Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*							
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	-	18.194	83.248	30.153	-	30.153	76.576	11.780	28.502	14.706	Continuing	Continuing
C97: *ACFT Avionics*	-	1.821	0.798	20.915	-	20.915	16.807	7.149	5.768	5.407	Continuing	Continuing
EW7: *Degraded Visual Environment*	-	0.000	0.000	8.272	-	8.272	58.800	4.450	22.545	7.803	Continuing	Continuing
VU3: *Networking And Mission Planning*	-	16.373	82.450	0.966	-	0.966	0.969	0.181	0.189	1.496	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development of Aircraft Avionics systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Program Element support research, development, and test efforts in the Engineering and Manufacturing Development phases of these systems.

The Airborne Maritime Fixed-Aviation (AMF-A) is the transformational system that provides Army Aviation interoperability capability for Future Force and Joint Force operations. The AMF-A integration effort provides for the non-recurring engineering required to integrate and qualify the AMF-A certified radios with Link 16 and/or other advanced networking waveforms into the Apache AH-64E and Unmanned Aircraft Systems (UAS). Specifically, the PRC-152A radio will be incorporated into the Shadow UAS Communications Relay Payload mission equipment package.

The Doppler Global Positioning System Navigation Set (DGNS) Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as inertial sensor, MIL-STD-1553 interface card, and Instrument Flight Rules map display. It also prepares Engineering Change Proposals (ECP) to the existing DGNS ASN-128D Line Replaceable Units (LRU) as a result of those trade studies. The DGNS upgrade continues with execution of Non-Recurring Engineering for Computer Display Unit (CDU) and Signal Data Converter LRU ECP packages. The ASN-128D CDU upgrade replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability and optimizes pilot interface to augment existing Instrument Flight Rules capability promoting safer flight operations. The CDU upgrade will support Assured-Position Navigation and Timing (A-PNT) operations in conjunction with additional system LRU upgrades, includes anti-jam antenna capabilities, and supports Department of Defense (DoD) and Army's requirement to maintain A-PNT throughout operations. This will require assessment and follow-on upgrade to the DGNS navigation system. The CDU upgrade will perform an assessment of A-PNT assurance levels to understand system performance and associated PNT capability gaps, and will evaluate candidate solutions to cover any identified gaps.

The Enhanced Aviation GATM Localizer Performance with Vertical Guidance (LPV) Embedded GPS Inertial (EGI) Navigation System (EAGLE) A-PNT integration program assesses current capabilities in identified operational PNT environment levels, tests identified upgrades to existing EGI hardware in order to accommodate A-PNT in identified operational environments, and incorporates M-Code. It supports DoD and Army's requirement to maintain A-PNT throughout operations and requires assessment and follow-on upgrade to the EGI navigation system. The EAGLE upgrade will perform an assessment of A-PNT assurance levels to understand system performance, associated PNT capability gaps, integrate anti-jam antenna capabilities, and evaluate candidate solutions to cover any identified gaps.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*

The Degraded Visual Environment/Brownout Rotorcraft Enhancement System (DVE/BORES) program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for ground taxi, hover, takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of integrated rotorcraft pilotage sensor(s), software, software related firmware, and pilot to system interfaces and cueing.

The Aviation Data Exploitation Capability (ADEC) is an Army aviation automated information system program providing specific capabilities needed at the aviation unit level to implement and support improvements within aviation operations, safety, and training to increase operational effectiveness and situational awareness at all command echelons. ADEC provides a common and interoperable capability required to implement the DoD mandated Military Flight Operations Quality Assurance processes. ADEC will standardize flight scheduling/management, risk management, mission approval, and flight data analysis and visualization. ADEC provides interfaces to Centralized Aviation Flight Records System (CAFRS) to reduce data entry and the information technology footprint while enabling disconnected and split based operations.

The Improved Data Modem (IDM) provides digital connectivity among airborne and ground platforms and transmission of air-to-air target data between IDM equipped aircraft using existing radio and crypto equipment. IDM new software architecture will incorporate the ability to host IDM functionality on hardware that meets the minimum requirements to run the IDM Operating Flight Program. These efforts will include development and testing of that capability, as well as any documentation required to ensure Government Purpose rights to the new software.

The FY 2018 funding request was reduced by $7.397 million to account for the availability of prior year execution balances.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	18.639	83.248	90.386	-	90.386
Current President's Budget	18.194	83.248	30.153	-	30.153
Total Adjustments	-0.445	0.000	-60.233	-	-60.233
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.445	-			
• Adjustments to Budget Years	0.000	0.000	-60.233	-	-60.233

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 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201A *I Aircraft Avionics*

Change Summary Explanation

FY18 reflects multiple adjustments to funding as follows: HQDA realignments to other programs (-$67.420 million), A-PNT increase ($15.086 million), under-execution (-$7.397 million), inflation (-$0.502 million).

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*				Project (Number/Name) C97 / *ACFT Avionics*			
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**
C97: *ACFT Avionics*	-	1.821	0.798	20.915	-	20.915	16.807	7.149	5.768	5.407	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development of Aircraft Avionics systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Project support research, development, and test efforts in the Engineering and Manufacturing Development phases of these systems.

The Airborne Maritime Fixed-Aviation (AMF-A) is the transformational system that provides Army Aviation interoperability capability for Future Force and Joint Force operations. The AMF-A integration effort provides for the non-recurring engineering required to integrate and qualify the AMF-A certified radios with Link 16 and/or other advanced networking waveforms into the Apache AH-64E and Unmanned Aircraft Systems (UAS). Specifically, the PRC-152A radio will be incorporated into the Shadow UAS Communications Relay Payload mission equipment package.

The Doppler Global Positioning System Navigation Set (DGNS) Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as inertial sensor, MIL-STD-1553 interface card, and Instrument Flight Rules map display. It also prepares Engineering Change Proposals (ECP) to the existing DGNS ASN-128D Line Replaceable Units (LRU) as a result of those trade studies. The DGNS upgrade continues with execution of Non-Recurring Engineering for Computer Display Unit (CDU) and Signal Data Converter LRU ECP packages. The ASN-128D CDU upgrade replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability and optimizes pilot interface to augment existing Instrument Flight Rules capability promoting safer flight operations. The CDU upgrade will support Assured-Position Navigation and Timing (A-PNT) operations in conjunction with additional system LRU upgrades, includes anti-jam antenna capabilities, and supports Department of Defense (DoD) and Army's requirement to maintain A-PNT throughout operations. This will require assessment and follow-on upgrade to the DGNS navigation system. The CDU upgrade will perform an assessment of A-PNT assurance levels to understand system performance and associated PNT capability gaps, and will evaluate candidate solutions to cover any identified gaps.

The Enhanced Aviation GATM Localizer Performance with Vertical Guidance (LPV) Embedded Global Positioning System (GPS) Inertial (EGI) Navigation System (EAGLE) A-PNT integration program assesses current capabilities in identified operational PNT environment levels, tests identified upgrades to existing EGI hardware in order to accommodate A-PNT in identified operational environments, and incorporates M-Code. It supports DoD and Army's requirement to maintain A-PNT throughout operations and requires assessment and follow-on upgrade to the EGI navigation system. The EAGLE upgrade will perform an assessment of A-PNT assurance levels to understand system performance, associated PNT capability gaps, integrate anti-jam antenna capabilities, and evaluate candidate solutions to cover any identified gaps.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Airborne Maritime Fixed (AMF-A) integration and qualification for Apache AH-64E and PRC-152A Radio for UAS platforms. ***Description:*** The AMF-A integration effort provides for the non-recurring engineering required to integrate and qualify the PRC-152A compliant radios and/or other advanced networking waveforms into the Apache AH-64E and UAS platforms for both production cut-in and retrofit activities. ***FY 2016 Accomplishments:*** Continued development of AMF-A antennas and associated Co-Site Analysis tasks. ***FY 2017 Plans:*** Complete catalogue development of AMF-A antennas and associated Co-Site Analysis tasks.	0.676	0.050	-	-	-
Title: Doppler Global Positioning System Navigation Set (DGNS) Upgrade/Assured-Position Navigation and Timing (A-PNT) Assessment ***Description:*** The DGNS Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as inertial sensor, MIL-STD-1553 interface card, and Instrument Flight Rules (IFR) map display. It also prepares ECPs to the existing DGNS ASN-128D LRU as a result of those trade studies. The DGNS upgrade continues with execution of Non-Recurring Engineering for CDU and Signal Data Converter LRU ECP packages. The ASN-128D CDU Upgrade replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability and optimized pilot interface to augment existing IFR capability and promote safer flight operations. It also enables CDU support for A-PNT operations in conjunction with additional system LRU upgrades, including anti-jam antenna capabilities. ***FY 2016 Accomplishments:*** Completed Computer Display Unit upgrade hardware Critical Design Review (CDR) ***FY 2017 Plans:*** Complete assessments and feasibility studies performed on the CDU Upgrade equipment to identify hardware and software changes required to meet A-PNT requirements. ***FY 2018 Base Plans:*** Complete assessments and feasibility studies performed on the DGNS CDU to determine upgrades needed to meet A-PNT requirements and begin executing hardware and software upgrades identified in the completed	1.145	0.200	6.310	-	6.310

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
assessment. Continues software modifications to legacy GPS receiver cards to include Resiliency Software Assurance Modification (RSAM) and continues GPS Anti-jam Antenna development.					
Title: Enhanced Aviation GATM Localizer Performance with Vertical Guidance (LPV) Embedded GPS Inertial (EGI) Navigation System (EAGLE) ***Description:*** The EAGLE Navigation System A-PNT integration program assesses current capabilities in identified operational PNT environment levels and tests identified upgrades to existing EGI hardware to accommodate A-PNT in identified operational environments. ***FY 2017 Plans:*** Initiate assessments and feasibility studies on the current EGI and EAGLE equipment to identify hardware and software changes required to meet A-PNT requirements and to incorporate M-Code. ***FY 2018 Base Plans:*** Complete assessments and feasibility studies performed on the EGI and EAGLE equipment, determine upgrades needed to meet A-PNT requirements, begin executing hardware and software upgrades identified in the completed assessment, and begin to incorporate M-Code. Continues software modifications to legacy GPS receiver cards to include Resiliency Software Assurance Modification (RSAM) and continues GPS Anti-jam Antenna development.	-	0.548	14.605	-	14.605
Accomplishments/Planned Programs Subtotals	1.821	0.798	20.915	-	20.915

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
• AA0723: *COMMS, NAV Surveillance*	82.904	69.960	166.050	4.289	170.339	130.750	138.892	131.701	142.924	Continuing	Continuing
• AA0704: *GATM Rotary Wing*	33.890	45.302	37.403	-	37.403	29.808	42.915	29.380	13.484	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project is comprised of multiple systems supporting aircraft avionics. While the detailed acquisition strategy varies from program to program, the general strategy is for each individual program to complete the development and testing efforts in coordination with the aircraft platforms on integration issues, use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, and utilize the Aviation & Missile Research, Development, and Engineering Center for

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

software development. This requires the use of various contract methods and types to accomplish the aircraft avionics development efforts. All required acquisition program documentation is prepared.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) C97 / *ACFT Avionics*	

Management Services ($ 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
PM Services (EAGLE)	Various	PM AME/AMRDEC SED : Redstone Arsenal, AL	0.000	-		0.200	Oct 2016	0.583	Oct 2017	-		0.583	Continuing	Continuing	Continuing
PM Services (DGNS Upgrade/ DGNS A-PNT)	Various	PM AME/AMRDEC SED : Redstone Arsenal, AL	0.063	0.556	Oct 2016	-		0.577	Oct 2017	-		0.577	Continuing	Continuing	Continuing
PM Services (AMF-A)	Various	PM AME : Redstone Arsenal, AL	1.863	0.676	Oct 2015	-		-		-		-	0.000	2.539	0.000
		Subtotal	1.926	1.232		0.200		1.160		-		1.160	-	-	-

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
AMF-A Antenna Development and Co-Site Analysis	Various	AMRDEC, Prototype Integration Facility/ CERDEC Flight Activity : Redstone Arsenal, AL/ Lakehurst, NJ	4.134	-		0.050	Mar 2017	-		-		-	0.000	4.184	0.000
DGNS A-PNT Assessment and Upgrade	SS/CPFF	BAE Systems : Wayne, NJ	0.000	-		0.200	Feb 2017	5.527	Feb 2018	-		5.527	Continuing	Continuing	Continuing
EGI/EAGLE A-PNT Assessment and Upgrade/ M-Code Integration	SS/CPFF	Honeywell : Clearwater, FL	0.000	-		0.348	Feb 2017	14.028	Feb 2018	-		14.028	Continuing	Continuing	Continuing
DGNS/EGI Anti-Jam Antenna Development	SS/CPFF	Mayflower : Bedford, MA	0.000	0.589	Sep 2016	-		0.200	Jan 2018	-		0.200	Continuing	Continuing	Continuing
		Subtotal	4.134	0.589		0.598		19.755		-		19.755	-	-	-

	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	6.060	1.821		0.798		20.915		-		20.915	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) C97 / *ACFT Avionics*	

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

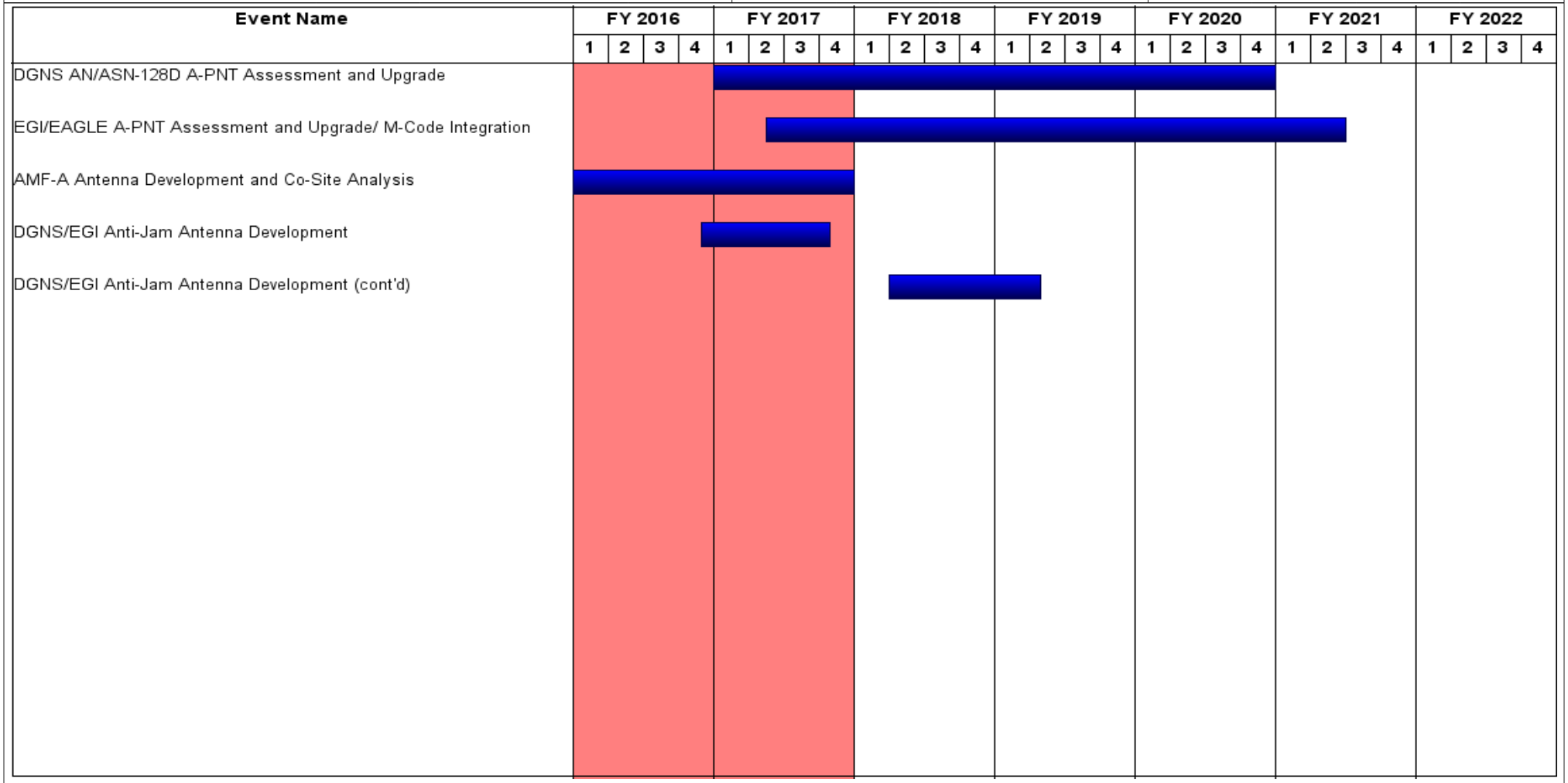

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DGNS AN/ASN-128D A-PNT Assessment and Upgrade	1	2017	4	2020
EGI/EAGLE A-PNT Assessment and Upgrade/ M-Code Integration	2	2017	2	2021
AMF-A Antenna Development and Co-Site Analysis	2	2011	4	2017
DGNS/EGI Anti-Jam Antenna Development	4	2016	4	2017
DGNS/EGI Anti-Jam Antenna Development (cont'd)	2	2018	2	2019

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) EW7 / *Degraded Visual Environment*	

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
EW7: *Degraded Visual Environment*	-	0.000	0.000	8.272	-	8.272	58.800	4.450	22.545	7.803	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for the Degraded Visual Environment/Brownout Rotorcraft Enhancement System (DVE/BORES) program was previously included in PE 0604201A, Aircraft Avionics/Project VU3, Networking and Mission Planning.

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development, system testing, integration and installation of the DVE/BORES on Army aircraft to support qualification and operational test events.

The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: DVE/BORES	-	-	8.272	-	8.272
Description: The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing.					
FY 2018 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** EW7 / *Degraded Visual Environment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop program documentation, perform system modeling and simulation activities, and continue the development of integration Modification Work Order procedures for hardware integration onto the UH/HH-60M and CH-47F.					
Accomplishments/Planned Programs Subtotals	-	-	8.272	-	8.272

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
• A00713: *Degraded Visual Environmnet*	-	-	-	-	-	-	56.082	59.171	181.774	Continuing	Continuing

Remarks

D. Acquisition Strategy

DVE's acquisition strategy is to use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, use the TAPO competitive contract for development, testing, and qualification of hardware and software for the DVE/BORES program, and utilize the Aviation & Missile Research, Development, and Engineering Center for software development. Integration will be done in coordination with the aircraft platforms, PM offices, and their OEMs. This requires the use of various contract methods and types to accomplish the DVE development efforts.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) VU3 / *Networking And Mission Planning*	

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
VU3: *Networking And Mission Planning*	-	16.373	82.450	0.966	-	0.966	0.969	0.181	0.189	1.496	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for the Degraded Visual Environment/Brownout Rotorcraft Enhancement System (DVE/BORES) program has been moved to PE 0604201A, Aircraft Avionics/ Project EW7, Degraded Visual Environment, beginning in FY18.

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development of Networking and Mission Planning systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Project support research, development, and test efforts in the Engineering and Manufacturing Development (EMD) phases of these systems.

The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/ synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing.

The Aviation Data Exploitation Capability (ADEC) is an Army aviation automated information system program providing specific capabilities needed at the aviation unit level to implement and support improvements within aviation operations, safety, and training to increase operational effectiveness and situational awareness at all command echelons. ADEC provides a common and interoperable capability required to implement the DoD mandated Military Flight Operations Quality Assurance processes. ADEC will standardize flight scheduling/management, risk management, mission approval, and flight data analysis and visualization. ADEC provides interfaces to Centralized Aviation Flight Records System (CAFRS) to reduce data entry and the information technology footprint while enabling disconnected and split based operations.

The Improved Data Modem (IDM) provides digital connectivity among airborne and ground platforms and transmission of air-to-air target data between IDM equipped aircraft using existing radio and crypto equipment. IDM new software architecture will incorporate the ability to host IDM functionality on hardware that meets the minimum requirements to run the IDM Operating Flight Program. These efforts will include development and testing of that capability, as well as any documentation required to ensure Government Purpose rights to the new software.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: DVE/BORES	14.636	80.541	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** VU3 / *Networking And Mission Planning*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing. ***FY 2016 Accomplishments:*** Identified an existing developmental system as the material solution and continued the development of an Airworthiness Qualification Package. Initiated airworthiness software development to meet airworthiness Design Assurance Levels, prepared program documentation, conducted modeling and simulation activities, and analyses to integrate the material solution onto the Utility Helicopter (UH/HH-60M) and Cargo Helicopter (CH-47F) aircraft. ***FY 2017 Plans:*** Continue the design and develop the technical system and sub-system specifications for the DVE/BORES. The DVE/BORES program will identify airworthiness requirements for hardware and software, complete identified aircraft trade studies with original equipment manufacturers, continue the development of program documentation, and initiate modeling and simulation as risk reduction activities. Program efforts include the issuance of a contract request for proposal with subsequent source selection evaluation of proposals.					
Title: Aviation Data Exploitation Capability (ADEC) ***Description:*** The ADEC is an Army aviation automated information system program providing specific capabilities needed at the aviation unit level to implement and support improvements within aviation operations, safety, and training to increase operational effectiveness and situational awareness at all command echelons. ADEC provides a common and interoperable capability required to implement the DoD mandated Military Flight Operations Quality Assurance processes. ADEC will standardize flight scheduling/management, risk management, mission approval, and flight data analysis and visualization. ADEC provides interfaces to CAFRS to reduce data entry and the information technology footprint while enabling disconnected and split based operations. ***FY 2016 Accomplishments:***	1.737	1.909	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** VU3 / *Networking And Mission Planning*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continued ADEC design, development, integration, and developmental testing of software version 2.0. ***FY 2017 Plans:*** Complete ADEC development, integration, and developmental and operational testing of software version 2.0.					
Title: Improved Data Modem ***FY 2018 Base Plans:*** Develop new software architecture that will incorporate the ability to host IDM functionality on any hardware that meets the minimum requirements to run the IDM Operating Flight Program. Efforts include the development and testing of that capability, as well as any documentation required to ensure Government Purpose rights to the new software.	-	-	0.966	-	0.966
Accomplishments/Planned Programs Subtotals	16.373	82.450	0.966	-	0.966

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
• AA0712: *Network and Mission Plan*	108.807	74.752	142.102	-	142.102	143.561	119.839	134.046	98.969	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project is comprised of multiple systems supporting aircraft avionics. While the detailed acquisition strategy varies from program to program, the general strategy is for each individual program to complete the development and testing efforts in coordination with the aircraft platforms on integration issues, use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, use the TAPO competitive contract for development, testing, and qualification of hardware and software for the DVE/BORES program, and utilize the Aviation & Missile Research, Development, and Engineering Center for software development. This requires the use of various contract methods and types to accomplish the aircraft avionics development efforts.

E. Performance Metrics

N/A