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

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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*	

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)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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.

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

Appropriation/Budget Activity 2040 *I* 7	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*	**Project (Number/Name)** EH2 *I 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					

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

Exhibit R-2A, **RDT&E Project Justification:** PB 2019 Army		**Date:** February 2018
Appropriation/Budget Activity 2040 *I* 7	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*	**Project (Number/Name)** EH2 *I EMARSS ADV DEV (MIP)*

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).

E. Performance Metrics

 N/A

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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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

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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																												

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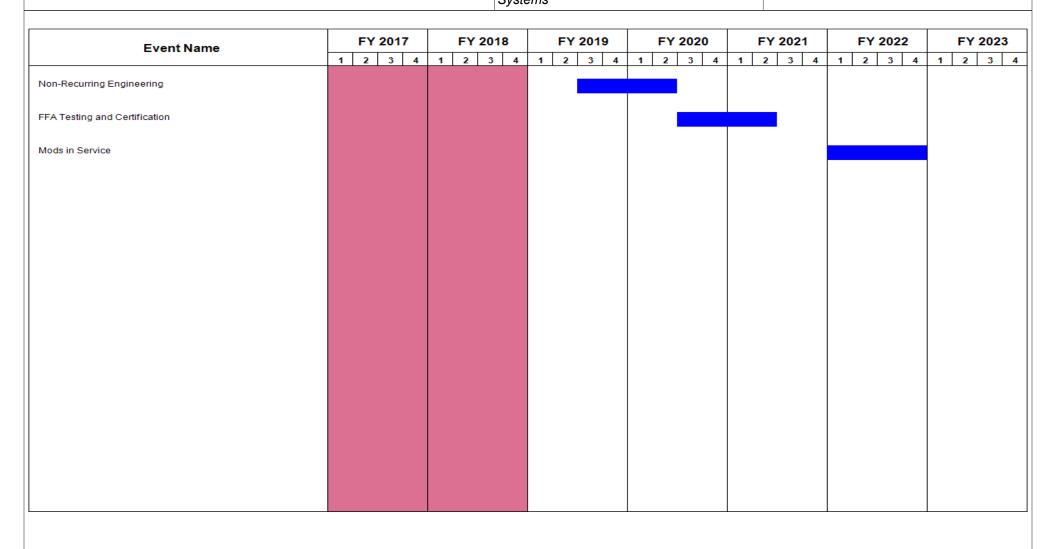| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH2 / *EMARSS ADV DEV (MIP)*

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

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

Appropriation/Budget Activity 2040 I 7				R-1 Program Element (Number/Name) PE 0305206A I Airborne Reconnaissance Systems						Project (Number/Name) EH3 I 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 Description: Research, Development, Test, and Evaluation (RDTE) funded LiDAR, SIGINT and Airborne Wide Area Persistent Surveillance System (AWAPSS) sensor enhancement.	-	1.893	5.577	-	5.577

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 I 7	**R-1 Program Element (Number/Name)** PE 0305206A I *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 I *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 ***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.	0.130	0.126	0.301	-	0.301
Title: Program Management Support ***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:***	-	0.092	0.653	-	0.653

Exhibit R-2A, **RDT&E Project Justification:** PB 2019 Army		**Date:** February 2018
Appropriation/Budget Activity 2040 *I* 7	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 *I 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

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

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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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

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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																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 *I* 7	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 *I 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

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

Appropriation/Budget Activity 2040 I 7	R-1 Program Element (Number/Name) PE 0305206A I *Airborne Reconnaissance Systems*	Project (Number/Name) EH5 I *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.
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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:*					

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)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
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					
Accomplishments/Planned Programs Subtotals	11.669	17.969	1.980	14.000	15.980

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
• 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.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 *I* 7	R-1 Program Element (Number/Name) PE 0305206A *I Airborne Reconnaissance Systems*	Project (Number/Name) EH5 *I ARL Payloads ADV DEV (MIP)*

E. Performance Metrics

 N/A

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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total 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.

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total 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

Exhibit R-4, **RDT&E Schedule Profile:** PB 2019 Army		**Date:** February 2018
Appropriation/Budget Activity 2040 I 7	**R-1 Program Element (Number/Name)** PE 0305206A I *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH5 I *ARL Payloads ADV DEV (MIP)*

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

Appropriation/Budget Activity 2040 I 7	R-1 Program Element (Number/Name) PE 0305206A I Airborne Reconnaissance Systems	Project (Number/Name) EH5 I ARL Payloads ADV DEV (MIP)

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

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
Appropriation/Budget Activity 2040 I 7				R-1 Program Element (Number/Name) PE 0305206A I Airborne Reconnaissance Systems				Project (Number/Name) EH7 I 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

Exhibit R-2A, **RDT&E Project Justification:** PB 2019 Army		**Date:** February 2018
Appropriation/Budget Activity 2040 *I* 7	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*	**Project (Number/Name)** EH7 *I Guardrail Common Sensor (GRCS) Payloads (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

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

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

| **Appropriation/Budget Activity**
2040 *I* 7 | **R-1 Program Element (Number/Name)**
PE 0305206A *I Airborne Reconnaissance Systems* | **Project (Number/Name)**
EH7 *I Guardrail Common Sensor (GRCS) Payloads (MIP)* |

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total 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

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

Appropriation/Budget Activity 2040 *I* 7	R-1 Program Element (Number/Name) PE 0305206A *I Airborne Reconnaissance Systems*	Project (Number/Name) EH7 *I Guardrail Common Sensor (GRCS) Payloads (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
ONS 22419 Development and Testing																												
ONS 22419 Fielding																												

Exhibit R-4A, **RDT&E Schedule Details:** PB 2019 Army		**Date:** February 2018
Appropriation/Budget Activity 2040 *I* 7	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*	**Project (Number/Name)** EH7 *I 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