Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army										**Date:** May 2017	
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 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	-	20.725	11.799	5.080	15.000	20.080	11.887	19.351	7.473	13.264	Continuing	Continuing
EH2: *EMARSS ADV DEV (MIP)*	-	1.740	0.000	0.000	-	0.000	3.205	3.218	0.000	2.011	Continuing	Continuing
EH3: *EMARSS Payloads ADV DEV (MIP)*	-	3.532	0.130	2.111	-	2.111	6.702	14.638	6.473	6.674	Continuing	Continuing
EH4: *ARL ADV DEV (MIP)*	-	5.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
EH5: *ARL Payloads ADV DEV (MIP)*	-	10.353	11.669	2.969	15.000	17.969	1.980	1.495	1.000	4.579	Continuing	Continuing

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 will be 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).

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

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	22.870	11.799	3.133	-	3.133
Current President's Budget	20.725	11.799	5.080	15.000	20.080
Total Adjustments	-2.145	0.000	1.947	15.000	16.947
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-2.145	0.000	1.947	15.000	16.947

Change Summary Explanation

Fiscal Year (FY) 2018 Base funds increase is a result of a funds realignment to support EMARSS Light Imaging Detection and Ranging (LiDAR) enhancement.
Fiscal Year (FY) 2018 OCO funds increase is a result of a funds realignment to support ARL New Signal Development.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017	
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EH2: *EMARSS ADV DEV (MIP)*	-	1.740	0.000	0.000	-	0.000	3.205	3.218	0.000	2.011	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 will be 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 supplemental type certificates (STC), testing, integration and Modifications in Service of Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems. Funding provides for 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 involved with the conversion of Liberty Project Aircraft (LPA) to the EMARSS Program of Record (POR), in regards to the Navy AAR-47 converting to Army AAR-57, Blue Force Tracker (BFT) to Blue Force Tracker-2 (BFT-2) and Common Missile Warning Systems (CMWS) upgrades.

B. Accomplishments/Planned Programs ($ in Millions)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Non-Recurring Engineering	1.740	-	-	-	-
Description: This funding line supports NRE, development of STC, testing and integration of Army AISR systems. Funding provides for 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 LPA in regards to the Navy AAR-47 changing to Army AAR-57, BFT to BFT-2. *FY 2016 Accomplishments:* Provided for all NRE and testing for conversion of initial Quick Reaction Capability (QRC) systems into the EMARSS POR. Upgraded communication and MEP will ensure continued worldwide deployability and over match dominance for AISR.					
Accomplishments/Planned Programs Subtotals	1.740	-	-	-	-

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

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• Aerial Common Sensors (ACS): *A02005*	96.500	-	-	-	-	-	-	-	-	0	96.500
• EMARSS SEMA Mods (MIP): *A02112*	13.669	55.897	15.279	36.000	51.279	21.139	4.416	3.011	2.282	Continuing	Continuing
• EMARSS Payloads (MIP): *AZ2054*	13.670	17.097	7.279	-	7.279	21.138	4.418	4.482	10.200	Continuing	Continuing
• EMARSS Payloads Adv Dev (MIP): *375206-EH3*	3.532	0.130	2.133	-	2.133	6.772	14.792	6.543	6.674	Continuing	Continuing
• ACS EMARSS (MIP): *655626 AC5*	0.002	-	-	-	-	-	-	-	-	0	0.002

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 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-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017	
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EH3: *EMARSS Payloads ADV DEV (MIP)*	-	3.532	0.130	2.111	-	2.111	6.702	14.638	6.473	6.674	Continuing	Continuing
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 will be 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) 2018 funding in the amount of $2.111 million provides LiDAR Enhancement and Mission Equipment Packages (MEP) and PED Sensor Engineering Support.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 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.	2.762	-	1.893	-	1.893

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2016 Accomplishments: Research, Development, Test, and Evaluation (RDTE) funded LiDAR, SIGINT and Airborne Wide Area Persistent Surveillance System (AWAPSS) sensor enhancement. **FY 2018 Base Plans:** RDTE funds LiDAR Enhancement Engineering Change Proposals (ECPs) and contractor system support.					
Title: EMARSS - Sensor Engineering Support **Description:** Matrix Government and Matrix Contractor engineering support for sensor enhancements. **FY 2016 Accomplishments:** Funds Matrix Government and Matrix Contractor engineering support for sensor enhancements. **FY 2017 Plans:** Funds Matrix Government and Matrix Contractor engineering support for sensor enhancements. **FY 2018 Base Plans:** Funds Matrix Contractor engineering support for sensor enhancements.	0.347	0.130	0.126	-	0.126
Title: Program Management Support **Description:** Program Management Office (PMO) support and travel, as well as Systems Engineering and Technical Assistance (SETA) support. **FY 2016 Accomplishments:** PMO support and travel, as well as SETA support. **FY 2018 Base Plans:** PMO government support and travel.	0.298	-	0.092	-	0.092
Title: EMARSS - Test and Evaluation **Description:** SIGINT Testing resulting from SIGINT Enhancements. **FY 2016 Accomplishments:** Sensor specific testing resulting from engineering design and development.	0.125	-	-	-	-
Accomplishments/Planned Programs Subtotals	3.532	0.130	2.111	-	2.111

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

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• Aerial Common Sensor: *A02005*	96.500	-	-	-	-	-	-	-	-	0	96.500
• EMARSS SEMA: *A02112*	13.669	55.897	15.279	36.000	51.279	21.139	4.416	3.011	2.282	Continuing	Continuing
• EMARSS MEP/PED Procurement: *AZ2054*	13.670	17.097	3.279	4.000	7.279	21.138	4.418	4.482	10.200	Continuing	Continuing
• EMARSS SEMA: *375206 EH2*	1.740	-	-	-	-	3.205	3.218	-	2.011	Continuing	Continuing
• ACS EMARSS (MIP): *655626 AC5*	0.002	-	-	-	-	-	-	-	-	0	0.002

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 design and test 24 systems as well as 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 will consist 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-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017	
Appropriation/Budget Activity 2040 *I* 7				**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*						**Project (Number/Name)** EH4 *I ARL ADV DEV (MIP)*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EH4: *ARL ADV DEV (MIP)*	-	5.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 (9). The Mission Equipment Package (MEP) objective is eight (8).

This funding line supports non-recurring engineering (NRE), development of supplemental type certificates (STC), testing, and integration. Funding provides for 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 involved with the conversion of Quick Reaction Capability (QRC) to the ARL-E Program of Record (POR).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Non-Recurring Engineering ***Description:*** Funding will provide for NRE and the technical drawing package associated with the Department of Army mandated installation of ASE on a DeHavilland dash 8 and the associated validation testing required for the installed ASE. This funding will also be utilized for the associated system level testing after the final sensor installation on the ARL-E DeHavilland dash 8 replacement platforms. ***FY 2016 Accomplishments:*** Provided funding for the Department of Army mandated ASE compliance and total system level testing for the ARL-E DeHavilland dash 8 replacement Program of Record aircraft. These aircraft will provide the Department of Army with a state of the art AISR platform ready for worldwide deployment in support of national interest.	5.100	-	-	-	-
Accomplishments/Planned Programs Subtotals	5.100	-	-	-	-

Exhibit R-2A, **RDT&E Project Justification:** FY 2018 Army		**Date:** May 2017
Appropriation/Budget Activity 2040 *I* 7	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*	**Project (Number/Name)** EH4 *I ARL ADV DEV (MIP)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• ARL SEMA (MIP): *A02109*	-	-	-	-	-	12.103	12.294	9.796	2.214	Continuing	Continuing
• ARL SEMA Mods (MIP): *A02110*	48.302	6.793	11.650	-	11.650	7.929	6.973	8.503	10.987	Continuing	Continuing
• ARL Payloads (MIP): *AZ2050*	68.540	74.380	59.938	-	59.938	19.320	23.265	4.470	80.000	Continuing	Continuing
• ARL Payloads ADV DEV (MIP): *375206-EH5*	12.498	11.669	3.000	15.000	18.000	2.000	1.511	1.011	4.579	Continuing	Continuing

Remarks

Note: 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 Long Range radar (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 the existing COMINT systems to effectively prosecute high priority and emerging modern signal emitters.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017	
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EH5: *ARL Payloads ADV DEV (MIP)*	-	10.353	11.669	2.969	15.000	17.969	1.980	1.495	1.000	4.579	Continuing	Continuing
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) 2018 Base funding of $2.969 million initiates the new signal enhancement development effort for Signal 4 to develop software, perform lab test, and perform flight test. This funding line supports continued software development to enhance COMINT collection capabilities to effectively prosecute high priority and emerging modern signal emitters. Signals for development can be fielded on ARL-E, Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS), and Guardrail.

Fiscal Year (FY) 2018 OCO funding of $15,000 million continues the new signal enhancement development effort for Signal 4, 4a, and 4b to develop software, perform lab test, and perform flight test. This funding line will also support the development and test of Signals 3 and 4 data and co-op capabilities.

B. Accomplishments/Planned Programs ($ in Millions)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Long Range Radar Development	6.053	-	-	-	-
Description: LRR Research and Development (R&D) Support					
FY 2016 Accomplishments: Initiate LRR prototype development.					
Title: Test Support to LRR	-	4.000	-	-	-
Description: Complete the LRR test					

PE 0305206A: *Airborne Reconnaissance Systems*
Army

R-1 Line #223

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2017 Plans: Complete the LRR test and New Signal Upgrades					
Title: New Signals (COMINT/Software Upgrades)	4.300	7.669	2.969	15.000	17.969
Description: To develop software for Signals 3, 3a, 3b, 4, 4a, and 4b. ***FY 2016 Accomplishments:*** Initiate Signal 3 software development. ***FY 2017 Plans:*** Start Development of COMINT Software Upgrades ***FY 2018 Base 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 2018 OCO Plans:*** Fiscal Year (FY) 2018 OCO funding of $15.0 million continues the new signal enhancement development effort for Signal 4, 4a, and 4b to develop software, perform lab testing and flight testing. This funding line will also support the development and test of Signals 3 and 4 data and co-op capabilities.					
Accomplishments/Planned Programs Subtotals	10.353	11.669	2.969	15.000	17.969

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• AZ2050 ARL MODS (MIP): *AZ2050*	68.540	74.380	59.938	-	59.938	7.613	8.215	-	-	0.000	218.686
• Theater Net-Centric Geol: *0605766A-DX9*	-	1.360	1.898	-	1.898	0.257	0.257	-	-	0	3.772
• A02109 ARL SEMA: *A02109*	-	-	-	-	-	12.103	12.294	9.796	-	0.000	34.193
• A02110 ARL SEMA MODS (MIP): *A02110*	48.302	6.793	11.650	-	11.650	19.636	22.023	-	-	Continuing	Continuing
• ARL ADV DEV (MIP): *0305206A-EH4*	5.100	-	-	-	-	-	-	-	-	Continuing	Continuing

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

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost

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.

E. Performance Metrics

N/A

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

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Long Range Radar Development	C/CPFF	Northrop Grumman : Linthicum Heights, MD	0.000	6.053	Mar 2016	-	-	-	-	-	-	-	0.000	6.053	0.000
New Signals (COMINT/ Software Upgrades)	C/CPFF	Boeing Argon : California	0.000	4.300	Dec 2015	7.669	Mar 2017	2.969	Mar 2018	12.000	Mar 2018	14.969	0.000	26.938	0.000
Subtotal			0.000	10.353		7.669		2.969		12.000		14.969	0.000	32.991	0.000

Remarks

New Signals Contract: W15P7T-10-D-D420/ KZ01. Fiscal Year (FY) 2018 Base funding of $2.969 million initiates the new signal enhancement development effort for Signal 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.

Fiscal Year (FY) 2018 OCO funding of $12,000 million continues the new signal enhancement development effort for Signal 4, 4a, and 4b to develop software to enhance the COMINT collection capabilities. This funding line will also support the development of Signals 3 and 4 data and co-op capabilities.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 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	0.000	-		4.000	Nov 2016	0.000		3.000	Mar 2018	3.000	0.000	7.000	0.000
Subtotal			0.000	-		4.000		0.000		3.000		3.000	0.000	7.000	0.000

Remarks

New Signals Contract: W15P7T-10-D-D420/ KZ01. Fiscal Year (FY) 2018 Base funding of $2.969 million initiates the lab and flight test for Signal 4 software to see if it meets the requirements in the ARL-E CPD.

Fiscal Year (FY) 2018 OCO remaining funding continues the lab and flight tests for Signal 4, 4a, and 4b software to see if it meets the requirements in the ARL-E CPD. This funding line will also support the testing of Signals 3 and 4 data and co-op capabilities.

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

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)*			

	Prior Years	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
Project Cost Totals	0.000	10.353	11.669	2.969	15.000	17.969	0.000	39.991	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
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)

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army				Date: May 2017	
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 MEP Contract Award	1	2016	1	2016
ARL-E MEP Integration	1	2016	4	2018
ARL-E System LUT	1	2019	1	2019
ARL-E New Signals Development and Test	2	2016	2	2020
ARL-E Signal 3 Development and Test	2	2016	3	2017
ARL-E Signal 4 Development and Test	3	2017	4	2018
ARL-E Signal 5 Development and Test	4	2018	2	2020