parameter) requirement. The acquisition strategy for the CSP program was based on a full and open competition for the Army. A competitive contract was awarded in Nov 2007 to Raytheon for the build, integration, test and delivery of the CSP. Full Rate Production (FRP) was completed June 2013. A three (3) year system support contract was awarded in July 2015 for sustainment and upgrade of the CSP to include retrofitting standard definition sensors with high definition sensors and to perform RDT&E activities. The Enhanced EO/IR Capability Production Document, approved 19 Dec 2016, defines additional KPP requirements for Full Motion Video (FMV) sensors. The first KPP increases detection, recognition, and identification requirements which can only be met with the High Definition (HD) variation of the CSP. Currently, units are being fielded HD CSPs, with additional HD CSPs in production and retrofit. The second KPP requirement is for the CSP to be a metric sensor with rapid and enhanced Target Location Accuracy (TLA). The acquisition strategy for CSP in FY 2019 is to mature Software and Hardware efforts for CSP that reduce cognitive burdens on the Warfighter, improve situational awareness, provide multiple fields of view, and enhance targeting capabilities.											
The acquisition strategy is to complete STARLite SPE software developmental test and integration onto Gray Eagle and Non-Recurring Engineering (NRE) support to the Night Vision and Electronic Sensors Directorate (NVESD) to continue enhancing CSP's usability for the Warfighter to reduce cognitive burden by providing improved situational awareness, while providing multiple fields of view in a simplified manner through Hardware (H/W) and S/W improvements.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 11A / Advanced Payload Develop & Spt (MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CSP Program Management	MIPR	PM EOIR : Fort Belvoir, VA	0.090	0.100		0.632		0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
STARLite Program Mgmt Personnel	Various	PM SAI : Aberdeen, MD	1.000	0.150		0.617		0.227		-		0.227	Continuing	Continuing	Continuing
Subtotal			1.090	0.250		1.249		0.327		-		0.327	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CSP Development	C/CPFF	Raytheon : McKinney, TX	84.022	-		-		-		-		-	0.000	84.022	-
STARLite Sensor CE Development	SS/CPFF	General Atomics ASI : Potway, CA	1.295	-		1.003		0.399		-		0.399	Continuing	Continuing	Continuing
CSP HW/SW Improvements Reduce Cognitive Burden	MIPR	Night Vision Labs : Fort Belvoir, VA	1.704	1.115		1.202		0.426	Mar 2019	-		0.426	Continuing	Continuing	Continuing
CSP Target Location Accuracy (TLA)	SS/CPFF	Raytheon : McKinney, TX	-	-		6.187		-		-		-	Continuing	Continuing	Continuing
Subtotal			87.021	1.115		8.392		0.825		-		0.825	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CSP TLA Integration (NRE)	SS/CPFF	PM MAE(General Automics) : San Diego, CA	-	-		0.781		-		-		-	Continuing	Continuing	Continuing
Subtotal			-	-		0.781		-		-		-	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>				Project (Number/Name) 11A / <i>Advanced Payload Develop & Spt (MIP)</i>					
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CSP Testing	MIPR	Various : Various	17.086	-		-		-		-		-	0.000	17.086	-
CSP HW/SW Improvements Reduce Cognitive Burden	MIPR	Night Vision Labs : Fort Belvoir, VA	-	0.200		0.311		0.100	Mar 2019	-		0.100	Continuing	Continuing	Continuing
STARLite YTC Software Development Testing	MIPR	YPG : Yuma Proving Ground	0.500	0.410		-		-		-		-	Continuing	Continuing	Continuing
STARLite IGE Testing	MIPR	Various : Various	13.441	-		-		-		-		-	0.000	13.441	-
Subtotal			31.027	0.610		0.311		0.100		-		0.100	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			119.138	1.975		10.733		1.252		-		1.252	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0305204A / Tactical Unmanned Aerial
Vehicles

Project (Number/Name)
11A / Advanced Payload Develop & Spt
(MIP)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CSP HD (EO/IR/LD) Production																												
CSP HD Production																												
CSP HD Retrofit																												
CSP HD Retrofit																												
CSP HW/SW Improvements Reduce Cognitive Burden Development																												
CSP HW/SW Development																												
CSP HW/SW Improvements Reduce Cognitive Burden Testing / Integration																												
CSP HW/SW Testing / Integration																												
CSP TLA Development																												
CSP TLA Development																												
CSP TLA Testing/Integration																												
CSP TLA Testing/Integration																												
STARLite (500) SPE SW Integration Flight Test																												
SW Integration																												
STARLite (501) SPE SW Integration Flight Test																												
SW Integration																												
STARLite Sensor CE Development																												
SW Development																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0305204A / Tactical Unmanned Aerial Vehicles

Project (Number/Name)

11A / Advanced Payload Develop & Spt (MIP)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CSP (EO/IR/LD) Award	1	2008	1	2008
CSP (EO/IR/LD) Production	1	2008	2	2016
CSP (EO/IR/LD) Testing	2	2009	4	2012
CSP (EO/IR/LD) Milestone C	2	2010	2	2010
CSP HD (EO/IR/LD) Development	2	2012	2	2013
CSP HD (EO/IR/LD) Testing	1	2013	3	2013
CSP HD (EO/IR/LD) Production	2	2013	2	2018
CSP HD Retrofit	4	2013	1	2019
CSP HW/SW Improvements Reduce Cognitive Burden Development	1	2016	4	2019
CSP HW/SW Improvements Reduce Cognitive Burden Testing / Integration	3	2017	4	2020
CSP TLA Development	2	2018	4	2020
CSP TLA Testing/Integration	2	2018	1	2021
Improvements to STARLite Sensor Processing and Exploitation	1	2014	3	2016
STARLite (500) SPE SW Integration Flight Test	3	2017	3	2018
STARLite (501) SPE SW Integration Flight Test	3	2018	3	2019
STARLite Sensor CE Development	2	2018	2	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>				Project (Number/Name) 11B / <i>Tsp Development (MIP)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
11B: <i>Tsp Development (MIP)</i>	-	2.301	1.480	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.781
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Signals Intelligence (SIGINT) Payload (TSP) is a SIGINT sensor for the Gray Eagle that detects radio frequency (RF) emitters. The TSP system will provide a SIGINT capability to the tactical commander. The TSP system will be a modular, scalable payload using an architecture that is software reconfigured to allow for growth and flexibility as technology, and as the adversaries use of technology, changes. This flexible architecture allows for third party software applications to be integrated into the TSP system. The TSP system processing, control and data dissemination is integrated into the Distributed Common Ground System - Army (DCGS-A) via the Operational Ground Station. It supports Manned/Unmanned (MUM) teaming with Brigade Combat Team ground SIGINT Terminal Guidance (STG) teams and manned airborne assets. The TSP system improves situational awareness and shortens the targeting cycle by detecting and identifying emitters associated with high value targets (HVTs). The TSP system is capable of processing conventional signals, standard military signals, and modern signals of interest. This includes detection, recognition, identification, direction finding, and high confidence geo-location.

Fiscal Year (FY) 2019 FDI/G8 has ceased EE PEG Investment (FY19-FY23) for TSP POR in support of acquisition strategy of QRCs towards a Family of Systems to meet the critical SIGINT capability need with the desired Signals of Interest on the UAS Grey Eagle Platform and the MQ-1C (ER).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineering Research Development Integration and Test Support.	2.301	1.480	-	-	-
Description: Engineering, Research, Development, Integration, and Test of the desired Signal of Interest. In addition, any activities for TSP for ongoing system improvements.					
FY 2018 Plans: Executed corrective engineering actions resulting from DT/LUT Testing Event. Initiate the required development work for TSP Beyond Block 1 for Future upgrades. Continue support of TSP Interim Contractor Logistics Support (ICLS).					
FY 2018 to FY 2019 Increase/Decrease Statement: Executed corrective engineering actions resulting from DT/LUT Testing Event. Initiate the required development work for TSP Beyond Block 1 for Future upgrades. Continue support of TSP Interim Contractor Logistics Support (ICLS).					
Accomplishments/Planned Programs Subtotals	2.301	1.480	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 11B / Tsp Development (MIP)			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• A01004: A01004 - SIGINT (MIP)	37.682	1.500	0.000	-	0.000	-	-	-	-	0.000	39.182
• 0605766A: TSP Theater Net-Centric Geolocation (TNG) - PE0605766A, Project DX9: TNG funding included in Tactical Exploitation of National Capabilities (TENCAP) funding line.	4.955	6.882	12.340	-	12.340	11.435	9.177	13.182	12.554	0.000	70.525
Remarks											
MQ-1 PAYLOAD - UAS - A00020: Shared Aircraft Procurement, Army (APA) procurement funding line for CSP, STARLite, TSP, and Advanced Payloads.											
SIGINT (MIP) - A01004: Procurement funding line for TSP Payloads. Under Parent Line MQ-1 Payloads (MIP) - A01001.											
TSP Theater Net-Centric Geolocation (TNG) - PE0605766A, Project DX9: TNG funding included in Tactical Exploitation of National Capabilities (TENCAP) funding line.											
D. Acquisition Strategy											
TSP is a threshold requirement for the MQ-1C Gray Eagle UAS. The TSP program completed the Engineering and Manufacturing Development (EMD) phase with a Milestone B decision in September 2011. The TSP Program EMD contract award was based on full-and-open competition with a period of performance that was completed in October 2015, and focused on integration and test onto the Gray Eagle platform, and integration and test of TSP software into the Operational Ground Station. The TSP EMD program is a derivative of systems that were fielded as a Quick Reaction Capability on the MQ-1C UAS and a variety of other manned platforms. The demonstrated scalability of these fielded materiel solutions allows the TSP EMD program to leverage effort that directly supports the TSP EMD program.											
The TSP program entered the Low Rate Initial Production (LRIP) phase with a Milestone C decision that was approved on 2 May 2014. The TSP Program LRIP contract award was based on sole source selection with a period of performance that was completed on June 2016, and primarily focused on the obsolescence of the EMD phase assets via the required Engineering Change Proposals, and the first initial production of 30 TSP Payloads in support of the Gray Eagle Platform. The TSP Program ICLS contract award was a result of previous sole selection with a period of performance of 12-months with a 5 year option for total completion into August 2021. The primary focus supports fielding of system, continuous contractual support through operational and sustainment transition, engineering corrective actions, support of the MQ-1C (ER), and the conversion of the 30 LRIP TSP systems.											
The TSP Block 1 is the current Program of Record capability. TSP Beyond Block 1 will address objectives and remaining deferred Block 1 threshold requirements as reflected in the approved Capability Production Document (CPD).											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>	Project (Number/Name) 11B / <i>Tsp Development (MIP)</i>
Improved Gray Eagle (IGE)- Program Manager Unmanned Aircraft Systems(PM UAS)received a Congressional plus up of \$49M President's Budget15(PB15) to procure Extended Range UAS which increases the CPD objective endurance requirements for the current GE configuration to an Improved Gray Eagle (IGE). TSP is scheduled for integration and testing on the IGE platform upon completion of the platform's Follow on Test Evaluation#2 scheduled 1QFY18.		
<u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 11B / Tsp Development (MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management-Gov	RO	PM SAI : APG	8.556	-		-		-		-		-	0.000	8.556	-
Program Management Support	MIPR	Various : APG	4.575	-		-		-		-		-	0.000	4.575	Continuing
FFRDC Support	SS/CR	MITRE : APG	2.198	0.350	Dec 2016	0.350		-		-		-	0.000	2.898	-
Subtotal			15.329	0.350		0.350		-		-		-	0.000	16.029	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TSP EMD	C/CPIF	BAE Systems, : Nashua, NH	20.206	-		-		-		-		-	0.000	20.206	-
TSP Engineering Changes	SS/CPFF	BAE Systems : Nashua, NH	8.295	-		0.477		-		-		-	0.000	8.772	-
MQ-1C (ER) and OGS Integration	SS/CPFF	Various : Various	6.575	-		-		-		-		-	0.000	6.575	-
TSP System Support (Logistics, Training, & Test)	MIPR	Various : Various	11.843	-		-		-		-		-	0.000	11.843	-
Block 2	C/CPIF	To Be Determined : To Be Determined	-	-		0.478		-		-		-	0.000	0.478	-
Subtotal			46.919	-		0.955		-		-		-	0.000	47.874	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	Various : Various	6.158	-		0.175		-		-		-	0.000	6.333	-
Subtotal			6.158	-		0.175		-		-		-	0.000	6.333	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>						Project (Number/Name) 11B / <i>Tsp Development (MIP)</i>			

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Activities	MIPR	ATEC/APG : Various	7.515	-		-		-		-		-	0.000	7.515	-
Initial Operational Test & Evaluation	MIPR	ATEC/Various : Various	2.372	-		-		-		-		-	0.000	2.372	-
Test Range & Aircraft Support	MIPR	CECOM Flight Activity : Lakehurst, NJ	4.268	-		-		-		-		-	0.000	4.268	-
TSP Production Qualification Test #4	MIPR	ATEC/Various : Various	3.170	1.951	Mar 2017	-		-		-		-	0.000	5.121	-
Subtotal			17.325	1.951		-		-		-		-	0.000	19.276	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	85.731	2.301		1.480		-		-		-	0.000	89.512	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>		Project (Number/Name) 11B / <i>Tsp Development (MIP)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
TSP Block 1 Integration and Test																												
MQ-1C Integration and Test																												
TSP DT/LUT 6U																												
TSP/QRC Customer Test																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>	Project (Number/Name) 11B / <i>Tsp Development (MIP)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TSP Block 1 Integration and Test	1	2015	4	2017
MQ-1C Integration and Test	1	2016	4	2017
TSP/MQ-1C Air Worthiness Release	1	2016	1	2016
TSP DT/LUT 6U	2	2017	1	2018
TSP/QRC Customer Test	2	2018	1	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 123 / Joint Technology Center System Integration			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
123: Joint Technology Center System Integration	-	3.942	4.712	4.748	-	4.748	4.954	5.101	5.231	1.000	0.000	29.688
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Unmanned Aircraft System (UAS) Joint Technology Center/System Integration Laboratory (JTC/SIL) is a Joint facility that develops, integrates, and supports the enhancement of its Multiple Unified Simulation Environment (MUSE) capability for Army systems and operational concepts. The JTC/SIL conducts prototype hardware and software development, builds the UAS Institutional Mission Simulator (IMS) trainers for the Shadow, Hunter, and Gray Eagle programs, and provides modeling and simulation support. The MUSE is a real-time, operator in-the-loop simulation that may be integrated with larger simulations in support of Army and Joint training exercises. The MUSE is also employed as a Mission Rehearsal Tool for ongoing combat operations. This project funds the management of the JTC/SIL and MUSE enhancements.

This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

Continued integration of Night Vision Image Generator (NVIG) into the Modeling & Simulation domain as it pertains to UAS simulation. Terrain, and model development for NVIG and Virtual Reality Scene Generator (VRSG) to increase fidelity. Support of theater level Exercises, Ulchi Freedom Guardian (UFG), Yama Sakura (YS) and Key Resolve (KR). Improvement of mapping capability for mission planning. Redesign of Windows Entity Server (WES) and NetLink to improve network routing, thus lessening bandwidth consumption. Incorporation of Common Image Generator Interface to provide an Image Generator (IG) agnostic solution thereby allowing for other IGs to be supported that are currently not supported. Continued implementation of tactical protocols into the simulation domain to enhance interoperability. Development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Redesign of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without touching code; again a reduction in costs and increased solution delivery speed.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	3.611	4.212	4.248	-	4.248
Description: Funding is provided for the following efforts.					
FY 2018 Plans:					
Continued integration of Night Vision Image Generator (NVIG) into the Modeling & Simulation domain as it pertains to UAS simulation. Terrain, and model development for NVIG and Virtual Reality Scene Generator (VRSG) to increase fidelity. Support of theater level Exercises, Ulchi Freedom Guardian (UFG), Yama					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles		Project (Number/Name) 123 / Joint Technology Center System Integration		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Sakura (YS) and Key Resolve (KR). Improvement of mapping capability for mission planning. Redesign of Windows Entity Server (WES) and NetLink to improve network routing, thus lessening bandwidth consumption. Incorporation of Common Image Generator Interface to provide an Image Generator (IG) agnostic solution thereby allowing for other IGs to be supported that are currently not supported. Continued implementation of tactical protocols into the simulation domain to enhance interoperability. Development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Redesign of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without touching code; again a reduction in costs and increased solution delivery speed.						
FY 2019 Base Plans: Continued movement towards standards based solutions, e.g. Common Image Generator Interface (CIGI), which will facilitate optimal interoperability and an IG agnostic framework with which to integrate with various IGs. Continued specific integration of Night Vision Image Generator (NVIG) and Virtual Reality Scene Generator (VRSG) into the Modeling & Simulation domain as it pertains to UAS simulation, terrain and model development. Continued support of annual/bi-annual theater level Exercises (Ulchi Freedom Guardian (UFG), Yama Sakura (YS) and Key Resolve (KR), Talisman Saber (TS), Pacific Sentry -2 & -3, as well as 5 other Exercises coming online, Integration Events (IEs) and Validation Events (VEs). Continued improvement of mapping capability for mission planning. Continued redesign of Windows Entity Server (WES) and NetLink to improve network routing and large PDU data feeds (i.e. ? 7 million+), thus lessening bandwidth consumption. Continued development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Continued implementation of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without modifying code; again a reduction in costs and increased solution delivery velocity. Continued architecture optimization, to facilitate extensibility and scalability, to maintain readiness for growth of M&S requirements coming from the Services.						
FY 2018 to FY 2019 Increase/Decrease Statement: The increase of \$133,000 funds the following: Additional sensor simulation and UAV platform simulation.						
Title: Management Services		0.331	0.500	0.500	-	0.500
Description: Funding is provided for the following efforts.						
FY 2018 Plans:						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018							
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>		Project (Number/Name) 123 / <i>Joint Technology Center System Integration</i>							
B. Accomplishments/Planned Programs (\$ in Millions)											
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total						
Continue coordination and oversight of MUSE product development.											
<i>FY 2019 Base Plans:</i> Continue coordination and oversight of MUSE product development.											
Accomplishments/Planned Programs Subtotals	3.942	4.712	4.748	-	4.748						
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PE 0305206F Air Force: <i>PE 0305206F Air Force</i>	3.841	3.429	3.480	-	3.480	3.548	3.607	3.680	3.746	Continuing	Continuing
Remarks											
The JTC/SIL and the MUSE receive funding from the Air Force. This effort is a continuing effort in support of Service UAS programs.											
D. Acquisition Strategy											
Continued MUSE development will be accomplished through a combination of Government in-house functional directorate support using a variety of existing contract vehicles.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305204A / Tactical Unmanned Aerial Vehicles				Project (Number/Name) 123 / Joint Technology Center System Integration					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	AMC, AMCOM, AMRDEC, SED : Redstone Arsenal, AL	2.688	0.331		0.500		0.520		-		0.520	Continuing	Continuing	Continuing
Subtotal			2.688	0.331		0.500		0.520		-		0.520	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MUSE Development	MIPR	AMC, AMCOM, AMRDEC, SED : Redstone Arsenal, AL	13.448	3.611		4.212		4.228		-		4.228	Continuing	Continuing	Continuing
Subtotal			13.448	3.611		4.212		4.228		-		4.228	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability Support	MIPR	AMC, RDECOM, AMRDEC : Redstone Arsenal, AL	9.460	-		-		-		-		-	0.000	9.460	-
Subtotal			9.460	-		-		-		-		-	0.000	9.460	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			25.596	3.942		4.712		4.748		-		4.748	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0305204A / Tactical Unmanned Aerial Vehicles

Project (Number/Name)

123 / Joint Technology Center System Integration

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Risk Management Framework: MUSE/AFFERS SW Dev. Kit																												
Vignette Planning and Rehearsal SW Refactoring(Service Orient																												
Incorporate Command and Control Using STANAG 4586																												
Generic 6 Degrees of Freedom																												
Web Based MUSE/AFSERS																												
Integration of Night Vision Image Generator (NVIG)																												
User Interface Redesign																												
Key Resolve Exercises																												
1Q each FY																												
Ulchi Freedom Guardian Exercises																												
3Q each FY																												
Yama Sakura Exercises																												
4Q each FY																												
MUSE/AFSERS Releases																												
3Q each FY																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / <i>Tactical Unmanned Aerial Vehicles</i>	Project (Number/Name) 123 / <i>Joint Technology Center System Integration</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Windows Entity Server and NetLink Redesign	1	2015	3	2016
Risk Management Framework: MUSE/AFFERS SW Dev. Kit	3	2015	4	2021
Vignette Planning and Rehearsal SW Refactoring(Service Oriented Architecture)	2	2015	4	2021
Incorporate Command and Control Using STANAG 4586	1	2016	3	2017
Generic 6 Degrees of Freedom	1	2017	4	2018
Web Based MUSE/AFSERS	1	2018	4	2019
Integration of Night Vision Image Generator (NVIG)	2	2019	4	2020
User Interface Redesign	1	2015	4	2022
Key Resolve Exercises	1	2015	1	2023
Ulchi Freedom Guardian Exercises	3	2015	3	2022
Yama Sakura Exercises	4	2015	4	2022
MUSE/AFSERS Releases	3	2015	3	2022

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305206A I Airborne Reconnaissance Systems							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	11.799	20.080	12.416	14.000	26.416	19.177	7.296	13.083	14.457	0.000	112.308
EH2: EMARSS ADV DEV (MIP)	-	0.000	0.000	3.205	-	3.205	3.218	0.000	2.011	2.051	0.000	10.485
EH3: EMARSS Payloads ADV DEV (MIP)	-	0.130	2.111	6.531	-	6.531	14.464	6.296	6.493	6.622	0.000	42.647
EH5: ARL Payloads ADV DEV (MIP)	-	11.669	17.969	1.980	14.000	15.980	1.495	1.000	4.579	5.784	0.000	58.476
EH7: Guardrail Common Sensor (GRCS) Payloads (MIP)	-	0.000	0.000	0.700	-	0.700	0.000	0.000	0.000	0.000	0.000	0.700

Note
This program is not a New Start and funding transferred from Program Element (PE) 0605626.

A. Mission Description and Budget Item Justification

Airborne Reconnaissance Low - Enhanced (ARL-E) is a worldwide self-deployable airborne Intelligence Surveillance Reconnaissance (ISR) system designed for timely, accurate, assured support to tactical forces over the full spectrum of operations. This system is a De Havilland DHC-8 aircraft replacing the DHC-7 in accordance with the Aerial ISR (AISR) 2020 Strategy. ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E Capabilities Production Document (CPD) requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), Electro-Optical/Infrared (EO/IR)/Full-Motion Video (FMV) , Multi-Mode Radar, Robust Communications Intelligence (COMINT), on-Board Collection, Analysis, Sensor Cross Cue and dissemination through Distributed Common Ground System-Army (DCGS-A) Enabled workstations. ARL-E will be assigned to the U.S. Army Intelligence and Security Command's Aerial ISR Brigade providing AISR support to combatant commanders. For the overall system, the Army Acquisition Objective and the Army Procurement Objective, is nine (9). The Mission Equipment Package (MEP) objective is eight (8).

The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's next generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, and include the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT).

The Guardrail Common Sensor (GRCS) is a RC-12X fixed-wing aircraft, which hosts Communications Intelligence (COMINT) and Electronic Intelligence (ELINT) sensors. It provides a persistent capability to detect, locate and classify/identify critical targets with a relevant degree of timeliness and accuracy. GRCS is assigned to two (2) U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance (AISR) support to

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305206A / <i>Airborne Reconnaissance Systems</i>

combatant commanders. In accordance with the Army's AISR 2020 strategy, the Army's Acquisition Objective/Army's Procurement Objective (AAO/APO) is 19 RC-12X; seven (7) fielded to 3rd MI BN; seven (7) fielded to the 204th MI BN, and five (5) pilot trainers to support Force Generation. The five (5) trainers are not equipped with Primary Mission Equipment (PME).

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	11.799	20.080	11.887	-	11.887
Current President's Budget	11.799	20.080	12.416	14.000	26.416
Total Adjustments	0.000	0.000	0.529	14.000	14.529
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.171	-	-0.171
• Other Adjustments 1	-	-	0.700	14.000	14.700

Change Summary Explanation

Fiscal Year (FY) 2019 OCO funds increase is a result of a funds realignment to support ARL New Signal Development.

Fiscal Year (FY) 2019 Base funds increase is a result of a funds realignment to support Guardrail Common Sensor (GRCS) Operational Needs Statement (ONS) 22410.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH2 / EMARSS ADV DEV (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EH2: EMARSS ADV DEV (MIP)	-	0.000	0.000	3.205	-	3.205	3.218	0.000	2.011	2.051	0.000	10.485
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Project EH2 last received funding in FY2016.												
A. Mission Description and Budget Item Justification The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's next generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, to include the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT). This funding line supports non-recurring engineering (NRE), development of type certificates (TC), testing, integration of Modifications in Service of Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems and engineering analysis/structural modifications to substantially increase EMARSS (King Air B300) payload capacity and time on station. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) and the integration of the AISR mission equipment package (MEP) as well as obsolescence issues and commonality with the conversion of Quick Reaction Capability (QRC) Liberty Project Aircraft (LPA), VADER and Constant Hawk/TACOP aircraft to the EMARSS Program of Record (POR).												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Non-Recurring Engineering								-	-	3.205	-	3.205
Description: This funding line supports non-recurring engineering (NRE), development of type certificates (TC), testing, integration of Modifications in Service of Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems and engineering analysis/studies/structural modifications to substantially increase EMARSS (King Air B300) payload capacity and time on station. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) and the integration of the AISR mission equipment package (MEP) as well as obsolescence issues and												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH2 / EMARSS ADV DEV (MIP)						
B. Accomplishments/Planned Programs (\$ in Millions)														
										FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
commonality with the conversion of Quick Reaction Capability (QRC) Liberty Project Aircraft (LPA), VADER and Constant Hawk/TACOP aircraft to the EMARSS Program of Record (POR). FY 2019 Base Plans: This funding line supports NRE, development of TC, testing and integration of Army AISR systems. Funding provides for the integration of DoD mandated safety equipment to meet current and evolving International Standards. It also enhances aircraft CNS, ASE and the integration of the AISR MEP as well as obsolescence issues involved with the transition from QRC to POR in regards to the Navy AAR-47 changing to Army AAR-57, BFT to BFT-2 and APX-123 Transponder to APX-119 Transponder. FY 2018 to FY 2019 Increase/Decrease Statement: RDT&E funds were not required in FY18														
Accomplishments/Planned Programs Subtotals										-	-	3.205	-	3.205
C. Other Program Funding Summary (\$ in Millions)														
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost			
• A02112: EMARSS SEMA Mods (MIP)	77.997	51.279	20.448	-	20.448	3.859	2.632	1.903	1.940	0.000	160.058			
• AZ2054: EMARSS Payloads (MIP)	17.097	7.279	18.809	-	18.809	2.195	2.214	7.834	7.987	0.000	63.415			
• EH3: EMARSS Payloads ADV DEV (MIP)	0.130	2.111	6.531	-	6.531	14.464	6.296	6.493	6.622	0.000	42.647			
Remarks The EMARSS RDTE efforts are found in the following two project lines; 0305206AEH2 EMARSS ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02112 and AZ2054. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.														
D. Acquisition Strategy The acquisition strategy, supported by the EMARSS CPD, is to design and test 24 systems as well as provide enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: Electro-optical/Infrared (EO/IR)/Full Motion Video (FMV); Communications Intelligence (COMINT); Wide Area Aerial Surveillance (WAAS); Light Imaging Detection and Ranging (LiDAR) and improved Synthetic Aperture Radar / Moving Target Indicator (SAR/MTI) radar; line-of-site (LOS) and														

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) EH2 / <i>EMARSS ADV DEV (MIP)</i>
beyond line-of-site (BLOS) communications; and Processing Exploitation and Dissemination (PED) supporting two Distributed Common Ground System - Army (DCGS-A) enabled operator workstations. The EMARSS fleet of 24 systems will consist of the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT).		
<u>E. Performance Metrics</u> N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH2 / EMARSS ADV DEV (MIP)							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO	RO	FW PO/ PM SAI : Huntsville, AL/ Aberdeen, MD	0.104	-		-		0.272	Nov 2018	-		0.272	0.000	0.376	-
Subtotal			0.104	-		-		0.272		-		0.272	0.000	0.376	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NRE	SS/CPFF	Northrop Grumman : Herndon, VA	-	-		-		2.933	Mar 2019	-		2.933	0.000	2.933	-
Subtotal			-	-		-		2.933		-		2.933	0.000	2.933	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing	MIPR	AFTD RTC : Eglin, AFB, FL	1.636	-		-		-		-		-	0.000	1.636	-
Subtotal			1.636	-		-		-		-		-	0.000	1.636	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1.740	-		0.000		3.205		-		3.205	0.000	4.945	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018																					
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems								Project (Number/Name) EH2 / EMARSS ADV DEV (MIP)																			
Event Name										FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Non-Recurring Engineering																																					
FFA Testing and Certification																																					
Mods in Service																																					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) EH2 / <i>EMARSS ADV DEV (MIP)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Non-Recurring Engineering	3	2019	2	2020
FFA Testing and Certification	3	2020	2	2021
Mods in Service	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH3 / EMARSS Payloads ADV DEV (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EH3: EMARSS Payloads ADV DEV (MIP)	-	0.130	2.111	6.531	-	6.531	14.464	6.296	6.493	6.622	0.000	42.647
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The EMARSS RDTE efforts are found in the following two (2) project lines; 0305206AEH2 EMARSS ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02112 and AZ2054. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

A. Mission Description and Budget Item Justification

The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's next generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, to include the following variants: eight EMARSS-G (Geo-INT); four EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight EMARSS-M (Multi-INT); and four EMARSS-S (SIGINT).

This funding line supports enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: Electro-Optical/Infrared (EO/IR)/Full Motion Video (FMV); Communications Intelligence (COMINT); Signals Intelligence (SIGINT); Wide Area Aerial Surveillance (WAAS); Light Imaging Detection and Ranging (LiDAR) and improved Synthetic Aperture Radar / Moving Target Indicator (SAR/MTI) radar; Line-Of-Site (LOS) and Beyond Line-Of-Sight (BLOS) communications; and Processing Exploitation and Dissemination (PED) supporting two Distributed Common Ground System - Army (DCGS-A) enabled operator workstations.

Fiscal Year (FY) 2019 funding in the amount of \$6.531 million provides LiDAR Sensor Development and Mission Equipment Packages (MEP) and PED Sensor Engineering Support.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: EMARSS - Sensor Enhancement	-	1.893	5.577	-	5.577
Description: Research, Development, Test, and Evaluation (RDTE) funded LiDAR, SIGINT and Airborne Wide Area Persistent Surveillance System (AWAPSS) sensor enhancement.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018				
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems	Project (Number/Name) EH3 / EMARSS Payloads ADV DEV (MIP)				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: RDTE funds next generation LiDAR Enhancement Engineering Change Proposals (ECPs) and contractor system support.							
FY 2019 Base Plans: RDTE funds next generation LiDAR Enhancement Engineering Change Proposals (ECPs) and contractor system support.							
FY 2018 to FY 2019 Increase/Decrease Statement: Increased funding is required in order to continue development on the next generation LiDAR sensor in order to meet CPD requirements and to ensure the safety, readiness and relevancy of the warfighter.							
Title: EMARSS - Sensor Engineering Support			0.130	0.126	0.301	-	0.301
Description: Matrix Government and Matrix Contractor engineering support for sensor enhancements.							
FY 2018 Plans: Funds Matrix Contractor engineering support for sensor enhancements.							
FY 2019 Base Plans: Funds Matrix Contractor engineering support for sensor enhancements.							
FY 2018 to FY 2019 Increase/Decrease Statement: Increased engineering support is required to manage the engineering development effort.							
Title: Program Management Support			-	0.092	0.653	-	0.653
Description: Program Management Office (PMO) support and travel, as well as Systems Engineering and Technical Assistance (SETA) support.							
FY 2018 Plans: PMO government support and travel.							
FY 2019 Base Plans: PMO government support and travel.							
FY 2018 to FY 2019 Increase/Decrease Statement:							

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH3 / EMARSS Payloads ADV DEV (MIP)				
B. Accomplishments/Planned Programs (\$ in Millions)												
								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increased program management is required to manage the engineering development effort.												
Accomplishments/Planned Programs Subtotals								0.130	2.111	6.531	-	6.531
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• A02112: EMARSS SEMA Mods (MIP)	77.997	51.279	20.448	-	20.448	3.859	2.632	1.903	1.940	0.000	160.058	
• AZ2054: EMARSS Payloads (MIP)	17.097	7.279	18.809	-	18.809	2.195	2.214	7.834	7.987	0.000	63.415	
• EH2: EMARSS ADV DEV (MIP)	-	-	3.205	-	3.205	3.218	-	2.011	2.051	0.000	10.485	
Remarks												
The EMARSS RDTE efforts are found in the following two (2) project lines; 0305206AEH2 EMARSS ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02112 and AZ2054. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.												
D. Acquisition Strategy												
The acquisition strategy, supported by the EMARSS CPD, is to provide enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: EO/IR FMV; COMINT; WAAS; LiDAR and improved SAR/MTI radar; LOS and BLOS communications; and PED supporting two DCGS-A enabled operator workstations. The EMARSS fleet of 24 systems consists of the following variants: eight EMARSS-G (Geo-INT); four EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight EMARSS-M (Multi-INT); and four EMARSS-S (SIGINT).												
E. Performance Metrics												
N/A												

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH3 / EMARSS Payloads ADV DEV (MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO	C/CR	PEO IEW&S, PM SAI : APG, MD	0.298	-		0.092		0.653	Dec 2019	-		0.653	Continuing	Continuing	-
Subtotal			0.298	-		0.092		0.653		-		0.653	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LiDAR sensor enhancement	SS/CPFF	JHU APL : Laurel, MD	1.500	-		-		-		-		-	0.000	1.500	-
AWAPSS sensor enhancement	C/CPIF	BAE : Nashua, CT	0.200	-		-		-		-		-	0.000	0.200	-
SIGINT sensor enhancement	C/CPFF	CACI/Boeing : APG, MD	0.114	-		-		-		-		-	0.000	0.114	-
SIGINT sensor enhancement	C/CPFF	Lockheed Martin Integrated Systems : Marlton, NJ	0.948	-		-		-		-		-	0.000	0.948	-
Advanced LiDAR Development	Option/ CPIF	TBD : APG MD	-	-		1.893		5.577	Dec 2019	-		5.577	Continuing	Continuing	-
Subtotal			2.762	-		1.893		5.577		-		5.577	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Government Engineering Support	MIPR	USACERDEC, I2WD : APG, MD	0.260	0.130	Nov 2016	-		-		-		-	Continuing	Continuing	-
Matrix Contractor Engineering Support	C/CPFF	BAH : APG, MD	0.087	-		0.126		0.301	Dec 2019	-		0.301	Continuing	Continuing	-
Subtotal			0.347	0.130		0.126		0.301		-		0.301	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH3 / EMARSS Payloads ADV DEV (MIP)				

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Government Testing	MIPR	CFA : Lakehurst, NJ	0.125	-		-		-		-		-	Continuing	Continuing	-
Subtotal			0.125	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.532	0.130	2.111	6.531	-	6.531	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems		Project (Number/Name) EH3 / EMARSS Payloads ADV DEV (MIP)	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EMARSS - P3I/Test																												
QRC to EMARSS POR Modification and Conversion																												
EMARSS Fielding																												
Advanced LIDAR Development																												
Sensor Upgrades/Enhancements																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems	Project (Number/Name) EH3 / EMARSS Payloads ADV DEV (MIP)	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMARSS - P3I/Test	3	2016	2	2017
QRC to EMARSS POR Modification and Conversion	2	2015	4	2019
EMARSS Fielding	3	2017	2	2020
Advanced LiDAR Development	2	2018	3	2021
Sensor Upgrades/Enhancements	1	2019	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH5 / ARL Payloads ADV DEV (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EH5: ARL Payloads ADV DEV (MIP)	-	11.669	17.969	1.980	14.000	15.980	1.495	1.000	4.579	5.784	0.000	58.476
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Airborne Reconnaissance Low - Enhanced (ARL-E) is a worldwide self-deployable airborne Intelligence Surveillance Reconnaissance (ISR) system designed for timely, accurate, assured support to tactical forces over the full spectrum of operations. This system is a De Havilland DHC-8 aircraft replacing the DHC-7 IAW the Aerial ISR (AISR) 2020 Strategy. ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E Capabilities Production Document (CPD) requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), Electro-Optical/Infrared (EO/IR)/Full-Motion Video (FMV) , Multi-Mode Radar, Robust Communications Intelligence (COMINT), on-Board Collection, Analysis, Sensor Cross Cue and dissemination through Distributed Common Ground System-Army (DCGS-A) Enabled workstations. ARL-E will be assigned to the U.S. Army Intelligence and Security Command's Aerial ISR Brigade providing AISR support to combatant commanders. For the overall system, the Army Acquisition Objective and the Army Procurement Objective, is nine. The Mission Equipment Package (MEP) objective is eight.

Fiscal Year (FY) 2019 Base funding of \$1.980 million continues the lab and flight test for Signal 3 and 4 software to see if it meets the requirements in the ARL-E CPD.

Fiscal Year (FY) 2019 OCO funding of \$14.000 million continues the new signal enhancement development effort for Signal 3 and 4 to develop software to enhance the COMINT collection capabilities. This funding line supports continued software development to enhance COMINT collection capabilities to effectively prosecute high priority and emerging modern signal emitters.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Long Range Radar Development	6.445	-	-	-	-
Description: Long Range Radar Development will be completed in FY18					
Title: New Signals (COMINT/Software Upgrades)	5.224	17.969	1.980	14.000	15.980
Description: To develop software for Signals 1, 2, 3 and 4					
FY 2018 Plans: Fiscal Year (FY) 2018 Base funding of \$2.969 million initiates the new signal enhancement development effort for Signal 4 to develop software, perform lab testing and flight testing.					
FY 2019 Base Plans:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems		Project (Number/Name) EH5 / ARL Payloads ADV DEV (MIP)	

B. Accomplishments/Planned Programs (\$ in Millions) Fiscal Year (FY) 2019 Base funding of \$1.980 million continues the lab and flight test for Signal 3 and 4 software to see if it meets the requirements in the ARL-E CPD. FY 2019 OCO Plans: Fiscal Year (FY) 2019 OCO funding of \$14.000 million continues the new signal enhancement development effort for Signal 3 and 4 to develop software to enhance the COMINT collection capabilities. FY 2018 to FY 2019 Increase/Decrease Statement: FY19 OCO added \$14.000 million	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	Accomplishments/Planned Programs Subtotals	11.669	17.969	1.980	14.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• AZ2050: AZ2050	74.380	59.938	7.613	-	7.613	8.215	-	-	-	0.000	150.146
• DX9: 0605766A-DX9	1.360	1.898	0.257	-	0.257	0.257	-	-	-	0.000	3.772
• A02109: A02109	-	-	12.103	-	12.103	12.294	9.796	-	-	0.000	34.193
• A02110: A02110	6.793	11.650	19.636	-	19.636	22.023	-	-	-	Continuing	Continuing

Remarks
 The Airborne Reconnaissance Low- Enhanced (ARL-E) RDTE efforts are found in the following two (2) project lines; 0305206AEH4 ARL ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH5 ARL Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02110 and AZ2050. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne Intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

D. Acquisition Strategy
 ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E CPD requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), EO/IR FMV, COMINT, on-Board Collection, Analysis, Sensor Cross Cue and dissemination through DCGS-A Enabled workstations. The development and testing of LRR is required to replace the current ARL Phoenix Eye Radar to increase performance and meet the improved requirements of the Appendix J Payload for the approved ARL-E CPD. The remainder will fund software development to enhance COMINT collection capabilities. The software will be added to existing COMINT systems to effectively prosecute high priority and emerging modern signal emitters.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems	Project (Number/Name) EH5 / ARL Payloads ADV DEV (MIP)
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH5 / ARL Payloads ADV DEV (MIP)					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Long Range Radar Development	C/CPFF	Northrop Grumman : Linthicum Heights, MD	6.053	-		-		-		-		-	0.000	6.053	-
New Signals (COMINT/ Software Upgrades)	C/CPFF	Boeing Argon : California	4.300	7.669	Mar 2017	14.969	Nov 2017	0.000		14.000	Mar 2019	14.000	0.000	40.938	-
Subtotal			10.353	7.669		14.969		0.000		14.000		14.000	0.000	46.991	N/A
Remarks New Signals Contract: W15P7T-10-D-D420/ KZ01. Fiscal Year (FY) 2019 OCO funding of \$14.000 million continues the new signal enhancement development effort for Signal 3 and 4 to develop software to enhance the COMINT collection capabilities. This funding line supports continued software development to enhance COMINT collection capabilities to effectively prosecute high priority and emerging modern signal emitters. .															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support to LRR and New Signals (COMINT/ Software Upgrades)	C/CPFF	Boeing Argon/NG : Mountain View, CA/ Lithicum, MD	-	4.000	Nov 2016	3.000	Nov 2017	1.980	Mar 2019	-		1.980	0.000	8.980	-
Subtotal			-	4.000		3.000		1.980		-		1.980	0.000	8.980	N/A
Remarks New Signals Contract: W15P7T-10-D-D420/ KZ01. Fiscal Year (FY) 2019 Base funding of \$1.980 million continues the lab and flight test for Signal 3 and 4 software to see if it meets the requirements in the ARL-E CPD.															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			10.353	11.669		17.969		1.980		14.000		15.980	0.000	55.971	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems		Project (Number/Name) EH5 / ARL Payloads ADV DEV (MIP)	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ARL-E Radar Development																												
ARL-E Radar Testing																												
ARL-E New Signals Development and Test																												
ARL-E Signals 3 and 4 Development and Test																												
ARL-E Signals Continued Signal 1 and 2 Development and Test																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) EH5 / <i>ARL Payloads ADV DEV (MIP)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ARL-E Radar Development	4	2015	2	2018
ARL-E Radar Testing	1	2018	1	2018
ARL-E New Signals Development and Test	2	2016	2	2022
ARL-E Signals 3 and 4 Development and Test	2	2016	2	2022
ARL-E Signals Continued Signal 1 and 2 Development and Test	4	2017	2	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH7 / Guardrail Common Sensor (GRCS) Payloads (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EH7: Guardrail Common Sensor (GRCS) Payloads (MIP)	-	0.000	0.000	0.700	-	0.700	0.000	0.000	0.000	0.000	0.000	0.700
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project EH7 is a new start.

A. Mission Description and Budget Item Justification

The Guardrail Common Sensor (GRCS) is a RC-12X fixed-wing aircraft, which hosts Communications Intelligence (COMINT) and Electronic Intelligence (ELINT) sensors. It provides a persistent capability to detect, locate and classify/identify critical targets with a relevant degree of timeliness and accuracy. GRCS is assigned to two (2) U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance (AISR) support to combatant commanders. In accordance with the Army's AISR 2020 strategy, the Army's Acquisition Objective/Army's Procurement Objective (AAO/APO) is 19 RC-12X; seven (7) fielded to 3rd MI BN; seven (7) fielded to the 204th MI BN, and five (5) pilot trainers to support Force Generation. The five (5) trainers are not equipped with Primary Mission Equipment (PME).

This funding line supports JICD 4.2 Compliance (ONS 22419).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: ONS 22419 Development	-	-	0.700	-	0.700
Description: Development and Testing for JICD 4.2 Compliance					
FY 2019 Base Plans: Development and Testing for JICD 4.2 Compliance					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase funding is required in order to develop and test for ONS 22410 for JICD 4.2 Compliance.					
Accomplishments/Planned Programs Subtotals	-	-	0.700	-	0.700

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• AZ2052: Guardrail Payloads (MIP)	24.450	35.070	4.346	-	4.346	0.129	0.112	0.093	0.074	0.000	64.274

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems				Project (Number/Name) EH7 / Guardrail Common Sensor (GRCS) Payloads (MIP)			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Complete</u>	<u>Total Cost</u>
Remarks											
D. Acquisition Strategy											
The acquisition strategy, supported by Operational Needs Statement (ONS) 22419, dated August 2017, is to provide additional enhancements to the SIGINT Sensors. Will leverage current PASS Contract #W15P7T-10-D-D420-KZ01.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems						Project (Number/Name) EH7 / Guardrail Common Sensor (GRCS) Payloads (MIP)			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ONS 22419 Development and Test	C/CPFF	PEO IEW&S : Aberdeen Proving Ground, MD	-	-		-		0.700	Nov 2018	-		0.700	0.000	0.700	0.700
Subtotal			-	-		-		0.700		-		0.700	0.000	0.700	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		0.000		0.700		-		0.700	0.000	0.700	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity

2040 / 7

R-1 Program Element (Number/Name)

PE 0305206A / Airborne Reconnaissance
Systems

Project (Number/Name)

EH7 I Guardrail Common Sensor (GRCS) Payloads (MIP)

[illegible]

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / Airborne Reconnaissance Systems	Project (Number/Name) EH7 / Guardrail Common Sensor (GRCS) Payloads (MIP)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ONS 22419 Development and Testing	1	2019	3	2019
ONS 22419 Fielding	3	2019	3	2019

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305208A I Distributed Common Ground/Surface Systems							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	32.284	24.700	38.667	-	38.667	57.481	57.621	38.802	2.567	0.000	252.122
D07: DCGS-A Common Modules (MIP)	-	32.284	24.700	38.667	-	38.667	57.481	57.621	38.802	2.567	0.000	252.122

Note

The Distributed Common Ground Systems - Army (DCGS-A) was formerly designated a Major Automation Information System (MAIS) program.

A. Mission Description and Budget Item Justification

Distributed Common Ground System - Army (DCGS-A) is the Intelligence, Surveillance and Reconnaissance (ISR) System of Systems (SoS) for Joint, Interagency, Allied, Coalition, and National data analysis, sharing and collaboration. The core functions of DCGS-A are: the vertical and horizontal synchronization of ISR Processing, Exploitation and Dissemination (PED) efforts; operations in a networked environment at multiple security levels; the control of select Army and joint sensor systems; the fusion of all acquired data and information, and distribution of relevant red (threat), gray (non-aligned), and environmental (weather and terrain) information; and providing the Warfighters' early warning, targeting, and sensor ground station capabilities. DCGS-A provides a single integrated ISR ground processing system composed of common components that are interoperable with sensors, other information sources, all Warfighting Functions, and the Defense Information & Intelligence Enterprise (DI2E) and Intelligence Community Information Technology Enterprise (IC ITE). DCGS-A is fielded in Fixed, Mobile, and embedded configurations emphasizing the use of reach and split based operations by improving accessibility of data in order to reduce forward deployed footprint. As new software capability drops are integrated and tested, a continuing series of modifications will be integrated and fielded to units IAW the Army Resourcing Priority List (ARPL) process.

DCGS-A is designated as a Program of Record (PoR) within the Command Post Computing Environment (CP CE) of the Common Operating Environment (COE). DCGS-A provides the Single and Shareable Geospatial Foundation (SSGF) Cross Cutting Capability (CCC), and is defining the DCGS-A architecture to fit within the COE as described by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) COE Implementation Plan. This is in accordance with the G-3/5/7 priority to align all Army networks, procurements and enhancements under one COE and one vision leveraging intelligence community investments. PM DCGS-A continues to work with PM Mission Command (PM MC) to converge on CP CE Tactical Server Infrastructure (TSI) for FY 2019 fielding.

DCGS-A software is tailored by echelon and scalable to each unit's mission. DCGS-A provides commanders and staffs the ability to maintain an accurate and up to date understanding of the operational environment. The DCGS-A contribution to commanders' visualization and situational awareness, rapid planning, and the synchronization of all warfighting functions, enable Army units to operate within the enemy's decision cycle. This capability enhances tactical and operational maneuver and the conduct of full spectrum operations across the range of military operations from Humanitarian Assistance and Disaster Relief (HADR) to major combat operations and campaigns through all phases of the Joint Continuum of Military Operations.

The DCGS-A configurations range from laptops to systems integrated in tactical shelters and mounted on tactical vehicles to large commodity servers operating in a sanctuary based data center processing environments. The fundamental intent and tenet of this approach is to reduce forward deployed equipment/footprint by co-locating the advanced analytics capabilities within the DCGS-A baseline with the regional data centers, where the data is stored. This infrastructure

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0305208A I Distributed Common Ground/Surface Systems

consolidation simultaneously reduces processor and communications requirements in tactical units by limiting the number of large data files transported across tactical communications systems. Following a successful operational assessment and Milestone C in 2QFY12/Full Deployment Decision in 1QFY13, Follow-on Test & Evaluation in 3QFY15, the program is deploying DCGS-A Increment 1 Software Baseline throughout the Army.

FY 2019 has no funding for Project 956.

FY 2019 Base funding in the amount of \$38.667 million for D07, DCGS-A, will be used for modification, testing and integration of commercially available technologies to support multi-source intelligence processing at the tactical levels, as directed in the FY 2017 National Defense Authorization Act (NOAA), Section 113 and Section 220 that will increase the Processing, Exploitation, and Dissemination capability our Army requires. DCGS-A will continue critical updates to the Army's ISR PED and multi-intelligence planning, analysis, and production capabilities through the exploitation of Cloud Computing and advanced analytics capabilities. This approach will achieve Information Technology efficiencies through alignment with the Intelligence Community Information Technology Environment (IC ITE), while providing iterative software updates required to remain current.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	32.284	24.700	46.400	-	46.400
Current President's Budget	32.284	24.700	38.667	-	38.667
Total Adjustments	0.000	0.000	-7.733	-	-7.733
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-7.733	-	-7.733

Change Summary Explanation

FY 2019 decrease of \$7.733M to project D07 supports re-phasing of funds to support program restructure.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305208A / Distributed Common Ground/Surface Systems				Project (Number/Name) D07 / DCGS-A Common Modules (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
D07: DCGS-A Common Modules (MIP)	-	32.284	24.700	38.667	-	38.667	57.481	57.621	38.802	2.567	0.000	252.122
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Note: The Distributed Common Ground System - Army was formerly designated a Major Automation Information System (MAIS) program.

A. Mission Description and Budget Item Justification

Distributed Common Ground System - Army (DCGS-A) is the Intelligence, Surveillance and Reconnaissance (ISR) System of Systems (SoS) for Joint, Interagency, Allied, Coalition, and National data analysis, sharing and collaboration. The core functions of DCGS-A are: the vertical and horizontal synchronization of ISR Processing, Exploitation and Dissemination (PED) efforts; operations in a networked environment at multiple security levels; the control of select Army and joint sensor systems; the fusion of all acquired data and information, and distribution of relevant red (threat), gray (non-aligned), and environmental (weather and terrain) information; and providing the Warfighters' early warning, targeting, and sensor ground station capabilities. DCGS-A provides a single integrated ISR ground processing system composed of common components that are interoperable with sensors, other information sources, all Warfighting Functions, compliant with standards providing the Defense Information & Intelligence Enterprise (DI2E) and Intelligence Community Information Technology Enterprise (IC ITE). DCGS-A is fielded in Fixed, Mobile, and embedded configurations emphasizing the use of reach and split based operations by improving accessibility of data in order to reduce forward deployed footprint. As enhanced commercial capabilities are integrated and tested, a continuing series of software capability drop releases will be provided into Army Common/commodity hardware and fielded to units IAW the Army Resourcing Priority List (ARPL) process.

DCGS-A is designated as a Program of Record (PoR) within the Command Post Computing Environment (CP CE) of the Common Operating Environment (COE). DCGS-A provides the Single and Shareable Geospatial Foundation (SSGF) Cross Cutting Capability (CCC), and is defining the DCGS-A architecture to fit within the COE as described by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) COE Implementation Plan. This is in accordance with the G-3/5/7 priority to align all Army networks, procurements and enhancements under one COE and one vision leveraging intelligence community investments. PM DCGS-A continues to work with PM Mission Command (PM MC) to converge on CP CE Tactical Server Infrastructure (TSI).

DCGS-A provides technologically advanced Processing, Exploitation, and Dissemination (PED) capabilities through iterative software releases delivered in tailored and scalable mobile, fixed, and embedded configurations in all maneuver and maneuver support units from Company Intelligence Support Team to Army Service Component Command, and in select maneuver sustainment units battalion and above.

FY 2019 Base funding in the amount of \$38.667 million for D07, DCGS-A, will be used for modification, testing and integration of commercially available technologies to support multi-source intelligence processing at the tactical levels, as directed in the FY 2017 National Defense Authorization Act (NOAA), Section 113 and Section 220 that will increase the Processing, Exploitation, and Dissemination capability our Army requires. DCGS-A will continue critical updates to the Army's ISR PED and multi-intelligence planning, analysis, and production capabilities through the exploitation of Cloud Computing and advanced analytics capabilities. This approach will achieve

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305208A / Distributed Common Ground/Surface Systems		Project (Number/Name) D07 / DCGS-A Common Modules (MIP)
Information Technology efficiencies through alignment with the Intelligence Community Information Technology Environment (IC ITE), while providing iterative software updates required to remain current.				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Title: Integrate and Test DCGS-A Software Description: Continue efforts to integrate and test DCGS-A software. DCGS-A will continue to expand on the capabilities provided by DCGS-A Increment 1 by leveraging commercial items at the Army and below echelons while providing new, enhanced, and leap-ahead Intelligence, Surveillance, and Reconnaissance (ISR) and Standard and Shareable Geospatial Foundation (SSGF) enterprise capabilities to align with the Intelligence Community (IC) and Army's Common Operating Environment (COE) and transformation objectives. DCGS-A and beyond will leverage the investment made in previous DCGS-A increments and include emerging technologies related to: Tasking of sensors; controlling select Army sensor systems; Processing, fusing, and Exploiting data and information; supporting knowledge generation; providing ground station capabilities; automated support to intelligence product generation; Disseminating information and intelligence about the threat, weather, and terrain at all echelons; automating intelligence synchronization, including ISR planning, reconnaissance and surveillance integration and assessment; supporting situation understanding; supporting targeting and effects; providing the Standard and Sharable Geospatial Foundation (SSGF) to COE Computing Environments (CEs). These requirements will be defined in the DCGS-A Capability Drops (CDs) as necessary to ensure DCGS-A provides the data, information, intelligence, situation awareness, and interoperability needed to support the Warfighter. FY 2018 Plans: Will continue to integrate and test DCGS-A Software. FY 2019 Plans: Will continue to integrate and test DCGS-A Software. FY 2018 to FY 2019 Increase/Decrease Statement: Testing requirements increased from one Capability Drop to multiple Capability Drops.		27.791	13.010	24.126
Title: Matrix Support Government for Software Integration Description: Matrix Support Government for software integration to the target platforms. FY 2018 Plans: Will continue Government Matrix Support for software integration to the target platforms. FY 2019 Plans: Will continue Government Matrix Support for software integration to the target platforms. FY 2018 to FY 2019 Increase/Decrease Statement:		1.131	3.899	3.787

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305208A / Distributed Common Ground/Surface Systems	Project (Number/Name) D07 / DCGS-A Common Modules (MIP)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Increased Government matrix support to accommodate software integration requirements for additional Capability Drops.				
Title: Project Management		1.641	2.118	1.997
Description: Project Management support to manage the cost, schedule, and performance metrics for the program.				
FY 2018 Plans: The program will prepare Acquisition Requirements Packages for solicitations to satisfy multiple capability drops.				
FY 2019 Plans: Continue acquisition document preparation and support for multiple capability drops.				
FY 2018 to FY 2019 Increase/Decrease Statement: Similar level of effort in FY18 and FY19.				
Title: Army and Joint Interoperability Testing/Developmental Testing/Operational Testing		-	2.090	5.568
Description: Testing of DCGS-A				
FY 2018 Plans: Testing of DCGS-A.				
FY 2019 Plans: Continue to support testing requirements for DCGS software.				
FY 2018 to FY 2019 Increase/Decrease Statement: Testing requirements increased from one Capability Drop to multiple Capability Drops.				
Title: Training Support		1.316	3.203	2.851
Description: Training support - embedded computer based training (CBT) for the DCGS-A software.				
FY 2018 Plans: Continue training support - embedded computer based training (CBT) for the DCGS-A software.				
FY 2019 Plans: Continue training support - embedded computer based training (CBT) for the DCGS-A software.				
FY 2018 to FY 2019 Increase/Decrease Statement: Similar level of effort in FY18 and FY19.				
Title: Logistics Documentation		0.405	0.380	0.338

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army								Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305208A / <i>Distributed Common Ground/Surface Systems</i>				Project (Number/Name) D07 / <i>DCGS-A Common Modules (MIP)</i>			

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Description: Logistics activities including maintenance task analysis, level of repair analysis, user manual, training support package, and MANPRINT activities. FY 2018 Plans: Continue logistics activities including task maintenance task analysis, level of repair analysis, user manual, training support package, and MANPRINT activities. FY 2019 Plans: Continue logistics activities including task maintenance task analysis, level of repair analysis, user manual, training support package, and MANPRINT activities. FY 2018 to FY 2019 Increase/Decrease Statement: Similar level of effort in FY18 and FY19.			
Accomplishments/Planned Programs Subtotals	32.284	24.700	38.667

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B01001: <i>DCGS-A (MIP)</i>	-	-	0.000	-	0.000	67.615	301.252	276.387	294.885	Continuing	Continuing
Remarks Note: The Distributed Common Ground System - Army is designated a Major Automation Information System (MAIS) program.											
D. Acquisition Strategy DCGS-A is a former ACAT IAM, Major Automated Information System (MAIS) program. The DCGS-A program will consist of multiple capability drops structured to meet DCGS-A User requirements. The DCGS-A program will follow the Information Technology (IT) Box concept for an agile acquisition strategy to iteratively provide and field Intelligence, Surveillance, and Reconnaissance (ISR) capabilities, hosted on Commercial off the Shelf (COTS) equipment/hardware, providing low risk, efficient, time- phased releases of capability to satisfy the Army's operational needs. The DCGS-A capabilities under Increment 1 will be leveraged to the maximum extent where applicable to meet the future DCGS-A requirements set. The DCGS-A will also leverage the Increment 1 configuration platforms fielded across the Army. DCGS-A is a collection of software packages (COTS, and GOTS products) selected to provide each Army echelon (from Battalion up to Echelon Above Corps (EAC)) the capability to synthesize and exploit intelligence data. DCGS-A delivers these software packages on COTS and GOTS hardware components, tailored to meet each Army Echelon's intelligence mission requirements. DCGS-A is the Army's ISR Foundation Layer for Tasking, Processing, Exploitation, Dissemination (TPED) and											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305208A / <i>Distributed Common Ground/Surface Systems</i>	Project (Number/Name) D07 / <i>DCGS-A Common Modules (MIP)</i>
development of situation understanding using intelligence information about the threat, weather, and terrain at all Army Echelons. DCGS-A provides the capabilities necessary for Commanders to access information, task organic sensors, and synchronize non-organic sensor assets with their organic assets. DCGS-A will continuously acquire and synthesize data and information from Joint, Interagency, Intergovernmental, and Multi-national (JIIM) sources to maintain an updated and accurate understanding of the operational environment to inform critical and time sensitive command decisions. The DCGS-A software baseline will be updated and iteratively deployed to address emerging and prioritized operational requirements. PM DCGS-A, in coordination with the operational user community, will align releases with the technological readiness of targeted enhancements, and to support low-risk integration and test cycle times. As capability drop requirements are approved, DCGS-A will leverage commercially available solutions and non-developmental items to meet user needs. The DCGS-A software will be hardware agnostic so that the software can be deployed in any processing hardware equipment. This allows the DCGS-A software to be scalable and deployable in different hardware system configurations, as required by the Army at different echelons. The implementation of the latest COTS hardware procurement through the Army Common Hardware System (CHS) program with the established post-deployment hardware sparing, sustainment, and maintenance provisions, will result in significant cost efficiencies. E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305208A / Distributed Common Ground/Surface Systems				Project (Number/Name) D07 / DCGS-A Common Modules (MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	Allot	DCGS-A : APG, MD	2.190	1.641	Oct 2016	2.118	Oct 2017	1.997	Oct 2018	-		1.997	Continuing	Continuing	-
Milestone preparation; Activities; Trade Space Analysis (TSA)	MIPR	Various : Various	3.318	-		-		-		-		-	0.000	3.318	-
Subtotal			5.508	1.641		2.118		1.997		-		1.997	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrate & Test software	C/FP	Various : Various	11.921	27.791	Jun 2017	13.010	Dec 2017	24.126	Dec 2018	-		24.126	Continuing	Continuing	Continuing
System reconfiguration	C/FP	Various : Various	4.020	-		-		-		-		-	Continuing	Continuing	-
Subtotal			15.941	27.791		13.010		24.126		-		24.126	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	Various : Various	3.805	1.131	Oct 2016	3.899	Oct 2017	3.787	Oct 2018	-		3.787	Continuing	Continuing	-
Training Development	MIPR	Various : Various	-	1.316	Jan 2017	3.203	Jan 2018	2.851	Oct 2018	-		2.851	Continuing	Continuing	-
Logistics Documentation	MIPR	Various : Various	-	0.405	Jan 2017	0.380	Jan 2018	0.338	Jan 2019	-		0.338	Continuing	Continuing	-
Subtotal			3.805	2.852		7.482		6.976		-		6.976	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Test & Integration Lab	MIPR	Various : Various	1.000	-		2.090	Mar 2018	5.568	Mar 2019	-		5.568	Continuing	Continuing	-
Subtotal			1.000	-		2.090		5.568		-		5.568	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018			
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305208A / Distributed Common Ground/Surface Systems					Project (Number/Name) D07 / DCGS-A Common Modules (MIP)				
		Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		26.254	32.284		24.700		38.667		-		38.667	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305208A / <i>Distributed Common Ground/Surface Systems</i>		Project (Number/Name) D07 / <i>DCGS-A Common Modules (MIP)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Capability Drop 1	CD 1				CD 2				1 CD1 IOC				2 CD2 IOC																			
Capability Drop 1 IOC																																
Capability Drop 2																																
Capability Drop 2 IOC																																
Continuous Capability Drop Modifications																																

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305208A / <i>Distributed Common Ground/Surface Systems</i>	Project (Number/Name) D07 / <i>DCGS-A Common Modules (MIP)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Capability Drop 1	1	2017	2	2019
Capability Drop 1 IOC	2	2019	2	2019
Capability Drop 2	4	2017	2	2020
Capability Drop 2 IOC	2	2020	2	2020
Continuous Capability Drop Modifications	3	2018	4	2023

UNCLASSIFIED

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

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	13.470	9.574	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.044
MQ1: MQ-1 Gray Eagle - Army UAV (MIP)	-	13.470	9.574	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.044

A. Mission Description and Budget Item Justification

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission 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.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	30.970	9.574	0.000	-	0.000
Current President's Budget	13.470	9.574	0.000	-	0.000
Total Adjustments	-17.500	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FY17 Amendment not appropriated	-17.500	-	-	-	-

Change Summary Explanation

The Fiscal Year (FY) 2017 increase requests MQ-1C Gray Eagle funding of \$17.500 million to support development of Cyber Threat assessment activities and design and integration efforts.

The Fiscal Year (FY) 2018 MQ-1C Gray Eagle funding of \$9.574 million will support Test and Evaluation efforts associated with the MQ-1C Gray Eagle Extended Range Engineering Change Proposal (ECP). The test effort will evaluate the changes to materiel (Extended Range Gray Eagle). The types of effort required include Environmental Testing, Electromagnetic Environmental Effects (E3) testing, transport/mobility testing, logistics demonstration, and Follow-On Operational Test and Evaluation (FOTE II).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305219A / MQ-1 Gray Eagle UAV				Project (Number/Name) MQ1 / MQ-1 Gray Eagle - Army UAV (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
MQ1: MQ-1 Gray Eagle - Army UAV (MIP)	-	13.470	9.574	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.044
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission 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) 2018 MQ-1 Gray Eagle funding of \$9.574 million will support Test and Evaluation efforts associated with the MQ-1C Gray Eagle Extended Range Engineering Change Proposal (ECP). The test effort will evaluate overall system level performance to ensure it meets developmental and operational requirements. The types of effort required include Environmental Testing, Electromagnetic Environmental Effects (E3) testing, transport/mobility testing, logistics demonstration, and Follow-On Operational Test and Evaluation (FOTE II).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MQ-1C Gray Eagle Extended Range - Testing	13.470	9.574	-	-	-
Description: MQ-1C ER Testing					
FY 2018 Plans: The FY2018 efforts will complete trans/mobility for Gray Eagle along with testing and evaluation of MQ1C Gray Eagle Extended Range system hardware.					
FY 2018 to FY 2019 Increase/Decrease Statement: MQ-1C Extended Range testing completed.					
Accomplishments/Planned Programs Subtotals	13.470	9.574	-	-	-

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• A00005: A00005	55.388	30.206	0.000	-	0.000	-	-	-	-	0.000	85.594
• AA6601: AA6601	-	74.291	98.640	92.000	190.640	34.030	15.970	-	2.263	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305219A / MQ-1 Gray Eagle UAV				Project (Number/Name) MQ1 / MQ-1 Gray Eagle - Army UAV (MIP)			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• EB6: 273744 EB6	-	39.362	17.896	-	17.896	6.764	4.321	0.223	0.165	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
An Extended Range Multi-Purpose (ERMP) Operational Requirement Document (ORD) was approved by the Joint Requirement Oversight Council (JROC) 6 Apr 2005. Milestone B occurred on 20 Apr 2005, and the System Development and Demonstration contract was awarded 8 Aug 2005, as a result of a competitive solicitation which included a vendor system capabilities demonstration. A Capabilities Production Document (CPD), version 8.7 was approved on 17 Jul 15. MQ-1C Gray Eagle completed FOTE 12 Jun 2015. On 14 Jul 2015, the trigger Configuration Steering Board (CSB) concurred with the Course of Action (COA) to validate the revised requirement for the Echelons Above Division (EAD) Gray Eagle and grant authorities through a new Acquisition Decision memorandum (ADM) to pursue the extended range capable Gray Eagle configuration. ER is an enhanced derivative of the MQ-1C Gray Eagle UAS and closes the capability gap by delivering extended surveillance coverage which supports Army RSTA missions in excess of 34 hours. ER's extended range provides the capacity for multi-intelligence payloads, precision strike capability, and reconnaissance in support of Special Operations Forces (SOF), Mission command from Aerial Intelligence Brigade (AIB) and U.S. Army Special Operations Command (USASOC). The Gray Eagle Research, Development, Test, and Evaluation (RDTE) acquisition strategy emphasis will be to complete Developmental test events (Environmental, E3, Transportability, & Performance Tests) to define and address system risks, followed by a FOTE II for the IGE.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305219A / MQ-1 Gray Eagle UAV				Project (Number/Name) MQ1 / MQ-1 Gray Eagle - Army UAV (MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PM UAS : Redstone Arsenal, AL	9.066	-		-		-		-		-	0.000	9.066	-
Subtotal			9.066	-		-		-		-		-	0.000	9.066	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Engineering	C/CPIF	General Atomics / ASI : San Diego, CA	165.070	-		-		-		-		-	0.000	165.070	-
Prototype Manufacturing	Various	General Atomics / ASI : San Diego, CA	213.776	-		-		-		-		-	0.000	213.776	-
Ground Support Equipment	C/CPIF	Various : Various	9.075	-		-		-		-		-	0.000	9.075	-
Ground Base Sense & Avoid (GBSAA)	SS/CPFF	Various : Various	16.445	-		-		-		-		-	0.000	16.445	-
Software / Hardware Development	SS/CPIF	General Atomics : San Diego, CA	95.179	-		-		-		-		-	0.000	95.179	-
Common System Integration (CSI) Obsolescence	SS/CPFF	General Dynamics Mission Systems/ Various : Various	19.985	-		-		-		-		-	0.000	19.985	-
MQ-1C Gray Eagle Extended Range - Longbow Integration	SS/CPFF	GA-ASI : Poway, CA	2.300	-		-		-		-		-	0.000	2.300	-
Subtotal			521.830	-		-		-		-		-	0.000	521.830	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	MIPR	Ft. Huachuca : Ft. Huachuca	24.501	-		-		-		-		-	0.000	24.501	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305219A / MQ-1 Gray Eagle UAV				Project (Number/Name) MQ1 / MQ-1 Gray Eagle - Army UAV (MIP)					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Training and Training Equipment	MIPR	Ft. Huachuca : Ft. Huachuca	43.892	-		-		-		-		-	0.000	43.892	-
Government Engineering Support	C/FFP	Various : Various	18.859	-		-		-		-		-	0.000	18.859	-
Subtotal			87.252	-		-		-		-		-	0.000	87.252	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	Various Government Agencies : Various Government Agencies	81.768	-		-		-		-		-	0.000	81.768	-
MQ-1C Gray Eagle Extended Range Development Testing and Software Testing	MIPR	Various Test Agencies : Various Test Agencies	-	13.470	Jan 2017	9.574		-		-		-	0.000	23.044	-
Subtotal			81.768	13.470		9.574		-		-		-	0.000	104.812	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			699.916	13.470		9.574		-		-		-	0.000	722.960	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018	
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305219A / MQ-1 Gray Eagle UAV		Project (Number/Name) MQ1 / MQ-1 Gray Eagle - Army UAV (MIP)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Electromagnetic Environmental Effects (E3) Qual Test																												
Operational Test Readiness Review I																												
Electromagnetic Environmental Effects (E3) Qual Test II																												
Environmental Qual Testing																												
Operational Test Readiness Review II																												
First Article Test																												
Operational Test Readiness Review III																												
Logistics Demonstration																												
Follow-on Operational Test and Evaluation II																												
Transport / Mobility Qual Test																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305219A / MQ-1 Gray Eagle UAV	Project (Number/Name) MQ1 / MQ-1 Gray Eagle - Army UAV (MIP)	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Engineering and Manufacturing Development	3	2005	4	2013
Critical Design Review	2	2006	2	2006
Operational Assessment	3	2009	3	2010
Milestone C	2	2011	2	2011
Initial Operational Test and Evaluation (IOT&E)	4	2012	4	2012
Engineering Software / Hardware Development	1	2013	1	2014
Electromagnetic Environmental Effects (E3) Qual Test	2	2017	3	2017
Operational Test Readiness Review I	3	2017	3	2017
Electromagnetic Environmental Effects (E3) Qual Test II	3	2017	3	2017
Environmental Qual Testing	3	2017	4	2017
Operational Test Readiness Review II	4	2017	4	2017
First Article Test	4	2017	1	2018
Operational Test Readiness Review III	1	2018	1	2018
Logistics Demonstration	1	2018	2	2018
Follow-on Operational Test and Evaluation II	3	2018	3	2018
Transport / Mobility Qual Test	3	2018	4	2018

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	1.613	2.191	6.180	-	6.180	3.222	1.174	0.000	0.000	0.000	14.380
RA7: RQ-11 Raven (MIP)	-	1.613	2.191	6.180	-	6.180	3.222	1.174	0.000	0.000	0.000	14.380

A. Mission Description and Budget Item Justification

The Family of Small Unmanned Aircraft System (FoSUAS) provides the battalion and below ground maneuver elements critical situational awareness and enhance force protection. The system provides the small unit commander an organic and responsive tactical Intelligence, Reconnaissance, Surveillance (IRS) capability through the ability to view real-time Full Motion Video and sensor data via the system ground control stations. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

A FoSUAS includes three hand-launched aircraft that do not require an improved launch/recovery location. In addition to the aircraft, the system contains ground control equipment, which includes an interoperable hand controller, Tactical Open Government Owned Architecture (TOGA). The equipment is fully transportable in or on rucksack type packs that are organic to the unit. FoSUAS is transitioning to a Capabilities Production Document (CPD) that will utilize existing RQ-11 and RQ-20 in a system of systems fielding concept, with a Short Range Micro (SRM) option under consideration.

Justification: Fiscal Year (FY) 2019 Research, Development, Test, and Evaluation (RDTE) Base funding of \$6.180 million will be utilized for Program Management Engineering support and to meet CPD Increment II Block II related requirements. Specifically, to continue the research and development required to identify and baseline the SRM prototype solution for the FoSUAS effort. Options range from testing non developmental items produced by industry to researching what other government agencies have achieved in quad copter development and technology.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	1.613	2.191	0.180	-	0.180
Current President's Budget	1.613	2.191	6.180	-	6.180
Total Adjustments	0.000	0.000	6.000	-	6.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	6.000	-	6.000

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV
Change Summary Explanation Increase in funding will primarily be used for Developmental Engineering for the investigation of options for Short Range Micro.		

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV				Project (Number/Name) RA7 / RQ-11 Raven (MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RA7: RQ-11 Raven (MIP)	-	1.613	2.191	6.180	-	6.180	3.222	1.174	0.000	0.000	0.000	14.380
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Family of Small Unmanned Aircraft System (FoSUAS) provides the battalion and below ground maneuver elements critical situational awareness and enhance force protection. The system provides the small unit commander an organic and responsive tactical Intelligence, Reconnaissance, Surveillance (IRS) capability through the ability to view real-time Full Motion Video and sensor data via the system ground control stations. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

A FoSUAS includes three hand-launched aircraft that do not require an improved launch/recovery location. In addition to the aircraft, the system contains ground control equipment, which includes an interoperable hand controller, Tactical Open Government Owned Architecture (TOGA). The equipment is fully transportable in or on rucksack type packs that are organic to the unit. FoSUAS is transitioning to a Capabilities Production Document (CPD) that will utilize existing RQ-11 and RQ-20 in a system of systems fielding concept, with a Short Range Micro (SRM) option under consideration.

Justification: Fiscal Year (FY) 2019 Research, Development, Test, and Evaluation (RDTE) Base funding of \$6.180 million will be utilized for Program Management Engineering support and to meet CPD Increment II Block II related requirements. Specifically, to continue the research and development required to identify and baseline the SRM prototype solution for the FoSUAS effort. Options range from testing non developmental items produced by industry to researching what other government agencies have achieved in quad copter development and technology.

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

	FY 2017	FY 2018	FY 2019
Title: Program Management Support	0.581	0.230	0.649
Description: Program Management Support during SRM engineering and testing efforts			
FY 2018 Plans: Program Management Support			
FY 2019 Plans: Program Management Support			
FY 2018 to FY 2019 Increase/Decrease Statement: Increase continues Program Management Support for Short Range Micro solution investigation of candidates.			
Title: Developmental Engineering	0.927	1.876	5.290
Description: Developmental Engineering			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV			Project (Number/Name) RA7 / RQ-11 Raven (MIP)				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019		
FY 2018 Plans: Continuing the Short Range Micro (SRM) prototype materiel baseline FY 2019 Plans: Continuing the Short Range Micro (SRM) prototype materiel baseline FY 2018 to FY 2019 Increase/Decrease Statement: Increase continues Development Engineering effort Short Range Micro (SRM) candidate investigation.											
Title: System Test and Evaluation Description: System Test and Evaluation FY 2018 Plans: Continue the prototype testing of the SRM FY 2019 Plans: Continue the development testing of the SRM FY 2018 to FY 2019 Increase/Decrease Statement: Increase for continuation of Test and Evaluation of candidates for Short Range Micro investigation.							0.105	0.085	0.241		
Accomplishments/Planned Programs Subtotals							1.613	2.191	6.180		
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• A00010: RQ-11 (RAVEN)	-	-	46.416	-	46.416	25.000	32.500	35.400	10.500	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
The Tactical Unmanned Product Office (TUAS) will contract utilizing full and open competition via an Other Transaction Agreement (OTA) or a traditional contracting method to host a fly-off and down select. The Government will make contract award based upon competitive source selection criteria.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV				Project (Number/Name) RA7 / RQ-11 Raven (MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Personnel	RO	AMRDEC, Redstone Arsenal, AL : AMRDEC, Redstone Arsenal, AL	1.109	0.581	Nov 2016	0.230		0.649		-		0.649	0.462	3.031	-
Subtotal			1.109	0.581		0.230		0.649		-		0.649	0.462	3.031	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Engineering	C/IDIQ	Aberdeen Proving Grounds, Natick Contracting Division, Orlando, FL : Aberdeen Proving Grounds, Natick Contracting Divis	8.897	0.927	Dec 2016	1.876	Dec 2017	5.290	Dec 2018	-		5.290	3.763	20.753	-
Developmental Engineering	C/IDIQ	AMRDEC, Redstone Arsenal, Redstone, AI : AMRDEC, Redstone Arsenal, Redstone, AI	1.935	-		-		-		-		-	0.000	1.935	-
Subtotal			10.832	0.927		1.876		5.290		-		5.290	3.763	22.688	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation 1	MIPR	Various : Various	0.941	0.105	Jul 2017	0.085	Jul 2018	0.241	Jul 2019	-		0.241	0.171	1.543	-
Test and Evaluation 2	MIPR	Varies : Varies	0.300	-		-		-		-		-	0.000	0.300	-
Subtotal			1.241	0.105		0.085		0.241		-		0.241	0.171	1.843	N/A

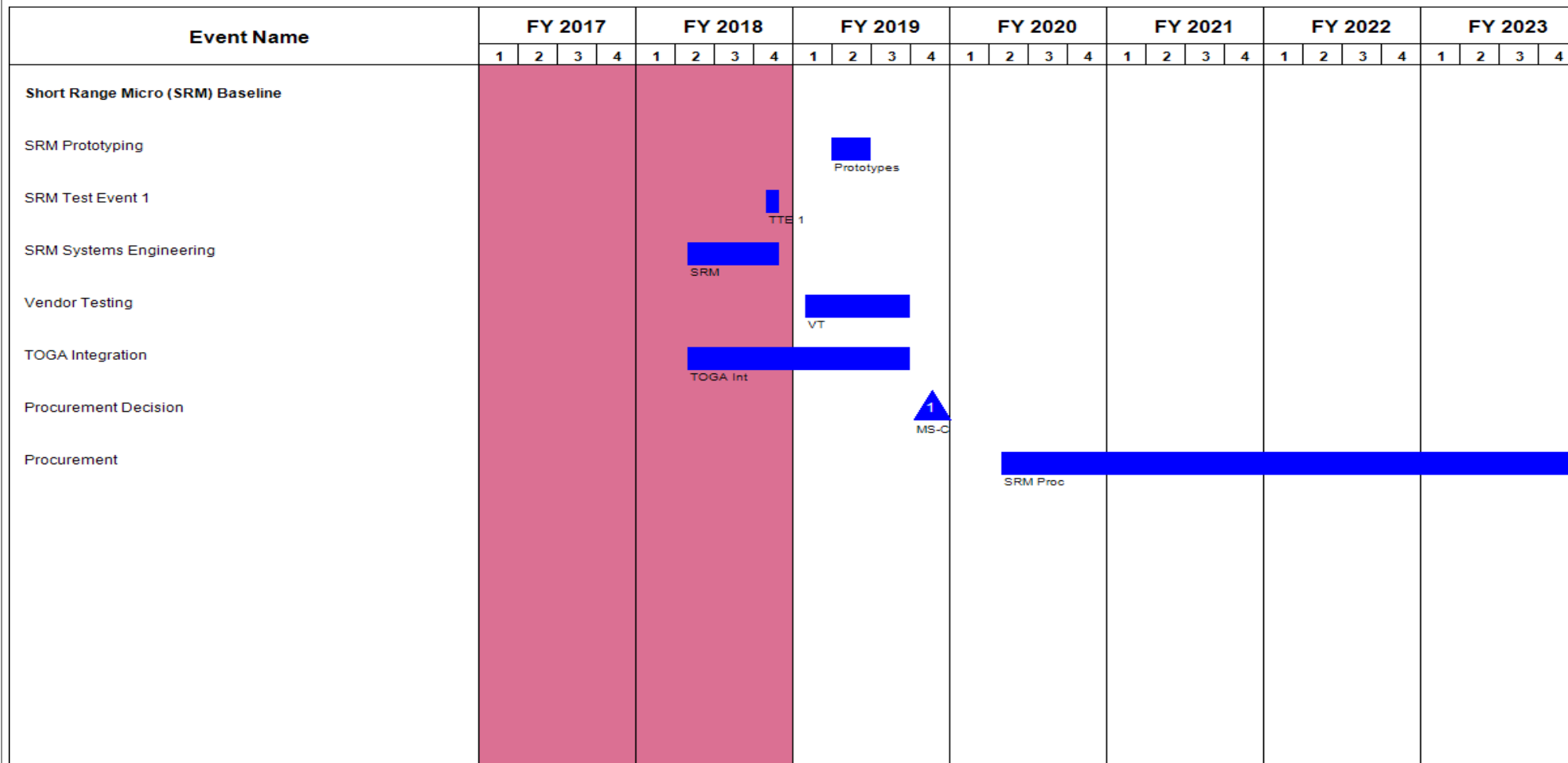
UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV				Project (Number/Name) RA7 / RQ-11 Raven (MIP)				
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.182	1.613		2.191		6.180		-		6.180	4.396	27.562	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV		Project (Number/Name) RA7 / RQ-11 Raven (MIP)	



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305232A / RQ-11 UAV	Project (Number/Name) RA7 / RQ-11 Raven (MIP)	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Short Range Micro (SRM) Baseline	1	2018	4	2018
SRM Prototyping	2	2019	2	2019
SRM Test Event 1	4	2018	4	2018
SRM Systems Engineering	2	2018	4	2018
Vendor Testing	1	2019	3	2019
TOGA Integration	2	2018	3	2019
Procurement Decision	4	2019	4	2019
Procurement	2	2020	4	2023

Note

N/A

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV

COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.597	12.773	12.863	-	12.863	10.817	2.269	3.000	0.225	0.000	46.544
RQ7: RQ-7 Shadow UAV	-	4.597	12.773	12.863	-	12.863	10.817	2.269	3.000	0.225	0.000	46.544

A. Mission Description and Budget Item Justification

The Tactical Unmanned Aircraft 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 1,090,000 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 have been 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.

Justification: Fiscal Year (FY) 2019 RQ-7B UAS Base funding of \$12.863 million will be utilized in the following: 1) \$10.696M will be used to continue modifications for the RQ-7B UAS, 2) \$2.167M provides interoperability and enhancements for the One System Remote Video Terminal (OSRVT). The \$10.696M for modifications of the RQ-7B UAS will conduct an operational test on the Shadow v2 Block III upgrade, complete testing of the air vehicle modifications to allow operations in a Global Positioning System (GPS) denied environment and Air Vehicle and Ground Equipment software development for interoperability and MUM-T. The operational test for the Block III upgrade is required to assess the safety, suitability and effectiveness of the Block III upgrade prior to fielding. The GPS denied development is a phased, multi-year effort. Phase I (FY16) provided a trade study to determine the best hardware and software alternatives. Phase II (FY16) initiated the design and development through preliminary design review. Phase III (FY17) completed design and development through critical design review and conducted engineering flight testing. Phase IV (FY18 & FY19) will complete development, qualification, and developmental testing. RDTE also provides interoperability modifications that support MUM-T with the AH-64 Apache Helicopter, and Systems Engineering and Test and Evaluation to support the capability improvements.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	7.597	12.773	10.163	-	10.163
Current President's Budget	4.597	12.773	12.863	-	12.863
Total Adjustments	-3.000	0.000	2.700	-	2.700
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	2.700	-	2.700
• RAA not appropriated	-3.000	-	-	-	-

Change Summary Explanation

Addition of \$2.7 Million in FY2019 will be used towards the completion of developmental testing of the ability to operate in a GPS denied environment; Interoperability software modifications that support Manned Unmanned Teaming with the AH-64 Apache Helicopter.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV				Project (Number/Name) RQ7 / RQ-7 Shadow UAV			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RQ7: RQ-7 Shadow UAV	-	4.597	12.773	12.863	-	12.863	10.817	2.269	3.000	0.225	0.000	46.544
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Unmanned Aircraft 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 1,090,000 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 have been 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.

Justification: Fiscal Year (FY) 2019 RQ-7B UAS Base funding of \$12.863 million will be utilized in the following: 1) \$10.696M will be used to continue modifications for the RQ-7B UAS, 2) \$2.167M provides interoperability and enhancements for the One System Remote Video Terminal (OSRVT). The \$10.696M for modifications of the RQ-7B UAS will conduct an operational test on the Shadow v2 Block III upgrade, complete testing of the air vehicle modifications to allow operations in a Global Positioning System (GPS) denied environment and Air Vehicle and Ground Equipment software development for interoperability and MUM-T. The operational test for the Block III upgrade is required to assess the safety, suitability and effectiveness of the Block III upgrade prior to fielding. The GPS denied development is a phased, multi-year effort. Phase I (FY16) provided a trade study to determine the best hardware and software alternatives. Phase II (FY16) initiated the design and development through preliminary design review. Phase III (FY17) completed design and development through critical design review and conducted engineering flight testing. Phase IV (FY18 & FY19) will complete development, qualification, and developmental testing. RDTE also provides interoperability modifications that support MUM-T with the AH-64 Apache Helicopter, and Systems Engineering and Test and Evaluation to support the capability improvements.

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

	FY 2017	FY 2018	FY 2019
Title: Air Vehicle Improvements	2.087	5.543	2.620
Description: Air Vehicle Improvements			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV	Project (Number/Name) RQ7 / RQ-7 Shadow UAV		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Complete development of the ability to operate in GPS denied environment. FY 2019 Plans: Complete developmental testing of the ability to operate in a GPS denied environment; Interoperability software modifications that support Manned Unmanned Teaming with the AH-64 Apache Helicopter. FY 2018 to FY 2019 Increase/Decrease Statement: 'Complete developmental testing of the ability to operate in a GPS denied environment				
Title: Ground Equipment Improvements Description: Ground Equipment Improvements FY 2018 Plans: Continues to fund Ground Equipment Improvements. Continues development of interoperability capabilities through use of Universal Ground Data Terminals and Universal Ground Control Stations. Network Security and System Vulnerability. FY 2019 Plans: Continues to fund Ground Equipment Improvements. Continues development of interoperability capabilities through use of Universal Ground Data Terminals and Universal Ground Control Stations. Network Security and System Vulnerability. FY 2018 to FY 2019 Increase/Decrease Statement: Continues to fund Ground Equipment Improvements. Continues development of interoperability capabilities through use of Universal Ground Data Terminals and Universal Ground Control Stations. Network Security and System Vulnerability		-	2.933	5.018
Title: Test and Evaluation Description: Test and Evaluation FY 2018 Plans: Continues to fund test and evaluation of Air Vehicle and Ground Equipment Improvements. FY 2019 Plans: Funds Operational Test for the Shadow V2 Block III upgrade and continues to fund test and evaluation of Air Vehicle and Ground Equipment. FY 2018 to FY 2019 Increase/Decrease Statement: Funds Operational Test for the Shadow V2 Block III upgrade and continues to fund test and evaluation of Air Vehicle and Ground Equipment.		0.492	0.900	2.454
Title: System Engineering/Program Management		0.699	1.278	1.304

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV			Project (Number/Name) RQ7 / RQ-7 Shadow UAV				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019		
Description: System Engineering/Program Management											
FY 2018 Plans: Continues to fund System Engineering/Program management											
FY 2019 Plans: Continues to fund System Engineering/Program management											
FY 2018 to FY 2019 Increase/Decrease Statement: Continues to fund System Engineering/Program management											
Title: One System Remote Video Terminal (OSRVT)							1.319	2.119	1.467		
Description: OSRVT											
FY 2018 Plans: Continues to fund interoperability and performance improvements for OSRVT.											
FY 2019 Plans: Continues to fund interoperability and performance improvements for OSRVT.											
FY 2018 to FY 2019 Increase/Decrease Statement: Continues to fund interoperability and performance improvements for OSRVT.											
Accomplishments/Planned Programs Subtotals							4.597	12.773	12.863		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• A00018: A00018	135.408	83.160	46.786	-	46.786	21.753	15.000	24.000	20.137	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
A System Capability Demonstration (SCD) was conducted with four contractors. The results from the SCD in conjunction with proposal evaluations resulted in the competitive down select of a Best Value TUAS. A successful Milestone II Army Systems Acquisition Review Council (ASARC) was conducted 21 Dec 1999 and a Milestone III Decision was reached on 25 Sep 2002. The full rate production contract was awarded 27 Dec 2002 and in FY2009 the last of the authorized 104 systems was placed on contract. Continued development of the selected Tactical Unmanned Aircraft Vehicle (TUAV) system will be accomplished through a series of modifications and retrofits such as Shadow v2, Communications Relay, Laser Designator, Block III engine, and reliability upgrades. Development/integration of											

UNCLASSIFIED

PE 0305233A: RQ-7 Shadow UAV
Army

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV				Project (Number/Name) RQ7 / RQ-7 Shadow UAV					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Base: Program Management	RO	PM UAS : Redstone Arsenal, AL	3.552	0.110	Nov 2016	0.426		0.491		-		0.491	Continuing	Continuing	Continuing
Subtotal			3.552	0.110		0.426		0.491		-		0.491	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
OIF Improvements / Block Upgrades / Capability Improvements	SS/CPFF	AAI Corporation : Hunt Valley, MD	4.605	-		-		1.302		-		1.302	0.000	5.907	-
System Engineering / Reliability Solutions	SS/CPFF	AAI Corporation : Hunt Valley, MD	2.025	-		-		4.252		-		4.252	Continuing	Continuing	-
Ground Equipment Improvements	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	19.298	-		2.933	Dec 2017	-		-		-	Continuing	Continuing	Continuing
Block III Engine Development	C/CPFF	LSF : Redstone Arsenal, AL	30.725	-		-		-		-		-	0.000	30.725	-
Other Air Vehicle Improvements	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	16.643	-		0.375		0.168		-		0.168	Continuing	Continuing	Continuing
GPS Denied Development	C/CPFF	TBD: Competitive in FY18 : TBD: Competitive in FY18	1.500	2.087	Dec 2016	5.168	Dec 2017	1.916		-		1.916	Continuing	Continuing	-
Payload Improvements	SS/CPFF	Various : Various	4.750	-		-		-		-		-	0.000	4.750	-
One System Remote Video Terminal (OSRVT)	SS/CPFF	AAI Corporation, MD : AAI Corporation, MD	13.087	1.319	Apr 2017	2.119		1.467		-		1.467	Continuing	Continuing	Continuing
Subtotal			92.633	3.406		10.595		9.105		-		9.105	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV				Project (Number/Name) RQ7 / RQ-7 Shadow UAV					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	2.549	0.379	Dec 2016	0.284		0.183		-		0.183	Continuing	Continuing	Continuing
Base: Government Engineering and Logistic Support	MIPR	Various : Various	1.274	0.189	Nov 2016	0.568		0.630		-		0.630	Continuing	Continuing	Continuing
Subtotal			3.823	0.568		0.852		0.813		-		0.813	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RQ-7 Developmental Testing of Product Development	Various	Various : Various	5.675	0.413	Dec 2016	0.800		1.000		-		1.000	Continuing	Continuing	Continuing
RQ-7 Operational Testing of Product Developments	MIPR	Various : Various	0.400	0.100	Dec 2016	0.100		1.454		-		1.454	Continuing	Continuing	Continuing
OSRVT Developmental Testing	MIPR	Various : Various	0.100	-		-		-		-		-	0.000	0.100	-
OSRVT - Operational Testing	MIPR	Various : Various	2.033	-		-		-		-		-	0.000	2.033	-
Subtotal			8.208	0.513		0.900		2.454		-		2.454	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			108.216	4.597		12.773		12.863		-		12.863	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 7

R-1 Program Element (Number/Name)
PE 0305233A / RQ-7 Shadow UAV

Project (Number/Name)
RQ7 / RQ-7 Shadow UAV

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GPS Denied Development																												
GPS Denied																												
Interoperability Upgrades																												
IU																												
Software Block Upgrades																												
SBU																												
Reliability Improvements																												
RI																												
OSRVT Increment II Interoperability Improvements																												
OSRVT																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305233A / RQ-7 Shadow UAV	Project (Number/Name) RQ7 / RQ-7 Shadow UAV	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Block III Engine Development	1	2015	3	2016
GPS Denied Development	3	2016	4	2019
Interoperability Upgrades	1	2015	4	2020
Software Block Upgrades	1	2015	4	2020
Reliability Improvements	1	2019	4	2020
OSRVT Increment II Interoperability Improvements	1	2013	4	2023

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0307665A I Biometrics Enabled Intelligence							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	8.854	8.573	4.310	2.214	6.524	4.800	0.000	0.000	0.000	0.000	28.751
B17: BIOMETRICS ENABLED INTELLIGENCE - MIP	-	8.854	8.573	4.310	2.214	6.524	4.800	0.000	0.000	0.000	0.000	28.751

A. Mission Description and Budget Item Justification

The Army Program of Record for biometrics tactical collection capability is presently the Biometrics Automated Toolset-Army (BAT-A). It consists of the BAT-A Kit, BAT-A Handheld and BAT-A Web Service. This capability supports the Army Force Protection Mission and Identity Dominance Mission. The BAT-A system collects, matches, stores, and shares 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 system is also used by non-Military Intelligence personnel (Infantry and Military Police) for protection missions. The capability was originally deployed as a Quick Reaction Capability and has been deployed in a combat zone for over 17 years. Today, BAT-A supports Operation Freedom's Sentinel, Operation Inherent Resolve and Operation Guantanamo Bay. The BAT-A system will reach end of useful life in FY22.

The \$4.310 million of FY 2019 Base Funding will continue the transition phase established in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC), the replacement for the BAT-A. The program will use the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.

The FY 2019 OCO of \$2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence Repository (BI2R) -the unique software-based analytic production system used by the National Ground Intelligence Center (NGIC) specifically to create the Biometric Enabled Watchlist for Operation Freedom's Sentinel (OFS) and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) Commercial Cloud Service (C2S) cloud.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
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			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	8.854	8.573	0.000	-	0.000
Current President's Budget	8.854	8.573	4.310	2.214	6.524
Total Adjustments	0.000	0.000	4.310	2.214	6.524
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	4.310	2.214	6.524
Change Summary Explanation					
The FY 2019 funding request was reduced by \$1.490 million to account for the availability of prior year execution balances.					
The \$4.310 million of FY 2019 Base Funding will continue on the transition phase established in FY 2018 for Next Generation Biometric Collection Capability, (NXGBCC) the replacement for the BAT-A. The program will use the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.					
The FY 2019 OCO of \$2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence 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.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0307665A / <i>Biometrics Enabled Intelligence</i>				Project (Number/Name) B17 / <i>BIOMETRICS ENABLED INTELLIGENCE - MIP</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
BI7: <i>BIOMETRICS ENABLED INTELLIGENCE - MIP</i>	-	8.854	8.573	4.310	2.214	6.524	4.800	0.000	0.000	0.000	0.000	28.751
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Program of Record for biometrics tactical collection capability is presently the Biometrics Automated Toolset-Army (BAT-A). It consists of the BAT-A Kit, BAT-A Handheld and BAT-A Web Service. This capability supports the Army Force Protection Mission and Identity Dominance Mission. The BAT-A system collects, matches, stores, and shares 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 system is also used by non-Military Intelligence personnel (Infantry and Military Police) for protection missions. The capability was originally deployed as a Quick Reaction Capability and has been deployed in a combat zone for over 17 years. Today, BAT-A supports Operation Freedom's Sentinel, Operation Inherent Resolve and Operation Guantanamo Bay. The BAT-A system will reach end of useful life in FY22.

The \$4.310 million of FY 2019 Base Funding will continue the transition phase established in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC), the replacement for the BAT-A. The program will use the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.

The FY 2019 OCO of \$2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence Repository (BI2R -the unique software-based analytic production system used by the National Ground Intelligence Center (NGIC) specifically to create the Biometric Enabled Watchlist for Operation Freedom's Sentinel (OFS) and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) Commercial Cloud Service (C2S) cloud.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Army G2 Projects	7.104	6.036	0.000	2.214	2.214
Description: Army G2 supports various development of intelligence capabilities currently used to support Operation Freedom's Sentinel (OFS) and Operation Inherent Resolve (OIR) including Vigilant Pursuit Systems and the Biometrics Intelligence Information Repository (BI2R).					
FY 2018 Plans: FY 2018 RDT&E OCO Funding (\$3,886) supports Five Vigilant Pursuit System Sets (10 vehicles total plus equipment) are currently deployed in support of OFS (two sets) and OIR (three sets). The Vigilant Pursuit					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0307665A / Biometrics Enabled Intelligence	Project (Number/Name) B17 / BIOMETRICS ENABLED INTELLIGENCE - MIP			
B. Accomplishments/Planned Programs (\$ in Millions)						
System currently consists of 2 vehicles with integrated Multi-Intelligence (Multi-INT) Collection, Processing, Exploitation, and Dissemination capability packages installed on Mine-Resistant Ambush Protected All-Terrain Vehicles (MATVs). The funding supports developmental activities to create modularized, 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.						
The remaining FY 2018 RDT&E OCO Funding (\$2,150K) supports the development of new software code & associated testing to deliver the Biometric Intelligence Information Repository (I2AR) a replacement for the Biometrics Identity Intelligence 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.						
FY 2019 Base Plans: No RDT&E Base associated efforts are planned for FY 2019.						
FY 2019 OCO Plans: The FY 2019 OCO of \$2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence 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.						
FY 2018 to FY 2019 Increase/Decrease Statement: FY18 RDT&E OCO Funding (\$3,886K) supports developmental activities to create modularized, vehicle-independent and tailorable Multi-INT Collection, Processing, Exploitation, and Dissemination capability packages will conclude in FY18. The RDT&E funding of \$2,150K for FY19 will continue the development of new software code & associated testing.						
Title: Next Generation Biometric Collection Capability (NXGBCC)		-	2.537	4.310	-	4.310
Description: The Next Generation Biometric Collection Capability (NXGBCC) will be the successor program to the current BAT-A Program of Record.						
FY 2018 Plans:						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0307665A / Biometrics Enabled Intelligence		Project (Number/Name) B17 / BIOMETRICS ENABLED INTELLIGENCE - MIP		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY 2018 Base funding of \$2.537 million will support program planning and pre-acquisition efforts for the Next Generation Biometric Collection Capability (NXGBCC). FY 2019 Base Plans: The \$4.310 million of FY 2019 Base Funding will expand on the transition phase established in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC) the replacement for the BAT-A. The program will continue the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation. FY 2018 to FY 2019 Increase/Decrease Statement: The increase of \$1.773 million of FY 2019 Base Funding will further expand market research and industry engagement initiated in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC). The program will complete the OTA to down-select a prototype from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.						
Title: Joint Urgent Operational Needs Statement (JUONS) CC-0548 Description: OSD S&T effort to develop a portable rapid DNA solution to meet the requirements for JUONS CC-0548.		1.750	-	-	-	-
Accomplishments/Planned Programs Subtotals		8.854	8.573	4.310	2.214	6.524
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
The NXGBCC Acquisition Strategy is to procure a limited development integrated solution that meets the NXGBCC collect/store/match/share requirements and interfaces with the Biometric Family of Systems. The strategy will maximize mature technologies (integrated commercial off the shelf products) and reward industry for providing a solution that is integrated and can be fielded in FY21. The program office will use an Other Transaction Agreement (OTA) to down-select a prototype from commercial vendors. Upon OTA completion, the procurement, fielding and sustainment process will begin. The \$2.214 million of FY 2019 OCO funding will continue the development of new software code & associated testing necessary to deliver the Identity Intelligence Analytic Resource (I2AR). The acquisition strategy will be to exercise a contract option which enables for continuation of a contractor to develop activities for the Army Requirements Oversight Council (AROC) approved Quick Reaction Capability (QRC).						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0307665A / <i>Biometrics Enabled Intelligence</i>	Project (Number/Name) B17 / <i>BIOMETRICS ENABLED INTELLIGENCE - MIP</i>
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0307665A / <i>Biometrics Enabled Intelligence</i>						Project (Number/Name) B17 / <i>BIOMETRICS ENABLED INTELLIGENCE - MIP</i>			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Management Services	Various	Various : Various	12.921	-		2.537		-		-		-	0.000	15.458	-
PM Management Services	C/Various	TBD : TBD	-	-		-		4.310		2.214		6.524	0.000	6.524	-
Subtotal			12.921	-		2.537		4.310		2.214		6.524	0.000	21.982	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Base Products Development	C/IDIQ	Various : TBD	44.293	5.494	Jul 2017	5.247		-		-		-	0.000	55.034	-
Subtotal			44.293	5.494		5.247		-		-		-	0.000	55.034	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Civilian Personnel and Other Support Costs	Various	Various : Various	20.102	-		-		-		-		-	0.000	20.102	-
Subtotal			20.102	-		-		-		-		-	0.000	20.102	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
IA, T&E, Threat Assessment, Interoperability Certifications	Various	Various : TBD	0.917	3.360	Aug 2017	0.789		-		-		-	0.000	5.066	-
Subtotal			0.917	3.360		0.789		-		-		-	0.000	5.066	N/A

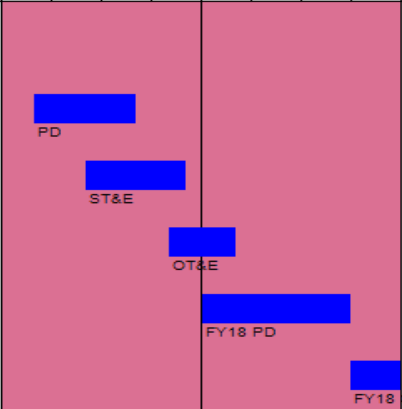
UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0307665A / <i>Biometrics Enabled Intelligence</i>					Project (Number/Name) B17 / <i>BIOMETRICS ENABLED INTELLIGENCE - MIP</i>					
		Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			78.233	8.854		8.573		4.310		2.214		6.524	0.000	102.184	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0307665A / <i>Biometrics Enabled Intelligence</i>		Project (Number/Name) B17 / <i>BIOMETRICS ENABLED INTELLIGENCE - MIP</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Army G2 Projects																												
Product Development																												
Systems Test & Evaluation																												
Operational Test & Evaluation																												
FY18 Product Development																												
FY18 Operational Test & Evaluation																												
Next Generation Biometric Collection Capability (NXGBCC)																												
NXGBCC Program Planning																												
AoA Report																												
CPD Signed																												
MS-C																												
Initial Operational Capability																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0307665A / <i>Biometrics Enabled Intelligence</i>	Project (Number/Name) B17 / <i>BIOMETRICS ENABLED INTELLIGENCE - MIP</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Contract Closeout	2	2015	2	2015
PM JPIv2 Closeout	2	2015	1	2016
Army G2 Projects	1	2017	1	2021
Product Development	1	2017	3	2017
Systems Test & Evaluation	2	2017	4	2017
Operational Test & Evaluation	4	2017	1	2018
FY18 Product Development	1	2018	3	2018
FY18 Operational Test & Evaluation	4	2018	4	2018
Next Generation Biometric Collection Capability (NXGBCC)	1	2018	1	2032
NXGBCC Program Planning	1	2018	4	2019
AoA Report	1	2018	2	2018
CPD Signed	1	2019	1	2019
MS-C	3	2020	3	2020
Initial Operational Capability	3	2021	1	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0310349A I Win-T Increment 2 - Initial Networking							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.680	4.723	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.403
EE7: WIN-T Increment 2 - Initial Networking	-	4.680	4.723	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.403

A. Mission Description and Budget Item Justification

Warfighter Information Network - Tactical Increment 2 (WIN-T Inc 2) provides the Army with On-The-Move (OTM) networking capability. The WIN-T Inc 2 network retains capabilities delivered by WIN-T Inc 1 and by leveraging proven Government and commercial technologies, adds greater network throughput and automated network management to optimize planning (to include spectrum use), initialization, monitoring and troubleshooting. WIN-T Inc 2 employs Satellite Communications OTM to extend the network in maneuver Brigade Combat Teams to Company-level through FY2018. Using equipment mounted on combat platforms, WIN-T Inc 2 delivers a mobile capability that reduces reliance on fixed infrastructure and allows key leaders to move on the battlefield while retaining situational awareness and mission command capabilities. Using the Highband Networking Radio, with the Highband Networking Waveform and high performance antennas, the WIN-T Inc 2 Line-of-Sight network offers an adaptive 30-Megabit per second aggregate throughput to key leaders in their Command Post or in their vehicle. The WIN-T Inc 2 network is self-forming, which means it automatically creates transmission paths based on terrain and environmental conditions; and self-healing, meaning that transmission paths will automatically re-route traffic to complete network transactions and calls even if one or more nodes break down or lose connectivity. This capability offers greater network reliability and better end-to-end connectivity than traditional point-to-point networks. WIN-T Inc 2 introduces the network management capability needed to keep mobile and dispersed forces networked through automated planning, initialization, monitoring, and troubleshooting. Finally, WIN-T Inc 2 adopts "Colorless Core" technology that encrypts both classified and unclassified user information in the network and minimizes the number of users on the "core" of the network. The Colorless Core allows commanders to utilize the tactical network without fear of the enemy intercepting information. Colorless Core is a technical insertion in the WIN-T Inc 1b network which enables information sharing between WIN-T Inc 1b and WIN-T Inc 2.

Inc 3 developed NetOps software and NetCentric Waveform (NCW) updates will be inserted into Inc 2 equipped units.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		PE 0310349A / Win-T Increment 2 - Initial Networking			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.867	4.723	5.833	-	5.833
Current President's Budget	4.680	4.723	0.000	-	0.000
Total Adjustments	-0.187	0.000	-5.833	-	-5.833
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-0.187	-	-5.833	-	-5.833
Change Summary Explanation					
Program has no FY 2019 RDTE requirement.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0310349A / Win-T Increment 2 - Initial Networking				Project (Number/Name) EE7 / WIN-T Increment 2 - Initial Networking			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EE7: WIN-T Increment 2 - Initial Networking	-	4.680	4.723	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.403
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Warfighter Information Network - Tactical Increment 2 (WIN-T Inc 2) provides the Army with On-The-Move (OTM) networking capability. The WIN-T Inc 2 network retains capabilities delivered by WIN-T Inc 1 and by leveraging proven Government and commercial technologies, adds greater network throughput and automated network management to optimize planning (to include spectrum use), initialization, monitoring and troubleshooting. WIN-T Inc 2 employs Satellite Communications OTM to extend the network in maneuver Brigade Combat Teams to Company-level through FY2018. Using equipment mounted on combat platforms, WIN-T Inc 2 delivers a mobile capability that reduces reliance on fixed infrastructure and allows key leaders to move on the battlefield while retaining situational awareness and mission command capabilities. Using the Highband Networking Radio, with the Highband Networking Waveform and high performance antennas, the WIN-T Inc 2 Line-of-Sight network offers an adaptive 30-Megabit per second aggregate throughput to key leaders in their Command Post or in their vehicle. The WIN-T Inc 2 network is self-forming, which means it automatically creates transmission paths based on terrain and environmental conditions; and self-healing, meaning that transmission paths will automatically re-route traffic to complete network transactions and calls even if one or more nodes break down or lose connectivity. This capability offers greater network reliability and better end-to-end connectivity than traditional point-to-point networks. WIN-T Inc 2 introduces the network management capability needed to keep mobile and dispersed forces networked through automated planning, initialization, monitoring, and troubleshooting. Finally, WIN-T Inc 2 adopts "Colorless Core" technology that encrypts both classified and unclassified user information in the network and minimizes the number of users on the "core" of the network. The Colorless Core allows commanders to utilize the tactical network without fear of the enemy intercepting information. Colorless Core is a technical insertion in the WIN-T Inc 1b network which enables information sharing between WIN-T Inc 1b and WIN-T Inc 2.

Inc 3 developed NetOps software and NetCentric Waveform (NCW) updates will be inserted into Inc 2 equipped units.

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

	FY 2017	FY 2018	FY 2019
Title: Product Development	3.783	2.938	-
Description: Product Development			
FY 2018 Plans: FY18 funds development efforts for Technical Insertions.			
FY 2018 to FY 2019 Increase/Decrease Statement: Program has no FY 2019 RDTE requirement.			
Title: Test and Evaluation	0.473	1.354	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0310349A / Win-T Increment 2 - Initial Networking			Project (Number/Name) EE7 / WIN-T Increment 2 - Initial Networking				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2017	FY 2018	FY 2019		
Description: Test and Evaluation											
FY 2018 Plans: FY18 funds support Operational Testing (JWA 18) and support Next Gen PoP and SNE efforts.											
FY 2018 to FY 2019 Increase/Decrease Statement: Program has no FY 2019 RDTE requirement.											
Title: Management Services							0.424	0.431	-		
Description: Provides system engineering and program management support											
FY 2018 Plans: Continues system engineering and program management support.											
FY 2018 to FY 2019 Increase/Decrease Statement: Program has no FY 2019 RDTE requirement.											
Accomplishments/Planned Programs Subtotals							4.680	4.723	-		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WIN-T Inc 2: WIN-T Inc 2 Procurement	291.933	420.492	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• WINT Inc 2 OCO: WIN-T Inc 2 OCO	1.288	-	0.000	-	0.000	-	-	-	-	0.000	1.288
• Inc 2 Spares: WIN-T Inc 2 Procurement Spares	19.808	23.935	0.000	-	0.000	-	-	-	-	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
The current Initial Production contract was awarded in 2010 for procurement of Low Rate Initial Production Lots. Lots 1-5a were procured prior to the Full Rate Production (FRP) decision review. Approval for full rate production was granted at the Defense Acquisition Board on 11 May 2015. Lots 5b/6 were the first full rate production lots procured. Lot 7 was procured in 2Q FY 2016. Lot 8 was procured in 1Q FY 2018. Inc 3 developed NetOps software and NetCentric Waveform was tested at Network Integration Evaluation (NIE) 16.2 event and will be inserted into Inc 2 equipped units.											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0310349A / Win-T Increment 2 - Initial Networking	Project (Number/Name) EE7 / WIN-T Increment 2 - Initial Networking
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0310349A / Win-T Increment 2 - Initial Networking				Project (Number/Name) EE7 / WIN-T Increment 2 - Initial Networking					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/ FFPLOE	Various : Various	0.620	0.424		0.431		-		-		-	0.000	1.475	-
Subtotal			0.620	0.424		0.431		-		-		-	0.000	1.475	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	MIPR	CERDEC : Various	0.396	3.783		2.938		-		-		-	0.000	7.117	-
Subtotal			0.396	3.783		2.938		-		-		-	0.000	7.117	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test	Various	Various : Various	5.756	0.473		1.354		-		-		-	0.000	7.583	-
Subtotal			5.756	0.473		1.354		-		-		-	0.000	7.583	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			6.772	4.680		4.723		-		-		-	0.000	16.175	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army				Date: February 2018			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0310349A / Win-T Increment 2 - Initial Networking			
				Project (Number/Name) EE7 / WIN-T Increment 2 - Initial Networking			

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Full Rate Production/Fielding																												
Logistics Demonstration																												
Capabilities Integration Evaluation (CIE) 17																												
Delivery Order Lot 8																												
Delivery Order Lot 9																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0310349A / <i>Win-T Increment 2 - Initial Networking</i>	Project (Number/Name) EE7 / <i>WIN-T Increment 2 - Initial Networking</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
LRIP Production	2	2010	3	2015
Network Integrated Evaluation 14.1	1	2014	1	2014
Developmental Test 1	2	2014	2	2014
Network Integrated Evaluation 14.2	3	2014	3	2014
Developmental Test 2	3	2014	3	2014
Network Integrated Evaluation 15.1 (FOT&E) (Stryker)	1	2015	1	2015
Log Verification	1	2016	1	2016
Full Rate Production/Fielding	3	2015	4	2029
NIE 16.2 NetOps/NCW	3	2016	3	2016
Logistics Demonstration	2	2017	2	2017
Capabilities Integration Evaluation (CIE) 17	4	2017	4	2017
Delivery Order Lot 8	1	2018	1	2018
Delivery Order Lot 9	2	2018	2	2018

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS

COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	59.891	60.877	53.958	-	53.958	59.848	61.071	62.543	63.749	0.000	421.937
E25: Mfg Science & Tech	-	59.891	60.877	53.958	-	53.958	59.848	61.071	62.543	63.749	0.000	421.937

A. Mission Description and Budget Item Justification

This Program Element (PE) develops, demonstrates, and transitions manufacturing processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, and sensors and electronics. Initiatives within the PE result in cost savings and reduced risk of transitioning military-unique manufacturing processes into production. Project E25 fosters the transfer of new/improved manufacturing technologies to the industrial base, including manufacturing efforts that have potential for high payoff across the spectrum of Army systems.

Work in this PE is related to, and fully coordinated with, PE 0603710A (Night Vision Advanced Technology), PE 0602303A (Missile Technology), PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0602601A (Combat Vehicle and Automotive Technology), and PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603002 (Medical Advanced Technology), and PE 0602705A (Electronics and Electronic Devices).

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology focus areas and the Army Modernization Strategy.

Work in this PE is performed by: the U.S. Army Research Development and Engineering Command (RDECOM), Aberdeen Proving Ground, MD; The U.S. Army Medical Research and Materiel Command (MRMC), Ft. Detrick, MD; and the Army Space and Missile Defense Command/Army Forces Strategic Command (SMDC/ARSTRAT), Huntsville, AL.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	62.287	60.877	59.083	-	59.083
Current President's Budget	59.891	60.877	53.958	-	53.958
Total Adjustments	-2.396	0.000	-5.125	-	-5.125
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.366	-			
• Adjustments to Budget Years	-	-	-5.125	-	-5.125

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS	
• FFRDC	-0.030	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS				Project (Number/Name) E25 / Mfg Science & Tech			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
E25: Mfg Science & Tech	-	59.891	60.877	53.958	-	53.958	59.848	61.071	62.543	63.749	0.000	421.937
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This Project develops and demonstrates manufacturing processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, and sensors and electronics. Focus is on components and subsystems such as advanced armor, lightweight structural components, sensors, propellants, and gun tubes. In addition, work is conducted to advance the state of the art in processing and fabrication techniques for coatings, multifunctional materials, and structural elements for Army specific applications.												
The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science & Technology focus areas and the Army Modernization Strategy.												
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2017	FY 2018	FY 2019
Title: Long Range Precision Fires										-	-	12.869
Description: The effort funds manufacturing improvements to support areas such as Advanced Weapon Systems, Fire Control, and Advanced Energetics and Warheads. Work focuses on addressing challenges in areas such as enhanced missile seekers; fuses and initiators for munitions; and boring, honing, and rifling cannon and mortar barrels.												
FY 2019 Plans:												
Will complete development of manufacturing processes for battery free initiators for scatterable munitions; develop methods to manufacture large caliber canon-boring tools at reduced cost; develop safer and more cost effective methods for mixing and packing of propellants; develop enhanced processes to fabricate large-caliber cannon and mortar tubes with longer range and higher durability than existing systems; and complete development of manufacturing technologies for complex missile seekers.												
FY 2018 to FY 2019 Increase/Decrease Statement:												
Planned progression of effort. Continues work from Lethality.												
Title: Next Generation Combat Vehicle (Formerly Ground Maneuver)										14.088	18.244	13.875
Description: This effort funds manufacturing technology advances needed for more affordable components and subsystems for tactical and combat vehicles and weapons systems. Work focuses on addressing challenges in areas such as advanced armor, lighter weight components, insensitive propellants, precision munitions, and vehicle power devices.												
FY 2018 Plans:												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS		Project (Number/Name) E25 / Mfg Science & Tech	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2017	FY 2018	FY 2019
Fabricate hatch and ramps for demonstration on selected vehicles, document and transition magnesium alloy ballistic specifications; demonstrate a cathode coating process and enhanced production of high energy density safe 5 volt lithium-ion batteries for use in Army ground vehicle systems; prove out and deliver a manufacturing line and associated processes for adaptive protection modules; transition improved rocket nozzle insulation processes to PM Precision Fires; construct an agile manufacturing cell and sensor suite to demonstrate efficient welding of thicker plate materials used for armored multi-purpose and other vehicles; continue development of a lithium-ion battery pilot line leveraging multiple battery form factors leading to reduced cost and increased throughput; research novel joining technology processes that will replace existing steel components leading to lighter heavy combat vehicles. FY 2019 Plans: Will develop manufacturing technology to reduce the cost and improve the performance of weight sensitive armor protection systems against future threats; demonstrate manufacturing technologies to reduce cost and improve performance when joining dissimilar materials for ground platform structural components; develop manufacturing techniques for ground vehicle powertrain components with improved efficiency and power density. FY 2018 to FY 2019 Increase/Decrease Statement: Planned progression of the effort.					
Title: Future Vertical Lift (Formerly Air Systems) Description: This effort funds manufacturing technology advances needed for more affordable manned and unmanned aircraft components and subsystems. Work focuses on addressing challenges in areas such as engine performance and life, ballistically tolerant fuel bladders and composite transmission sumps, reliable component integration/attachment, structural durability at low weight, sensors for aircraft protection and pilotage, and reduced corrosion. FY 2018 Plans: Transition to Utility Helicopters Project Office for qualification testing direct digitally manufactured helicopter engine components of additively manufactured articles resulting in increased performance and reduced weight of the T700 platform. FY 2019 Plans: Will investigate novel manufacturing methods for fabrication of composite material air platform components with reduced weight and improved fatigue resistance. FY 2018 to FY 2019 Increase/Decrease Statement: Planned progression of the effort.			3.373	1.557	0.592
Title: Networks and Command, Control, Communications and Intelligence (Formerly Command, Control, Communications and Intelligence Systems)			17.271	11.678	8.314

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS	Project (Number/Name) E25 / Mfg Science & Tech		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Description: This effort funds manufacturing technology advances needed for more affordable components and subsystems for intelligence, surveillance, reconnaissance and targeting systems, mission command systems, electronic warfare and improved explosive device detect/defeat systems. Work focuses on addressing challenges in areas such as large format multi-color focal plane arrays, flexible displays, night vision sensors, target detectors, advanced antennas and sensors. FY 2018 Plans: Transition improved processes for 12um focal plane arrays used in high definition cameras to Project Manager (PM) ? Soldier Sensors and Lasers; deliver to PM Aircraft Survivability Equipment millimeter wave packaging improvements to include module development and antenna/module interface advancements of devices used in radio frequency threat warning applications in air combat platforms; continue optimization of a manufacturing process to produce ultra-thin, lightweight, wide-band conformal antennas; continue refining and validating a 3D, read-only integrated circuit manufacturing process resulting in sensors with improved sensitivity and dynamic range; improve assembly processes utilizing epoxies that resist high shocks & temperature cycling for weapon boresight systems. FY 2019 Plans: Will complete optimization of manufacturing process to produce ultra-thin, wide-band, conformal antennas for Army platforms; investigate process improvements for digital imagers and sensors for aviation protection and pilotage. FY 2018 to FY 2019 Increase/Decrease Statement: Planned progression of the effort. Work continues in Future Vertical Lift and Soldier Lethality.				
Title: Air & Missile Defense Description: This effort funds manufacturing improvements to support areas such as High Energy Laser system components (e.g. diodes, optics), interceptor components, and armament systems for counter-unmanned aerial systems and counter-rocket, artillery, and mortar systems. FY 2019 Plans: Will develop processes to improve manufacturing yield for high energy laser diodes. FY 2018 to FY 2019 Increase/Decrease Statement: Planned progression of effort. Continues work from Lethality.		-	-	0.592
Title: Soldier Lethality (Formerly Soldier Systems) Description: This effort funds manufacturing technology advances needed for more affordable components and subsystems in areas such as combat feeding, aerial delivery of supplies, expeditionary basing, Soldier-borne sensors, clothing, and protective equipment. Work focuses on addressing challenges in areas such as multifunctional fabrics for shelters, uniforms and portage		3.420	4.554	12.167

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS		Project (Number/Name) E25 / Mfg Science & Tech
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
equipment; affordable, non-contaminating packaging for rations; lightweight materials for body armor; and medical technologies such as biotechnology and vaccine production.				
FY 2018 Plans: Transition to Soldier protection systems programs of record a full scale manufacturing pilot line developed for polyethylene films; build a continuous reactor to demonstrate high yield manufacturing processes for gallium arsenide based solar arrays for portable Soldier power sources; refine manufacturing processes in the production of low cost augmented reality eyepieces that provide the Soldier with high resolution imagery across a wide field of view for increased situational awareness.				
FY 2019 Plans: Will develop manufacturing techniques for flexible light-weight solar cells, low cost freeform prism eyepieces, and components for Infantry sighting systems; develop manufacturing process improvement techniques for optical coatings and optical components to reduce cost and improve performance; complete characterization of a scaled up process for Adenovirus vaccine production.				
FY 2018 to FY 2019 Increase/Decrease Statement: Planned progression of the effort. Continues work from Medical and Networks and Command, Control, Communications and Intelligence.				
Title: Cross-cutting		11.420	12.643	5.549
Description: This effort funds manufacturing technology advances with impact across processes or platforms of Army interest. Work focuses on addressing challenges in areas such as advanced additive manufacturing technologies for fabrication of weapons systems, platforms, and munitions; and novel manufacturing techniques for expedient and cost effective repair of worn or damaged platform components.				
FY 2018 Plans: Complete delivery to PM MAS processes and tooling requirements of 2D and 3D additively manufactured energetics and electronics for use in 40mm grenades; demonstrate a laser enhanced net shaping repair process at Anniston Army Depot for the qualification and reclamation of Army components; perform modeling and simulation for cold spray repair processes to reduce the sustainment cost of Army weapon systems.				
FY 2019 Plans: Will demonstrate advanced additive manufacturing capabilities for the build, remanufacture, and life extension of critical weapon systems components to improve performance, allow fabrication of structures not possible thorough subtractive methods, and/or improve component affordability; demonstrate an integrated augmented reality solution for advanced machining.				
FY 2018 to FY 2019 Increase/Decrease Statement:				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS	Project (Number/Name) E25 / Mfg Science & Tech		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Planned progression of effort.				
Title: Lethality Description: The effort funds manufacturing improvements to support areas such as Advanced Weapon Systems, Fire Control, Logistics, Emerging Technologies, and Advanced Energetics and Warheads. Work focuses on addressing challenges in areas such as enhanced missile seekers; fuses and initiators for munitions; and boring, honing, and rifling cannon and mortar barrels. FY 2018 Plans: Improve manufacturing methods, conduct materials analysis and demonstrate more efficient production processes that enable multi-mode missile seekers; build and test prototype programmable initiators of an automated, scaled-up manufacturing process addressing requirements for Family of Scatterable Munitions (FASCAM); develop smart tooling and process models of a software-based module capable of aiding production engineers across the organic industrial base and S&T community to verify and implement best value part manufacturing programs; fabricate disk components and test components to demonstrate spark plasma sintering process to reduce costs and lead times for large caliber cannon broach cutting tools; demonstrate processes on internal components that validate suitable energetic inks in the production of next generation hand grenades and small munitions; mature the manufacturing processes for the fabrication of small format liquid reserve batteries which support small to medium caliber munitions and hand emplaced munitions; mature waterjet milling to produce the rifling in large caliber cannon tubes in order to replace the expensive broaching process; investigate advanced manufacturing techniques for small caliber lightweight cartridge cases. FY 2018 to FY 2019 Increase/Decrease Statement: Planned progression of the effort. Work from this effort is continues in Long Range Precision Fires and in Air & Missile Defense.		9.319	11.100	-
Title: Medical Description: This effort funds manufacturing technology advances needed for more affordable process methods in areas such as manufacturing of lighter weight multi-functional materials, biotechnology, vaccines, medical equipment power sources, and component ruggedization that directly address Soldier rehabilitation. FY 2018 Plans: Produce test batches in the development of a modernized, scaled-up production process addressing spray drying and encapsulation methods of the Adenovirus vaccine. FY 2018 to FY 2019 Increase/Decrease Statement: Planned progression of effort. Work continues in Soldier Lethality.		1.000	1.101	-
Accomplishments/Planned Programs Subtotals		59.891	60.877	53.958

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / <i>INDUSTRIAL PREPAREDNESS</i>	Project (Number/Name) E25 / <i>Mfg Science & Tech</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks Not applicable for this item.		
D. Acquisition Strategy Not applicable for this item.		
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS						Project (Number/Name) E25 / Mfg Science & Tech			
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TBD	C/Various	TBD : TBD	-	-		0.018		-		-		-	0.000	0.018	-
Subtotal			-	-		0.018		-		-		-	0.000	0.018	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TBD	Various	TBD : TBD	231.921	59.891		60.859		53.958		-		53.958	0.000	406.629	-
Subtotal			231.921	59.891		60.859		53.958		-		53.958	0.000	406.629	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			231.921	59.891		60.877		53.958		-		53.958	0.000	406.647	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
Appropriation/Budget Activity 2040 / 7								R-1 Program Element (Number/Name) PE 0708045A / INDUSTRIAL PREPAREDNESS								Project (Number/Name) E25 / Mfg Science & Tech												
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												
	N/A																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / <i>INDUSTRIAL PREPAREDNESS</i>	Project (Number/Name) E25 / <i>Mfg Science & Tech</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
N/A	1	2016	4	2019

Note

N/A

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	11.959	12.119	-	12.119	8.644	8.769	8.908	9.506	Continuing	Continuing
FE1: Dscs-Dcs (Phase II)	-	0.000	6.756	4.234	-	4.234	4.265	4.381	4.505	4.566	Continuing	Continuing
FE2: MILSATCOM System Engineering	-	0.000	4.203	4.392	-	4.392	4.379	4.388	4.403	4.940	Continuing	Continuing
FE4: Enroute Mission Command	-	0.000	1.000	3.493	-	3.493	0.000	0.000	0.000	0.000	0.000	4.493

Note

Program in FY 2017 and prior funded in OSD PE 0303142A. Realigned in FY 2018 to OSD PE 1203142A to reflect Major Force Program 12 (MFP12) Space.

A. Mission Description and Budget Item Justification

FE1: Dscs-Dcs (Phase II):

This project provides funds to develop Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future Force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations

FE2: Military Satellite Communications (MILSATCOM)System Engineering (SE):

Military Satellite Communications (MILSATCOM)System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts, performed by MILSATCOM SE, lead to savings for the overall Army in the out years.

FE4 / Enroute Mission Command:

Mission Description and Budget Item Justification:

Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)

Due to rephasing of FY 2017 OPA funding into FY 2018/2019, program was restructured in Dec 2015. MDA addressed schedule issues (Oct 2016) by authorizing to field a Ku FISA FOC (4QFY17) and complete a Modification Word Order (MWO), adding Ka FISA capability, post Ku FISA FOC.

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	11.959	19.425	-	19.425
Current President's Budget	0.000	11.959	12.119	-	12.119
Total Adjustments	0.000	0.000	-7.306	-	-7.306
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-7.306	-	-7.306

Change Summary Explanation

Reduction in project FE1 funding reflects updated costs to develop interfaces necessary to fully integrate Digital IF technology in DoD gateway architecture, complete IA accreditation, and finalize interoperability tests and certifications.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) FE1 / Dscs-Dcs (Phase II)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FE1: Dscs-Dcs (Phase II)	-	0.000	6.756	4.234	-	4.234	4.265	4.381	4.505	4.566	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project provides funds to develop Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future Force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: SATCOM Terminal Digital IF Implementation Analysis									-	3.831	3.014	
Description: SATCOM Terminal Digital Intermediate Frequency (IF) implementation analysis aimed at improving bandwidth efficiency of gateway terminals while providing an additional layer of resiliency through terminal redundancy. These analyses include various evaluations for digital terminal components to replace current, less efficient, analog components. These analyses also include assessment of terrestrial connectivity among SATCOM terminals to enable Continuity Of Operations (COOP) and Failover scenarios required for resiliency.												
FY 2018 Plans: Develop interfaces necessary to fully integrate Digital IF technology into DoD gateway architecture. Complete IA accreditation and finalize interoperability tests and certifications.												
FY 2019 Plans: Assess various vendor implementations for compliance with Digital IF standard. Perform multi-vendor interoperability analysis to ensure maximum vendor participation in future Digital IF technology and foster competition.												
FY 2018 to FY 2019 Increase/Decrease Statement: Reduction in funds is due to switch from standard development and IA certification to conducting multi-vendor interoperability analysis.												
Title: Electromagnetic Interference Mitigation Analysis									-	2.925	1.220	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) FE1 / Dscs-Dcs (Phase II)				
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2017	FY 2018	FY 2019
Description: Assess various interference mitigation/cancellation technologies for effectiveness in SATCOM gateway operations. Mature technology to software/firmware that will improve SATCOM modem/terminal performance in contested environment. FY 2018 Plans: Investigate and develop solutions to support satellite communications operating in a contested environment. Perform interoperability and IA accreditation tests. Integrate solutions into DoD gateway satellite communications architecture. FY 2019 Plans: Mature Interference Mitigation / Cancellation technology to software/firmware that can be incorporated in SATCOM modem/terminal. Integrate solutions into DoD gateway satellite communications architecture. FY 2018 to FY 2019 Increase/Decrease Statement: Reduction in funds is due to switch from developing solutions and conducting testing to maturing software/firmware and integration.												
Accomplishments/Planned Programs Subtotals										-	6.756	4.234
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• BB8500: Defense Enterprise Wideband Satcom Systems	143.805	161.383	108.133	-	108.133	111.000	99.480	118.628	108.253	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
This effort finances Project Manager, Defense Communications and Army Transmission Systems (PM DCATS) netcentric systems engineering, modem risk mitigation, and Risk Management Framework (RMF) support. Funding provides for SATCOM terminal upgrades, enhancement of baseband throughput capabilities, technology insertion and upgrades which enhance decision support capabilities, allowing for full utilization of Wideband Global SATCOM (WGS) capabilities. Both the Wideband SATCOM Operational Management System (WSOMS) and the Enterprise Wideband SATCOM Terminal System (EWSTS) Capability Production Documents (CPDs) contain Netcentric-Ready Key Performance Parameters (NR-KPPs) as required by CJCSI 6212.01C. Netcentric efforts are required to facilitate the migration from the current trunk-based communications systems to Internet Protocol (IP) based systems and to engineer, test and integrate IP based capabilities into EWSTS and WSOMS systems. Studies, risk mitigation, system integration and advanced demonstrations for Netcentric baseband and policy based control will accommodate technology insertion, data sharing, remote operations, architecture efforts and use of commercial technology, thus ensuring the life of the Defense Enterprise Wideband System (DEWSS) terminal family beyond 2025 and reducing lifecycle costs and enterprise requirements on the WGS and Defense Satellite Communication System (DSCS) satellites in the future.												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE1 / Dscs-Dcs (Phase II)

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)						Project (Number/Name) FE1 / Dscs-Dcs (Phase II)			
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SATCOM Terminal Digital IF Implementation Analysis	MIPR	TBD : APG, MD	-	-		2.709	Jan 2018	2.183	Jan 2019	-		2.183	Continuing	Continuing	Continuing
Electromagnetic Interference Mitigation Analysis	MIPR	TBD : APG, MD	-	-		2.393	Jan 2018	1.035	Jan 2019	-		1.035	Continuing	Continuing	Continuing
Subtotal			-	-		5.102		3.218		-		3.218	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Support	Allot	PdM WESS : Ft. Belvoir, VA	-	-		1.121		0.689		-		0.689	Continuing	Continuing	Continuing
Contractor Support	C/CPFF	ACC, MD : APG, MD	-	-		0.533	Jan 2018	0.327	Jan 2019	-		0.327	Continuing	Continuing	Continuing
Subtotal			-	-		1.654		1.016		-		1.016	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		6.756		4.234		-		4.234	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018																					
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)								Project (Number/Name) FE1 / Dscs-Dcs (Phase II)																			
Event Name										FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SATCOM Terminal Digital IF Implementation Analysis																																					
Electromagnetic Interface Mitigation Analysis																																					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE1 / Dscs-Dcs (Phase II)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SATCOM Terminal Digital IF Implementation Analysis	1	2018	4	2023
Electromagnetic Interface Mitigation Analysis	1	2018	4	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) FE2 / MILSATCOM System Engineering			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FE2: MILSATCOM System Engineering	-	0.000	4.203	4.392	-	4.392	4.379	4.388	4.403	4.940	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FE2: Military Satellite Communications (MILSATCOM) System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts, performed by MILSATCOM SE, lead to savings for the overall Army in the out years.

FY 2019 funds support the continued systems engineering required to support technology maturation, systems analysis, and planning associated with joint SATCOM development efforts including complying with the outcome of the Protected SATCOM Communications Systems (PSCS) Analysis of Alternatives (AoA). In addition, FY 2019 funding covers the Protected Tactical Service Field Demo (PTSFD) Modem Testing, Narrowband Mobile User Objective System (MUOS) Analysis of Alternatives (AoA), Protected Tactical Service Field Demo (PTSFD), Network Centric Waveform Tool (NCWT) Development and Testing, Network Centric Waveform - Resilient (NCW-R) engineering support and other efforts that have impact on tactical Army use of military and commercial satellite constellations. These efforts have a direct impact in reducing technical and programmatic risk for the acquisition efforts for tactical Army SATCOM systems using these constellations.

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

	FY 2017	FY 2018	FY 2019
Title: Protected Communications System Engineering and WGS Communications	-	1.051	1.185
FY 2018 Plans: Product development and analysis for the Protected Communications and WGS Communications System Engineering to include CCW-R, NCW Tool, and Protected Tactical Waveform Programs.			
FY 2019 Plans: Product development and analysis for the Protected Communications and WGS Communications System Engineering to include NCW-R, NCW Tool, and Protected Tactical Waveform Programs.			
FY 2018 to FY 2019 Increase/Decrease Statement: No significant change.			
Title: System Engineering Support	-	2.552	2.644
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
In house Engineering Support, Contractor Support and System Architecture & Analysis			
FY 2019 Plans: In house Engineering Support, Contractor Support and System Architecture & Analysis			
FY 2018 to FY 2019 Increase/Decrease Statement: No significant change.			
Title: Testing and certification of critical SATCOM and Satellite-On-The-Move (SOTM) communication and network technologies FY 2018 Plans: Testing and certification of critical SATCOM and SOTM communication and network technologies. FY 2019 Plans: Testing and certification of critical SATCOM and SOTM communication and network technologies. FY 2018 to FY 2019 Increase/Decrease Statement: No significant change.	-	0.600	0.563
Accomplishments/Planned Programs Subtotals	-	4.203	4.392

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 456: MILSATCOM System Engineering	4.287	-	0.000	-	0.000	-	-	-	-	0.000	4.287
Remarks FY 2017 and prior funding was aligned to 0303142A/456. FY 2016 0.908M FY 2017 4.287M											
D. Acquisition Strategy This project funds advanced systems engineering, research, development, test and evaluation of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation of the technology will transition to PM Tactical Network and related programs of record.											
E. Performance Metrics N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)						Project (Number/Name) FE2 / MILSATCOM System Engineering			
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Protected Communications and WGS Communications SE	TBD	Various : APG, MD	-	-		1.051		1.185	Jan 2019	-		1.185	Continuing	Continuing	Continuing
Subtotal			-	-		1.051		1.185		-		1.185	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering (In House)	MIPR	PM WIN-T : APG, MD	-	-		1.200		1.214	Sep 2019	-		1.214	Continuing	Continuing	-
Engineering Contractors Support	C/CPFF	PM WIN-T : APG, MD	-	-		1.152		1.200	Mar 2019	-		1.200	Continuing	Continuing	-
System Architecture & Analysis	Various	CERDEC : APG, MD	-	-		0.200		0.230	Apr 2019	-		0.230	Continuing	Continuing	-
Subtotal			-	-		2.552		2.644		-		2.644	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Terminal Testing and Evaluation System Engineering	FFRDC	PEO C3T : TBD	-	-		0.200		0.200	Dec 2018	-		0.200	0.000	0.400	-
Test Support	MIPR	Matrix : APG, MD	-	-		0.175		0.163	Apr 2019	-		0.163	0.000	0.338	-
Testing, Certification	MIPR	TBD : APG, MD	-	-		0.225		0.200	Jul 2019	-		0.200	0.000	0.425	-
Subtotal			-	-		0.600		0.563		-		0.563	0.000	1.163	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		4.203		4.392		-		4.392	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018			
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)			Project (Number/Name) FE2 / MILSATCOM System Engineering				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)		Project (Number/Name) FE2 / MILSATCOM System Engineering	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Wideband AoA																												
Protected Tactical Service Field Demo Modem Testing																												
Narrowband (MUOS) AoA																												
Protected Tactical Service Field Demo																												
NCW Tool Development and Testing																												
Army PTW Modem Development																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Wideband AoA	4	2016	2	2018
Protected Tactical Service Field Demo Modem Testing	1	2018	4	2020
Narrowband (MUOS) AoA	3	2019	2	2021
Protected Tactical Service Field Demo	4	2015	2	2021
NCW Tool Development and Testing	1	2015	4	2023
Army PTW Modem Development	1	2022	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) FE4 / Enroute Mission Command			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FE4: Enroute Mission Command	-	0.000	1.000	3.493	-	3.493	0.000	0.000	0.000	0.000	0.000	4.493
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.												
Ku FOC was achieved in September 2017 as directed by MDA due to rephasing of FY 2017 OPA funding into FY 2018/2019 and program was restructure in Dec 2015. A Modification Work Order (MWO), adding Ka Fixed Installed Satellite Antenna (FISA) capability begins in FY18.												
FY 2019 funding supports the Ka FISA Post Deployment Assessment (PDA) requirement which will validate the EMC capability for warfighters to conduct mission command utilizing the Key Leader Enroute Node (KEN), Dependent Airborne Node (DAN) and Command and Staff Palletized Airborne Node (CASPAN) on the C17 aircraft.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: EMC Testing									-	1.000	3.493	
Description: Post Deployment Assessment (PDA)												
FY 2018 Plans: Wideband Global System (WGS) Terminal and Modem Certification.												
FY 2019 Plans: Ka FISA Post Deployment Assessment (PDA)												
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 Funding increase is for Post Deployment Assessment (PDA)												
Accomplishments/Planned Programs Subtotals									-	1.000	3.493	

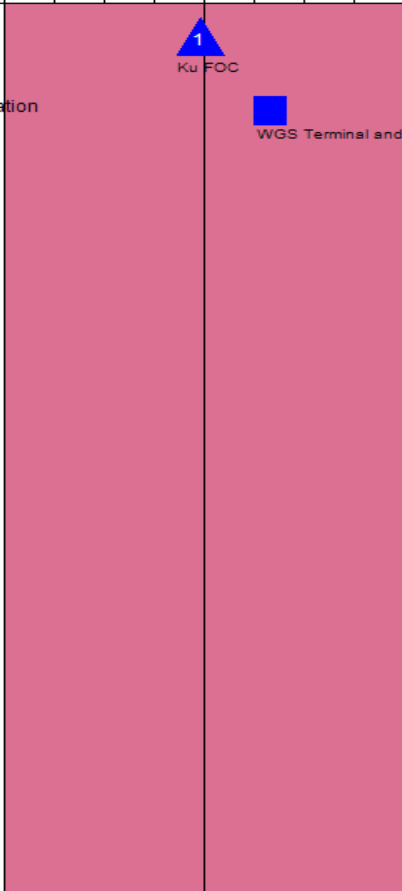
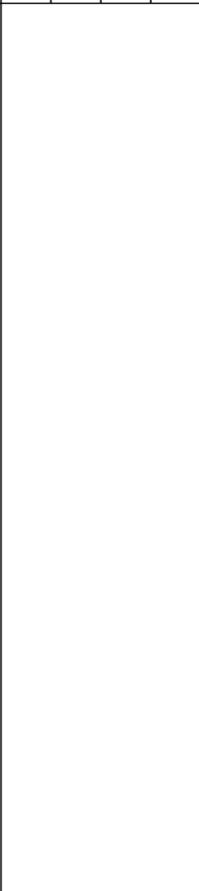
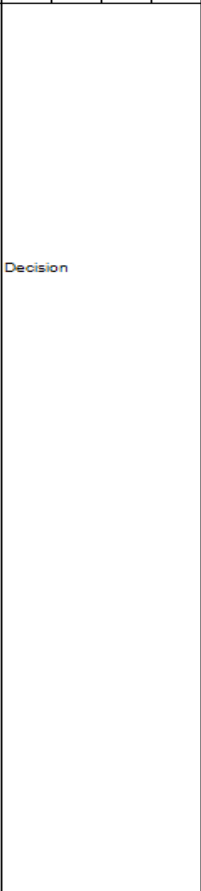
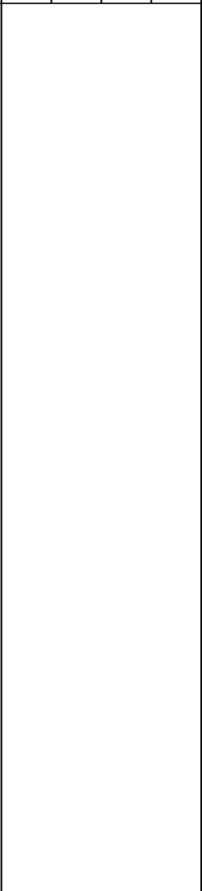
UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)			Project (Number/Name) FE4 / Enroute Mission Command				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B00015: Enroute Mission Command (EMC)	-	21.667	37.401	-	37.401	8.653	-	-	-	0.000	67.721
Remarks											
B08400: OPA funding line for EMC											
D. Acquisition Strategy											
The continued procurement of the EMC full operational capability follows DoDI 5000.02, 7 Jan 2015, Enclosure 13, Rapid Fielding of Capabilities. The Milestone Decision Authority (MDA) and project manager will tailor and streamline program strategy based on the required timelines to meet urgent need capability requirements. The Army Executive Agent signed an Acquisition Decision Memorandum (ADM) on 27 April 2015 delegating MDA to PEO C3T. The MDA signed an ADM on 11 May 2015 selecting the KuKa Antenna and Radome for the Full Operational Capability (FOC). An ADM was signed on 20 May 2015 granting approval to enter into production and deployment phase.											
Ku FOC was achieved in September 2017 as directed by MDA due to rephasing of FY 2017 OPA funding into FY 2018/2019 and program was restructure in Dec 2015. A Modification Work Order (MWO), adding Ka Fixed Installed Satellite Antenna (FISA) capability begins in FY18.											
FY 2019 funding (173142 FE4) supports the Ka FISA Post Deployment Assessment (PDA) requirement which will validate the EMC capability for warfighters to conduct mission command utilizing the Key Leader Enroute Node (KEN), Dependent Airborne Node (DAN) and Command and Staff Palletized Airborne Node (CASPAN) on the C17 aircraft.											
Initial Operational Capability met in May 2015 with modification of five C-17s with satellite antennae and installation kits, and roll-on/roll-off, battalion level, Key Leader Node (KEN). FOC is 35 C-17s, eight Key Leader Enroute Node (KEN), and 24 company level Dependent Airborne Nodes (DAN), and a Command and Staff Palletized Airborne Node (CASPAN).											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) FE4 / Enroute Mission Command					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ka FISA Post Deployment Assessment (PDA)	MIPR	Air Mobility Command (AMC) : Ft Bragg, NC	-	-		-		3.493	May 2019	-		3.493	0.000	3.493	-
Subtotal			-	-		-		3.493		-		3.493	0.000	3.493	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing	MIPR	Army Test and Evaluation Command (ATEC) : Ft. Bragg, NC	-	-		1.000		-		-		-	0.000	1.000	-
Subtotal			-	-		1.000		-		-		-	0.000	1.000	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		1.000		3.493		-		3.493	0.000	4.493	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018																					
Appropriation/Budget Activity 2040 / 7										R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)										Project (Number/Name) FE4 / Enroute Mission Command																	
Event Name										FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Ku Full Operational Capability (FOC)																																					
Wideband Global System (WGS) Terminal and Modem Certification																																					
Ka FISA Post Deployment Assessment (PDA)																																					
Disposition Decision																																					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE4 / Enroute Mission Command	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Ku Full Operational Capability (FOC)	4	2017	4	2017
Wideband Global System (WGS) Terminal and Modem Certification	2	2018	2	2018
Ka FISA Post Deployment Assessment (PDA)	3	2019	4	2019
Disposition Decision	4	2021	4	2021

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 1208053A I Joint Tactical Ground System							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	10.228	7.400	-	7.400	9.282	9.529	11.209	11.658	0.000	59.306
FE7: Joint Tact Grd Station-P3I(MIP)	-	0.000	10.228	7.400	-	7.400	9.282	9.529	11.209	11.658	0.000	59.306

Note

Funding moved from PE 0208053A to PE 1208053A as directed by OSD to track Space Programs.

A. Mission Description and Budget Item Justification

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (PACOM, CENTCOM, EUCOM), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity. JTAGS funding was moved to a new PE as directed by OSD to track Space Programs. Program Office core employee labor costs have been moved from RDTE to OMA as part of an OSD auditability directive.

The JTAGS Program Element (PE) supports development and test to meet JTAGS Operational Requirement(s) Document (ORD) thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 1 is complete. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. P3I Block II Phase 2 Spiral 1 delivers Increased sensor capabilities to include, but not be limited to, GEO satellite Starer and additional Highly Elliptical Orbit data. Spiral 2 delivers increased sensor, communications, training, and exercise capabilities to include, but not be limited to, integration of the Missile Defense System Exerciser (FY2018-19). Spiral 3 delivers software tuning and testing in accordance with the Operational Requirements Document (ORD) (FY2019-20). JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1208053A / <i>Joint Tactical Ground System</i>

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	10.228	11.594	-	11.594
Current President's Budget	0.000	10.228	7.400	-	7.400
Total Adjustments	0.000	0.000	-4.194	-	-4.194
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-4.194	-	-4.194

Change Summary Explanation

Program Office core employee labor costs \$1.536 million moved from RDTE to OMA as part of an OSD auditability directive.
The FY 2019 funding request was reduced by \$2.658 million to account for the availability of prior year execution balances

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1208053A / Joint Tactical Ground System				Project (Number/Name) FE7 / Joint Tact Grd Station-P3I(MIP)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FE7: Joint Tact Grd Station-P3I(MIP)	-	0.000	10.228	7.400	-	7.400	9.282	9.529	11.209	11.658	0.000	59.306
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding moved from PE 0208053A to PE 1208053A as directed by OSD to track Space Programs

A. Mission Description and Budget Item Justification

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (PACOM, CENTCOM, EUCOM), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity. JTAGS funding was moved to a new PE as directed by OSD to track Space Programs. Program Office core employee labor costs have been moved from RDTE to OMA as part of an OSD auditability directive.

The JTAGS Program Element (PE) supports development and test to meet JTAGS Operational Requirement(s) Document (ORD) thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 1 is complete. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. P3I Block II Phase 2 Spiral 1 delivers Increased sensor capabilities to include, but not be limited to, GEO satellite Starer and additional Highly Elliptical Orbit data. Spiral 2 delivers increased sensor, communications, training, and exercise capabilities to include, but not be limited to, integration of the Missile Defense System Exerciser (FY2018-19). Spiral 3 delivers software tuning and testing in accordance with the Operational Requirements Document (ORD) (FY2019-20). JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

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

	FY 2017	FY 2018	FY 2019
Title: JTAGS Test and Evaluation Support	-	1.616	1.083

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army									Date: February 2018		
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 1208053A / Joint Tactical Ground System				Project (Number/Name) FE7 / Joint Tact Grd Station-P3I(MIP)			
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019
Description: Test and evaluation support for the JTAGS P3I Block II program											
FY 2018 Plans: Begin testing support of the JTAGS P3I Block II Phase 2 Spiral 2 development program											
FY 2019 Plans: Complete testing support of the JTAGS P3I Block II Phase 2 Spiral 2 development program											
FY 2018 to FY 2019 Increase/Decrease Statement: Funding for testing efforts decreased due to test completions in FY 2018 and reduced testing requirements in FY 2019.											
Title: JTAGS Block II Phase 2									-	8.612	6.317
Description: JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. P3I Block II Phase 2 Spiral 1 delivers stereo SBIRS Geosynchronous scanner capability and SBIRS HEO Pseudo-Link 4 (P/ L 4) data. Spiral 2 delivers Cobra Brass and "Walkers" data (FY2018-19). Spiral 3 delivers software tuning and testing to the Operational Requirements Document (ORD) (FY2019-20). JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible Also includes Government management/oversight of the JTAGS Block II program.											
FY 2018 Plans: Begin development efforts of the JTAGS Block II Phase 2 Spiral 2 program and Government management/oversight.											
FY 2019 Plans: Continue development efforts of the JTAGS Block II Phase 2 Spiral 2 program. Also covers some Government management/ oversight.											
FY 2018 to FY 2019 Increase/Decrease Statement: Funding for Block II Phase 2 development efforts decreased to account for the availability of prior year execution balances.											
Accomplishments/Planned Programs Subtotals									-	10.228	7.400
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 635: Joint Tact Grd Station-P3I(MIP)	12.649	-	0.000	-	0.000	-	-	-	-	0.000	12.649

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 1208053A / Joint Tactical Ground System				Project (Number/Name) FE7 / Joint Tact Grd Station-P3I(MIP)			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• BZ8420: JOINT TACTICAL GROUND STATION MODS (JTAGS)	4.417	-	5.434	-	5.434	-	-	-	6.393	0.000	16.244
Remarks											
D. Acquisition Strategy											
Under this program element, critical improvements will be developed making maximum use of Non-Developmental Items (NDI)/Commercial Off-The-Shelf (COTS) components. After design and integration, the system will be subject to thorough developmental and validation/verification testing to verify performance, operational effectiveness and suitability. P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, improving warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2 is further divided into three spirals to provide critical capabilities to the fielded units faster. JTAGS Block II Phase 2 Spiral 1 delivers stereo SBIRS Geosynchronous scanner capability and SBIRS Highly Elliptical Orbit (HEO) Pseudo-Link 4 (P/L 4) data. Spiral 2 delivers Cobra Brass and "Walkers" data (FY2018-19). Spiral 3 delivers software tuning and testing in accordance with the Operational Requirements Document (ORD) (FY2019-20). JTAGS Block II Phase 2 is a Cost Plus Incentive Fee (CPIF) option on the JTAGS Block II (P3I) contract (W9113M-12-C-0055). The option was definitized 4Q17. JROC-Memos 197-12 and 113-13 direct fielding of JTAGS Block II capabilities as soon as possible.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 1208053A / Joint Tactical Ground System				Project (Number/Name) FE7 / Joint Tact Grd Station-P3I(MIP)					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Allot	Various : Redstone Arsenal AL	-	-		2.689		1.190	Oct 2018	-		1.190	0.000	3.879	-
Subtotal			-	-		2.689		1.190		-		1.190	0.000	3.879	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JTAGS P3I Block II Phase 2 Development	Option/ C/PIF	Northrop Grumman : Colorado Springs Co	-	-		4.590	Dec 2017	3.749	Dec 2018	-		3.749	Continuing	Continuing	-
Subtotal			-	-		4.590		3.749		-		3.749	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	TBD : Huntsville AL	-	-		1.333	Dec 2017	1.378	Nov 2018	-		1.378	Continuing	Continuing	-
Subtotal			-	-		1.333		1.378		-		1.378	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support (ATEC/AIC/ JITC)	Various	Various : Various	-	-		1.616	Dec 2017	1.083	Dec 2018	-		1.083	Continuing	Continuing	-
Subtotal			-	-		1.616		1.083		-		1.083	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018								
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1208053A / Joint Tactical Ground System					Project (Number/Name) FE7 / Joint Tact Grd Station-P3I(MIP)									
					Prior Years		FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals					-		-		10.228		7.400		-		7.400		Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 7		R-1 Program Element (Number/Name) PE 1208053A / <i>Joint Tactical Ground System</i>		Project (Number/Name) FE7 / <i>Joint Tact Grd Station-P3I(MIP)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JTAGS P3I Block II Phase 2																												
JTAGS P3I Block II Phase 2 Spiral 2 (Cobra Brass and Slow Walkers)																												
JTAGS P3I Block II Phase 2 Spiral 3 (tuning and testing to ORD)																												
Future Sensor Integration and Technology Refresh																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1208053A / <i>Joint Tactical Ground System</i>	Project (Number/Name) FE7 / <i>Joint Tact Grd Station-P3I(MIP)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JTAGS P3I Block II Phase 2	1	2018	3	2021
JTAGS P3I Block II Phase 2 Spiral 2 (Cobra Brass and Slow Walkers)	1	2018	1	2021
JTAGS P3I Block II Phase 2 Spiral 3 (tuning and testing to ORD)	4	2019	3	2020
Future Sensor Integration and Technology Refresh	3	2020	4	2022