Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605217N *I (U)Common Avionics*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	42.711	58.163	51.486	-	51.486	46.841	36.037	35.882	36.630	Continuing	Continuing
0572: *JT Service/NV Std Avionics CP/SB*	0.000	42.711	53.512	51.486	-	51.486	46.841	36.037	35.882	36.630	Continuing	Continuing
3425: *Digital Warfare*	0.000	0.000	4.651	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.651

Note

Digital Warfare (DW) efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.

(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

A. Mission Description and Budget Item Justification

This project provides for the identification, study, design, development, demonstration, test, evaluation, and qualification of standard avionics capabilities for Navy use, and wherever practicable, use across all Services and Foreign Military Sales. Such air combat electronics developments include communications and airborne networking, navigation and sensors, flight avionics, safety systems, and flight mission information systems for both forward fit and retrofit aircraft. These efforts continue to maintain federated systems while encouraging transition of procurements to support a modular system for enhanced performance and affordability. Consideration is given up front to reduce acquisition costs through larger procurement quantities that satisfy multi-aircraft customer requirements and that reduce life cycle costs in the areas of reliability, maintainability, and training.

Digital Warfare(DW) supports systems of systems requirements modeling and allocation, development of data technical baselines, digital architectures and data models, and provides data science for enterprise and warfare pilots in support of a composable, modular Navy. DW efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605217N *I (U)Common Avionics*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	54.599	58.163	62.003	-	62.003
Current President's Budget	42.711	58.163	51.486	-	51.486
Total Adjustments	-11.888	0.000	-10.517	-	-10.517
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-5.650	0.000			
• SBIR/STTR Transfer	-1.130	0.000			
• Program Adjustments	-3.000	0.000	-9.716	-	-9.716
• Rate/Misc Adjustments	0.000	0.000	-0.801	-	-0.801
• Congressional General Reductions Adjustments	-0.021	-	-	-	-
• Congressional Directed Reductions Adjustments	-2.087	-	-	-	-

Change Summary Explanation

Technical: Not applicable.

Schedule:

Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM): CH-53K Integration/Certification of 8.33 kHz, Mode S, Reduced Vertical Separation Minimums (RVSM), Required Navigation Performance/Area Navigation (RNP/RNAV), and Automatic Dependent Surveillance-Broadcast Out (ADS-B (Out)) effort slid to 1Q/18 due to FY17 Congressional adjustment. Evaluate ADS-BO technologies/develop solutions to support platform integrations and develop CNS/ATM Common Component to support RNP/RNAV developmental platform requirements extended to 4Q/23.

Tactical Communications: Extended Transmission Security (TRANSEC) and Crypto Modernization (Suite B) to 4Q/23. Added NSA Certification 5 to 3Q/23 and added OFP Software Production Milestone to 1Q/23. SATCOM S/W Development with Mobile User Objective System extended to 2Q/19 due to the additional qualification testing that is required for MUOS.

Ground Proximity Warning System/Terrain Awareness System (GPWS/TAWS II): Edits made to schedule to incorporate changes in schedule dates to align to both V-22 and H-60 platforms' schedules; extended H-60 TAWS II Software Development completion date to 4Q/17; added H-60 TAWS II IOC 2Q/19; shifted V-22 TAWS II Requirements Development from 1Q/18 to 2Q/19; added TAWS II Software Re-Architecture 1Q/18 to incorporate MIL-STD 882E Level 1

requirements; Shifted V-22 TAWS II Software Development from 1Q/19 to 1Q/20; added V-22 Integration contract in 3Q/20; shifted V-22 TAWS II Developmental Test from 1Q/21 to 4Q/21.

Collaborative Warfare (CW): Naval Aviation Netted Sensors and Maritime Targeting Experimentation, Naval Aviation and Maritime Targeting Requirements and CONOPS, Standards and Architectures/Requirements Development all extended to 4Q/23.

Mid Air Collision Avoidance Capability: Budget realigned FY18-FY23 per the Office of the Chief of Naval Operations (OPNAV) direction. Added Analysis of Alternatives for 1Q/19, added DoD Architectural Framework Development 1Q/18, added Model Based Systems Engineering (MBSE) 1Q/18, extended Phase 2 Risk Reduction for Prototyping of Algorithms and Software extended to 4Q/23. MDD/ASR shifted from 2Q/18 to 4Q/22, RFP Release Decision shifted from 2Q/19 to 2Q/23 , added Draft CDD Submitted for 2Q/22, added CDD Approved 2Q/23, Integrated Logistics Assessment shifted from 3Q/19 to 3Q/23, Milestone B shifted from 4Q/19 to 4Q/23. The following were deleted: SRB/SRR 1Q/19, Phase 2 Spec Development 1Q18, SFR 2Q/19, PDR 3Q/19, Software Design and Development 1Q/20, CDR 3Q/20, Platform Integration and Test Support 3Q/21, MH-60R/S DT 3Q/22, and TRR 3Q/22.

(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

3425: Digital Warfare (DW) stood up separately within Program Element to set requirements, prioritize resources, and lead efforts on information interoperability and human/machine teaming starting 1QTR FY18 through the FYDP. DW efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.

Project Unit 0572 JT Service/NV Std Avionics CP/SB: The FY 2019 funding request was reduced by $2.500 million to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 0572 / *JT Service/NV Std Avionics CP/SB*	

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
0572: *JT Service/NV Std Avionics CP/SB*	0.000	42.711	53.512	51.486	-	51.486	46.841	36.037	35.882	36.630	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

A. Mission Description and Budget Item Justification

Joint Services/Navy Standard Avionics Components and Subsystems: This project provides for the identification, study, design, development, demonstration, test, evaluation, and qualification of standard avionics capabilities for Navy use, and wherever practicable, use across all Services and Foreign Military Sales. Standard avionics capabilities under
development include the Joint Service Review Committee for Avionics Standardization (JSRC-AS), Communication Navigation Surveillance/Air Traffic Management (CNS/ATM), Tactical Communications (TACCOM), Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II), Collaborative Warfare (CW), Avionics Component Improvement Program (AvCIP), Mid Air Collision Avoidance Capability (MCAC), and Avionics Architectures Team (AAT). Participation in Human Factors Quality Management Board ensures Navy safety upgrades and mandatory safety improvements for naval aircraft.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Service Review Committee for Avionics Standardization (JSRC-AS)	0.462	0.995	0.995	0.000	0.995
Articles:	-	-	-	-	-
Description: The JSRC-AS program supports Congressional and Assistant Secretary of the Navy for Research, Development and Acquisition direction to control the growing proliferation of unique avionics and improve coordination among the services through the identification, development, and promotion of investigative and development efforts across the services and U.S. Coast Guard. The JSRC-AS supports the development, analysis and review of new avionics requirements with potential for joint service application. The JSRC-AS consists of an O-6 Level principal from each service and U.S. Coast Guard, as well as the appropriate staff, to support joint service working group efforts. The JSRC-AS reports to the O-7 level tri-service Aviation Common Systems Board who reports to the O-9 level Joint Aeronautical Commanders Group.					
FY 2018 Plans: Provide leadership in support of the Navy's interest to the Joint Services Review Committee for Avionics Standardization (JSRC-AS) tri-service committee promoting commonality and joint programs with focus on					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
interoperability, communications, navigation, Joint Services avionics obsolescence management, and update of the Core Avionics Master Plan. ***FY 2019 Base Plans:*** Provide leadership in support of the Navy's interest to the JSRC-AS tri-service committee promoting commonality and joint programs with focus on interoperability, communications, navigation, Joint Services avionics obsolescence management, and update of the Core Avionics Master Plan. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Title: Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) ***Articles:*** ***Description:*** This program will conduct and support CNS/ATM research, studies, development, integration, demonstration, test and evaluation efforts for Naval aviation platforms in development. Platform integration of Mode Select (S), 8.33 kHz, Reduced Vertical Separation Minimum (RVSM), Required Navigation Performance Area Navigation (RNP/RNAV) to include M Code, and Automatic Dependent Surveillance-Broadcast Out (ADS-B (Out)) functional integration and certification efforts into Naval aircraft. Assist with insertion of communication, navigation, surveillance, and supporting technologies and conduct capability certification on developmental platforms such as F-35, CH-53K, and Unmanned Air Systems. Capabilities include Mode S, 8.33 kHz, RVSM, RNP/RNAV, ADS-BO, and other civil and military capabilities. ***FY 2018 Plans:*** Assist with insertion and integration of CNS/ATM technologies and certification of developmental platforms. Evaluate technologies and develop solutions to support platform integrations. Develop CNS/ATM Common Components to support RNP RNAV developmental platform requirements. Continue integration/certification of Mode Select, 8.33 kHz, RVSM, RNP/RNAV, and ADS-BO into CH-53K. Research and develop GPS enhancements to support CNS/ATM RNP/RNAV improvements. Research and develop Automatic Dependent Surveillance-Broadcast Out (ADS-BO) System Design Assurance requirements as well as compatibility with the emerging Global Positioning System (GPS) M Code and its impact on Required Navigation Performance Area Navigation (RNP/ RNAV). ***FY 2019 Base Plans:***	0.484 -	2.952 -	1.368 -	0.000 -	1.368 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Assist with insertion and integration of Communication Navigation Surveillance/Air Traffic Management (CNS/ ATM) technologies and certification of developmental platforms. Evaluate technologies and develop solutions to support platform integrations. Develop CNS/ATM Common Components to support RNP/RNAV developmental platform requirements. Continue integration/certification of Mode Select, 8.33 kHz, Reduced Vertical Separation Minimum (RVSM), RNP/RNAV, and ADS-B (Out) into CH-53K. Research and develop GPS enhancements to support CNS/ATM RNP RNAV improvements. Research and develop ADS-B (Out) System Design Assurance requirements as well as compatibility with the emerging GPS M Code and its impact on RNP RNAV. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the contract that awarded in FY18 for the CH-53K primary hardware development contract for ADS-B (Out).					
Title: Tactical Communications (TACCOM) ***Articles:*** ***Description:*** This program will conduct research, studies, development, integration, demonstration, test and evaluation efforts to ensure tactical communication systems and capabilities are developed and available to support naval aviation requirements. Perform tactical communication platform integration studies and activities to determine technical and cost effective solutions across naval aviation. Develop tactical communications (voice/data) requirements, concepts and systems which have application across naval aviation. Support all necessary tasks to ensure evolution of legacy communications systems incorporating programmable Communication Security/Information Assurance, Transmission Security (TRANSEC) mandated National Security Agency (NSA) Crypto Modernization initiatives, Tactical Secure Voice (TSV) Suite B, Combat Net Radio (CNR) Variable Message Format (VMF), Beyond Line-of-Sight, Satellite Communication (SATCOM) Modernization including Mobile User Objective System (MUOS), High Frequency, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN) civil interoperability, and data link into the ARC-210 system. Support for networking requirements development and prototyping, Integrated Waveform (IW), Intelligence Broadcast System over modern Code Division Multiple Access based satellite channels, Tactical Networks, Data Links, and Link 16. ***FY 2018 Plans:*** Continue Satellite Communication (SATCOM) Software (S/W) development with Mobile User Objective System (MUOS) capabilities. Continue Operational Flight Plan (OFP) S/W integration. Continue crypto engine	18.632 -	19.777 -	19.479 -	0.000 -	19.479 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
integration for NSA and Information Assurance (IA) certification. Continue Combat Net radio interoperability with SATURN waveform. Complete red-side provisioning options for the RT-2036. Continue Transmission Security (TRANSEC) SATCOM Crypto Modernization in accordance with NSA directives and Tactical Secure Voice (TSV) Suite B for interoperability. ***FY 2019 Base Plans:*** Continue SATCOM S/W development with MUOS capabilities. Complete crypto engine integration for NSA and Information Assurance (IA) certification. Continue Combat Net radio interoperability with SATURN waveform. Continue TRANSEC SATCOM Crypto Modernization in accordance with NSA directives and TSV Suite B for interoperability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the finalization for the Operational Flight Plan Software Integration efforts in FY18.					
Title: Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II) ***Articles:*** ***Description:*** This program will conduct research, studies, development, integration, demonstration, test and evaluation efforts to meet naval aviation GPWS/TAWS II requirements. These requirements span all operational modes and operational environments, to include Degraded Visual Environment. Perform GPWS/TAWS II platform integration studies and activities to determine technical and cost effective solutions across naval aviation. Develop GPWS/TAWS II solutions tailored to platform performance and range of military operations. Develop simulation models for use at Manned Flight Simulator (MFS) or other simulation environments as required for platform tailoring, including procurement of test article hardware. Evaluate aircraft simulation models for suitability in GPWS/TAWS II development effort. Develop GPWS/TAWS II algorithms utilizing simulation environments as real-time hardware and pilot in the loop tool. Develop and evaluate algorithm interfaces necessary for integration of the algorithm within platform host computer. Develop software code to execute GPWS/TAWS II algorithm in host platforms. ***FY 2018 Plans:***	2.131 -	8.668 -	7.843 -	0.000 -	7.843 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete Phase I & II DT on MH-60R/S. Conduct Milestone C and Fleet Release of Terrain Awareness Warning System (TAWS II) on MH-60R/S. Conduct TAWS II Software Re-Architecture. ***FY 2019 Base Plans:*** Fleet Release of TAWS II on MH-60R/S IOC. Complete TAWS II Software Re-Architecture. Initiate V-22 TAWS II Requirements Development. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the finalization of the initial H-60 TAWS II Developmental Testing.					
Title: Collaborative Warfare (CW)	0.204	0.240	0.244	0.000	0.244
Articles:	-	-	-	-	-
Description: The CW component is a Research & Development effort to identify targeting gaps and determine the warfighting benefit of integrating networked capabilities into naval aircraft to fill those gaps. The CW component also addresses maritime targeting gaps for naval aircraft to operate more effectively with other military services. The following efforts are included: 1) Comprehensive naval aviation and maritime targeting requirements that map fleet gaps and requirements to cross-platform naval aviation solutions. 2) Netted sensors and maritime targeting capability proof of concept prototype demonstrations leveraging the Navy's Fleet Experimentation campaign. 3) Coordinating Naval Aviation requirements with the Office of Naval Research Future Naval Capability Enabling Capability for the Common Radio Enhancement (CoRE). 4) Coordination of Naval Aviation strategy with Intelligence Community (IC) efforts in the areas of High Side Data Fusion, Combat Systems Integration, and National to Tactical Integration. ***FY 2018 Plans:*** Continue executing to Naval Aviation and Maritime Targeting Experimentation and Requirements. Develop requirements, standards, and architectures in support of new and updated netted-sensors' Concept of Operations and capabilities. ***FY 2019 Base Plans:*** Continue executing to Naval Aviation and Maritime Targeting Experimentation and Requirements. Develop requirements, standards, and architectures in support of new and updated netted-sensors' Concept of Operations and capabilities. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase between FY18 and FY19 is due to the inflation pricing factors for Systems Engineering efforts.					
Title: Avionics Component Improvement Program (AvCIP)	4.403	4.572	4.872	0.000	4.872
Articles:	-	-	-	-	-
Description: Investigate high value Return On Investment component improvement candidate projects in support of NAVAIR Commander's focus areas of Readiness and Speed to the Fleet. Stop operating and sustainment cost growth by reducing costs for fielded systems and implementing life-cycle cost reduction initiatives as part of new systems development. This program positions resources for next year application to fast-track corrections to existing problematic systems. Projects address critical readiness issues (significant back-orders or impending sustainability failures that threaten to down aircraft), functional performance obsolescence issues (system failing to support mission requirement), and top sustainment cost drivers (out of proportion annual maintenance or repair costs). Resources enable design and development of technology insertion and product redesign or replacement to meet readiness goals, meet mission objectives, or reduce overall sustainment costs. Candidate projects are submitted via a rigorous template, reviewed by a panel of Avionics professionals, and selected based upon urgency, warfighting contributions, breadth of application and scope of Return On Investment. Resources cover non-recurring engineering elements (including design and development, prototypes, platform integration, test and evaluation), program management and associated logistics elements (including technical data preparation, support equipment, provisioning, and training). Analysis shows under this program between 2006 and 2017 has enabled sustainment and procurement cost avoidances in excess of $275M in cost for the $62M of funding invested through 2017. ***FY 2018 Plans:*** Address current fleet problem avionics systems (top readiness degraders, cost drivers, obsolescence-driven sustainability, capability loss, fleet head-hurters). ***FY 2019 Base Plans:*** Address current fleet problem avionics systems (top readiness degraders, cost drivers, obsolescence-driven sustainability, capability loss, fleet head-hurters). ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase between FY18 and FY19 is due to increase in Primary Hardware Development for AVCIP projects.					
Title: Mid Air Collision Avoidance Capability (MCAC)	2.856	2.108	3.500	0.000	3.500
Articles:	-	-	-	-	-
Description: This program will conduct research, studies, and development, integration, demonstration, test and evaluation efforts to meet Naval Aviation Mid Air Collision Avoidance Capability (MCAC) requirements. These requirements span all operational modes and operational environments, to include Degraded Visual Environment. Perform (MCAC) platform integration studies and activities to determine technical and cost effective solutions across Naval Aviation. Develop MCAC solutions tailored to platform performance and range of military operations. Develop simulation models for use at Manned Flight Simulator (MFS) or other simulation environments as required for platform tailoring, including procurement of test article hardware. Evaluate aircraft simulation models for suitability in MCAC development effort. Develop MCAC solutions utilizing simulation environments as real-time hardware and pilot in the loop tools. Develop and evaluate interfaces necessary for integration of MCAC within platform host environment.					
FY 2018 Plans: Complete documentation/efforts to support the program re-phase and commencement of an Analysis of Alternatives (AoA) in FY19. Initiate MBSE methodology implementation for capturing systems requirements and begin Phase II Risk Reduction Prototyping to evaluate MCAC algorithm and software. Initiate the DoDAF development.					
FY 2019 Base Plans: Commencement of AoA. Continue MBSE methodology implementation for capturing systems requirements based on initial AoA guidance/findings. Continue Phase II Risk Reduction Prototyping to evaluate MCAC algorithm and software. Continue collaboration with other engineering competencies and platform PMAs to capitalize on existing development of related capabilities for potential adoption.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase between FY18 and FY19 is due to the initiation and execution of the Analysis of Alternatives in FY19 to capitalize on existing development of related capabilities for potential adoption.					
Title: Avionics Architectures Team (AAT)	13.539	14.200	13.185	0.000	13.185
Articles:	-	-	-	-	-
Description: The Avionics Architectures Team (AAT) provides hardware and software (HW/SW) standards and product line development and management for common HW/SW operating environments to establish testable open architecture requirements in accordance with National Defense Authorization Act (NDAA) Section 801 Open Architecture language, DoD Directive 5000.1, N6/N7 Naval Open Architecture Requirements Letter 9010, Ser. N6N7/5U916276, and SECNAVINST 5000.2E. The Future Airborne Capability Environment (FACE) Technical Standard is developed through Navy, Army, Air Force, Industry and Academia collaboration in accordance with Public Law 104-113. The Hardware Open Systems Technologies (HOST) standard is being developed through government and academia collaboration and will be provided to industry for prototyping efforts. The Functional Architecture for Strategic Reuse (FASTR) initiative will define a standard process for mission level capability decomposition to support product line development and management. The AAT provides Subject Matter Experts to define and architect a set of Open Architecture Standards and product lines, design principles and guidance, development and integration tools, acquisition strategy, contracting guidance and cost estimates. The results will enable Department of Defense (DoD) weapons systems to systematically procure open, modular and reconfigurable software architectures, reuse HW/SW and deliver scalable, portable and interoperable war fighting capabilities at a faster rate, reducing redundant development costs and increasing competition. Infrastructure components and frameworks built to these standards will support Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) capability upgrades on various platforms by enabling integration of common, non-proprietary applications. The AAT initiatives enable the government's role as Lead Systems Integrator, per the Weapons System Acquisition Reform Act (WSARA) 2009, and cost effectively manage data rights for reuse across the DoD. ***FY 2018 Plans:*** Provide development support, mission based engineering, systems engineering and program management for design and acquisition strategy implementation guidance. Generate revisions for future editions of the FACE Technical Standard based on issues identified by government and industry consortium and develop corresponding conformance tools. Research new hardware technologies and develop Tier 2 Hardware Open Systems Technologies (HOST) specifications to support widely adopted commercial technologies and platform requirements. Provide input to platforms developing Tier 3 HOST specifications. Assist platforms with strategies for modular functional architectures and implementation of FACE and HOST standards. Participate					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
in international collaboration efforts to define comprehensive open architecture strategy. Generate alignment strategies for a comprehensive open architecture approach between Navy, Army and Air Force. Support the implementation of Naval Aviation's data model strategy. Provide subject Matter Expert support for platform integration and competitive source selection. Academia prototyping and demonstration efforts for FACE, FASTR and HOST initiatives. ***FY 2019 Base Plans:*** Provide development support, mission based engineering, systems engineering and program management for design and acquisition strategy implementation guidance. Generate revisions for future editions of the FACE Technical Standard based on issues identified by government and industry consortium and develop corresponding conformance tools. Research new hardware technologies and develop Tier 2 HOST specifications to support widely adopted commercial technologies and platform requirements. Provide input to platforms developing Tier 3 HOST specifications. Assist platforms with strategies for modular functional architectures and implementation of FACE and HOST standards. Participate in international collaboration efforts to define comprehensive open architecture strategy. Generate alignment strategies for a comprehensive open architecture approach between Navy, Army and Air Force. Support the implementation of Naval Aviation's data model strategy. Provide subject Matter Expert support for platform integration and competitive source selection. Academia prototyping and demonstration efforts for FACE, FASTR and HOST initiatives. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the shift from Systems Engineering to Primary Hardware Development for prototyping efforts.					
Accomplishments/Planned Programs Subtotals	42.711	53.512	51.486	0.000	51.486

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
• APN/0577: *Common Avionics Changes*	144.838	123.507	117.551	-	117.551	83.544	91.236	105.177	129.379	562.115	3,817.994

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

D. Acquisition Strategy

Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) program is a system of systems. The program will encompass the integration of various systems which will be procured utilizing existing contracts for integration on forward-fit and retrofit platforms to provide CNS/ATM functionality. Tactical Communications (TACCOM) is utilizing a firm fixed price contract to Rockwell Collins for research and development of the ARC-210 Gen 5/6 and other Navy contract vehicles for integration studies. The Navy will integrate systems and components to satisfy platform requirements to achieve tactical communication capability as determined by analyses. Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II) Software Modules will be developed by a Government Software Product Team in collaboration with Industry where required. Avionics Component Improvement Program (AvCIP) will annually review, compete and select candidate component improvement proposals according to urgency, criticality of warfighting contributions, technical risk, breadth of application, and scope of Return On Investment (ROI). Projects are selected by a panel of Avionics management experts, including representatives from OPNAV N98, NAVAIR, NAVICP, and the Fleet. Projects are executed by managers in platform or commodity offices that own the component. The AvCIP program management team manages project selection, allocates funds, monitors multiple project executions against proposed spend plans, and tracks solution performance and achievement of projected ROIs over time using Fleet maintenance and component performance databases. Cost avoidances are coordinated with OPNAV N98 to balance Flying Hour Program costs. Component improvement solutions include modular hardware, software and material upgrades. Resources cover engineering elements (including design and development, prototypes, platform integration, test and evaluation), program management and associated logistics elements (including technical data preparation, support equipment, provisioning, and training). Mid Air Collision Avoidance Capability (MCAC) is the capability umbrella which encompasses all systems designed and developed which aid in air-to-air collision avoidance. Systems include but are not limited to Traffic Collision Avoidance Systems and Mid Air Collision Avoidance Systems. MCAC Software Modules will be developed by a Government Software Product Team in collaboration with Industry where required. Avionics Architectures Team (AAT) will provide acquisition strategy guidance and support to platforms implementing open systems architectures to address open architecture requirements.

E. Performance Metrics

Joint Services Review Committee for Avionics (JSRC-AS) - Provide leadership in support of the Navy's interest to the JSRC tri-service committee promoting commonality and joint programs with focus on interoperability, communications, Communication Navigation Surveillance/Air Traffic Management (CNS/ATM), Joint Services avionics obsolescence
management and the update of the Core Avionics Master Plan. Support and participate in Naval Aviation Requirements Group panels, Operational Advisory Group, and Human Factors Quality Management Board.
Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) - Successfully complete platform integration, test, and certifications.
Tactical Communications (TACCOM) - Achieve Joint Interoperability Test Command and National Security Agency certifications on system developmental efforts to meet operational requirements.
Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II) - Develop algorithm and software to meet platform specific requirements, successfully complete flight test, and deliver product on schedule. Successfully complete Milestone C, and Fleet Release.
Collaborative Warfare (CW) - Identify collaborative warfighting capability gaps and ensure the development of the most intelligent, cost effective, and timely solutions to fill those gaps.
Avionics Component Improvement Program (AvCIP) - Successful project competition and selection, execution of allocated funds, fielding of solutions, and documentation of component performance enhancement and benefits.
Mid Air Collision Avoidance Capability (MCAC) - Achieve program acquisition milestones on cost and schedule meeting platform requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

Avionics Architectures Team (AAT) - Provide leadership in support of the Navy's interest to the Future Airborne Capability Environment (FACE) Consortium. Participate in technical and business working groups within the FACE Consortium to foster solutions that promote interoperable and integrated warfighting capability for all services. Successfully functionally decompose,prototype and demonstrate FACE conformant applications and FACE compatible operating environments. Develop technical specifications for Hardware Open System Technologies (HOST). Prototype and demonstrate HOST avionics components.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

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
Primary Hardware Dev CNS/ATM	SS/CPFF	Sikorsky : Stratford, CT	0.000	0.000		1.750	Dec 2017	0.000		-		0.000	0.000	1.750	1.750
Primary Hardware Dev	Various	Various : Various	0.000	2.999	Mar 2017	3.841	Jan 2018	5.504	Jan 2019	-		5.504	Continuing	Continuing	Continuing
Primary Hardware Dev GPWS/TAWS II	WR	NAWCAD : Patuxent River, MD	0.000	0.000	Jan 2017	1.359	Oct 2017	1.630	Dec 2018	-		1.630	Continuing	Continuing	Continuing
Aircraft Integration TACCOM	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	6.080	Nov 2016	8.453	May 2018	11.724	Jan 2019	-		11.724	0.000	26.257	26.257
Aircraft Integration GPWS/ TAWS II	SS/CPIF	Lockheed Martin : Owego, NY	0.000	0.000		2.936	Dec 2017	1.764	Dec 2018	-		1.764	0.000	4.700	4.700
Aircraft IntegrationTACCOM	C/CPFF	Rockwell Collins : Cedar Rapids, IA	0.000	4.291	Aug 2017	3.000	Nov 2017	0.000		-		0.000	0.000	7.291	7.291
Aircraft Integration	Various	Various : Various	0.000	0.159	Jul 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering AAT	MIPR	DTIC : Fort Belvior, VA	0.000	7.027	Jan 2017	7.144	Jan 2018	4.895	Jan 2019	-		4.895	Continuing	Continuing	Continuing
Systems Engineering TACCOM	WR	NAWCAD : Patuxent River, MD	0.000	2.083	Dec 2016	1.091	Dec 2017	1.022	Nov 2018	-		1.022	Continuing	Continuing	Continuing
Systems Engineering	Various	Various : Various	0.000	3.339	Mar 2017	2.802	Jan 2018	2.730	Dec 2018	-		2.730	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.100	Dec 2016	2.372	Dec 2017	2.215	Nov 2018	-		2.215	Continuing	Continuing	Continuing
Systems Engineering MCAC	WR	NAWCAD : Patuxent River, MD	0.000	1.396	Dec 2016	0.000		1.191	Dec 2018	-		1.191	Continuing	Continuing	Continuing
		Subtotal	0.000	27.474		34.748		32.675		-		32.675	Continuing	Continuing	N/A

Support ($ 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
Software Development TACCOM	SS/FFP	Rockwell : Cedar Rapids, IA	0.000	0.000		3.009	Mar 2018	3.021	Mar 2019	-		3.021	0.000	6.030	6.030
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.000	0.578	Mar 2017	1.188	Nov 2017	1.041	Nov 2018	-		1.041	Continuing	Continuing	Continuing
Software Development	Various	Various : Various	0.000	0.687	Nov 2016	0.000		0.000		-		0.000	0.000	0.687	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 0572 / *JT Service/NV Std Avionics CP/SB*

Support ($ 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
		Subtotal	0.000	1.265		4.197		4.062		-		4.062	Continuing	Continuing	N/A

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
Developmental Test and Evaluation	Various	Various : Various	0.000	1.519	Mar 2017	0.000		0.221	Mar 2019	-		0.221	Continuing	Continuing	Continuing
Developmental Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	1.429	Mar 2017	1.293	Nov 2017	1.775	Nov 2018	-		1.775	Continuing	Continuing	Continuing
		Subtotal	0.000	2.948		1.293		1.996		-		1.996	Continuing	Continuing	N/A

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
Contractor Engineering Support	Various	Various : Various	0.000	3.801	Apr 2017	3.311	Jan 2018	2.879	Jan 2019	-		2.879	Continuing	Continuing	Continuing
Contactor Engineering Support TACCOM	C/CPFF	Precise : Lexington Park, MD	0.000	1.329	Dec 2016	1.737	Dec 2017	1.812	Dec 2018	-		1.812	0.000	4.878	4.958
Contractor Engineering Support AAT	C/CPFF	Precise : Lexington Park, MD	0.000	1.533	Dec 2016	1.889	Dec 2017	2.025	Dec 2018	-		2.025	0.000	5.447	5.739
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	0.000	0.331	Mar 2017	0.807	Nov 2017	0.466	Nov 2018	-		0.466	Continuing	Continuing	Continuing
Government Engineering Support AAT	WR	NAWCAD : Patuxent River, MD	0.000	1.776	Dec 2016	2.467	Dec 2017	2.641	Dec 2018	-		2.641	0.000	6.884	-
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.000	2.146	Mar 2017	2.942	Nov 2017	2.844	Nov 2018	-		2.844	Continuing	Continuing	Continuing
Program Management Support	Various	Various : Various	0.000	0.052	Dec 2017	0.036	Jan 2018	0.035	Jan 2019	-		0.035	Continuing	Continuing	Continuing
Travel	WR	NAVAIR : Patuxent River, MD	0.000	0.056	Dec 2016	0.085	Feb 2018	0.051	Feb 2019	-		0.051	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 0572 / *JT Service/NV Std Avionics CP/SB*

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
Subtotal			0.000	11.024		13.274		12.753		-		12.753	Continuing	Continuing	N/A

Remarks

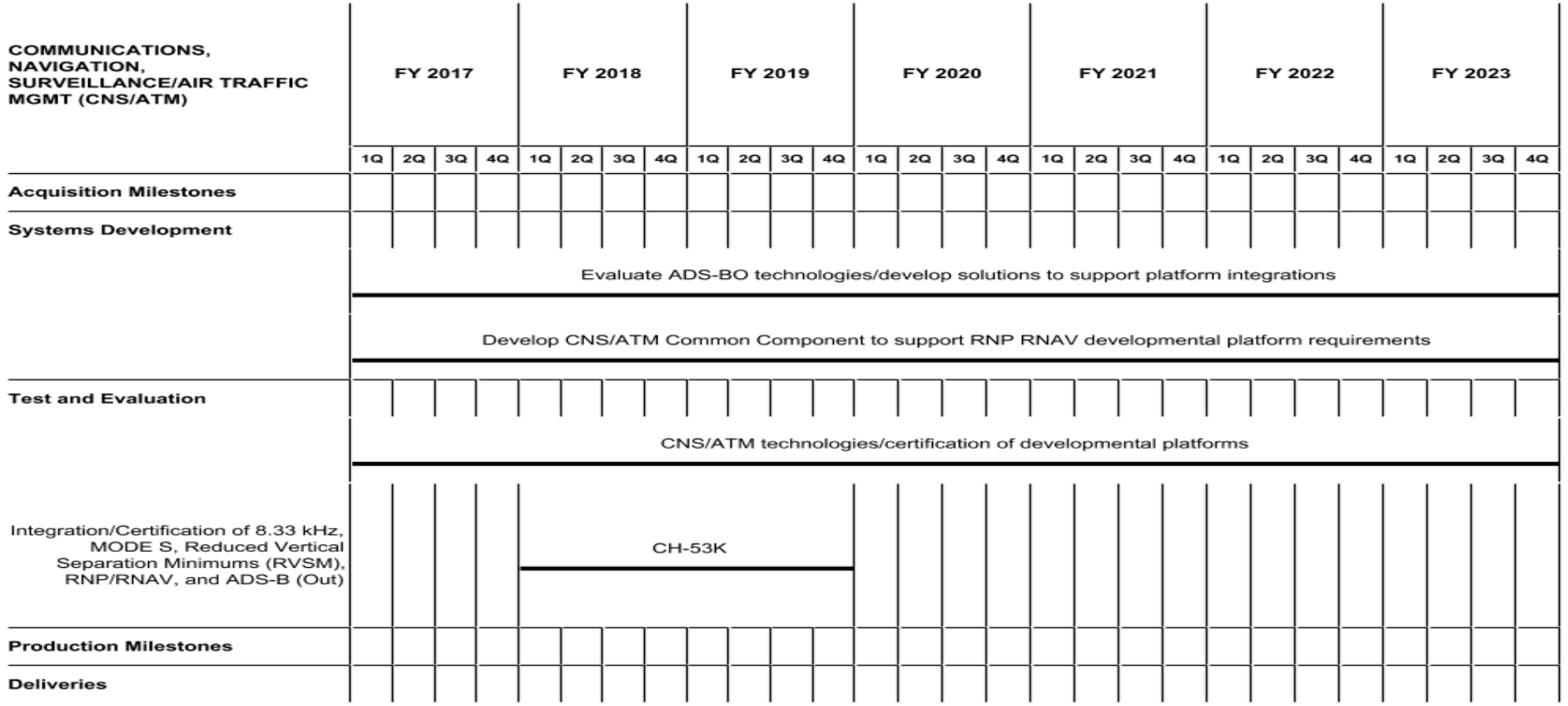
CES - TAWS II is going through a software re-architecture to meet MLSTD 882-E Level I. TAWS II V-22 effort starting system safety functional hazard assessment in FY18.

	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	42.711		53.512		51.486		-		51.486	Continuing	Continuing	N/A

Remarks

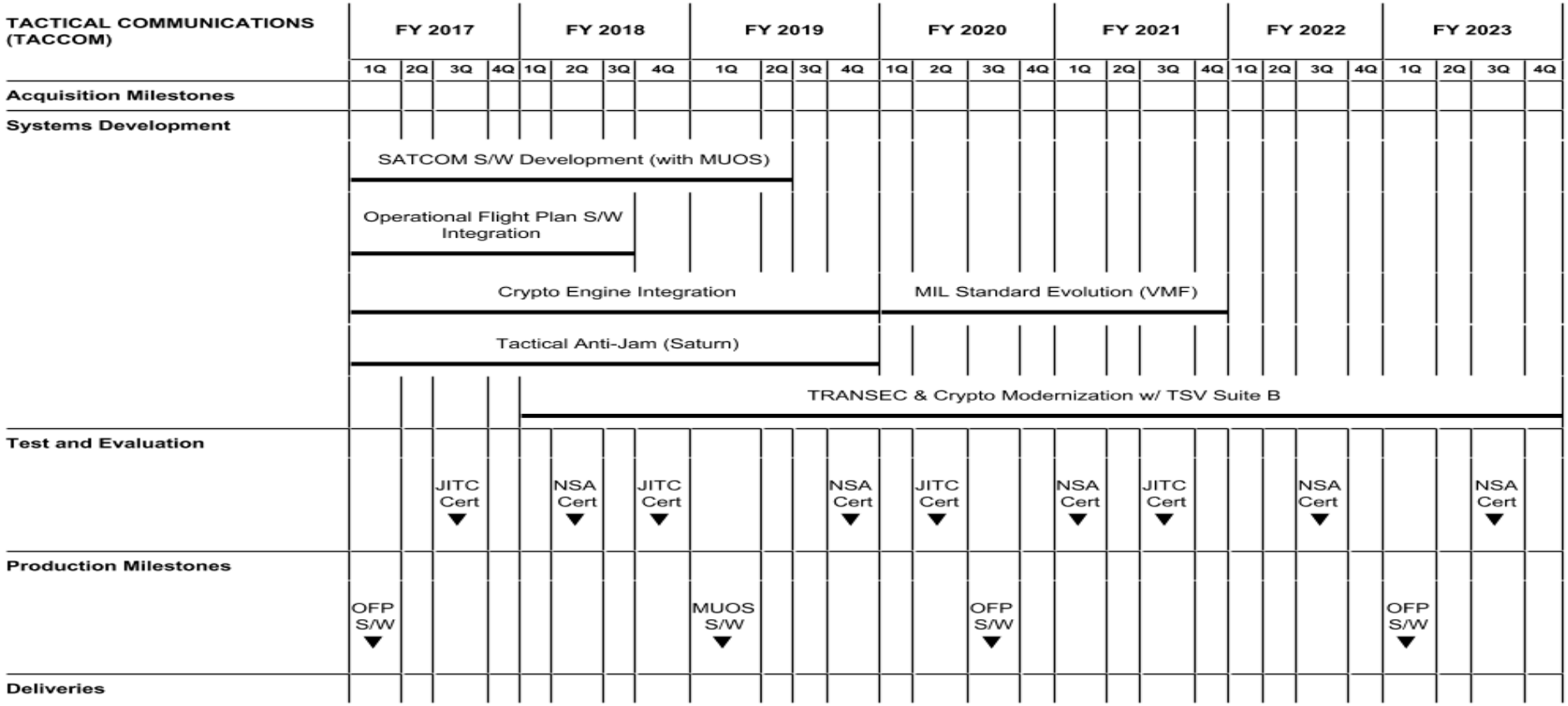
(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



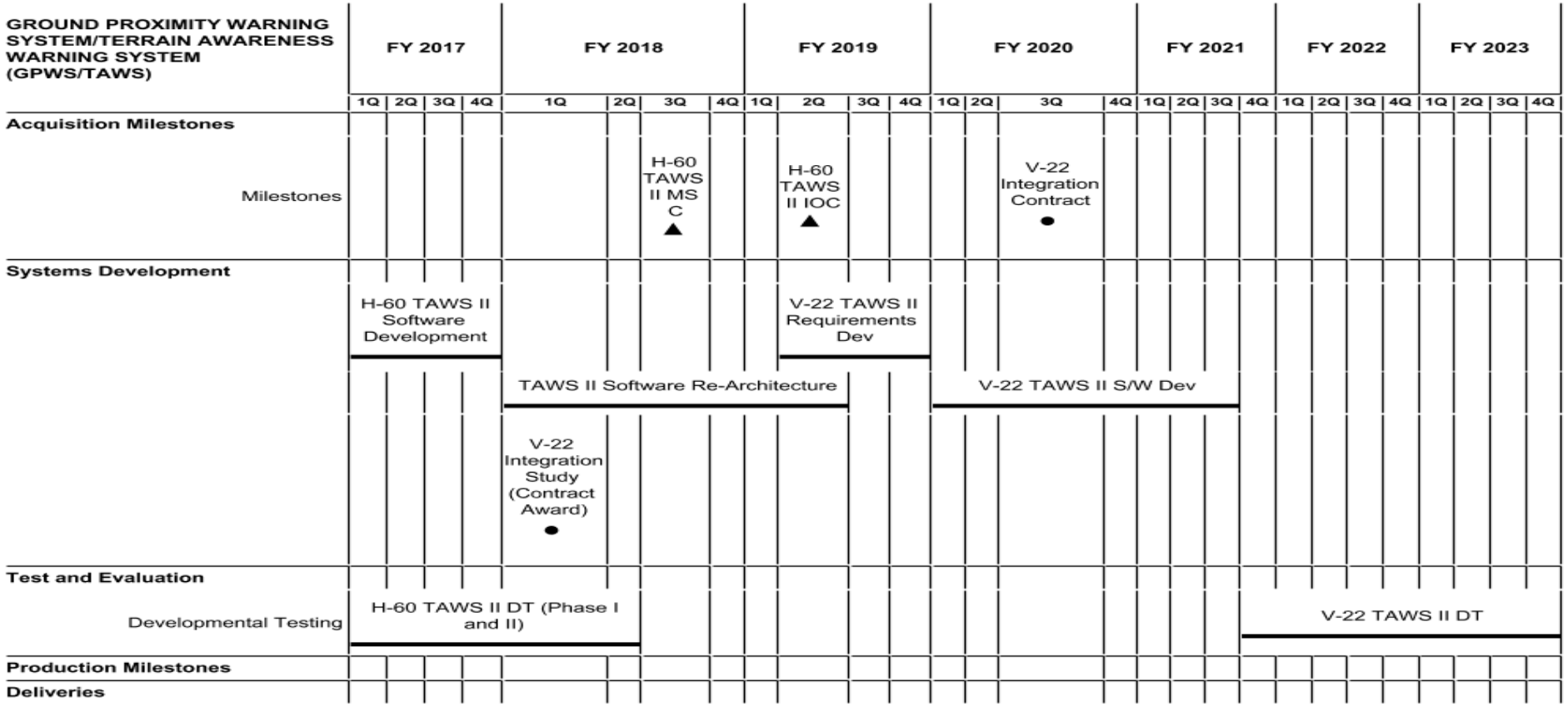
2019DON - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



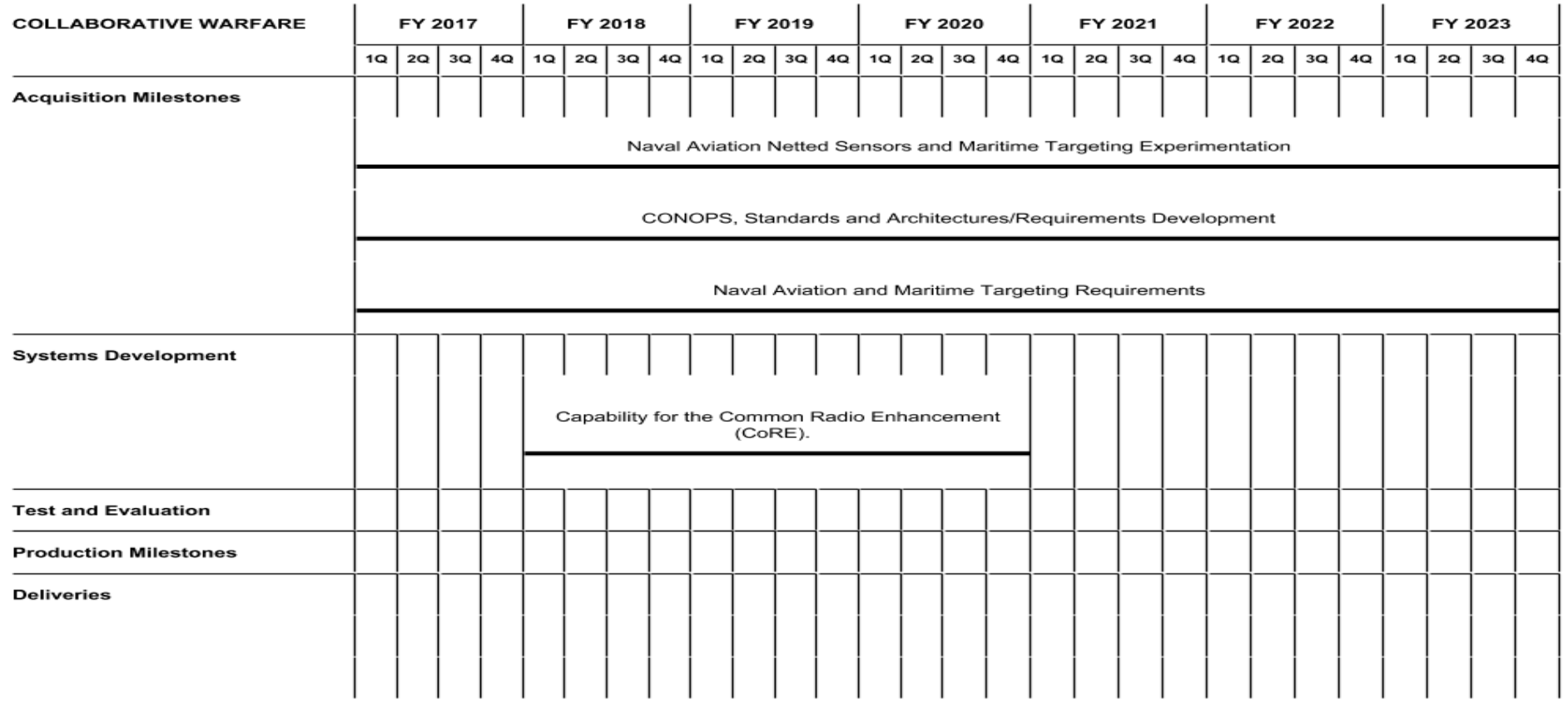
2019DON - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



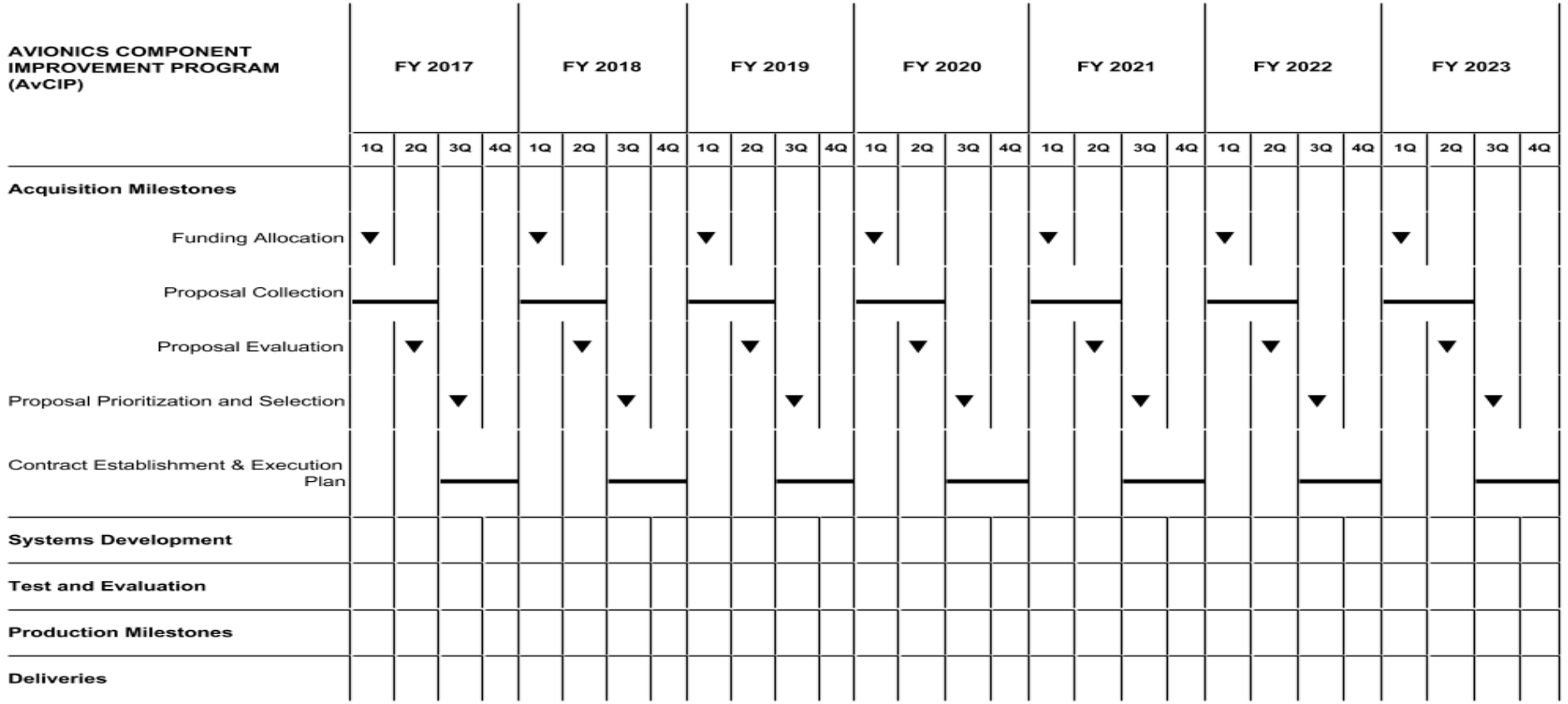
2019DON - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



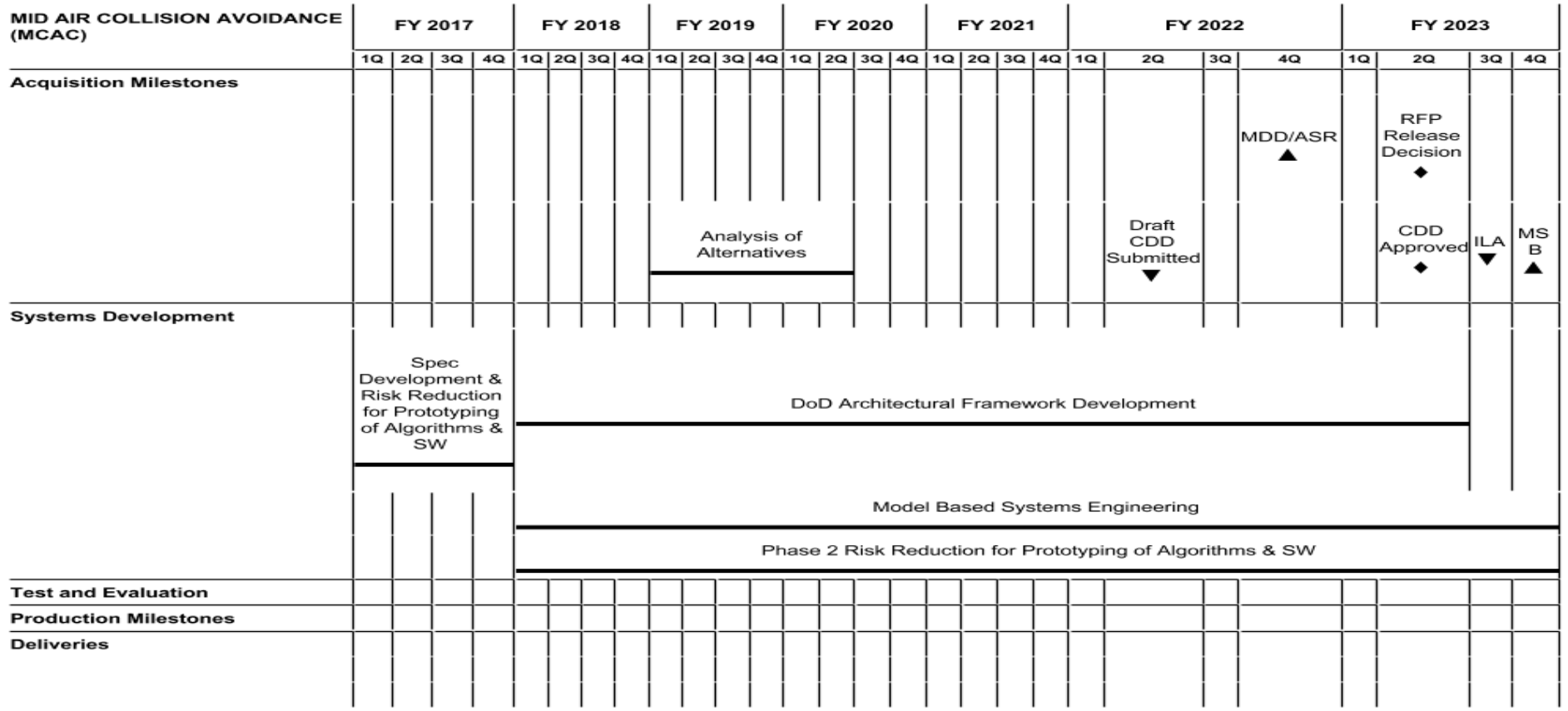
2019DON - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
COMMUNICATIONS, NAVIGATION, SURVEILLANCE/AIR TRAFFIC MGMT (CNS/ ATM)				
Systems Development: Evaluate ADS-B (Out) technologies/develop solutions to support platform integrations	1	2017	4	2023
Systems Development: Develop CNS/ATM Common Component to support RNP RNAV developmental platform requirements	1	2017	4	2023
Test and Evaluation: CNS/ATM technologies/certification of developmental platforms	1	2017	4	2023
Test and Evaluation: Integration/Certification of 8.33 kHz, MODE S, Reduced Vertical Separation Minimums (RVSM), RNP/RNAV, and ADS-B (Out): for CH-53K	1	2018	4	2019
TACTICAL COMMUNICATIONS (TACCOM)				
Systems Development: GEN5 Integrated Waveform Satellite Communications (SATCOM) S/W Development	1	2017	2	2019
Systems Development: Operational Flight Plan	1	2017	3	2018
Systems Development: Crypto Engine Integration	1	2017	4	2019
Systems Development: MIL Standard Evolution (VMF)	1	2020	4	2021
Systems Development: Tactical Anti-Jam (Saturn)	1	2017	4	2019
Systems Development: Transmission Security (TRANSEC) & Crypto Modernization w/ Tactical Secure Voice (TSV) Suite B	1	2018	4	2023
Test and Evaluation: NSA Cert 1	1	2021	1	2021
Test and Evaluation: JITC Cert 1	3	2017	3	2017
Test and Evaluation: NSA Cert 2	2	2018	2	2018
Test and Evaluation: JITC Cert 2	4	2018	4	2018
Test and Evaluation: NSA Cert 3	4	2019	4	2019
Test and Evaluation: JITC Cert 3	2	2020	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation: JITC Cert 4	3	2021	3	2021
Test and Evaluation: NSA Cert 4	3	2022	3	2022
Test and Evaluation: NSA Cert 5	3	2023	3	2023
Production Milestones: OFP S/W 1	1	2017	1	2017
Production Milestones: MUOS S/W	1	2019	1	2019
Production Milestones: OFP S/W 2	3	2020	3	2020
Production Milestones: OFP S/W 3	1	2023	1	2023
GROUND PROXIMITY WARNING SYSTEM/TERRAIN AWARENESS WARNING SYSTEM (GPWS/TAWS)				
Acquisition Milestones: Milestones: H-60 TAWS II MS C	3	2018	3	2018
Acquisition Milestones: Milestones: H-60 TAWS II IOC	2	2019	2	2019
Acquisition Milestones: Milestones: V-22 Integration Contract	3	2020	3	2020
Systems Development: H-60 TAWS II Software Development	1	2017	4	2017
Systems Development: V-22 TAWS II Requirements Development	2	2019	4	2019
Systems Development: TAWS II Software Re-Architecture	1	2018	2	2019
Systems Development: V-22 TAWS II Software Development	1	2020	3	2021
Systems Development: V-22 CFIT Integration Study	1	2018	1	2018
Test and Evaluation: Developmental Testing: H-60 TAWS II DT (Phase I and II)	1	2017	2	2018
Test and Evaluation: Developmental Testing: V-22 TAWS II DT	4	2021	4	2023
COLLABORATIVE WARFARE				
Acquisition Milestones: Naval Aviation Netted Sensors and Maritime Targeting Experimentation	1	2017	4	2023
Acquisition Milestones: Netted Sensors CONOPS, Standards and Architectures/ Requirements Development	1	2017	4	2023
Acquisition Milestones: Naval Aviation and Maritime Targeting Requirements	1	2017	4	2023
Systems Development: Capability for the Common Radio Enhancement (CoRE)	1	2018	4	2020
AVIONICS COMPONENT IMPROVEMENT PROGRAM (AvCIP)				

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Funding Allocation: Funding Allocation1	1	2017	1	2017
Acquisition Milestones: Funding Allocation: Funding Allocation2	1	2018	1	2018
Acquisition Milestones: Funding Allocation: Funding Allocation3	1	2019	1	2019
Acquisition Milestones: Funding Allocation: Funding Allocation4	1	2020	1	2020
Acquisition Milestones: Funding Allocation: Funding Allocation5	1	2021	1	2021
Acquisition Milestones: Funding Allocation: Funding Allocation6	1	2022	1	2022
Acquisition Milestones: Funding Allocation: Funding Allocation7	1	2023	1	2023
Acquisition Milestones: Proposal Collection: Proposal Collection1	1	2017	2	2017
Acquisition Milestones: Proposal Collection: Proposal Collection2	1	2018	2	2018
Acquisition Milestones: Proposal Collection: Proposal Collection3	1	2019	2	2019
Acquisition Milestones: Proposal Collection: Proposal Collection4	1	2020	2	2020
Acquisition Milestones: Proposal Collection: Proposal Collection5	1	2021	2	2021
Acquisition Milestones: Proposal Collection: Proposal Collection6	1	2022	2	2022
Acquisition Milestones: Proposal Collection: Proposal Collection7	1	2023	2	2023
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation1	2	2017	2	2017
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation2	2	2018	2	2018
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation3	2	2019	2	2019
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation4	2	2020	2	2020
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation5	2	2021	2	2021
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation6	2	2022	2	2022
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation7	2	2023	2	2023
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection1	3	2017	3	2017
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection2	3	2018	3	2018
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection3	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection4	3	2020	3	2020
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection5	3	2021	3	2021
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection6	3	2022	3	2022
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection7	3	2023	3	2023
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan1	3	2017	4	2017
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan2	3	2018	4	2018
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan3	3	2019	4	2019
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan4	3	2020	4	2020
Acquisition Milestones: Contract Establishment & Execution Plan: Conract Establishment & Execution Plan5	3	2021	4	2021
Acquisition Milestones: Contract Establishment & Execution Plan: Conract Establishment & Execution Plan6	3	2022	4	2022
Acquisition Milestones: Contract Establishment & Execution Plan: Conract Establishment & Execution Plan7	3	2023	4	2023
MID AIR COLLISION AVOIDANCE (MCAC)				
Acquisition Milestones: MDD/ASR	4	2022	4	2022
Acquisition Milestones: RFP Release Decision	2	2023	2	2023
Acquisition Milestones: CDD Approved	2	2023	2	2023
Acquisition Milestones: Integrated Logistics Assessment	3	2023	3	2023
Acquisition Milestones: MS B	4	2023	4	2023
Acquisition Milestones: Draft CDD Submitted	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Analysis of Alternatives	1	2019	2	2020
Systems Development: Spec Development & Risk Reduction for Prototyping of Algorithms & SW	1	2017	4	2017
Systems Development: DoD Architectural Framework Development	1	2018	2	2023
Systems Development: Model Based Systems Engineering	1	2018	4	2023
Systems Development: Phase 2 Risk Reduction for Prototyping of Algorithms & SW	1	2018	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*				Project (Number/Name) 3425 / *Digital Warfare*			
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**
3425: *Digital Warfare*	0.000	0.000	4.651	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.651
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Chief of Naval Operations concurred with the Task Force Netted Navy recommendation to stand up the Digital Warfare (DW) project to set requirements, prioritize resources, and lead efforts on information interoperability and human/machine teaming.

NAVAIR, NAVSEA, SPAWAR, associated Program Executive Offices, warfare and system centers and University Affiliated Research Centers/Federally Funded Research and Development Centers will support the Model Based Engineering, Technical Design, and Requirements branches in the new Digital Warfare effort under OPNAV N2N6. In order to develop capability from the top down, the Digital Warfare will develop requirements for the system of systems to include all of the associated interoperability requirements. Due to the complexity of this work, Digital Warfare will evolve the traditional requirements development methodology to a model based systems engineering environment that will include associated model extensions, reports, views, configuration management, help desk support, and documentation. This work will be completed by a series of teams, each focused on a separate threat domain, and made up of system modelers, fleet representatives, program of record representatives, architecture and interoperability experts, etc. The products generated by these teams will include data technical baselines for domain areas with individual profiles for each program of record, coordinated requirements recommendations, and potential areas for S&T and experimentation to fill gaps. Digital Warfare will also explore emerging digital technologies including human/machine teaming.

Each SYSCOM will be involved in creating Data Technical Baseline (DTB) profiles specific for each program of record. DTBs may consist of interfaces, protocols, content, information quality, architectural aspects, and knowledge base frameworks. SYSCOMs will exercise technical authority to assess Program of Record compliance to DTBs and Key Performance Parameters in support of gate reviews and system engineering technical reviews.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: DIGITAL WARFARE	0.000	4.651	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Provide Subject Matter Expert (SME) support for the domain functional decomposition based on prioritized mission areas. Support the analytical agenda from OPNAV N81 and N9I for the specific mission area capabilities. Provide modeling and documentation support for Joint Capability Integration Development System (JCIDS), OPNAV Program Objective Memorandum (POM) process, and ASN (RD&A) Acquisition Process. Coordinate and work across the SYSCOMs and PEOs on the OPNAV Model Based Systems Engineering (MBSE) requirements allocation process.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Participate in the definition of MBSE tool functionality and views based on Echelon I stakeholder requirements. Collaboratively develop tool extensions to complement JCIDS and POM processes. Support development of cross-SYSCOM Modeling Standards and Policies for Science and Technology and Program of Records. Create models in the modeling environment. Provide SME support for data science teams in data exploration and analysis, information and knowledge extraction techniques, and application to mission area data requirements. Provide engineering inputs to and review Navy Integrated Capability Concepts for data architecture consistencies. Explore Machine Learning techniques to support human/machine teaming for decision making. Develop an overarching Data Technical Baseline (DTB) and DTB profiles for Program of Records (POR) under SYSCOM cognizance. Assess PORs against their DTB profile during all Systems Engineering Technical Review events and gate reviews. Provide common infrastructure for MBSE and DTB environments, to include access management, configuration management, and help desk support. ***FY 2019 Base Plans:*** Digital Warfare efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 to FY 2019 reflects Digital Warfare standing up as a separate Program Element. Digital Warfare efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.					
Accomplishments/Planned Programs Subtotals	0.000	4.651	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Procurement strategy is determined by market survey and cooperative opportunities.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*

E. Performance Metrics

Digital Warfare will set requirements, prioritize resources, and lead efforts on information interoperability and human/machine teaming. This will result in a workforce that is trained in new systems engineering and modeling concepts and tools. It will also result in development of a requirements modeling environment to include associated model extensions, reports, views, and configuration management and in the development of digital technical baselines for programs to use to ensure cross-domain interoperability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 3425 / *Digital Warfare*	

Support ($ 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
Digital Warfare Office Support	WR	Naval Air War : Patuxent River, MD	0.000	0.000		1.201	Oct 2017	0.000		-		0.000	0.000	1.201	-
		Subtotal	0.000	0.000		1.201		0.000		-		0.000	0.000	1.201	N/A

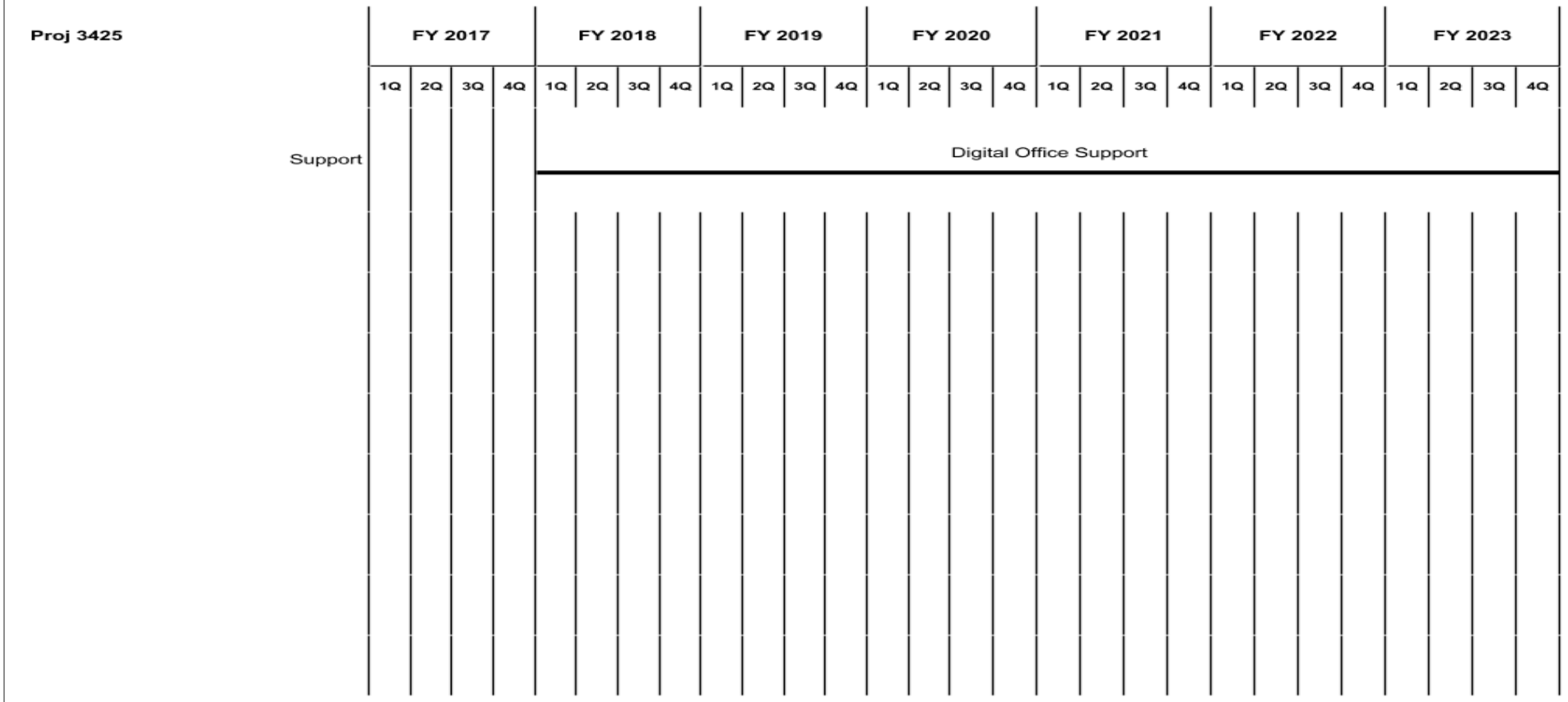
Management Services ($ in Millions)

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
Contract Engineer Support	Various	Various : Various	0.000	0.000		3.450	Dec 2017	0.000		-		0.000	0.000	3.450	-
		Subtotal	0.000	0.000		3.450		0.000		-		0.000	0.000	3.450	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	0.000		4.651		0.000		-		0.000	0.000	4.651	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*



2019PB - 0605217N - 3425

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3425				
Support: DWO Support	1	2018	4	2023