Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
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 Common Avionics*

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	87.394	49.316	37.055	54.540	-	54.540	52.321	38.171	36.407	33.569	Continuing	Continuing
0572: *JT Service/NV Std Avionics CP/SB*	87.394	49.316	37.055	54.540	-	54.540	52.321	38.171	36.407	33.569	Continuing	Continuing

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.

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.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	51.486	43.187	36.859	-	36.859
Current President's Budget	49.316	37.055	54.540	-	54.540
Total Adjustments	-2.170	-6.132	17.681	-	17.681
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-6.132			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.700	0.000			
• SBIR/STTR Transfer	-1.469	0.000			
• Program Adjustments	0.000	0.000	17.461	-	17.461
• Rate/Misc Adjustments	-0.001	0.000	0.220	-	0.220

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
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 Common Avionics*

Change Summary Explanation

The FY 2021 funding request net increase is for misc. rate adjustments and the reprogramming of Digital Interoperability (DI)/Marine Air Ground Task Force (MAGTF) Agile Network Gateway Link (MANGL) from PMA275, V-22.

Technical:

Digital Interoperability (DI)/Marine Air Ground Task Force (MAGTF) Agile Network Gateway Link (MANGL) reprogrammed from PMA275, PE 0604262N/PU 1425 and PE 0206121M/BLI 0590 FY21 - FY24 to support the integration and central management of DI, resulting in zero sum realignment with no new start.

Schedule:

Tactical Communications (TACCOM): Extended SATCOM S/W Development (with Mobile User Objective System (MUOS)) from 4Q/19 to 2Q/20 due to SPAWAR/JTIC qualification lab availability. Adjusted Military (MIL) Standard Evolution for Variable Message Format (VMF) from 1Q/20 to 1Q/21, due to delays in the finalization of the specifications needed to complete the VMF.

Ground Proximity Warning System/Terrain Awareness System (GPWS/TAWS II): Changes incorporated to align with platforms' schedule. Changes in the PMA-299 MH-60R/S TAWS II schedule is due to realignment to meet the SCS-2X software schedule; planned for Fleet release in 2023 vice 2024. PMA-275 V-22 schedule was adjusted to account for reprioritization of software manpower to higher priority efforts such as RNP/RNAV, LNAV, and JPALS.
FY20: Realigned H-60 TAWS II Software Development FB3 from 4Q/20 to 3Q/20
FY21: Added V-22 TAWS II Requirements Dev to 4Q/21; Added Lockheed Martin SC 2.X Integration Testing FB3 to 4Q/21
FY22: Realigned H-60 TAWS II Software Development FB4 from 1Q/23 to 1Q/22; Realigned V-22 TAWS II Software Development FB1 from 3Q/21 to 1Q/22; Added H-60 TAWS II DT 3 to 1Q/22; Removed V-22 Integrated Logistic Assessment (ILA) from 2Q/22
FY23: Changed MS C aircraft platform from V-22 to H-60 and moved MS from 2Q/23 to 3Q/23; Realigned H-60 Fleet Release from 4Q/24 to 4Q/23; Added H-60 TAWS II DT 4 to 2Q/23; Added Boeing/Raytheon Integration Testing FB1 to 4Q/23; Removed V-22 Fleet Release from 4Q/23; Added Lockheed Martin SC 2.X Integration Testing FB4 to 1Q/23; Added V-22 Integration Contract to 1Q/23
FY24: Added V-22 TAWS II Software Development FB2 to 3Q/24; Realigned V-22 TAWS II DT 1 from 2Q/21 to 1Q/24
FY25: Realigned TAWS II Follow on Dev Platforms from 1Q/24 to 1Q/25; Added Boeing/Raytheon Integration Testing FB2 to 3Q/25; Added V-22 TAWS II DT 2 to 3Q/25

Digital Interoperability (DI)/Marine Air Ground Task Force (MAGTF) Agile Networking Gateway Link (MANGL):
Schedule inserted to reflect reprogrammed funding from PMA275, V-22.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *Common Avionics*	Project (Number/Name) 0572 / *JT Service/NV Std Avionics CP/SB*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0572: *JT Service/NV Std Avionics CP/SB*	87.394	49.316	37.055	54.540	-	54.540	52.321	38.171	36.407	33.569	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

(U) Common Avionics 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), Avionics Architectures Team (AAT), and Digital Interoperability (DI)/Marine Air Ground Task Force (MAGTF) Agile Networking Gateway Link (MANGL). 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Joint Service Review Committee for Avionics Standardization (JSRC-AS)	0.685	1.015	0.982	0.000	0.982
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 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 2021 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 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** There is no significant change from FY20 to FY21.					
Title: Communication Navigation Surveillance/Air Traffic Management (CNS/ATM)	0.526	0.136	0.137	0.000	0.137
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-BO) 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 2020 Plans:*** Continue to evaluate technologies and develop solutions to support platform integrations. ***FY 2021 Base Plans:*** Continue to evaluate technologies and develop solutions to support platform integrations. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
There is no significant change from FY20 to FY21.					
Title: Tactical Communications (TACCOM)	16.549	12.906	8.849	0.000	8.849
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), Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced SINCGARS Improvement Program (E-SIP), SINCGARS Cryptographic Modernization with TSV 3, 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 2020 Plans:
Complete Tactical Anti-Jam (Saturn). Continue TRANSEC SATCOM Crypto Modernization in accordance with NSA directives and TSV Suite B for interoperability. Complete delta NSA Certification and delta JITC Certification. Complete Operational Flight Plan (OFP) Software Baseline.

FY 2021 Base Plans:
Continue TRANSEC SATCOM Crypto Modernization in accordance with NSA directives and TSV Suite B for interoperability. Perform MIL Standard Evolution (VMF). Obtain delta NSA certification and delta Joint Interoperability Test Command (JITC) certification for Gen5 Operational Flight Plan (OFP) software release.

FY 2021 OCO Plans:
N/A

FY 2020 to FY 2021 Increase/Decrease Statement:

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Decrease of $4.057 million from FY20 to FY21 is due to the MUOS waveform completing compliance qualification in FY20 with no required design changes to the radio hardware.					
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. 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 2020 Plans:*** Award the H-60 Integration Contract. Continue TAWS II Software Re-Architecture and begin H-60 Software Development. ***FY 2021 Base Plans:*** Complete TAWS II Software Re-Architecture. Complete H-60 TAWS II Software Development FB3 and deliver TAWS II FB3. Begin Lockheed Martin SC-2X Integration Testing FB3. Begin V-22 TAWS II requirements development. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $1.990 million from FY20 to FY21 is due to realignment of the PMA299 MH-60R/S TAWS II project to meet the SCS-2X software schedule release to the Fleet in 2023 vice 2024.	3.797 -	4.592 -	6.582 -	0.000 -	6.582 -
Title: Collaborative Warfare (CW) ***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	0.222 -	0.250 -	0.240 -	0.000 -	0.240 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 cyber-resilient requirements that map fleet gaps and requirements to cross-platform naval aviation solutions. 2) Netted sensors and maritime targeting proof of concept prototype experiments and demonstrations with the Defense Advanced Research Projects Agency (DARPA) and Office of Naval Research (ONR) Future Naval Capability. Mature cyber-resilient technologies for practical application across Naval Aviation platforms, the Navy, and Joint Services. 3) Developing cyber-resilient architecture and implementation standards in support of broad Naval Aviation program integration. 4) Integrating Naval Aviation cyber-resilient requirements and Navy control system architectures for broad Naval Aviation programs. ***FY 2020 Plans:*** Continue executing to Naval Aviation and Maritime Targeting Experimentation and Requirements. Continue to develop requirements, standards, and architectures in support of new and updated netted-sensors' Concept of Operations and capabilities. ***FY 2021 Base Plans:*** Coordinate Cyber Resilient OS (CROS) experiment using Defense Advanced Research Projects Agency (DARPA) and Office of Naval Research (ONR) technologies in support of a common Naval Aviation mission-computing environment, leveraging existing efforts and examining parallel development. This experiment would be in a lab environment and focused on the effectiveness of the cyber-resilient technologies. Execute CROS experiment in operationally-representative platform or systems integration lab. Work with Naval Aviation program managers to develop platform implementation plans. Continue to develop cyber-resilient requirements, standards, and architectures that assure netted-sensors' Concept of Operations and capabilities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** There is no significant change from FY20 to FY21.					
Title: Avionics Component Improvement Program (AvCIP)	4.249	4.971	6.993	0.000	6.993
Articles:	-	-	-	-	-
Description: Investigate high value Return On Investment component improvement candidate projects. Design and develop solutions that correct avionics systems reliability, performance and sustainment deficiencies in support of NAVAIR Commander's Strategic Imperatives of 'Aligning existing resources to better support today's Readiness' and 'Increase Speed of Products to the Fleet.' Stop operating and sustainment cost growth by					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 aviation electronics 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 2019 has enabled sustainment and procurement cost avoidances in excess of $360 million in cost for the $80 million of funding invested through 2019. ***FY 2020 Plans:*** Address current fleet problem avionics systems (top readiness degraders, cost drivers, obsolescence-driven sustainability, capability loss, fleet head-hurters). ***FY 2021 Base Plans:*** Address current fleet problem avionics systems (top readiness degraders, cost drivers, obsolescence-driven sustainability, capability loss, fleet head-hurters). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $2.022 million from FY20 to FY21 is due to escalation factors and ASN-139 Test & Repair Stations Future Readiness - Cross Functional Team Project 0014. This effort will fund Non-Recurring Engineering task to develop modernized depot level test stations in support of a NAVSUP long-term repair contract for the ASN-139 Carrier Aircraft Inertial Navigation System.					
Title: Mid Air Collision Avoidance Capability (MCAC) ***Articles:*** ***Description:*** This program will conduct research, studies, and development, integration, demonstration, test and evaluation	0.593 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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. MCAC Program Termination effective FY19 per N98, Ser N98/18U142416. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A					
Title: Avionics Architectures Team (AAT) ***Articles:***	22.695 -	13.185 -	11.565 -	0.000 -	11.565 -
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 direct response to the Modular Open Systems Architecture (MOSA) requirement in accordance with 10 U.S.C. 2446a-2446c; Tri-Service Memorandum for Service Acquisition Executives and Program Executive Officers, 07 Jan 2019; 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 Software Open Systems Technologies (SWOST) includes the Future Airborne Capability Environment (FACE) Technical Standard. This 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 through Platform Integration and Modeling 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					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 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 2020 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 Future Airborne Capability Environment (FACE), Functional Architecture for Strategic Reuse (FASTR) and Hardware Open Systems Technologies (HOST) initiatives. ***FY 2021 Base Plans:*** Provide development support, mission based engineering, systems engineering and program management for design and acquisition strategy implementation guidance, and demonstrate interoperability of the standards. 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, Air Force and international					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
partners. 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 Future Airborne Capability Environment (FACE), Functional Architecture for Strategic Reuse (FASTR) and Hardware Open Systems Technologies (HOST) initiatives. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $1.620 million from FY20 to FY21 is due to completion of the Conformance Test Suite 3.0 that will be delivered and accepted in FY20.					
Title: Digital Interoperability (DI) / Marine Air Ground Task Force (MAGTF) Agile Networking Gateway Link (MANGL) ***Articles:*** ***Description:*** Digital Interoperability (DI) is the United States Marine Corps' strategy to bridge multiple generations of technology using three matured technologies; gateways, software defined radios, and Commercial Off-The-Shelf (COTS) interfaces. This modular developmental approach enables iterative migration to advanced waveforms and payloads while providing enhanced digital connectivity between forces using dissimilar technologies. DI will enable fleet integration of new capabilities on COTS tablets and Government Off-The-Shelf (GOTS) applications. DI will also enable logistics tracking and reporting (cargo and personnel) with the use of Radio Frequency Identification technology, advanced Electronic Warfare/Cyber capability, and threat data capturing/off-boarding. The architecture establishes the foundation to enable system performance data off-boarding, as well as data fusion and artificial intelligence augmentation capabilities. Development and testing of MANGL components, to include Software Reconfigurable Payload (SRP), gateways and tablets, in Hub and Spoke configurations for MV-22B. Translates messages from one tactical data link to another (i.e. Link 16 to Adaptive Networking Wideband Waveform [ANW2]) with a tactically proven gateway thereby leveraging previous investments. Provides the foundation for Command, Control, Communications, Electromagnetic Spectrum Operations, and Intelligence exploitation of platform/sensor data off-boarding, data fusion, and distributed processing. Enables real-time blue force situational awareness and improved decision-making through the sharing of a Common Operational Picture, including friendly force positions, capabilities, and threat information for both the aircrew and embarked troops. Provides for operations in denied and degraded environments, enables range extension and distributed operations.	0.000 -	0.000 -	19.192 4	0.000 -	19.192 4

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
SRP 2.0 is a single common payload module that is government configuration controlled architecture, and reconfigurable to support simultaneous missions and applications making maximum use of available bandwidth and ensuring interoperability all with a cyber-secure, National Security Agency (NSA) approved, cryptographic solution. There are earlier versions of the SRP (1.0 and 1.5) operationally deployed in other naval platforms. SRP 2.0 provides an imminently upgradable platform for eventual inclusion of Low Probability of Intercept (LPI)/ Low Probability of Detection (LPD) and advanced mesh waveforms for the exchange of tactical data, imagery, and video. Incorporation of new waveforms can be accomplished within 18 months vice the 36 to 48 months required for integration and initial fielding using traditional approaches. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** Centralized program management activities for acquisition documentation preparation, critical design review (CDR), system design and development, test planning, logistics support development, mission based engineering, and systems engineering. Order four (4) test articles comprising one (1) SRP 2.0, one (1) gateway, and four (4) tablets per article using existing system development contracts. Initiate integration and logistics analysis for MV-22. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funds were realigned from APN BLI 0590 V-22 (TILT/ROTOR ACFT) OSPREY and RDTEN PE 0604262N V-22A, Proj: 1425 V-22 to support the development and central management of DI MANGL common avionics.					
Accomplishments/Planned Programs Subtotals	49.316	37.055	54.540	0.000	54.540

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APN/0577: *Common Avionics Changes*	117.487	82.978	143.322	-	143.322	129.506	160.168	165.204	187.221	893.497	4,575.508

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *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 Collins Aerospace 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, NAVSUP, 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. MCAC Program Termination effective FY19 per N98, Ser N98/18U142416. Avionics Architectures Team (AAT) will provide acquisition strategy guidance and support to platforms implementing open systems architectures to address open architecture requirements. Digital Interoperability (DI)/Marine Air Ground Task Force (MAGTF) Agile Networking Gateway Link (MANGL) seeks approval as a Middle Tier Rapid Prototyping/Rapid Fielding Program and/or Other Transaction Authority (OTA) initiating at or just prior to Milestone C. The MANGL program will procure upgraded system components previously fielded by other initiatives, through firm fixed price contracts from various OEMs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Dev	Various	Various : Various	6.950	13.067	Jan 2019	4.563	Jan 2020	6.353	Jan 2021	-		6.353	Continuing	Continuing	Continuing
Primary Hardware Dev	WR	NAWCAD : Patuxent River, MD	0.734	0.519	Nov 2018	1.184	Nov 2019	1.803	Nov 2020	-		1.803	Continuing	Continuing	Continuing
Primary Hardware Dev DI/ MANGL	MIPR	NRL : Washington, DC	0.000	0.000		0.000		13.767	Jan 2021	-		13.767	0.000	13.767	13.767
Primary Hardware Dev DI/ MANGL	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		1.437	Nov 2020	-		1.437	0.000	1.437	1.437
Aircraft Integration TACCOM	SS/FFP	Collins Aerospace : Cedar Rapids, IA	20.969	10.896	Jan 2019	6.496	Jan 2020	2.359	Jan 2021	-		2.359	0.000	40.720	40.720
Aircraft Integration GPWS/ TAWS II	SS/CPIF	Lockheed Martin : Owego, NY	0.304	0.090	Nov 2018	1.079	Mar 2020	1.488	Nov 2020	-		1.488	0.000	2.961	2.961
Aircraft Integration	Various	Various : Various	0.000	0.000		0.000		1.347	Dec 2020	-		1.347	0.000	1.347	1.347
Systems Engineering AAT	MIPR	DTIC : Fort Belvior, VA	15.252	4.494	Jan 2019	3.425	Jan 2020	3.301	Jan 2021	-		3.301	0.000	26.472	26.472
Systems Engineering TACCOM	WR	NAWCAD : Patuxent River, MD	4.585	1.883	Nov 2018	1.110	Nov 2019	1.304	Nov 2020	-		1.304	Continuing	Continuing	Continuing
Systems Engineering	Various	Various : Various	5.558	2.460	Dec 2018	3.298	Dec 2019	1.706	Dec 2020	-		1.706	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.861	0.638	Nov 2018	0.494	Nov 2019	1.295	Nov 2020	-		1.295	Continuing	Continuing	Continuing
Systems Engineering MCAC	WR	NAWCAD : Patuxent River, MD	2.679	0.424	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Yr Product Dev no longer funded in FYDP	Various	Various : Various	1.462	0.000		0.000		0.000		-		0.000	0.000	1.462	1.462
		Subtotal	60.354	34.471		21.649		36.160		-		36.160	Continuing	Continuing	N/A

Remarks

Primary Hardware Dev Various increase in FY21 is due to AvCIP ASN-139 Test & Repair Stations Future Readiness - Cross Functional Team Project 0014.
Primary Hardware Dev DI/MANGL and Aircraft Integration increase in FY21 is due to reprogramming of funds from PMA275, V-22 for integration and central management of DI.
Systems Engineering NAWCAD PAX increase in FY21 is due to the H-60 and V-22 TAWS II S/W Development.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development TACCOM	SS/FFP	Collins Aerospace : Cedar Rapids, IA	0.738	0.049	Mar 2019	1.700	Mar 2020	1.570	Mar 2021	-		1.570	0.000	4.057	4.057
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	1.000	1.834	Nov 2018	0.960	Nov 2019	1.521	Nov 2020	-		1.521	Continuing	Continuing	Continuing
Support Development	Various	Various : Various	0.469	0.850	May 2019	0.000		0.000		-		0.000	0.000	1.319	1.319
		Subtotal	2.207	2.733		2.660		3.091		-		3.091	Continuing	Continuing	N/A

Remarks

ILS increase in FY21 is due to reprogramming of funds from PMA275, V-22 for integration and central management of DI.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation	Various	Various : Various	2.646	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test and Evaluation	WR	NAWCAD : Patuxent River, MD	2.619	1.380	Nov 2018	0.600	Nov 2019	1.608	Nov 2020	-		1.608	Continuing	Continuing	Continuing
		Subtotal	5.265	1.380		0.600		1.608		-		1.608	Continuing	Continuing	N/A

Remarks

T&E increase in FY21 is due to reprogramming of funds from PMA275, V-22 for integration and central management of DI.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	4.066	2.234	Jan 2019	2.055	Jan 2020	2.489	Jan 2021	-		2.489	Continuing	Continuing	Continuing
Contractor Engineering Support TACCOM	C/CPFF	Precise : Lexington Park, MD	3.886	1.137	Dec 2018	1.812	Dec 2019	1.812	Dec 2020	-		1.812	0.000	8.647	8.647
Contractor Engineering Support AAT	C/CPFF	Precise : Lexington Park, MD	2.888	2.360	Dec 2018	2.442	Dec 2019	2.503	Dec 2020	-		2.503	0.000	10.193	10.193

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	0.932	0.427	Nov 2018	0.781	Nov 2019	1.458	Nov 2020	-		1.458	Continuing	Continuing	Continuing
Government Engineering Support AAT	WR	NAWCAD : Patuxent River, MD	2.524	1.442	Nov 2018	2.322	Nov 2019	2.353	Nov 2020	-		2.353	Continuing	Continuing	Continuing
Program Management Support	WR	NAWCAD : Patuxent River, MD	5.137	3.050	Nov 2018	2.681	Nov 2019	3.014	Nov 2020	-		3.014	Continuing	Continuing	Continuing
Program Management Support	Various	Various : Various	0.081	0.002	Nov 2018	0.000		0.002	Nov 2020	-		0.002	Continuing	Continuing	Continuing
Travel	WR	NAVAIR : Patuxent River, MD	0.054	0.080	Feb 2019	0.053	Feb 2020	0.050	Feb 2021	-		0.050	Continuing	Continuing	Continuing
		Subtotal	19.568	10.732		12.146		13.681		-		13.681	Continuing	Continuing	N/A

Remarks

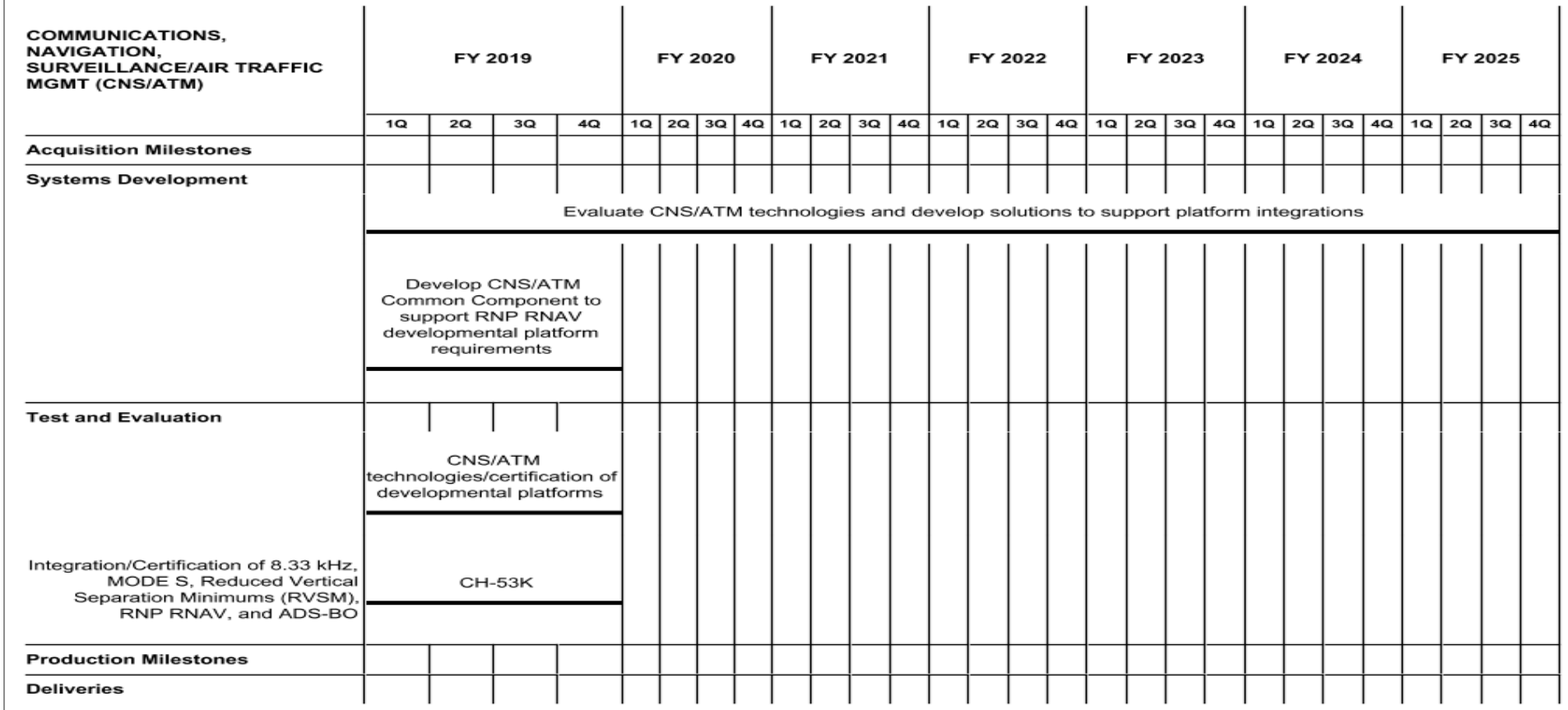
Management Services increase in FY21 is due to reprogramming of funds from PMA275, V-22 for integration and central management of DI.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	87.394	49.316		37.055		54.540		-		54.540	Continuing	Continuing	N/A

Remarks

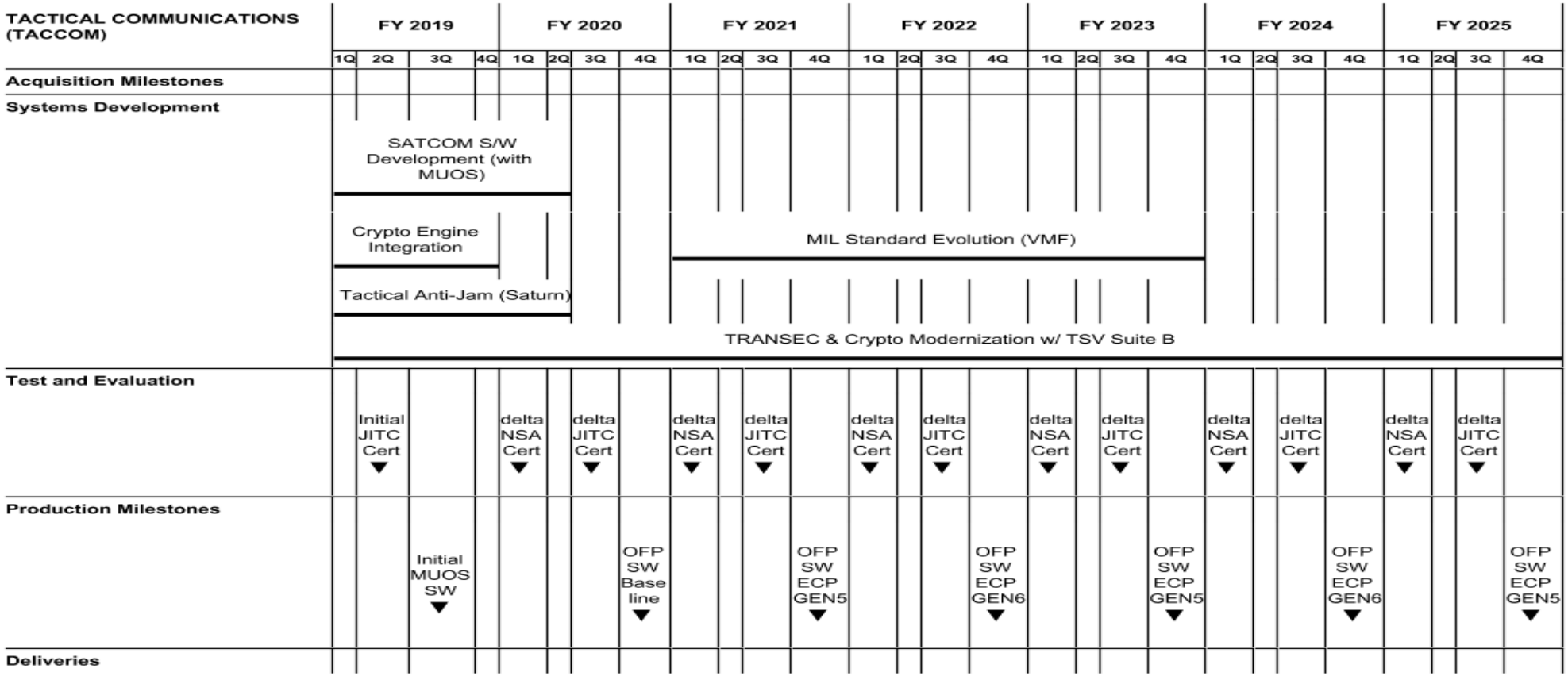
(U) Common Avionics FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



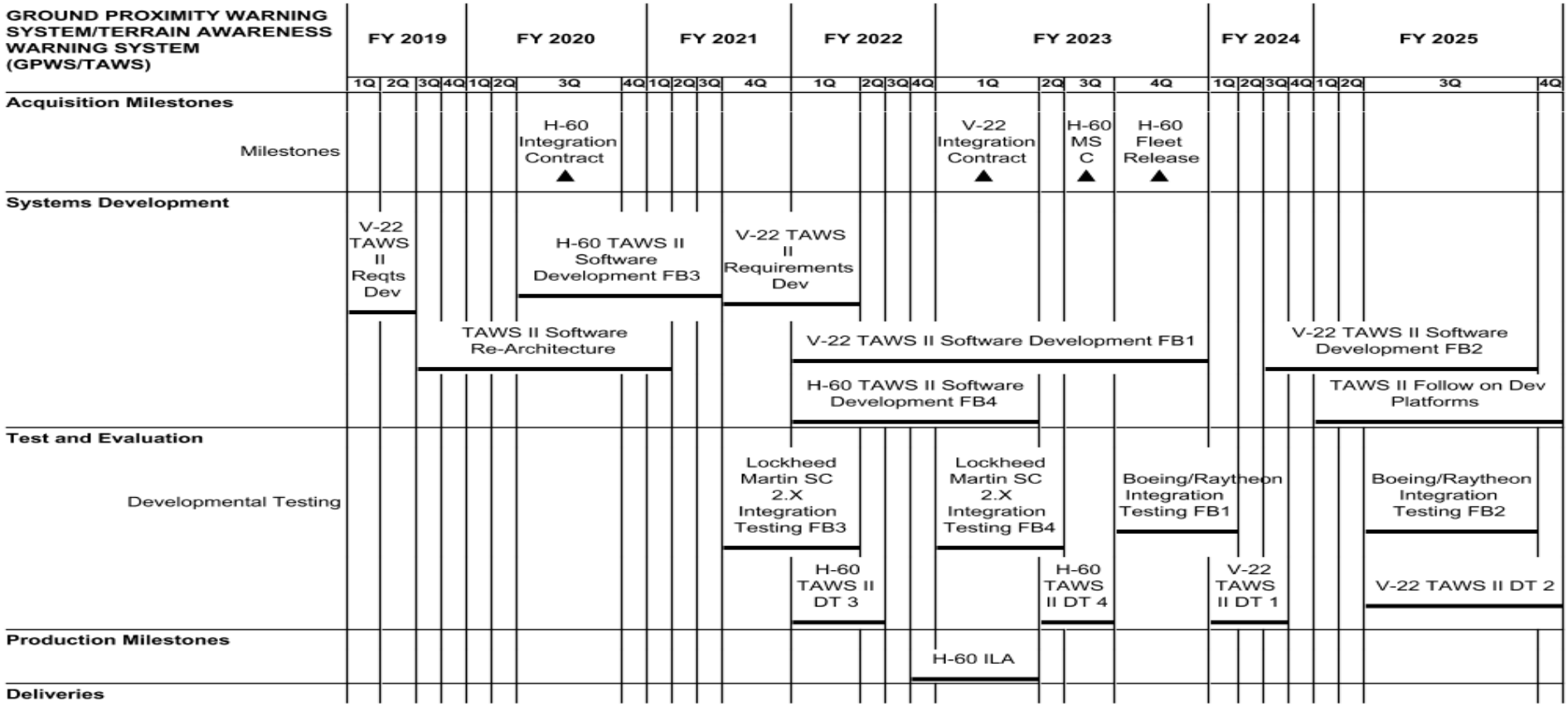
2021PB - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



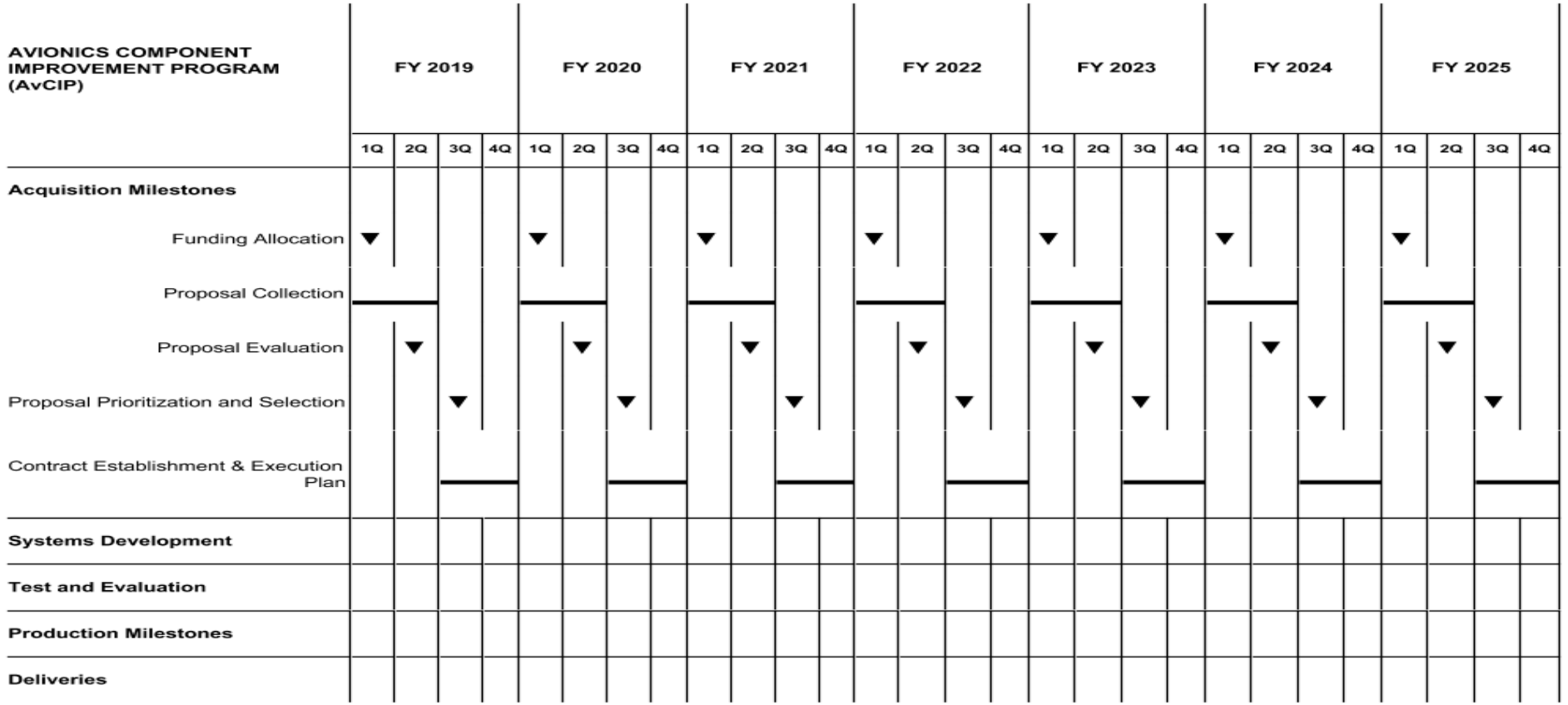
2021PB - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



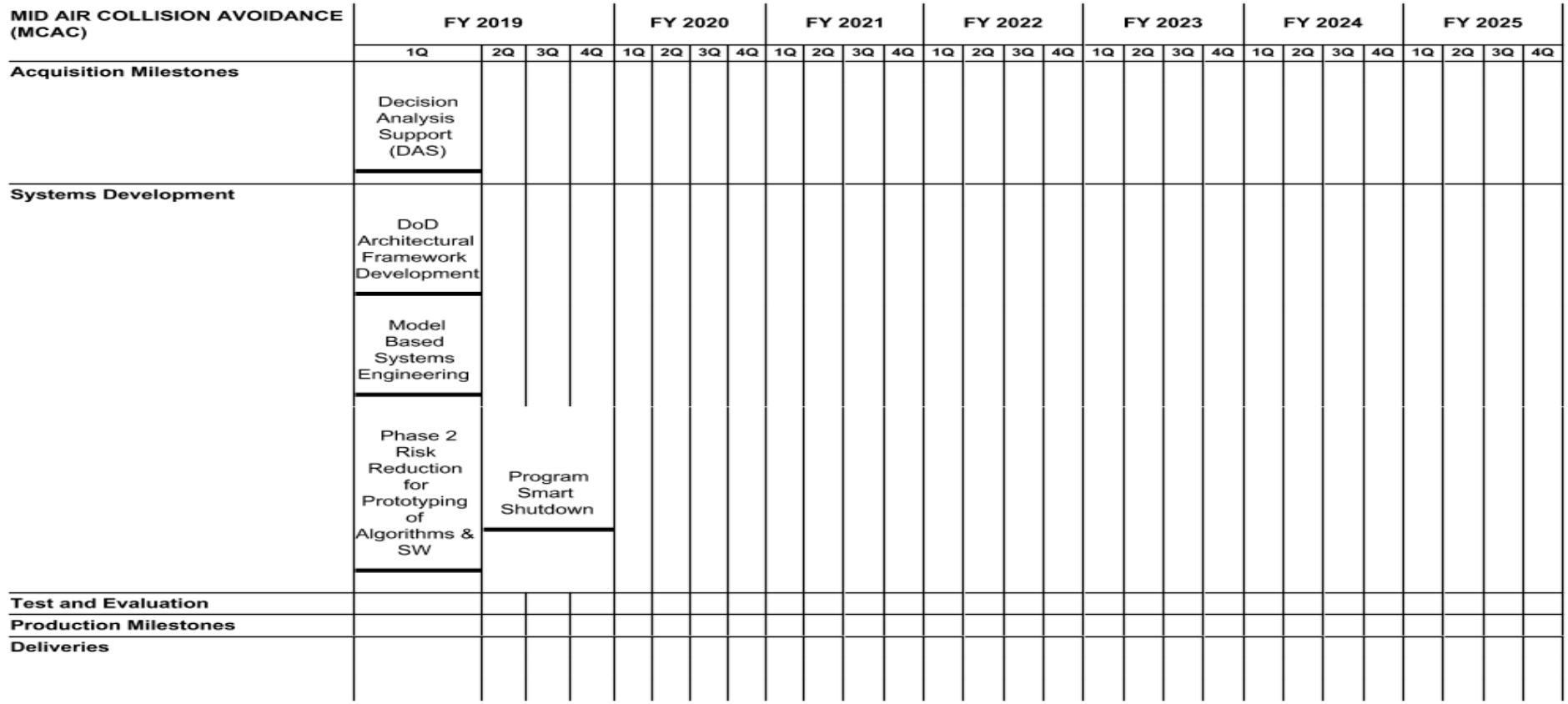
2021PB - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



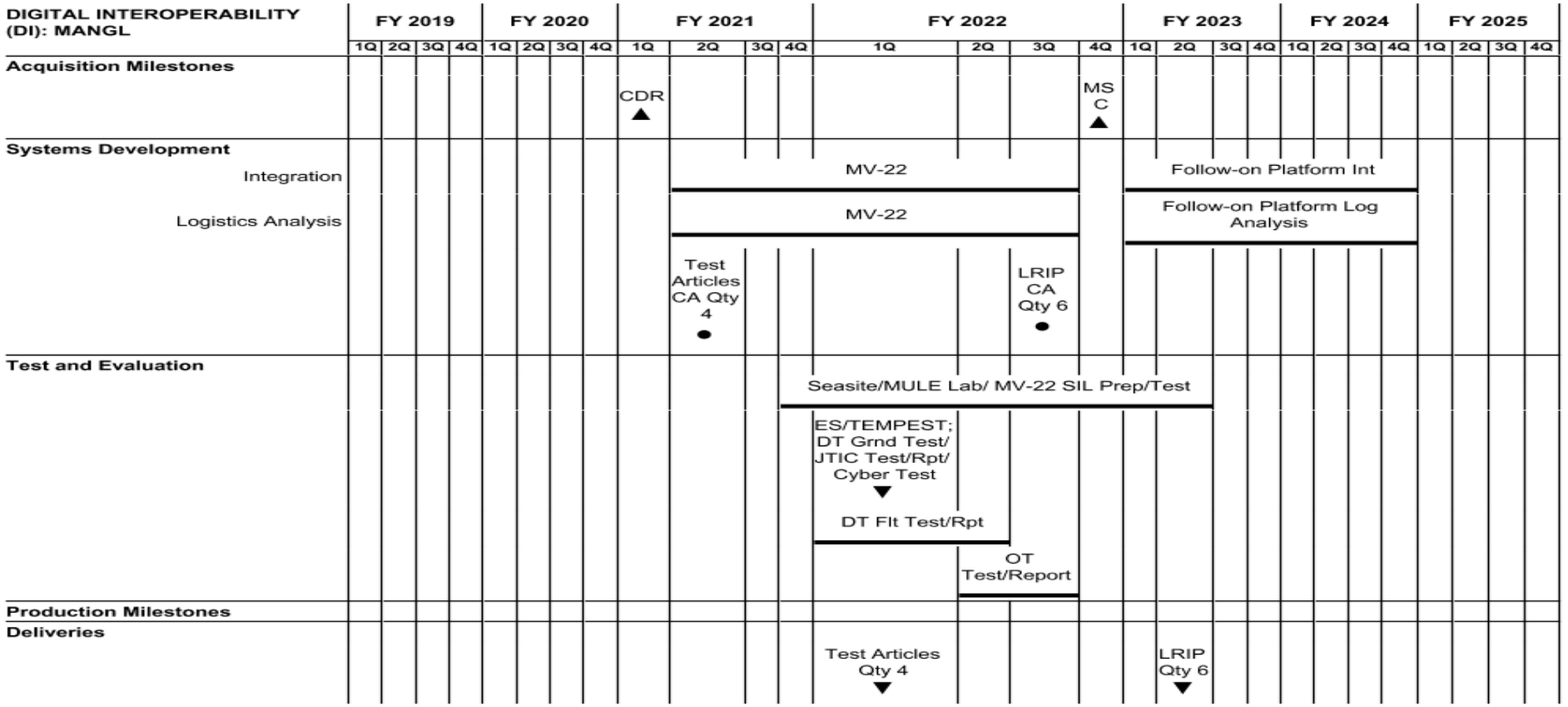
2021PB - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2021PB - 0605217N - 0572 MCAC Program Termination effective FY19 per N98, Ser N98/18U142416.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2021PB - 0605217N - 0572

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *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 CNS/ATM technologies and develop solutions to support platform integrations	1	2019	4	2025
Systems Development: Develop CNS/ATM Common Component to support RNP RNAV developmental platform requirements	1	2019	4	2019
Test and Evaluation: CNS/ATM technologies/certification of developmental platforms	1	2019	4	2019
Test and Evaluation: Integration/Certification of 8.33 kHz, MODE S, Reduced Vertical Separation Minimums (RVSM), RNP RNAV, and ADS-BO: for CH-53K	1	2019	4	2019
TACTICAL COMMUNICATIONS (TACCOM)				
Systems Development: GEN6 Integrated Waveform Satellite Communications (SATCOM) S/W Development	1	2019	2	2020
Systems Development: Crypto Engine Integration	1	2019	4	2019
Systems Development: MIL Standard Evolution (VMF)	1	2021	4	2023
Systems Development: Tactical Anti-Jam (Saturn)	1	2019	2	2020
Systems Development: Transmission Security (TRANSEC) & Crypto Modernization w/ Tactical Secure Voice (TSV) Suite B	1	2019	4	2025
Test and Evaluation: Initial JITC Cert 2	2	2019	2	2019
Test and Evaluation: Delta NSA Cert 3	1	2020	1	2020
Test and Evaluation: Delta JITC Cert 3	3	2020	3	2020
Test and Evaluation: Delta NSA Cert 1	1	2021	1	2021
Test and Evaluation: Delta JITC Cert 4	3	2021	3	2021
Test and Evaluation: Delta NSA Cert 4	1	2022	1	2022
Test and Evaluation: Delta JITC Cert 5	3	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *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: Delta NSA Cert 5	1	2023	1	2023
Test and Evaluation: Delta JITC Cert 6	3	2023	3	2023
Test and Evaluation: Delta NSA Cert 6	1	2024	1	2024
Test and Evaluation: Delta JITC Cert 7	3	2024	3	2024
Test and Evaluation: Delta NSA Cert 7	1	2025	1	2025
Test and Evaluation: Delta JITC Cert 8	3	2025	3	2025
Production Milestones: Initial MUOS S/W	3	2019	3	2019
Production Milestones: OFP S/W Baseline	4	2020	4	2020
Production Milestones: OFP S/W ECP GEN5 3	4	2023	4	2023
Production Milestones: OFP S/W ECP GEN6 4	4	2024	4	2024
Production Milestones: OFP S/W ECP GEN5 5	4	2021	4	2021
Production Milestones: OFP S/W ECP GEN6 6	4	2022	4	2022
Production Milestones: OFP S/W ECP GEN5 7	4	2025	4	2025
GROUND PROXIMITY WARNING SYSTEM/TERRAIN AWARENESS WARNING SYSTEM (GPWS/TAWS)				
Acquisition Milestones: Milestones: H-60 Integration Contract	3	2020	3	2020
Acquisition Milestones: Milestones: V-22 Integration Contract	1	2023	1	2023
Acquisition Milestones: Milestones: H-60 MS C	3	2023	3	2023
Acquisition Milestones: Milestones: H-60 Fleet Release	4	2023	4	2023
Systems Development: H-60 TAWS II Software Development FB3	3	2020	3	2021
Systems Development: V-22 TAWS II Requirements Development FY19	1	2019	2	2019
Systems Development: V-22 TAWS II Requirements Development	4	2021	1	2022
Systems Development: TAWS II Software Re-Architecture	3	2019	1	2021
Systems Development: V-22 TAWS II Software Development FB1	1	2022	4	2023
Systems Development: V-22 TAWS II Software Development FB2	3	2024	3	2025
Systems Development: H-60 TAWS II Software Development FB4	1	2022	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: TAWS II Follow on Developmental Platforms	1	2025	4	2025
Test and Evaluation: Developmental Testing: Lockheed Martin SC 2.X Integration Testing FB3	4	2021	1	2022
Test and Evaluation: Developmental Testing: Lockheed Martin SC 2.X Integration Testing FB4	1	2023	2	2023
Test and Evaluation: Developmental Testing: Boeing/Raytheon Integration Testing FB1	4	2023	1	2024
Test and Evaluation: Developmental Testing: Boeing/Raytheon Integration Testing FB2	3	2025	3	2025
Test and Evaluation: Developmental Testing: H-60 TAWS II DT 3	1	2022	2	2022
Test and Evaluation: Developmental Testing: H-60 TAWS II DT 4	2	2023	3	2023
Test and Evaluation: Developmental Testing: V-22 TAWS II DT 1	1	2024	3	2024
Test and Evaluation: Developmental Testing: V-22 TAWS II DT 2	3	2025	4	2025
Production Milestones: H-60 Integrated Logistics Assessment	4	2022	1	2023
AVIONICS COMPONENT IMPROVEMENT PROGRAM (AvCIP)				
Acquisition Milestones: Funding Allocation: Funding Allocation2	1	2025	1	2025
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: Funding Allocation: Funding Allocation1	1	2024	1	2024
Acquisition Milestones: Proposal Collection: Proposal Collection1	1	2024	2	2024
Acquisition Milestones: Proposal Collection: Proposal Collection2	1	2025	2	2025
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

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *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 Evaluation: Proposal Evaluation2	2	2025	2	2025
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 Evaluation: Proposal Evaluation8	2	2024	2	2024
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection2	3	2025	3	2025
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection3	3	2019	3	2019
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: Proposal Prioritization and Selection: Proposal Prioritization and Selection8	3	2024	3	2024
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan2	3	2025	4	2025
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

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *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: 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
Acquisition Milestones: Contract Establishment & Execution Plan: Conract Establishment & Execution Plan8	3	2024	4	2024
MID AIR COLLISION AVOIDANCE (MCAC)				
Acquisition Milestones: Decision Analysis Support (DAS)	1	2019	1	2019
Systems Development: DoD Architectural Framework Development	1	2019	1	2019
Systems Development: Model Based Systems Engineering	1	2019	1	2019
Systems Development: Phase 2 Risk Reduction for Prototyping of Algorithms & SW	1	2019	1	2019
Systems Development: Program Smart Shutdown	2	2019	4	2019
DIGITAL INTEROPERABILITY (DI): MANGL				
Acquisition Milestones: CDR	1	2021	1	2021
Acquisition Milestones: Milestone C	4	2022	4	2022
Systems Development: Integration: MV-22	2	2021	3	2022
Systems Development: Integration: Follow-on Platform Integration	1	2023	4	2024
Systems Development: Logistics Analysis: MV-22	2	2021	3	2022
Systems Development: Logistics Analysis: Follow-on Platform Logistics Analysis	1	2023	4	2024
Systems Development: Logistics Analysis: Test Articles CA Qty 4	2	2021	2	2021
Systems Development: Logistics Analysis: LRIP CA Qty 6	3	2022	3	2022
Test and Evaluation: Seasite/MULE Lab/ MV-22 SIL Prep/Test	4	2021	2	2023
Test and Evaluation: ES/TEMPEST; DT Ground Test/ JTIC Test/Report/ Cyber Test	1	2022	1	2022
Test and Evaluation: DT Flight Test/Report	1	2022	2	2022
Test and Evaluation: OT Test/Report	2	2022	3	2022
Deliveries: Test Articles Qty 4	1	2022	1	2022
Deliveries: LRIP Qty 6	2	2023	2	2023