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 0604270N *I Electronic Warfare (EW) Dev*							
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	1,060.821	86.719	114.349	134.194	-	134.194	119.285	107.202	103.289	105.363	Continuing	Continuing
0556: *EW Counter Response*	505.101	21.600	42.673	48.197	-	48.197	21.867	22.094	22.548	23.001	Continuing	Continuing
1742: *EW Technical Development and T&E*	5.411	1.762	1.764	1.613	-	1.613	1.649	1.683	1.718	1.753	Continuing	Continuing
2175: *Tactical Air Electronic Warfare*	500.877	43.713	48.624	63.948	-	63.948	73.228	57.449	53.350	54.419	0.000	895.608
3308: *Technology Development*	2.276	6.085	6.238	8.366	-	8.366	8.532	9.037	8.987	9.168	Continuing	Continuing
3309: *Assault Survivability Optimization*	4.332	0.833	6.910	0.828	-	0.828	0.879	0.896	0.913	0.932	Continuing	Continuing
3327: *MAGTF EW Aviation Development*	39.598	12.362	7.677	10.036	-	10.036	12.118	15.006	14.716	15.011	Continuing	Continuing
3371: *MAGTF EW Interoperability Development*	3.226	0.364	0.463	1.206	-	1.206	1.012	1.037	1.057	1.079	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 418												

A. Mission Description and Budget Item Justification

This program element includes development of Electronic Warfare (EW) systems for the United States Navy (USN), United States Marine Corps (USMC), and United States Army tactical aircraft, USMC helicopters, surface combatants, data link vulnerability assessments, precision targeting, USN and USMC radio frequency jammers, and development and testing of electronic warfare devices for emerging threats and emergency contingencies. This element also includes: development of hardware/ software solutions that link on-board integrated Aircraft Survivability Equipment (iASE) that are compatible with mission planning information and systems; studies, analysis and evaluations of current and future aircraft threats and Advanced EW Suite capabilities; modeling and simulation for improved countermeasure capabilities, and development and testing to address new and emerging threats. The projects in this element improve the ability of the Joint Force to strike diverse targets inside adversary air and missile defense networks to destroy mobile power-projection platforms and enhance close combat lethality in complex terrain.
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 requirement prior to full-rate production decision.

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 0604270N *I Electronic Warfare (EW) Dev*	

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	83.624	116.811	190.776	-	190.776
Current President's Budget	86.719	114.349	134.194	-	134.194
Total Adjustments	3.095	-2.462	-56.582	-	-56.582
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.462			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.850	0.000			
• SBIR/STTR Transfer	-1.755	0.000			
• Program Adjustments	0.000	0.000	-56.408	-	-56.408
• Rate/Misc Adjustments	0.000	0.000	-0.174	-	-0.174

Change Summary Explanation

The FY 2021 funding request was reduced by $7.194 million to account for the availability of prior year execution balances.

Schedule:
Project Unit 2175 / Tactical Air Electronic Warfare:
Acquisition Milestones: ALQ-214 SW Improvement Fielding Decision moved from 3rd Qtr. FY 2019 to 4th Qtr. FY 2020 due to Software delays. ALQ-214 Adaptive Radar Countermeasures (ARC) Requirements Definition changed to Requirements Definition Award in 2nd Qtr. FY 2019. ALQ-214 ARC Full Operational Capability (FOC) changed from 2nd Qtr. FY 2023 to 4th Qtr. FY 2025. ARC FOC schedule has been adjusted to allow for incremental SW development off ramps enabling iterative fleet released capabilities. Dual Band Decoy (DBD) Risk Reduction Contract Award added to 3rd Qtr. FY 2021. DBD Production Contract Award moved from 4th Qtr. FY 2023 to 3rd Qtr. FY 2022 for schedule correction. DBD Initial Operational Capability (IOC) - Early Operational Capability (EOC moved from 4th Qtr. FY 2023 to 2nd Qtr FY 2024 due to the delay in EMD award.
Systems Development: ALQ-214 Software (SW) Improvement Development end date changed from 2nd Qtr. FY 2019 to 3rd Qtr. FY 2020 due to software delays. ALQ-214 ARC Development Phase II added in 3rd Qtr. FY 2020. Phase II ARC integration with the F/A-18E/F Mission Computer for improved situational awareness will occur through 4th Qtr. FY 2025. DBD Prototype Demonstrations changed from 1st Qtr. FY 2021 through 3rd Qtr. FY 2021 to 3rd Qtr. FY 2020 through 4th Qtr. FY 2021 due to early demonstration lab testing. DBD EMD end date moved from 4th Qtr. FY 2024 to the 2nd Qtr. of FY 2025 due to the delay in EMD award. DBD Design Reviews 1 and 2 have moved from 1st Qtr. FY 2022 and 3rd Qtr. FY 2022 to 3rd Qtr. FY 2022 and 1st Qtr. FY 2023 due to the delay in EMD award.
Test and Evaluation: ALQ-214 SW Improvement Testing DT/IT end date changed from 2nd Qtr. FY 2019 to 3rd Qtr. FY 2020 due to software delays. ALQ-214 SW Improvement Testing DT/IT on the C/D aircraft changed from 1st. Qtr FY 2020 to 4th Qtr. FY 2020 ending in 1st Qtr. FY 2021 due to software delays. ARC DT/IT added 4th Qtr. FY 2019 through 3 Qtr. FY 2020 in support of Quick Reaction Capability (QRC) load.
DBD Testing: DBD Verification, Correction of Deficiencies will begin in 4th Qtr. FY 2024 ending in 4th Qtr. FY 2025.

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 0604270N *I Electronic Warfare (EW) Dev*

Production Milestones: DBD Contract Awards Low Rate Initial Production (LRIP) changed to Early Operational Capability (EOC) and includes EOC 2 and EOC 3 beginning in the 3rd Qtr. FY 2023 ending in the 2nd Qtr FY 2026.

Project Unit 3308 / Technology Development: Acquisition Milestones: FY 2018, FY 2019 Operational Flight Profile (OFP), Electronic Warfare (EW) FY 2018 Suite OFP Release, and FY 2018 System Development Analysis have been incorporated into EW 2019 and FY 2020 OFP Efforts. FY 2020 and FY 2021 Target Generator moved to 2nd Qtr. FY 2021 and FY 2022 due to continued Digital Radio Frequency Memory (DFRM) Target Generator Requirements Analysis & Planning.
Test and Evaluation: Suite Level Electronic Countermeasures (ECM) Testing was added from 2nd Qtr. FY 2019 through 4th Qtr. FY 2024 due to continuous ECM testing. Threat Simulation and Test Assets: DFRM Target Generator Development is now DRFM Target Generator Requirements Analysis & Planning.

Project Unit 3309 / Assault Survivability Optimization: FY 2020 AH-1Z/UH-1Y and MV-22 flight test moved from 2nd/3rd Qtr to 3rd/4th Qtr based on aircraft and test range availability and to combine test with other service aircraft to reduce cost and maximize national asset seeker test vans. FY 2020 F/A-18E/F air to air flight test moved from 2nd/3rd Qtr to 3rd/4th Qtr due to range availability and combining test with F-35 flight test.

Project Unit 3327 / MAGTF EW Aviation Development: BLK X has been broken out into a rack-mounted system and a modular podded system. AN/ALQ-231(V)1 BLK X Developmental Test of rack-mounted system will complete 4th Qtr FY 2020; AN/ALQ-231(V)1 BLK X Operational Test of rack-mounted system will complete 1st Qtr FY 2021; AN/ALQ-231(V)1 BLK X Developmental Test of modular podded system will complete 2nd Qtr FY 2022; AN/ALQ-231(V)1 BLK X Operational Test of modular podded system will complete 4th Qtr FY 2022. Jammer Techniques Technical Evaluation and Threat Emulator/Simulator efforts began 2nd QTR FY 2019.

Project Unit 3371 / Spiral 2 request for proposal added from 1QTR FY20 to 2QTR FY20 to support transition of Spiral 2 to Program of Record

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 0556 / *EW Counter Response*	

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
0556: *EW Counter Response*	505.101	21.600	42.673	48.197	-	48.197	21.867	22.094	22.548	23.001	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Jammer Techniques Optimization (JATO) organization produces the jamming techniques and Electronic Attack (EA) optimization algorithms that are critical for current and future Airborne Electronic Attack (AEA) systems of the United States Navy (USN) and United States Marine Corps (USMC) to execute the evolving AEA mission. Through Modeling & Simulation (M&S), laboratory testing, and field testing, JATO optimizes parameters for existing EA systems (such as AN/ALQ-99 Tactical Jamming System (TJS) and the AN/ALQ-231(V) Intrepid Tiger II Family of Systems) to best counter existing threats, and applies that knowledge to define the requirements for follow-on AEA systems such as the Next Generation Jammer Mid-Band (NGJ-MB) and Next Generation Jammer Low Band (NGJ-LB) programs. As commercial and military Radio Frequency (RF) threats evolve and proliferate, the JATO organization provides updated tactics, techniques, and procedures to maximize the potency of USN and USMC AEA in meeting the Combatant Command (COCOM) Commanders' EW priorities, to include highly contested environments, Force Protection, Information Operations, and enhanced communications jamming. (Classified discussion available upon request).

JATO's Advanced Techniques Group (ATG) focuses specifically on electronic countermeasures to advanced threat weapon systems and Command, Control, and Communications (C3) networks that are challenging existing EA approaches, and how to best apply advances in geolocation and unknown threat characterization to EA responses. Additional efforts include risk reduction activities to evaluate and minimize EA interference with US weapons systems, and research/technology studies in support of upgrades to existing AEA systems such as the AN/ALQ-99 TJS.

The Electronic Warfare (EW) Advanced Capability Development project focuses on increasing the Department of the Navy's understanding and utilization of rapidly-evolving technologies that operate in the Electromagnetic spectrum. As commercial and military Radio Frequency (RF) threats evolve and proliferate, this project tracks the relevant technology, intelligence, and tactics to maximize the potency of USN and USMC AEA through the rapid insertion of emergent technologies into existing AEA weapon systems and aircraft platforms.

The Special Capability Pod (SCP) project leverages existing Navy and Joint Service investments and focuses on continued development, test and evaluation of SCPs for highly flexible Electronic Warfare (EW) on USN EA-18G aircraft. Initial efforts to develop Navy pod variants were funded by the Air Force in FY18 as an OSD initiative. The SCPs will be specifically designed to address EW capability gaps and counter emerging electronic threats. As an iterative program, the highly modular interior design of the SCPs allows them to be integrated with current technology and upgraded electronics to provide the USN a rapidly adaptable solution against highly specialized and continuously evolving threats. (Classified discussion available upon request.)

The Electromagnetic Maneuver Warfare (EMW) Resource Allocation Management (RAM) project develops a software application to interface with the display in the cockpit of the EA-18G. The software application will provide the aircrew with smart decision aids in flight to enhance EW capability and survivability, optimized flight profiles, and jamming effectiveness in highly contested environments. EMW RAM efforts are being conducted as a collaborative project with Australia under the Airborne Multi-Platform Electronic Warfare Project Arrangement.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Jammer Techniques Optimization (JATO)	19.659	16.505	16.835	0.000	16.835
Articles:	-	-	-	-	-
FY 2020 Plans: The JATO organization will continue engineering development and test support of existing and emerging systems such as the EA-18G, and AN/ALQ-249 (NGJ-MB) to address potential RF and Cyber/EW effects on current and evolving radar/communications threats. JATO will continue to generate tactics, techniques, and procedures to optimize the capabilities of systems such as, but not limited to, the AN/ALQ-99, ALQ-218, ALQ-227, AN/ALQ-231(V), and Unmanned Aerial Systems (UAS) payloads. JATO continues to meet COCOM Commanders' EW priorities including support for Overseas Contingency Operations and Force Protection. (Classified discussion available upon request).					
FY 2021 Base Plans: The JATO organization will continue engineering development and test support of existing and emerging systems such as, but not limited to, the EA-18G, AN/ALQ-249 (NGJ-MB) and Next Generation Jammer Low Band (NGJ-LB) to address potential RF and Cyber/EW effects on current and evolving radar/communications threats. JATO will continue to generate tactics, techniques, and procedures to optimize the capabilities of systems such as, but not limited to, the AN/ALQ-99, ALQ-218, ALQ-227, AN/ALQ-231(V), and Unmanned Aerial Systems (UAS) payloads. JATO continues to meet COCOM Commanders' EW priorities including support for Overseas Contingency Operations and Force Protection. (Classified discussion available upon request).					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding increase from FY 2020 to FY 2021 due to inflation.					
Title: Electronic Warfare (EW) Advanced Development	1.941	9.443	4.541	0.000	4.541
Articles:	-	-	-	-	-
FY 2020 Plans: Efforts in FY 2020 include initial hardware and software prototyping, engineering, and multi-system effects characterization for capabilities into systems including, but not limited to, the AN/ALQ-99, AN/ALQ-231, AN/ALQ-249, NGJ-LB, and other manned and unmanned aircraft payloads to address existing capability gaps on COCOM Integrated Priority Lists. (Classified discussion available upon request).					
FY 2021 Base 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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Efforts in FY 2021 include initial hardware and software prototyping, engineering, and multi-system effects characterization for capabilities into systems including, but not limited to, the AN/ALQ-99, AN/ALQ-231, AN/ALQ-249, NGJ-LB, and other manned and unmanned aircraft payloads to address existing capability gaps on COCOM Integrated Priority Lists. FY 2021 funding supports research, development, integration and test and evaluation of advanced technologies into current, and future, Airborne Electronic Attack (AEA) weapons systems in laboratory and operational environments. (Classified discussion available upon request). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreases in FY 2021 as FY 2020 funded efforts such as laboratory updates for unique test equipment, threat target emulators and stand up of facilities at heightened security levels complete.					
Title: Special Capability Pod (SCP)	0.000	16.600	26.181	0.000	26.181
Articles:	-	-	-	-	-
Description: The Special Capability Pods (SCPs) project leverages other ongoing Navy and Joint Service investments and focuses on continued development, test and evaluation of rapidly repurposable pods for highly flexible Airborne Electronic Attack capability. ***FY 2020 Plans:*** Efforts in FY 2020 will result in the delivery of initial technology demonstration prototypes. (Classified discussion available upon request). ***FY 2021 Base Plans:*** FY 2021 efforts for SCP include continued test and evaluation of the initial two prototypes delivered in FY 2020, as well as development and lab/flight demonstration of alternate payloads with various research labs and industry partners. SCP software and operator interface will also be updated based on Fleet TTP development during integrated testing and the initial operational deployment of SCP in FY 2020. Additional SCPs will be built to support a limited contingency capability for COCOM Commanders, including potential flight test to enable carrier-based deployment with embarked EA-18G squadrons. (Classified discussion available upon request.) ***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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding increases in FY 2021 to continue T&E on prototype SCPs delivered in FY 2020 and develop new SCP configurations, incorporating mature technologies to provide additional capabilities against advanced adversary systems.					
Title: Electromagnetic Manuever Warfare (EMW) Resource Allocation Manager (RAM) ***Articles:***	0.000 -	0.125 -	0.640 -	0.000 -	0.640 -
Description: The Department of Navy is developing dynamic Electromagnetic Maneuver Warfare (EMW) Resource Allocation Management (RAM) applications to increase operators effectiveness in the Electromagnetic Spectrum (ES). ***FY 2020 Plans:*** FY 2020 efforts includes development of defined Electronic Warfare (EW) architecture framework. (Classified discussion available upon request). ***FY 2021 Base Plans:*** Continue development of EMW RAM architecture framework. Consolidate and analyze data collected during algorithm demonstration. Initial implementation of the EMW RAM platform agnostic algorithms into specific aircraft systems and sub-systems or designated surrogate hardware. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY20 to FY21 is required to consolidate data collected during the EMW RAM platform agnostic algorithm demonstration.					
Accomplishments/Planned Programs Subtotals	21.600	42.673	48.197	0.000	48.197

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/0513: *AEA Systems*	40.182	33.843	21.061	-	21.061	27.203	25.002	25.103	25.394	99.004	677.051

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

D. Acquisition Strategy

The JATO organization, comprised of a partnership between the Government and several University Affiliated Research Centers, continues to research EW tactics and techniques. The JATO prime delivery order, a cost plus fixed fee contract that covers the period of FY 2017 through FY 2021, was awarded to Johns Hopkins University in 4th Qtr. FY 2017.

The Electronic Warfare (EW) Advanced Capability Development project will investigate developmental and existing technologies from commercial and governmental sources for integration into current and emerging USN and USMC EW weapon systems and aircraft. These technologies, once demonstrated to have sufficient maturity, will transition into the applicable acquisition programs. Additionally, the project will pursue technology development and demonstration through rapid acquisition or Speed to Fleet initiatives to the greatest extent possible.

The Special Capability Pod (SCP) project leverages existing Navy and Joint Service investments and focuses on continued development, test and evaluation of SCPs for highly flexible Electronic Warfare (EW) on USN EA-18G aircraft. Initial efforts to develop Navy pod variants were funded by the Air Force in FY18 as an OSD initiative. The SCPs will be specifically designed to address EW capability gaps and counter emerging electronic threats. As an iterative program, the highly modular interior design of the SCPs allows them to be integrated with current technology and upgraded electronics to provide the USN a rapidly adaptable solution against highly specialized and continuously evolving threats. (Classified discussion available upon request.)

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

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 HDW Development - SCP	Various	Various : Various	0.000	0.000		10.343	Nov 2019	14.180	Nov 2020	-		14.180	Continuing	Continuing	Continuing
Systems Engineering	WR	Naval Research Lab : Maryland	15.810	1.893	Nov 2018	1.931	Nov 2019	1.969	Nov 2020	-		1.969	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	24.741	4.859	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : Point Mugu, CA	93.061	4.347	Nov 2018	7.792	Nov 2019	7.466	Nov 2020	-		7.466	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : China Lake, CA	0.000	0.000		2.400	Nov 2019	3.461	Nov 2020	-		3.461	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC Det : Crane, IN	11.601	0.390	Nov 2018	1.498	Nov 2019	1.710	Nov 2020	-		1.710	Continuing	Continuing	Continuing
Systems Engineering	Various	Various : Various	14.893	0.425	Nov 2018	1.789	Nov 2019	1.824	Nov 2020	-		1.824	Continuing	Continuing	Continuing
Prior Year Development cost no longer Funded in the FYDP	Various	Various : Various	263.147	0.000		0.000		0.000		-		0.000	0.000	263.147	-
		Subtotal	423.253	11.914		25.753		30.610		-		30.610	Continuing	Continuing	N/A

Remarks

Funding increases from FY 2020 to FY 2021 due to additional developmental Special Capability Pods (SCP) being built to expand the capability package addressing additional threats.

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
Development Support - Jammer Techniques Optimization (JATO)	SS/CPFF	Johns Hopkins Unv : Maryland	49.578	4.120	Dec 2018	4.202	Dec 2019	4.286	Dec 2020	-		4.286	Continuing	Continuing	Continuing
Development Support - EW Advanced Development	SS/CPFF	Johns Hopkins Unv : Maryland	0.000	0.000		2.481	Dec 2019	1.118	Dec 2020	-		1.118	Continuing	Continuing	Continuing

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

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
Development Support - Jammer Techniques Optimization (JATO)	SS/CPFF	GTRI : Atlanta, GA	0.987	0.400	Dec 2018	0.800	Dec 2019	0.816	Dec 2020	-		0.816	Continuing	Continuing	Continuing
Development Support - EW Advanced Development	SS/CPFF	GTRI : Atlanta, GA	0.000	0.000		2.000	Dec 2019	0.806	Dec 2020	-		0.806	Continuing	Continuing	Continuing
Eng & Tech Srvc	Various	Various : Various	20.285	1.074	Dec 2018	1.816	Dec 2019	2.443	Dec 2020	-		2.443	Continuing	Continuing	Continuing
Prior year Support costs no longer funded in the FYDP	Various	Various : Various	2.256	0.000		0.000		0.000		-		0.000	0.000	2.256	-
		Subtotal	73.106	5.594		11.299		9.469		-		9.469	Continuing	Continuing	N/A

Remarks

Funding decreases from FY 2020 to FY 2021 due to reduced advanced development support required from University Affiliated Research Centers (UARC).

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
JATO Flight Test	WR	NAWCWD : Point Mugu, CA	2.642	1.620	Nov 2018	1.652	Nov 2019	1.685	Nov 2020	-		1.685	Continuing	Continuing	Continuing
JATO Ground/Lab Test	WR	NAWCWD : Point Mugu, CA	4.058	1.610	Nov 2018	1.642	Nov 2019	1.675	Nov 2020	-		1.675	Continuing	Continuing	Continuing
JATO Flight Test	WR	Various : Various	0.354	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
SCP Test	WR	Various : Various	0.000	0.000		1.157	Nov 2019	3.568	Nov 2020	-		3.568	Continuing	Continuing	Continuing
Advanced Development Test	WR	NAWCAD : Patuxent River, MD	0.000	0.795	May 2019	1.020	Nov 2019	1.040	Nov 2020	-		1.040	Continuing	Continuing	Continuing
		Subtotal	7.054	4.025		5.471		7.968		-		7.968	Continuing	Continuing	N/A

Remarks

Funding increases from FY 2020 to FY 2021 due to SCP test events against advanced adversary systems.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

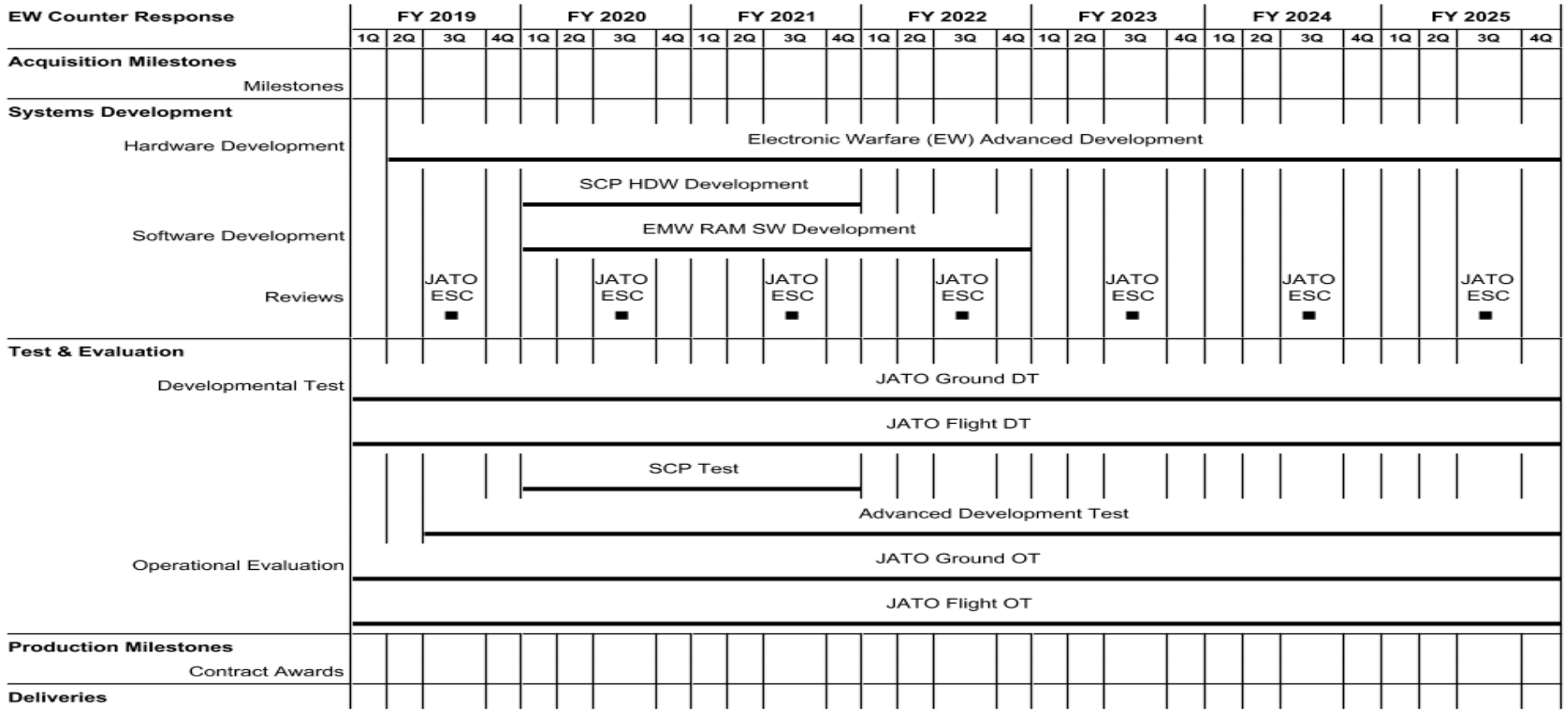
Management Services ($ in Millions)

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
Program Management Support	WR	Various : Various	1.348	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Travel	WR	Various : Various	0.340	0.067	Oct 2018	0.150	Oct 2019	0.150	Oct 2020	-		0.150	Continuing	Continuing	Continuing
		Subtotal	1.688	0.067		0.150		0.150		-		0.150	Continuing	Continuing	N/A

	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	505.101	21.600		42.673		48.197		-		48.197	Continuing	Continuing	N/A

Remarks

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*



2021DON - 0604270N - 0556

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EW Counter Response				
Systems Development: Hardware Development: Electronic Warfare (EW) Advanced Development	2	2019	4	2025
Systems Development: Hardware Development: Special Capability Pod (SCP) Hardware Development	1	2020	4	2021
Systems Development: Software Development: Electromagnetic Manuever Warfare (EMW) Resource Allocation Manager (RAM) Development	1	2020	4	2022
Systems Development: Reviews: JATO Executive Steering Committee 2019	3	2019	3	2019
Systems Development: Reviews: JATO Executive Steering Committee 2020	3	2020	3	2020
Systems Development: Reviews: JATO Executive Steering Committee 2021	3	2021	3	2021
Systems Development: Reviews: JATO Executive Steering Committee 2022	3	2022	3	2022
Systems Development: Reviews: JATO Executive Steering Committee 2023	3	2023	3	2023
Systems Development: Reviews: JATO Executive Steering Committee 2024	3	2024	3	2024
Systems Development: Reviews: JATO Executive Steering Committee 2025	3	2025	3	2025
Test & Evaluation: Developmental Test: JATO Ground Developmental Test	1	2019	4	2025
Test & Evaluation: Developmental Test: JATO Flight Developmental Test	1	2019	4	2025
Test & Evaluation: Developmental Test: SCP Test	1	2020	4	2021
Test & Evaluation: Developmental Test: Advanced Development Test	3	2019	4	2025
Test & Evaluation: Operational Evaluation: JATO Ground Operational Test	1	2019	4	2025
Test & Evaluation: Operational Evaluation: JATO Flight Operational Test	1	2019	4	2025

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 1742 / *EW Technical Development and T&E*	

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
1742: *EW Technical Development and T&E*	5.411	1.762	1.764	1.613	-	1.613	1.649	1.683	1.718	1.753	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funds provided for Electronic Warfare systems for the United States Navy (USN), United States Marine Corps (USMC), and United States Army tactical aircraft, USMC helicopters, surface combatants, data link vulnerability assessments, precision targeting, USN and USMC radio frequency jammers, and development and testing of electronic warfare devices for emerging threats and emergency contingencies. The development of Aircraft Survivability Equipment (ASE) and Electronic Warfare (EW) countermeasures solutions for the USN, USMC and Coalition Aircraft include studies and evaluations of current and future aircraft threats, modeling and simulation for improved countermeasure capabilities, and development and testing to address new and emerging threats. (More details available at a higher classification upon request).

Funds also provide for quick reaction prototyping of tactical information and electronic warfare systems. (Details held at a higher classification). Systems address various requirements across multiple platforms (air, surface, and subsurface), airborne and surface cryptologic operational requirements, and joint missions to research, assess, and develop information warfare and electronic warfare systems and capabilities. These systems/capabilities provide information dominance to friendly forces during conflict necessary for successful mission accomplishment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Electronic Warfare Technical Development and Test & Evaluation	1.762	1.764	1.613	0.000	1.613
Articles:	-	-	-	-	-
FY 2020 Plans: *Engineer development and test support efforts of existing and emerging systems such as the EA-6B, EA-18G, and Next Generation Jammer to address potential Radio Frequency (RF) and Cyber/EW effects on current and evolving radar/communications threats. *Generate techniques, tactics, and procedures to optimize the capabilities of systems such as, but not limited to, the AN/ALQ-99, USQ-113, ALQ-218, ALQ-227, AN/ALQ-231, ALE-43; assist in requirements definitions of emerging AEA systems. *Conduct technical studies and analysis in the form of Hack-a-thon event(s). (Details held at a higher classification).					
FY 2021 Base 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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
*Increase ongoing engineering development activities and continue test support efforts of existing and emerging systems such as the EA-6B, EA-18G, and Next Generation Jammer to address potential RF and Cyber/EW effects on current and evolving radar/communications threats. *Generate any new techniques, tactics, and procedures to optimize the capabilities of systems such as, but not limited to, the AN/ALQ-99, USQ-113, ALQ-218, ALQ-227, AN/ALQ-231, ALE-43; assist in requirements definitions of emerging AEA systems. *Conduct reduced scope of technical studies and analysis in the form of Hack-a-thon event(s). (Details held at a higher classification, beyond GENSER). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY21 decrease is due to a shift in the scope of the studies and analysis contract supporting Electronic Warfare.					
Accomplishments/Planned Programs Subtotals	1.762	1.764	1.613	0.000	1.613

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Development of classified prototypes and special capabilities. The Navy is granted streamlined acquisition authority for the development of classified prototypes and special capabilities under the Deputy Assistant Secretary of the Navy (DASN) Command, Control, Communications, Computers, and Intelligence (C4I).

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

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
Development(1)	C/FP	Classified : classified	4.154	0.809	Oct 2018	0.887	Oct 2019	0.904	Oct 2020	-		0.904	Continuing	Continuing	Continuing
		Subtotal	4.154	0.809		0.887		0.904		-		0.904	Continuing	Continuing	N/A

Remarks

1-Due to classification category, will not be on GENSER classified exhibits.

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
Development Support	WR	NAVSEA : Maryland	0.300	0.300	Oct 2018	0.300	Jan 2020	0.300	Oct 2020	-		0.300	Continuing	Continuing	Continuing
Studies & Analysis(1)	C/CPFF	Classified : Classified	0.000	0.653	Oct 2018	0.577	Dec 2019	0.409	Oct 2020	-		0.409	Continuing	Continuing	Continuing
		Subtotal	0.300	0.953		0.877		0.709		-		0.709	Continuing	Continuing	N/A

Remarks

1-Due to classification category, will not be on GENSER classified exhibits.

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
Mod & Sim	C/CPFF	Classified : Classified	0.957	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.957	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

	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
Project Cost Totals	5.411	1.762		1.764		1.613		-		1.613	Continuing	Continuing	N/A

Remarks

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

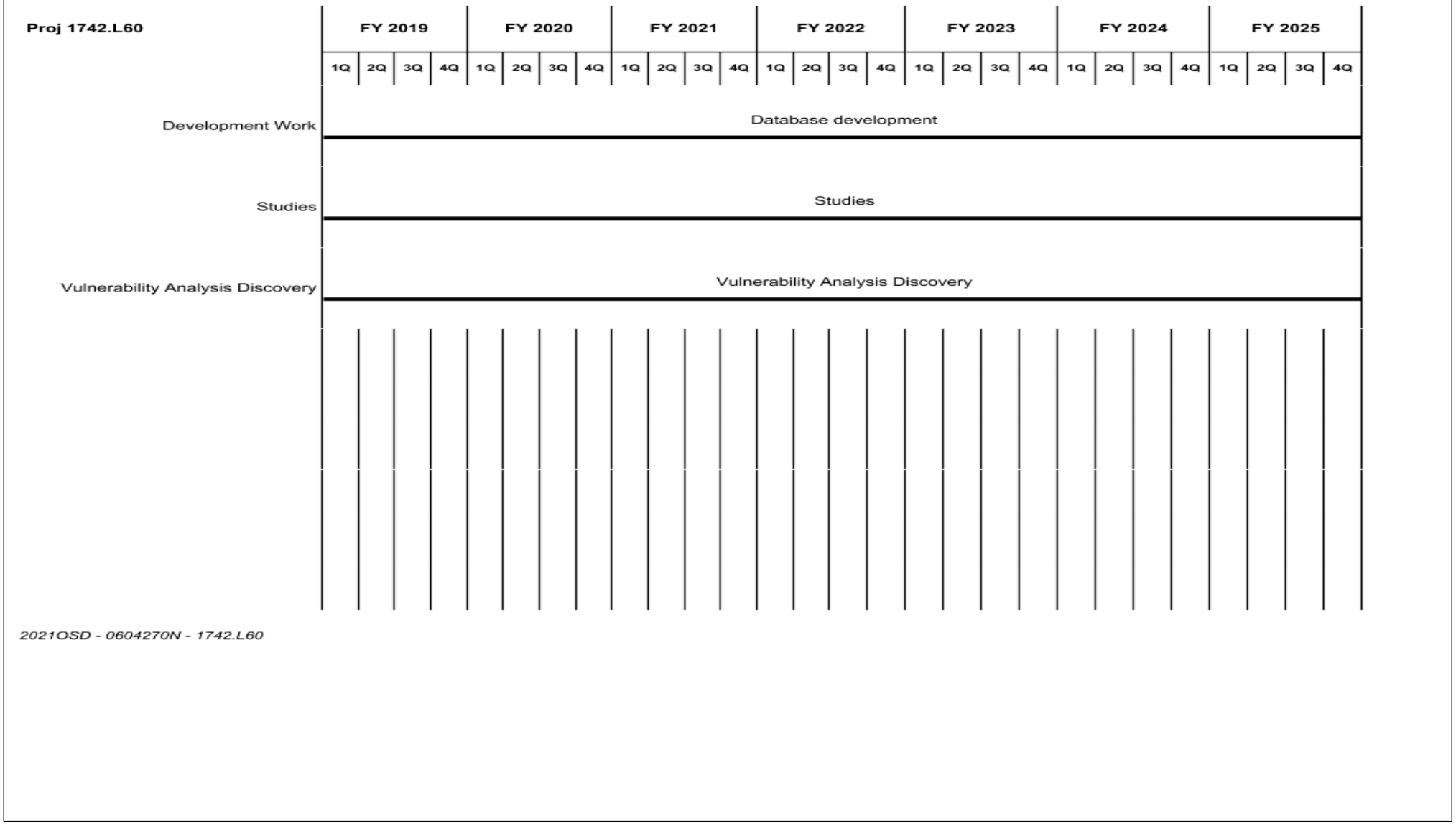


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1742.L60				
Development Work: Database development	1	2019	4	2025
Studies: Studies	1	2019	4	2025
Vulnerability Analysis Discovery: Vulnerability Analysis Discovery	1	2019	4	2025

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 2175 / *Tactical Air Electronic Warfare*	

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
2175: *Tactical Air Electronic Warfare*	500.877	43.713	48.624	63.948	-	63.948	73.228	57.449	53.350	54.419	0.000	895.608
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 418

A. Mission Description and Budget Item Justification

Integrated Defensive Electronic Countermeasures (IDECM) Block 4 (IB-4) is an Engineering Change Proposal (ECP) to the ALQ-214 to render it suitable for operation on F/A-18C/D aircraft (replacing the ALQ-126B and significantly improving F/A-18C/D survivability) while retaining all IDECM suite functionality when installed on F/A-18E/F aircraft. The IB-4 acquisition and contract strategy includes development of the Common On-Board Jammer for the F/A-18 C/D/E/F aircraft through sole source contract awards for modifications to the ALQ-214. IB-4, ALQ-214 ECP efforts include hardware and software design, development, integration and testing on the host aircraft. The F/A-18 EW suite includes the ALR-67 Radar Warning Receiver (RWR), the ALE-47 Countermeasures Dispensing Set (CMDS), the mission computer and other avionics.

ALQ-214 software improvement will provide the ALQ-214 with digital radio frequency memory (DRFM) technique capability significantly improving F/A-18C/D/E/F survivability. Acquisition and contract strategy includes development, integration and test of the ALQ-214 software improvements through sole-source contract award. Modifications to other F/A-18E/F Block II and Block III aircraft avionics may be required in order to develop and integrate this capability. These other avionics may include, but are not limited to, the ALR-67(V)2, ALR-67(V)3, ALE-47, ALE-50 AAED, ALE-55 FOTD, mission computer and fire control radar.

F/A-18 E/F ALQ-214 Adaptive Radar Countermeasures (ARC) will provide the ALQ-214 with improved Radio Frequency (RF) threat detection algorithms and jamming against modern threat radars. Modifications to other F/A-18E/F Block II and Block III aircraft avionics may be required in order to develop and integrate this capability. These other avionics may include, but are not limited to, the ALR-67(V)2, ALR-67(V)3, ALE-47, ALE-50 AAED, ALE-55 FOTD, mission computer and fire control radar.

The Dual Band Decoy (DBD) will provide expanded RF capability against current and emerging modern RF threat radars, significantly improving the survivability of the F/A-18 E/F. DBD will replace the current ALE-55 FOTD beginning with fielding of an Early Operational Capability in FY 2024. Modifications to other F/A-18E/F Block II and Block III aircraft avionics may be required in order to develop and integrate this capability. These other avionics may include, but are not limited to, the ALR-67(V)2, ALR-67(V)3, ALE-47, ALE-50 AAED, ALE-55 FOTD, mission computer and fire control radar.

This Project also includes/enables integrated Aircraft Survivability Equipment (iASE) which improves situational awareness for own-ship, wingman, and distributed command and control.
Projects in this element also includes studies, investigations, and analysis for Advanced Electronic Warfare (EW) Suite capabilities.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Tactical Air EW	43.713	48.624	63.948	0.000	63.948
Articles:	-	-	-	-	-
FY 2020 Plans: IDECM ARC Development, Integration and Test will be awarded 3rd Qtr. FY 2020 and continue until the target FOC in 4th Qtr. FY 2025. ARC FY 2020 plans will involve completion of the Systems Requirement Review (SRR) as well as final preparations for the execution of the Preliminary Design Review (PDR). Dual Band Decoy (DBD) Competitive Prototyping, Development, Integration and Test continues into FY 2021.					
FY 2021 Base Plans: FY21 - IDECM ARC Development, Integration and Test will continue until the target FOC in 4th Qtr. FY 2025. IOC incremental releases are planned for the ARC capability starting in FY 2021. FY 2021 funding supports Contractor ARC development, Organic laboratory/flight testing, Mission Data File Optimization and Multi-Spectral Defensive Electronic Warfare Systems Support Activity (MDEWSSA) Release Support. Dual Band Decoy (DBD) Competitive Prototyping continues through FY 2021, followed by a competitive EMD phase including Development, Integration and Test starting in FY 2022 continuing into FY 2025.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase of $15.324 Million due to the continued development, integration and testing of ARC and DBD.					
Accomplishments/Planned Programs Subtotals	43.713	48.624	63.948	0.000	63.948

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/0576 004-12: *Common On-Board Jammer*	66.854	45.314	42.387	-	42.387	49.543	50.427	52.021	21.498	10.185	810.394
• PANMC/0182: *Airborne Expendable CM*	23.712	14.698	0.000	-	0.000	25.802	46.085	46.997	47.933	Continuing	Continuing

Remarks

PANMC 0182 Air Expendables Countermeasures (CM) funding represents only a portion of the total PANMC 0182 Air Expendables CM Budget.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

D. Acquisition Strategy

IB-4 Engineering Change Proposal (ECP) and Software Improvement (SWIP) development contracts were awarded sole-source to Harris in 2009 and 2012 respectively. Harris is the original developer/manufacturer and current sustainer of the ALQ-214. Annual IB-4 production awards are planned through 2025.

ARC development contract is a sole source contract awarded to Leidos in 2019 and continuing through 2023. DBD development is planned as an evolutionary development approach with competitive prototyping phase which started in FY 2019 continuing through FY 2021, followed by a competitive EMD phase starting in FY 2022 continuing into FY 2025.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

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
Adaptive Radar Countermeasures (ARC) Development	SS/CPFF	Leidos : Arlington, VA	0.000	12.595	Jan 2019	9.691	Apr 2020	18.103	Dec 2020	-		18.103	64.476	104.865	104.865
Adaptive Radar Countermeasures (ARC) Development	SS/FFP	L3Harris : Clifton, NJ	0.000	1.844	Sep 2019	0.000		0.000		-		0.000	0.000	1.844	1.844
Dual Band Decoy Development	C/FFP	BAE : Nashua, NH	0.000	12.000	May 2019	13.940	Dec 2019	13.495	Nov 2020	-		13.495	0.000	39.435	39.435
Dual Band Decoy Development	C/FFP	Raytheon : Goleta, CA	0.000	12.000	Jun 2019	13.940	Jan 2020	9.550	Nov 2020	-		9.550	0.000	35.490	35.490
Dual Band Decoy Development EMD Risk Reduction	C/FFP	BAE : Nashua, NH	0.000	0.000		0.000		3.442	Apr 2021	-		3.442	0.000	3.442	3.442
Dual Band Decoy Development EMD Risk Reduction	C/FFP	Raytheon : Goleta, Ca	0.000	0.000		0.000		3.441	Apr 2021	-		3.441	0.000	3.441	3.441
Dual Band Decoy Development EMD	C/FFP	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	105.000	105.000	105.000
Prior Year Prod Dev costs no longer funded in FYDP	Various	Various : Various	307.712	0.000		0.000		0.000		-		0.000	0.000	307.712	-
		Subtotal	307.712	38.439		37.571		48.031		-		48.031	169.476	601.229	N/A

Remarks

IDECM ARC Requirements Definition began in FY 2019. Development, Integration and Test will begin in FY 2020 and continue into FY 2025. Contractor ARC development increase from FY 2020 to FY 2021 due to Organic laboratory/flight testing, Mission Data File Optimization and MDEWSSA Release Support beginning in FY 2021.
Dual Band Decoy (DBD) Competitive Prototyping, Development, Integration and Test started in FY 2019 and continues into FY 2021. The DBD Prototype Source Selection allowed for up to 3 awards, only 2 contracts were awarded (BAE and Raytheon). A competitive EMD phase will start in FY 2022 continuing into FY 2025.

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 2175 / *Tactical Air Electronic Warfare*	

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
Integrated Log Supt- ARC	WR	NAWCAD : Pax River, MD	0.000	0.000		0.057	Nov 2019	0.058	Nov 2020	-		0.058	0.242	0.357	-
Software Dev-ALQ - 214 SW Dev	SS/CPFF	L3Harris : Clifton, NJ	29.656	0.929	Apr 2019	0.000		0.000		-		0.000	0.000	30.585	30.585
Engineering Support	WR	Various : Various	2.413	0.249	Nov 2018	0.000		0.000		-		0.000	0.000	2.662	-
Engineering Support ARC	WR	Various : Various	0.000	1.416	Nov 2018	1.611	Nov 2019	3.140	Nov 2020	-		3.140	12.349	18.516	-
Engineering Support Dual Band Decoy	WR	Various : Various	0.000	2.067	Nov 2018	2.277	Nov 2019	1.576	Nov 2020	-		1.576	6.563	12.483	-
Software Dev-ALQ - 214 SW Dev	C/CPFF	GTRI : Atlanta GA	0.000	0.222	Dec 2018	0.000		0.000		-		0.000	0.000	0.222	0.222
Prior Year Support costs no longer funded in FYDP	Various	Various : Various	21.104	0.000		0.000		0.000		-		0.000	0.000	21.104	-
		Subtotal	53.173	4.883		3.945		4.774		-		4.774	19.154	85.929	N/A

Remarks

Software Dev - ALQ-214 SW Dev. Software Development challenges required additional funding to complete the effort.
IDECM ARC Support for Development, Integration and Test continues into FY 2025. Organic laboratory/flight testing, Mission Data File Optimization and MDEWSSA Release Support begins in FY 2021.
Dual Band Decoy (DBD) Support for Development, Integration and Test continues into FY 2025. DBD engineering support costs were refined in FY 2019 and FY 2020 to reflect actuals and updated cost projections.

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
Integrated Test & Eval ALQ-214 SW Imp	WR	NAWCWD : China Lake, CA	0.952	0.000		0.000		0.000		-		0.000	0.000	0.952	-
Integrated Test & Eval ALQ-214 SW Imp C/D Aircraft	WR	NAWCWD : China Lake, CA	0.000	0.000		4.000	Jun 2020	0.000		-		0.000	0.000	4.000	-
Oper Test & Eval IDECM	WR	NAWCWD : China Lake, CA	2.737	0.000		0.000		0.000		-		0.000	0.000	2.737	-

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

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
Eng & Tech Srvcs (Non-FFRDC)	SS/CPFF	Various : Various	2.453	0.032	Jan 2019	0.000		0.000		-		0.000	0.000	2.485	2.485
Dev Test & Eval Supt ARC	WR	Various : Various	0.000	0.000		1.303	Dec 2019	6.076	Nov 2020	-		6.076	0.000	7.379	-
Integrated Test & Eval ARC	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	6.465	6.465	-
Oper Test & Eval ARC	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	10.309	10.309	-
Oper Test & Eval ARC (VX-9)	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	6.900	6.900	-
Dev Test & Eval Supt Dual Band Decoy	WR	Various : Various	0.000	0.000		1.250	Nov 2019	4.500	Nov 2020	-		4.500	4.961	10.711	-
Integrated Test & Eval Dual Band Decoy	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	2.115	2.115	-
Oper Test & Eval Dual Band Decoy	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	12.896	12.896	-
Oper Test & Eval DBD (VX-9)	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	3.788	3.788	-
Eng Test & Eval ARC	WR	Various : Various	0.000	0.321	Nov 2018	0.502	Nov 2019	0.513	Nov 2020	-		0.513	2.151	3.487	-
Prior Year T&E costs no longer funded in FYDP	WR	Various : Various	43.998	0.000		0.000		0.000		-		0.000	0.000	43.998	-
		Subtotal	50.140	0.353		7.055		11.089		-		11.089	49.585	118.222	N/A

Remarks

ALQ-214 SWIP Integrated Test & Evaluation on the F/A-18 C/D aircraft will occur in FY 2020.
IDECM ARC Integration and Test continues into FY 2025. ARC Developmental Test and Evaluation support, Mission Data File Optimization and MDEWSSA Release Support begins in FY 2021.

Dual Band Decoy (DBD) Developmental Testing in FY 2020 includes Tow Line characterization.
DBD Integration and Test continues into FY 2025. FY 2021 DBD Test and Evaluation increase due to the start of prototype evaluations for each contractor during lab, chamber, and flight tests.

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 2175 / *Tactical Air Electronic Warfare*	

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
Travel	Allot	NAWCAD : Pax River, MD	0.917	0.038	Oct 2018	0.053	Oct 2019	0.054	Oct 2020	-		0.054	0.230	1.292	-
Prior Year Mgmt costs no longer funded in FYDP	Various	Various : Various	88.935	0.000		0.000		0.000		-		0.000	0.000	88.935	-
		Subtotal	89.852	0.038		0.053		0.054		-		0.054	0.230	90.227	N/A

	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
Project Cost Totals	500.877	43.713		48.624		63.948		-		63.948	238.445	895.607	N/A

Remarks

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

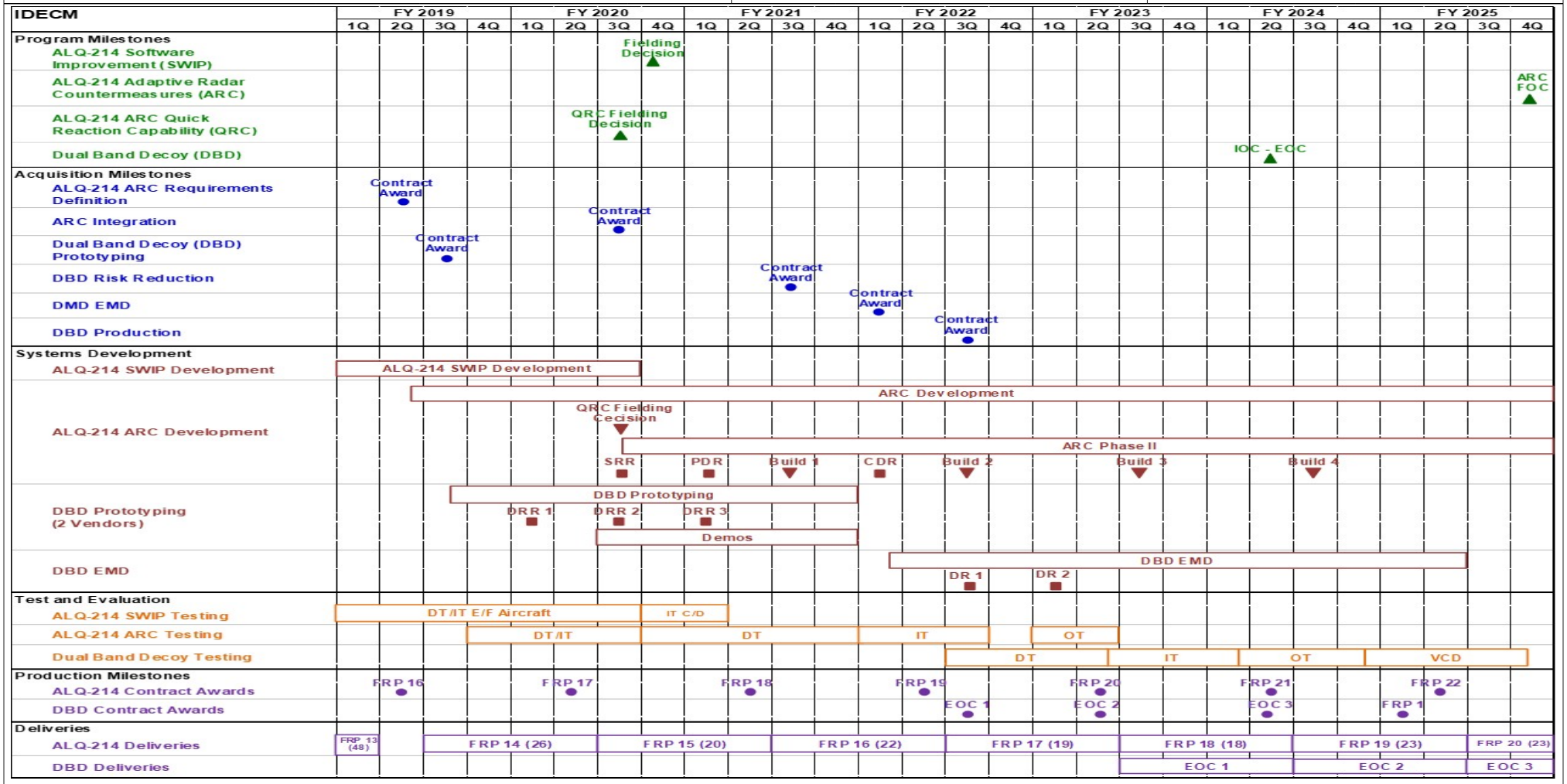


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IDECM				
Acquisition Milestones: ALQ-214 SW Improvement: ALQ-214 SW Improvement Fielding Decision	4	2020	4	2020
Acquisition Milestones: ALQ-214 ARC Requirements Definition: ALQ-214 ARC Requirements Definition Award	2	2019	2	2019
Acquisition Milestones: ARC Integration Award: ARC Integration Award	3	2020	3	2020
Acquisition Milestones: ALQ-214 ARC: ALQ-214 ARC FOC	4	2025	4	2025
Acquisition Milestones: Dual Band Decoy (DBD) Prototyping: Contract Award	3	2019	3	2019
Acquisition Milestones: DBD EMD Risk Reduction: Contract Award	3	2021	3	2021
Acquisition Milestones: DBD EMD: Contract Award	1	2022	1	2022
Acquisition Milestones: DBD Production: Contract Award	3	2022	3	2022
Acquisition Milestones: DBD: Iinitial Operational Capability (IOC) - Early Operational Capability (EOC)	2	2024	2	2024
Systems Development: ALQ-214 SW Improvement Development: ALQ-214 SW Improvement Development	1	2019	3	2020
Systems Development: ALQ-214 ARC Development: ARC Development	2	2019	4	2025
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC QRC Fielding Decision	3	2020	3	2020
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Phase II	3	2020	4	2025
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Systems Requirements Review	3	2020	3	2020
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Preliminary Design Review	1	2021	1	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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Critical Design Review	1	2022	1	2022
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC ML Build 1	3	2021	3	2021
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC ML Build 2	3	2022	3	2022
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC ML Build 3	3	2023	3	2023
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC ML Build 4	3	2024	3	2024
Systems Development: Dual Band Decoy Prototyping (2 Vendors): DBD Prototyping	3	2019	4	2021
Systems Development: Dual Band Decoy Prototyping (2 Vendors): Design Readyness Review 1	1	2020	1	2020
Systems Development: Dual Band Decoy Prototyping (2 Vendors): Design Readyness Review 2	3	2020	3	2020
Systems Development: Dual Band Decoy Prototyping (2 Vendors): Design Readyness Review 3	1	2021	1	2021
Systems Development: Dual Band Decoy Prototyping (2 Vendors): Prototype Demonstrations	3	2020	4	2021
Systems Development: Dual Band Decoy EMD: DBD EMD	1	2022	2	2025
Systems Development: Dual Band Decoy EMD: Design Review 1	3	2022	3	2022
Systems Development: Dual Band Decoy EMD: Design Review 2	1	2023	1	2023
Test and Evaluation: ALQ-214 SW Improvement Testing: ALQ-214 SW Improvement Development Testing (DT)/Integrated Testing (IT) E/F	1	2019	3	2020
Test and Evaluation: ALQ-214 SW Improvement Testing: ALQ-214 SW Improvement Integrated Testing (IT) on C/D Aircraft	4	2020	1	2021
Test and Evaluation: ALQ-214 ARC Testing: ARC QRC DT/IT	4	2019	3	2020
Test and Evaluation: ALQ-214 ARC Testing: ALQ-214 ARC Developmental Testing	4	2020	4	2021
Test and Evaluation: ALQ-214 ARC Testing: ALQ-214 ARC Integrated Testing	1	2022	3	2022
Test and Evaluation: ALQ-214 ARC Testing: ALQ-214 ARC Operational Testing	1	2023	2	2023
Test and Evaluation: Dual Band Decoy Testing: DBD Developmental Testing	3	2022	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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation: Dual Band Decoy Testing: DBD Integrated Testing	2	2023	1	2024
Test and Evaluation: Dual Band Decoy Testing: DBD Operational Testing	1	2024	4	2024
Test and Evaluation: Dual Band Decoy Testing: DBD Verification, Correction of Deficiencies	4	2024	4	2025
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 16	2	2019	2	2019
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 17	2	2020	2	2020
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 18	2	2021	2	2021
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 19	2	2022	2	2022
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 20	2	2023	2	2023
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 21	2	2024	2	2024
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 22	2	2025	2	2025
Production Milestones: Dual Band Decoy Contract Awards: DBD Early Operation Capability (EOC 1)	3	2022	3	2022
Production Milestones: Dual Band Decoy Contract Awards: DBD Early Operation Capability (EOC 2)	2	2023	2	2023
Production Milestones: Dual Band Decoy Contract Awards: DBD Early Operation Capability (EOC 3)	2	2024	2	2024
Production Milestones: Dual Band Decoy Contract Awards: DBD Full Rate Production (FRP1)	1	2025	1	2025
Deliveries: IDECM Block 4: IDECM Block 4 FRP 13 Deliveries (48)	1	2019	1	2019
Deliveries: IDECM Block 4: IDECM Block 4 FRP 14 Deliveries (26)	3	2019	2	2020

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: IDECM Block 4: IDECM Block 4 FRP 15 Deliveries (20)	3	2020	2	2021
Deliveries: IDECM Block 4: IDECM Block 4 FRP 16 Deliveries (22)	3	2021	2	2022
Deliveries: IDECM Block 4: IDECM Block 4 FRP 17 Deliveries (19)	3	2022	2	2023
Deliveries: IDECM Block 4: IDECM Block 4 FRP 18 Deliveries (18)	3	2023	2	2024
Deliveries: IDECM Block 4: IDECM Block 4 FRP 19 Deliveries (23)	3	2024	2	2025
Deliveries: IDECM Block 4: IDECM Block 4 FRP 20 Deliveries (23)	3	2025	4	2025
Deliveries: DBD: DBD EOC 1 Deliveries	3	2023	2	2024
Deliveries: DBD: DBD EOC 2 Deliveries	3	2024	2	2025
Deliveries: DBD: DBD EOC3 Deliveries	3	2025	4	2025

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3308 / *Technology Development*	

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
3308: *Technology Development*	2.276	6.085	6.238	8.366	-	8.366	8.532	9.037	8.987	9.168	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PE 0604279N consolidated to PE 0604270N beginning in FY 2017.

A. Mission Description and Budget Item Justification

Project Unit 3308 / Technology Development funds efforts that focus on the quick reaction prototyping and fielding of Tactical Electronic Warfare (EW)/countermeasures solutions for increased resilience and survivability by improving the active electronic defense of tactical aircraft. This self-protection provides friendly forces the ability to deploy, survive, operate, maneuver, and regenerate in all domains while under attack as well as strike diverse targets inside adversary air and missile defense networks to destroy mobile power-projection platforms. This Project also includes/enables integrated Aircraft Survivability Equipment (iASE) which improves situational awareness for own-ship, wingman, and distributed command and control. Significant investments have been made in the modular hardware and reprogrammable software resident in ASE capability which is fielded today. Technology Development makes specific investments towards: countermeasure/jammer/receiver algorithm development, Advanced EW Suite capability studies/investigation/analysis, threat data file and model updates as modern threats continue to evolve. These updated data files and algorithms can be deployed within hours of release by squadron maintenance personnel to aircraft while still on the ramp or flight deck. This program directly addresses the operational requirement of Strike survivability platforms for optimization of EW/countermeasure solutions across the Department of Navy.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Technology Development	6.085	6.238	8.366	0.000	8.366
Articles:	-	-	-	-	-
FY 2020 Plans: Perform EW vulnerability studies/analysis, product development and test conducted for the ALQ-214 system on the F/A-18 C/D and E/F for both USMC and Navy aircraft. Develop, model and test advanced electronic countermeasure algorithms for USMC and Navy aircraft to defend against modern threats both inside and outside the currently protected RF spectrum.					
FY 2021 Base Plans: Perform EW vulnerability studies/analysis, product development and test conducted for the ALQ-214 system on the F/A-18 C/D and E/F for both USMC and Navy aircraft. Develop, model and test advanced electronic countermeasure algorithms for USMC and Navy aircraft to defend against modern threats both inside 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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
outside the currently protected RF spectrum. Contractor and Organic SWIP and ARC modeling, simulation, and technique optimization development will commence in FY21 ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $2.128 Million due to emerging threats outside currently protected RF spectrum. This requires additional algorithms development and testing. Contractor and Organic SWIP and ARC modeling, simulation, and technique optimization development will commence in FY21					
Accomplishments/Planned Programs Subtotals	6.085	6.238	8.366	0.000	8.366

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Electronic Warfare/vulnerability studies/analysis, product development and test conducted for strike aircraft across the Future Years Defense Program (FYDP).

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

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
Software Dev - ALQ-214 SW Dev	SS/CPFF	Harris : Clifton,NJ	0.545	0.000	Sep 2019	1.000	Feb 2020	1.000	Jan 2021	-		1.000	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	WR	NAWCWD : Point Mugu, CA	0.000	2.000	Dec 2018	0.690	Dec 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	MIPR	Wright Patterson AFB : Dayton, OH	0.000	2.500	May 2019	2.600	Mar 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	C/BA	Leidos : Arlington, VA	0.000	0.000		0.000		3.000	Dec 2020	-		3.000	Continuing	Continuing	Continuing
		Subtotal	0.545	4.500		4.290		4.000		-		4.000	Continuing	Continuing	N/A

Remarks

Product Development includes a Threat Characterization effort in FY 2019 and FY 2020.
Contractor SWIP and ARC modeling, simulation, and technique optimization development will commence in FY21.

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 Dev - ALQ-214 SW Dev	WR	NAWCWD : Point Mugu, CA	0.000	0.000		0.456	Jan 2020	1.490	Nov 2020	-		1.490	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	C/CPFF	Johns Hopkins : Baltimore, MD	0.000	0.475	Jul 2019	0.260	Jul 2020	0.310	Apr 2021	-		0.310	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	C/BA	Leidos : Arlington, VA	1.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	WR	NRL : Arlington, VA	0.075	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	1.075	0.475		0.716		1.800		-		1.800	Continuing	Continuing	N/A

Remarks

Contractor and Organic SWIP and ARC modeling, simulation, and technique optimization development will commence in FY21.

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3308 / *Technology Development*	

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
Engineering & Evaluation	WR	NAWCWD : Point Mugu, CA	0.000	0.000		1.232	Jan 2020	1.622	Nov 2020	-		1.622	Continuing	Continuing	Continuing
Engineering & Evaluation	WR	Various : Various	0.656	1.110	Feb 2019	0.000		0.944	Nov 2020	-		0.944	Continuing	Continuing	Continuing
		Subtotal	0.656	1.110		1.232		2.566		-		2.566	Continuing	Continuing	N/A

Remarks

Organic SWIP and ARC modeling, simulation, and technique optimization development will commence in FY21.

	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	2.276	6.085		6.238		8.366		-		8.366	Continuing	Continuing	N/A

Remarks

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

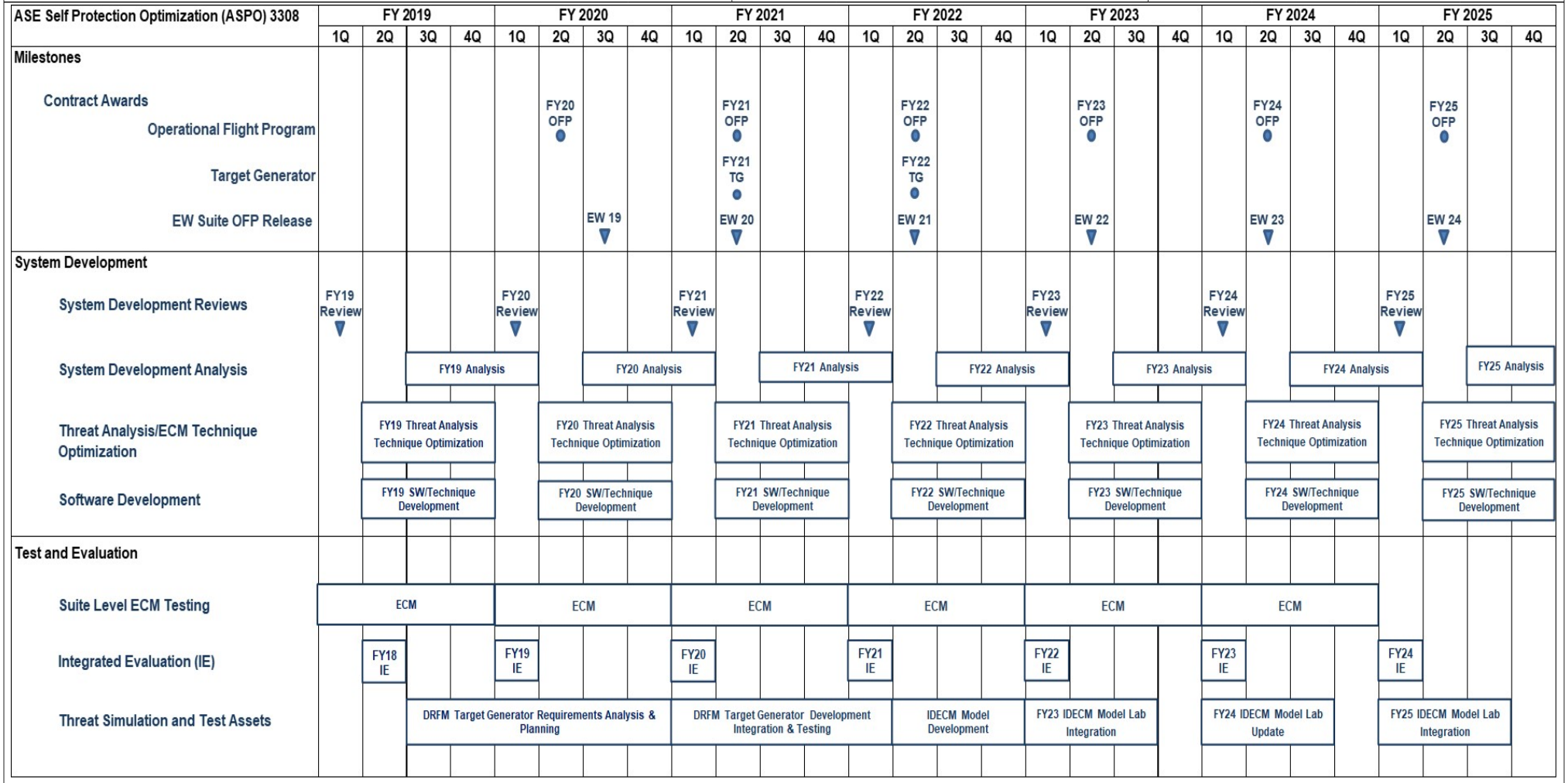


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
(U) ASE Self Protection Optimization (ASPO)				
Milestones: Contract Awards: FY-20 Operational Flight Program	2	2020	2	2020
Milestones: Contract Awards: FY-21 Operational Flight Program	2	2021	2	2021
Milestones: Contract Awards: FY-22 Operational Flight Program	2	2022	2	2022
Milestones: Contract Awards: FY-23 Operational Flight Program	2	2023	2	2023
Milestones: Contract Awards: FY-24 Operational Flight Program	2	2024	2	2024
Milestones: Contract Awards: FY-25 Operational Flight Program	2	2025	2	2025
Milestones: Contract Awards: FY-21 Target Generator	2	2021	2	2021
Milestones: Contract Awards: FY-22 Target Generator	2	2022	2	2022
Milestones: EW Suite OFP Release: Release-19	3	2020	3	2020
Milestones: EW Suite OFP Release: Release-20	2	2021	2	2021
Milestones: EW Suite OFP Release: Release-21	2	2022	2	2022
Milestones: EW Suite OFP Release: Release-22	2	2023	2	2023
Milestones: EW Suite OFP Release: Release-23	2	2024	2	2024
Milestones: EW Suite OFP Release: Release-24	2	2025	2	2025
Systems Development: Systems Development Reviews: FY-19 Review	1	2019	1	2019
Systems Development: Systems Development Reviews: FY-20 Review	1	2020	1	2020
Systems Development: Systems Development Reviews: FY-21 Review	1	2021	1	2021
Systems Development: Systems Development Reviews: FY-22 Review	1	2022	1	2022
Systems Development: Systems Development Reviews: FY-23 Review	1	2023	1	2023
Systems Development: Systems Development Reviews: FY-24 Review	1	2024	1	2024
Systems Development: Systems Development Reviews: FY-25 Review	1	2025	1	2025

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: System Development Analysis: FY-19 Analysis	3	2019	1	2020
Systems Development: System Development Analysis: FY-20 Analysis	3	2020	1	2021
Systems Development: System Development Analysis: FY-21 Analysis	3	2021	1	2022
Systems Development: System Development Analysis: FY-22 Analysis	3	2022	1	2023
Systems Development: System Development Analysis: FY-23 Analysis	3	2023	1	2024
Systems Development: System Development Analysis: FY-24 Analysis	3	2024	1	2025
Systems Development: System Development Analysis: FY-25 Analysis	3	2025	4	2025
Systems Development: Threat Analysis/Technique Optimization: FY-19 Threat Analysis/Technique Optimization	2	2019	4	2019
Systems Development: Threat Analysis/Technique Optimization: FY-20 Threat Analysis/Technique Optimization	2	2020	4	2020
Systems Development: Threat Analysis/Technique Optimization: FY-21 Threat Analysis/Technique Optimization	2	2021	4	2021
Systems Development: Threat Analysis/Technique Optimization: FY-22 Threat Analysis/Technique Optimization	2	2022	4	2022
Systems Development: Threat Analysis/Technique Optimization: FY-23 Threat Analysis/Technique Optimization	2	2023	4	2023
Systems Development: Threat Analysis/Technique Optimization: FY-24 Threat Analysis/Technique Optimization	2	2024	4	2024
Systems Development: Threat Analysis/Technique Optimization: FY-25 Threat Analysis/Technique Optimization	2	2025	4	2025
Systems Development: Software Development: FY-19 SW/Technique Development	2	2019	4	2019
Systems Development: Software Development: FY-20 SW/Technique Development	2	2020	4	2020
Systems Development: Software Development: FY-21 SW/Technique Development	2	2021	4	2021
Systems Development: Software Development: FY-22 SW/Technique Development	2	2022	4	2022
Systems Development: Software Development: FY-23 SW/Technique Development	2	2023	4	2023
Systems Development: Software Development: FY-24 SW/Technique Development	2	2024	4	2024

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Software Development: FY-25 SW/Technique Development	2	2025	4	2025
Test and Evaluation: Suite Level ECM Testing: FY19 ECM Testing	1	2019	4	2019
Test and Evaluation: Suite Level ECM Testing: FY20 ECM Testing	1	2020	4	2020
Test and Evaluation: Suite Level ECM Testing: FY21 ECM Testing	1	2021	4	2021
Test and Evaluation: Suite Level ECM Testing: FY22 ECM Testing	1	2022	4	2022
Test and Evaluation: Suite Level ECM Testing: FY23 ECM Testing	1	2023	4	2023
Test and Evaluation: Suite Level ECM Testing: FY24 ECM Testing	1	2024	4	2024
Test and Evaluation: Integrated Evaluation: FY-18 Integrated Evaluation	2	2019	2	2019
Test and Evaluation: Integrated Evaluation: FY-19 Integrated Evaluation	1	2020	1	2020
Test and Evaluation: Integrated Evaluation: FY-20 Integrated Evaluation	1	2021	1	2021
Test and Evaluation: Integrated Evaluation: FY-21 Integrated Evaluation	1	2022	1	2022
Test and Evaluation: Integrated Evaluation: FY-22 Integrated Evaluation	1	2023	1	2023
Test and Evaluation: Integrated Evaluation: FY-23 Integrated Evaluation	1	2024	1	2024
Test and Evaluation: Integrated Evaluation: FY-24 Integrated Evaluation	1	2025	1	2025
Test and Evaluation: Threat Simulation and Test Assets: Digital Radio Frequency Memory (DFRM) Target Generator Requirements Analysis & Planning	3	2019	4	2020
Test and Evaluation: Threat Simulation and Test Assets: DFRM Target Generator Development Integration and Testing	4	2020	1	2022
Test and Evaluation: Threat Simulation and Test Assets: IDECM Model Development	2	2022	4	2022
Test and Evaluation: Threat Simulation and Test Assets: IDECM FY-23 Model Lab Integration	1	2023	3	2023
Test and Evaluation: Threat Simulation and Test Assets: IDECM FY-24 Model Lab Update	1	2024	3	2024
Test and Evaluation: Threat Simulation and Test Assets: IDECM FY-25 Model Lab Integration	1	2025	3	2025

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3309 / *Assault Survivability Optimization*	

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
3309: *Assault Survivability Optimization*	4.332	0.833	6.910	0.828	-	0.828	0.879	0.896	0.913	0.932	Continuing	Continuing
Quantity of RDT&E Articles	480	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Program was established to fill aircraft survivability gaps against current and future threat systems. This project addresses the Air Expendable Countermeasures (AECM) requirement maintaining a portfolio of countermeasures capable of defeating current and advancing surface-to-air and air-to-air threat missile systems to include the development, testing, and rapid fielding of advanced countermeasures and enhanced employment techniques needed to support fleet combat operations. Countermeasure dispensing techniques are developed using capability advancements tied to integrated Aircraft Survivability Equipment (iASE) investments by leveraging available sensor data in the iASE Suite. Improved countermeasure dispense techniques are rapidly delivered to operational Fleet aircraft thru Mission Data File updates via established software update processes. Also, new expendable countermeasure technology developed in industry, by other DoD Components and through other R&D programs can be transitioned to AECM Program of Record to meet the required operational platform survivability without further investment in iASE systems. This Project also includes/enables iASE which improves situational awareness for own-ship, wingman, and distributed command and control. Resources will be applied to the following areas:

1) Studies and evaluations to optimize employment of current countermeasures and iASE capabilities.
2) Development and demonstration of advanced expendable countermeasures and countermeasure techniques.
3) Testing and evaluation of advanced countermeasures.
4) Development of system software enhancements and integration for the testing and deployment of advanced countermeasure techniques.
5) Development of and upgrades to modeling tools and specialized equipment required to conduct evaluation of advanced countermeasures against proliferating threats.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Assault Survivability Optimization	0.833	6.910	0.828	0.000	0.828
Articles:	-	-	-	-	-
FY 2020 Plans: Continue development and testing of advanced countermeasure techniques and upgrade specialized evaluation equipment for advancing threat systems. Perform modeling and simulation to support effectiveness flight testing of 1X1X8 advanced countermeasure flares for F/A-18E/F against air-to-air threat systems. Perform modeling and simulation to support effectiveness flight testing of advanced countermeasure flares for AH-1Z/ UH-1Y and MV-22 against current emerging threat systems. Perform capability upgrades to test equipment to					

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
evaluate countermeasure effectiveness. Perform modeling, simulation and testing of advanced radio frequency countermeasure. Develop advance countermeasures to defeat merging threats. ***FY 2021 Base Plans:*** Continue development and testing of advanced countermeasure techniques against advancing threat systems. Perform modeling and simulation to support effectiveness flight testing to optimize expendable countermeasure effectiveness and determine applicability of 1x1x8 countermeasures on MH-60S against ground to air threats. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2020 funding level included $6.1M to address existing, known survivability shortfalls in USMC platforms.					
Accomplishments/Planned Programs Subtotals	0.833	6.910	0.828	0.000	0.828

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Acquisition strategy is to leverage improvements in air expendable countermeasures technology and integration of existing iASE sensor data to enhance platform survivability on USN and USMC platforms through more effective dispense techniques, investing in enhancements in modeling and simulation tools to better evaluate countermeasure effectiveness, upgrading test and evaluation equipment to incorporate current and future threats for effectiveness tests, and developing and demonstrating advanced concept countermeasures for future threats. New advanced countermeasures are then transitioned to the Procurement of Ammunition Navy and Marine Corps appropriation for procurement and fielding. New optimized and advanced countermeasure techniques are delivered via operational Mission Data Files (MDF) to increase aircraft/aircrew survivability. F-35 is driving a Common Carriage solution that will be programmed for USN Aircraft in FY 2022 for IOC in FY 2025. Common Carriage will standardize countermeasures across Services to increase capability/lethality/survivability and countermeasure load-out to support operations in contested environments.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

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
Expendable Countermeasure Technique Modeling and Simulation	WR	NSWC Crane : Crane, IN	1.242	0.423	Oct 2018	0.406	Oct 2019	0.414	Oct 2020	-		0.414	Continuing	Continuing	Continuing
AH-1Z/UH-1Y and MV-22 Expendable Countermeasure Technique Modeling and Simulation	WR	NSWC Crane : Crane, IN	0.000	0.000		0.778	Oct 2019	0.000		-		0.000	0.000	0.778	0.778
AH-1Z/UH-1Y and MV-22 RFCM Modeling and Simulation	WR	NSWC Crane : Crane, IN	0.000	0.000		0.174	Oct 2019	0.000		-		0.000	0.000	0.174	0.174
RFCM Modeling and Simulation	C/CPFF	Booz Allen Hamilton : McClean, VA	0.000	0.000		0.101	Dec 2019	0.000		-		0.000	0.000	0.101	0.101
Archive Product Development Efforts	Various	Various : Various	0.835	0.002	Jun 2019	0.000		0.000		-		0.000	0.000	0.837	0.837
		Subtotal	2.077	0.425		1.459		0.414		-		0.414	Continuing	Continuing	N/A

Remarks

Infrared (IR) Decoys: FY 2020 modeling and simulation funding supports the development of advanced countermeasure techniques prior to air to air flight test for F/A-18 and ground to air flight test for AH-1Z/UH-1Y and MV-22. FY 2021 modeling and simulation funding supports the development of advanced countermeasure techniques prior to ground to air flight test for MH-60S using 1X1X8 advanced countermeasures. Radio Frequency (RF) Decoys: FY 2020 modeling and simulation funding supports modeling and simulation of advanced RF decoys on USMC platforms and modeling and simulation tools capability upgrades.

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
Test Mission Data File Software Development	WR	FRCSE : Jacksonville, FL	0.310	0.071	Oct 2018	0.072	Dec 2019	0.073	Nov 2020	-		0.073	Continuing	Continuing	Continuing
AH-1Z/UH-1Y and MV-22 Test Mission Data File Software Development	WR	FRCSE : Jacksonville, FL	0.000	0.000		0.144	Jan 2020	0.000		-		0.000	0.000	0.144	0.144

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

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
AH-1Z/UH-1Y and MV-22 Operational Mission Data File Software Development and Release	WR	FRCSE : Jacksonville, FL	0.000	0.000		0.450	Mar 2020	0.000		-		0.000	0.000	0.450	0.450
		Subtotal	0.310	0.071		0.666		0.073		-		0.073	Continuing	Continuing	N/A

Remarks

FY 2020 Software development funding supports the creation of test Mission Data Files (MDF) and enhanced operational flight program algorithms for flight effectiveness testing for F/A-18E/F, AH-1Z/UH-1Y and MV-22. FY 2021 software development funding support the creation of test mission data file for MH-60S using 1X1X8 advanced countermeasures for dispense techniques optimization test flights.

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 T&E Flight Tests	WR	Various : Various	0.575	0.337	Mar 2019	0.276	Dec 2019	0.294	Dec 2020	-		0.294	Continuing	Continuing	Continuing
AH-1Z/UH-1Y and MV-22 Developmental T&E Flight Tests	WR	Various : Various	0.000	0.000		0.821	Mar 2020	0.000		-		0.000	0.000	0.821	0.821
RFCM Millimeter Wave Testing	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.180	Mar 2020	0.000		-		0.000	0.000	0.180	0.180
Advanced Countermeasures Development	WR	NSWC Crane : Crane, IN	0.000	0.000		0.625	Oct 2019	0.000		-		0.000	0.000	0.625	0.625
Advance Threat Simulator Hardware in the Loop Simulator	WR	NSWC Crane : Crane, IN	0.000	0.000		0.288	Jan 2020	0.000		-		0.000	0.000	0.288	0.288
Threat Analysis and Characterization and Signature Measurement Capability for Seeker Test Van Capability Upgrades	MIPR	SAIC : Reston, VA	0.000	0.000		1.035	Dec 2019	0.000		-		0.000	0.000	1.035	1.035

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

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
Engineering and Evaluation for Advance Countermeasure Composition	MIPR	Orbital ATK : Arlington, VA	0.000	0.000		0.278	Mar 2020	0.000		-		0.000	0.000	0.278	0.278
Capability Upgrades for Tiger Pod Infrared Measurement and AICES Pod	WR	NAWCWD : Pt Mugu, CA	0.000	0.000		0.575	Oct 2019	0.000		-		0.000	0.000	0.575	0.575
Capability Upgrades for Mongoose Pod	WR	NAWCWD : Pt Mugu, CA	0.000	0.000		0.128	Oct 2019	0.000		-		0.000	0.000	0.128	0.128
Archive Prior Year Test and Evaluation Efforts	Various	Various : Various	1.168	0.000		0.000		0.000		-		0.000	0.000	1.168	1.168
		Subtotal	1.743	0.337		4.206		0.294		-		0.294	Continuing	Continuing	N/A

Remarks

FY 2020 Developmental T&E flight test following modeling and simulation will evaluate expendable countermeasure effectiveness and determine applicability of 1x1x8 countermeasures for F/A-18E/F against air-to-air threats. Developmental T&E flight test following modeling and simulation evaluation will optimize expendable countermeasure effectiveness and determine applicability of 1x1x8 countermeasures for AH-1Z/UH-1Y and MV-22. FY 2020 advanced countermeasure development and engineering will determine solutions to defeat advanced threats in multiple spectrums. FY 2020 test equipment capability upgrades will improve countermeasure test equipment to evaluate effectiveness against advanced threats. FY 2021 developmental flight test following modeling and simulation will optimize expendable countermeasure effectiveness and determine applicability of 1x1x8 countermeasures on MH-60S against ground to air threats.

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
Project Management	WR	FRCSE : Jacksonville, FL	0.202	0.000		0.056	Feb 2020	0.047	Oct 2020	-		0.047	Continuing	Continuing	Continuing
AH-1Z/UH-1Y and MV-22 Advanced Countermeasure Dispense Technique Development Project Management	WR	FRCSE : Jacksonville, FL	0.000	0.000		0.154	Oct 2019	0.000		-		0.000	0.000	0.154	0.154

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

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
Advanced Countermeasure Dispense Technique Development Project Management	C/FFP	Georgia Tech Applied Research Corporation : Atlanta, GA	0.000	0.000		0.132	Dec 2019	0.000		-		0.000	0.000	0.132	0.132
USMC Common Carriage Survey and Evaluation Study	WR	Various : Various	0.000	0.000		0.237	Oct 2019	0.000		-		0.000	0.000	0.237	0.237
		Subtotal	0.202	0.000		0.579		0.047		-		0.047	Continuing	Continuing	N/A

Remarks

Project management required to coordinate increased development activities for Navy and USMC platforms. USMC Common Carriage Survey funding will determine applicability of converting USMC aircraft platforms from round to square countermeasures.

	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	4.332	0.833		6.910		0.828		-		0.828	Continuing	Continuing	N/A

Remarks

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

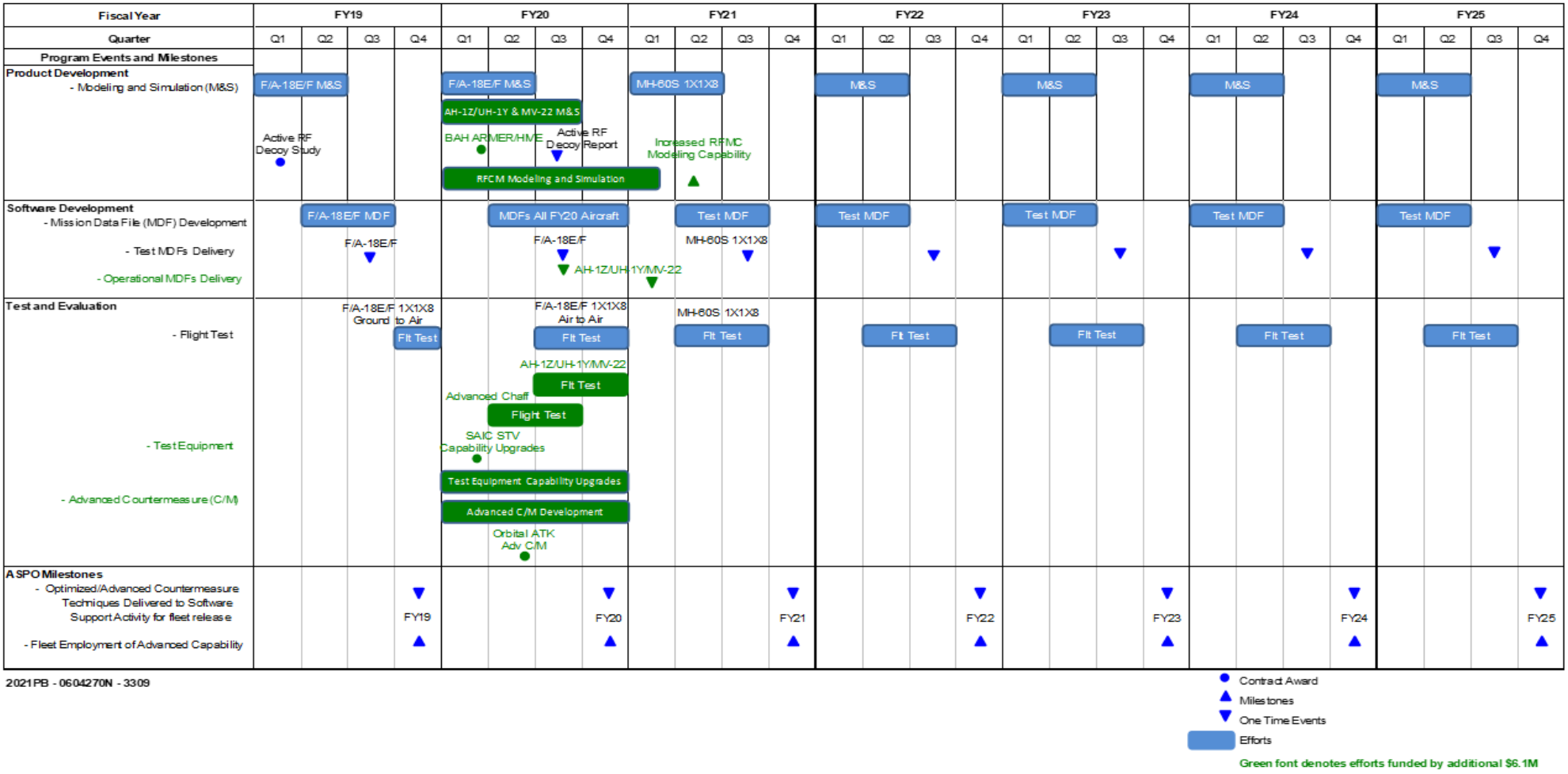


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Assault Survivability Optimization				
Product Development: Modeling and Simulation (M&S): RFCM Modeling and Simulation for active radio frequency decoy contract	1	2019	1	2019
Product Development: Modeling and Simulation (M&S): RFCM Modeling and Simulation for active radio frequency decoy report	3	2020	3	2020
Product Development: Modeling and Simulation (M&S): FY19 Modeling and Simulation	1	2019	2	2019
Product Development: Modeling and Simulation (M&S): FY20 Modeling and Simulation	1	2020	2	2020
Product Development: Modeling and Simulation (M&S): AH-1Z/UH-1Y and MV-22 FY20 Modeling and Simulation	1	2020	3	2020
Product Development: Modeling and Simulation (M&S): FY20 RFCM Modeling and Simulation	1	2020	1	2021
Product Development: Modeling and Simulation (M&S): FY21 Modeling and Simulation	1	2021	2	2021
Product Development: Modeling and Simulation (M&S): FY22 Modeling and Simulation	1	2022	2	2022
Product Development: Modeling and Simulation (M&S): FY23 Modeling and Simulation	1	2023	2	2023
Product Development: Modeling and Simulation (M&S): FY24 Modeling and Simulation	1	2024	2	2024
Product Development: Modeling and Simulation (M&S): FY25 Modeling and Simulation	1	2025	1	2025
Software Support: Mission Data File (MDF) Development: FY19 Mission Data Files Development	2	2019	3	2019
Software Support: Mission Data File (MDF) Development: FY20 Mission Data Files Development	2	2020	4	2020
Software Support: Mission Data File (MDF) Development: FY21 Mission Data Files Development	2	2021	3	2021
Software Support: Mission Data File (MDF) Development: FY22 Mission Data Files Development	2	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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Software Support: Mission Data File (MDF) Development: FY23 Mission Data Files Development	2	2023	3	2023
Software Support: Mission Data File (MDF) Development: FY24 Mission Data Files Development	2	2024	3	2024
Software Support: Mission Data File (MDF) Development: FY25 Mission Data Files Development	2	2025	3	2025
Software Support: MDFs: FY19 Test Mission Data Files	3	2019	3	2019
Software Support: MDFs: FY20 F/A-18E/F Test Mission Data Files	2	2020	2	2020
Software Support: MDFs: FY20 AH-1Z/UH-1Y and MV-22 Test Mission Data Files	3	2020	3	2020
Software Support: MDFs: FY20 Operational Mission Data Files	4	2020	4	2020
Software Support: MDFs: FY21 Test Mission Data Files	3	2021	3	2021
Software Support: MDFs: FY22 Test Mission Data Files	3	2022	3	2022
Software Support: MDFs: FY23 Test Mission Data Files	3	2023	3	2023
Software Support: MDFs: FY24 Test Mission Data Files	3	2024	3	2024
Software Support: MDFs: FY25 Test Mission Data Files	3	2025	3	2025
Test and Evaluation: Flight Test: FY19 Flight Test	4	2019	4	2019
Test and Evaluation: Flight Test: FY20 F/A-18E/F Flight Test	3	2020	4	2020
Test and Evaluation: Flight Test: FY20 AH-1Z/UH-1Y and MV-22 Flight Test	3	2020	4	2020
Test and Evaluation: Flight Test: Advanced Chaff Flight Test	2	2020	3	2020
Test and Evaluation: Flight Test: FY21 Flight Test	2	2021	3	2021
Test and Evaluation: Flight Test: FY22 Flight Test	2	2022	3	2022
Test and Evaluation: Flight Test: FY23 Flight Test	2	2023	3	2023
Test and Evaluation: Flight Test: FY24 Flight Test	2	2024	3	2024
Test and Evaluation: Flight Test: FY25 Flight Test	2	2025	3	2025
Test and Evaluation: Test Equipment: Test Equipment Capability Upgrades Contract Award	1	2020	1	2020

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation: Test Equipment: Test Equipment Capability Upgrades	1	2020	4	2020
Test and Evaluation: Advanced Countermeasures (CM): Advance Countermeasure Development	1	2020	4	2020
Test and Evaluation: Advanced Countermeasures (CM): Advance Countermeasure Engineering and Evaluation Contract	2	2020	2	2020
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY19 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2019	4	2019
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 20 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2020	4	2020
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 21 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2021	4	2021
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 22 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2022	4	2022
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 23 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2023	4	2023
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 24 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2024	4	2024
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 25 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2025	4	2025
ASPO Milestones: Fleet Employment of Advanced Capability: FY19 Fleet Employment of Advanced Capability	4	2019	4	2019

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ASPO Milestones: Fleet Employment of Advanced Capability: FY20 Fleet Employment of Advanced Capability	4	2020	4	2020
ASPO Milestones: Fleet Employment of Advanced Capability: FY21 Fleet Employment of Advanced Capability	4	2021	4	2021
ASPO Milestones: Fleet Employment of Advanced Capability: FY22 Fleet Employment of Advanced Capability	4	2022	4	2022
ASPO Milestones: Fleet Employment of Advanced Capability: FY23 Fleet Employment of Advanced Capability	4	2023	4	2023
ASPO Milestones: Fleet Employment of Advanced Capability: FY24 Fleet Employment of Advanced Capability	4	2024	4	2024
ASPO Milestones: Fleet Employment of Advanced Capability: FY25 Fleet Employment of Advanced Capability	4	2025	4	2025

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3327 / *MAGTF EW Aviation Development*	

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
3327: *MAGTF EW Aviation Development*	39.598	12.362	7.677	10.036	-	10.036	12.118	15.006	14.716	15.011	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project unit supports the United States Marine Corps (USMC) development of Marine Air Ground Task Force (MAGTF) Electronic Warfare (EW) and the various elements of its distributed System of Systems (SoS). The SoS addresses MAGTF EW sufficiency gaps in the areas of Electronic Attack (EA), EW Support (ES), and Electronic Protection with a multitude of payloads designed for carriage on a variety of organic MAGTF air assets. Payload development plans follow an adaptable, modular and open architecture philosophy to combat the increasing capability gap and enable future growth at a reduced operational and sustainment cost. A key element to this capability is the AN/ALQ-231(V) Intrepid Tiger II program.

The AN/ALQ-231(V)1 pod is the variant of the Intrepid Tiger II pod flown on the AV-8B and F/A-18A-D platforms, with plans for future integration of AN/ALQ-231(V)1 Block X on USMC Tilt-rotor, fixed wing, and rotary wing aircraft. The AN/ALQ-231(V)3 is the variant of the Intrepid Tiger II pod flown on the UH-1Y platform, with plans for future integration on AH-1 platforms. All payload variants are capable of conducting, supporting, and coordinating Electro-Magnetic Spectrum (EMS) operations in the form of EA and ES against Irregular Warfare threats. Additionally, all payloads are scalable and adaptable for emerging threats and are interoperable with the USMC's Electronic Warfare Services Architecture (EWSA). The Intrepid Tiger II capability is design to be integrated for MAGTF tactical coordination of cyberspace and EW operations via the Cyber Electronic Warfare Coordination Cell (CEWCC).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Intrepid Tiger II (AN/ALQ-231)	9.811	5.075	10.036	0.000	10.036
Articles:	-	-	-	-	-
Description: The program will develop, mature, and test Intrepid Tiger II based solutions to radar threats in support of the penetrating jammer mission with plans to release variants of the AN/ALQ-231(V)1 BLK X Radar Jammer for use on the MV-22, AV-8B, and F/A-18C/D platforms, as well as for future use on the C-130 and CH-53K.					
FY 2020 Plans: Finalize BLK X EDM rack-mounted design and its initial integration on the MV-22 platform. Complete Integrated Developmental Test (DT) and evaluation of both BLK X software and hardware on MV-22.					
FY 2021 Base 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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2021 efforts include development of the BLK X design for a modular pod shell. Correction of Developmental Test deficiencies and initial Operational Testing (OT) of the rack-mounted design on MV-22 will complete. In addition, Lab Testing and initial DT of the modular pod design for AV-8B and/or C-130 will commence. Continue development of the EWSA in support of evolving Intrepid Tiger II target sets and missions. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increases in FY 2021 as development of the BLK X modular pod design increases.					
Title: MAGTF EW Jammer Techniques Development ***Articles:*** ***FY 2020 Plans:*** FY 2020 will continue efforts to advance the development of new and updated EW jammer techniques. These techniques will be designed to exploit the interrelated cyberspace domain and the electromagnetic spectrum (EMS) through the development, validation, and delivery of MAGTF EW-specific Tactics, Techniques, and Procedures (TTPs) and the testing of MAGTF EW systems against existing and emerging threats. FY 2020 efforts will include the test and evaluation of counter-radar technique performance and effectiveness of BLK X on MV-22 during Developmental Testing. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Development and integration of BLK X specific jammer techniques will be complete with FY20 funding.	2.551 -	2.602 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	12.362	7.677	10.036	0.000	10.036

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/0587: *MAGTF EW For Aviation*	11.590	26.536	27.794	-	27.794	29.384	24.633	25.130	25.631	91.968	393.230

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

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

Remarks

D. Acquisition Strategy

This project unit is part of USMC led efforts to ensure Marine Corps requirements are included in the budget process for the Future Year Defense Program and beyond. These efforts include AN/ALQ-231(V) Intrepid Tiger II Family of Systems, Collaborative Electronic Warfare (EW)/EW Battle Management, and EW Service Architecture (EWSA). These programs are the Marine Corps' initial steps to create systems to distribute EW capability across the battlespace.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

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
Intrepid Tiger BLK X Hardware Development	WR	NAWCWD : Point Mugu, CA	15.630	0.193	Nov 2018	0.375	Nov 2019	2.520	Nov 2020	-		2.520	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.377	1.193	Nov 2018	0.436	Nov 2019	0.445	Nov 2020	-		0.445	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : Point Mugu, CA	18.304	7.725	Nov 2018	4.299	Nov 2019	4.385	Nov 2020	-		4.385	Continuing	Continuing	Continuing
Systems Engineering	WR	Various : Various	0.000	0.007	Nov 2018	0.000		0.000		-		0.000	0.000	0.007	-
		Subtotal	35.311	9.118		5.110		7.350		-		7.350	Continuing	Continuing	N/A

Remarks

Funding increases in FY 2021 due to ramping up of BLK X modular pod development.

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
Development Support	Various	Various : Various	0.430	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Eng & Tech Services	Various	Various : Various	0.367	0.640	Nov 2018	0.109	Nov 2019	0.111	Nov 2020	-		0.111	Continuing	Continuing	Continuing
		Subtotal	0.797	0.640		0.109		0.111		-		0.111	Continuing	Continuing	N/A

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
Intrepid Tiger BLK X Testing	WR	NAWCAD : Patuxent River, MD	1.062	0.000		0.850	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Intrepid Tiger BLK X Testing	WR	NAWCWD : Point Mugu, CA	2.290	2.363	Nov 2018	1.515	Nov 2019	1.688	Nov 2020	-		1.688	Continuing	Continuing	Continuing
Intrepid Tiger BLK X Testing	Various	Various : Various	0.135	0.212	Nov 2018	0.057	Nov 2019	0.850	Nov 2020	-		0.850	Continuing	Continuing	Continuing
		Subtotal	3.487	2.575		2.422		2.538		-		2.538	Continuing	Continuing	N/A

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

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
Travel	Various	Various : Various	0.003	0.029	Oct 2018	0.036	Oct 2019	0.037	Nov 2020	-		0.037	Continuing	Continuing	Continuing
		Subtotal	0.003	0.029		0.036		0.037		-		0.037	Continuing	Continuing	N/A

	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	39.598	12.362		7.677		10.036		-		10.036	Continuing	Continuing	N/A

Remarks

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

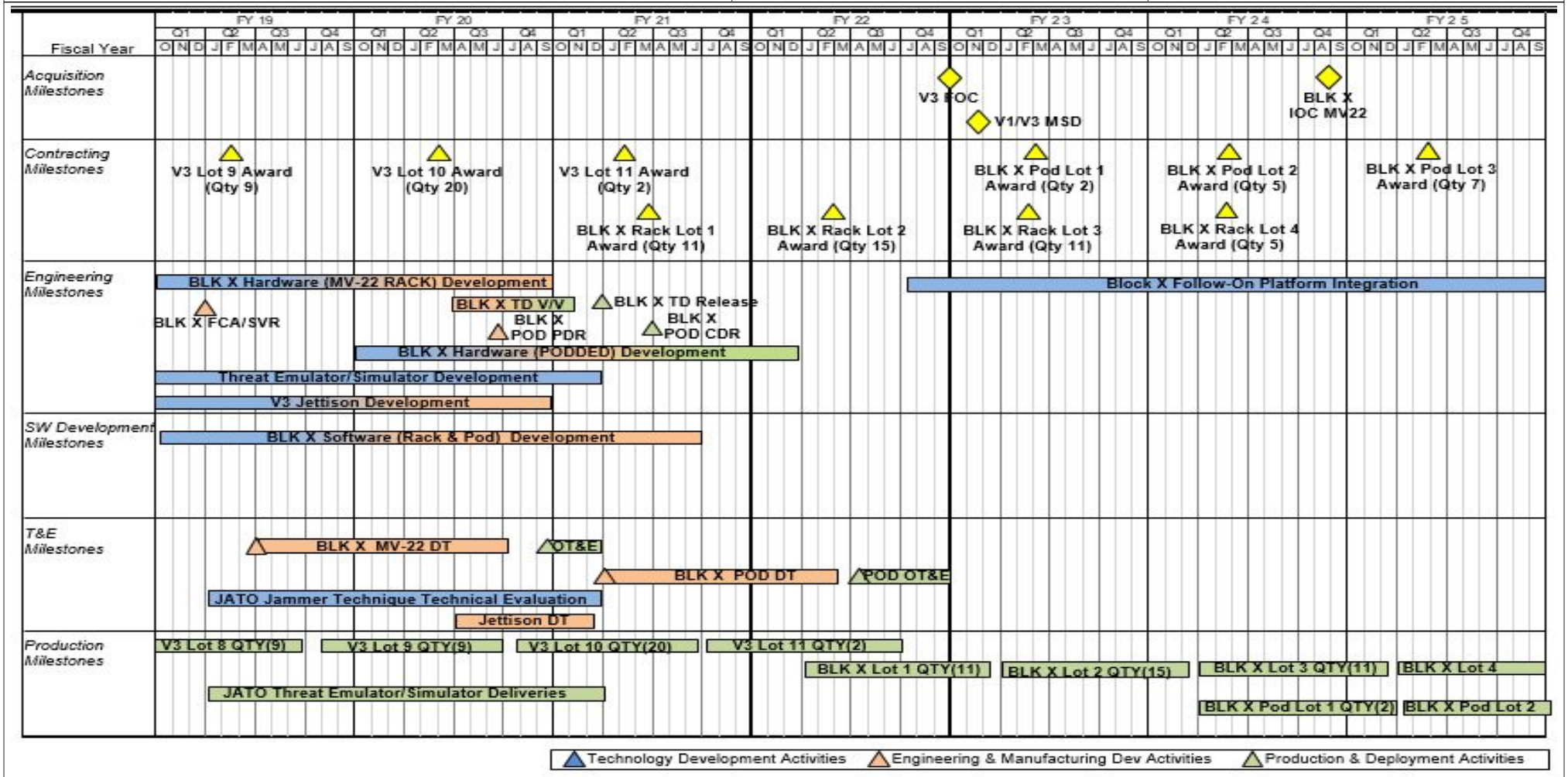


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Intrepid Tiger II (AN/ALQ-231)				
Engineering Milestones: AN/ALQ-231(V)1 BLK X Functional Configuration Audit / System Verification Review	1	2019	1	2019
Engineering Milestones: AN/ALQ-231(V)1 BLK X TD Fleet Release	1	2021	1	2021
Systems Development: AN/ALQ-231(V)1 BLK X (Rack and Pod) Hardware Development	1	2019	1	2022
Systems Development: AN/ALQ-231(V)1 BLK X (Rack and Pod) Software Development	1	2019	3	2021
Systems Development: Follow-On Platform Integration	4	2022	4	2025
Test & Evaluation: AN/ALQ-231(V)1 BLK X Rack Developmental Test	3	2019	4	2020
Test & Evaluation: AN/ALQ-231(V)1 BLK X Rack OT&E	4	2020	1	2021
Test & Evaluation: AN/ALQ-231(V)1 BLK X Pod Developmental Test	2	2021	2	2022
Test & Evaluation: AN/ALQ-231(V)1 BLK X Pod OT&E	3	2022	4	2022
Production Milestones				
AN/ALQ-231(V)3 Production Lot 9 (Qty 9)	2	2019	2	2019
AN/ALQ-231(V)3 Production Lot 10 (Qty 20)	2	2020	2	2020
AN/ALQ-231(V)3 Production Lot 11 (Qty 2)	2	2021	2	2021
AN/ALQ-231(V)1 BLK X (Rack) Production Lot 1 (Qty 11)	2	2021	2	2021
AN/ALQ-231(V)1 BLK X (Rack) Production Lot 2 (Qty 15)	2	2022	2	2022
AN/ALQ-231(V)1 BLK X (Rack) Production Lot 3 (Qty 11)	2	2023	2	2023
AN/ALQ-231(V)1 BLK X (Pod) Production Lot 1 (Qty 2)	2	2023	2	2023
AN/ALQ-231(V)1 BLK X (Rack) Production Lot 4 (Qty 5)	2	2024	2	2024
AN/ALQ-231(V)1 BLK X (Pod) Production Lot 2 (Qty 5)	2	2024	2	2024

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AN/ALQ-231(V)1 BLK X (Pod) Production Lot 3 (Qty 7)	2	2025	2	2025
Deliveries: AN/ALQ-231(V)3 Lot 8 Deliveries (Qty 9)	1	2019	3	2019
Deliveries: AN/ALQ-231(V)3 Lot 9 Deliveries (Qty 9)	4	2019	3	2020
Deliveries: AN/ALQ-231(V)3 Lot 10 Deliveries (Qty 20)	4	2020	3	2021
Deliveries: AN/ALQ-231(V)3 Lot 11 Deliveries (Qty 2)	4	2021	3	2022
Deliveries: AN/ALQ-231(V)1 BLK X Lot 1 (Rack) Deliveries (Qty 11)	2	2022	1	2023
Deliveries: AN/ALQ-231(V)1 BLK X Lot 2 (Rack) Deliveries (Qty 15)	2	2023	1	2024
Deliveries: AN/ALQ-231(V)1 BLK X Lot 3 (Rack) Deliveries (Qty 11)	2	2024	1	2025
Deliveries: AN/ALQ-231(V)1 BLK X Lot 1 (Pod) Deliveries (Qty 2)	2	2024	1	2025
Deliveries: AN/ALQ-231(V)1 BLK X Lot 4 (Rack) Deliveries (Qty 5)	2	2025	4	2025
Deliveries: AN/ALQ-231(V)1 BLK X Lot 2 (Pod) Deliveries (Qty 5)	2	2025	4	2025
MAGTF EW Jammer Techniques Development				
Systems Development: Threat Emulator / Simulator Development	1	2019	1	2021
Test & Evaluation: Jammer Techniques Technical Evaluation	2	2019	1	2021
Deliveries: Threat Emulator / Simulator Delivery	2	2019	1	2021

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 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3371 / *MAGTF EW Interoperability Development*	

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
3371: *MAGTF EW Interoperability Development*	3.226	0.364	0.463	1.206	-	1.206	1.012	1.037	1.057	1.079	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project unit supports the United States Marine Corps air-ground interoperability by providing a variety of capabilities through multiple functions of the Software Reprogrammable Payload (SRP) when installed aboard SRP-capable aircraft. The spiral development plans allow adaptable, scalable, and open architecture philosophy to reduce stove-pipe solutions but enable future growth at a reduced operational and sustainment cost.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Software Reprogrammable Payload	0.364	0.463	1.206	0.000	1.206
Articles:	-	-	-	-	-

FY 2020 Plans:

Continue SRP support of a government-owned reference design for a flexible, in-operational reconfigurable software radio designed to meet current and future needs. Continue the development of the reduced form factor SRP for the identified platforms that can not support the Spiral 2 form factor and field evaluation of the Spiral 2. Support transition of Spiral 2 to Program of Record and Request for Proposal. Support the air-ground interoperability by providing a variety of capabilities through multiple functions of the Software Reprogrammable Payload when installed aboard SRP-capable aircraft.

FY 2021 Base Plans:

Continue SRP support of a government-owned reference design for a flexible, in-operational reconfigurable software radio
designed to meet current and future needs. Support the air-ground interoperability by providing a variety of capabilities through multiple functions of the Software Reprogrammable Payload when installed aboard SRP-capable aircraft. Continue the development of the reduced form factor SRP for the identified platforms that can not support the Spiral 2 form factor. Continue transition support of Spiral 2 to Program of Record and Request for Proposal package.

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The increase of .743 between FY 2020 and FY 2021 will provide engineering/systems engineering support for optimization of performance for air-ground interoperability and range for aircraft-to-aircraft data relay.					
Accomplishments/Planned Programs Subtotals	0.364	0.463	1.206	0.000	1.206

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This project unit is part of United States Marine Corps led efforts to ensure Marine Corps requirements are included in the budget process for the Future Year Defense Program and beyond. This effort is for the Software Reprogrammable Payload. This program is part of the Marine Corps initial steps to create a common interoperable system to distribute multiple data types across the battle-space through spiral 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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*

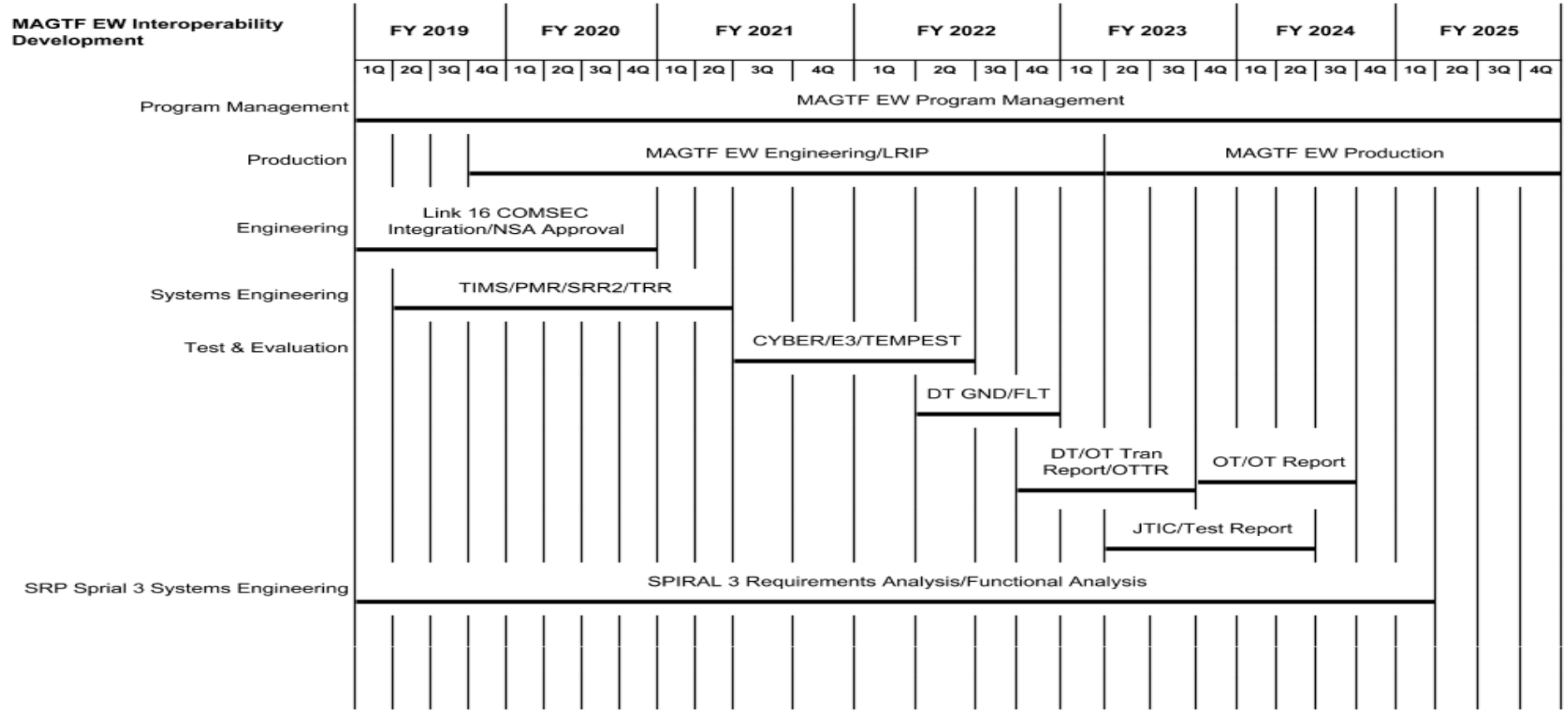
Product Development ($ in Millions)

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
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.114	0.364	Nov 2018	0.243	Nov 2019	0.425	Nov 2020	-		0.425	Continuing	Continuing	Continuing
Systems Engineering	WR	NRL : Washington, DC	0.509	0.000		0.000		0.225	Dec 2020	-		0.225	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Assurance Technology Corp : Carlisle, MA	1.154	0.000		0.000		0.241	Dec 2020	-		0.241	0.000	1.395	1.395
Systems Engineering	C/CPFF	DCS : Alexandria, VA	0.449	0.000		0.220	Nov 2019	0.315	Nov 2020	-		0.315	0.000	0.984	0.984
		Subtotal	3.226	0.364		0.463		1.206		-		1.206	Continuing	Continuing	N/A

	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	3.226	0.364		0.463		1.206		-		1.206	Continuing	Continuing	N/A

Remarks

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*



2021PB - 0604270N - 3371

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 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MAGTF EW Interoperability Development				
Program Management: MAGTF EW Program Management	1	2019	4	2025
Production: MAGTF EW Engineering/LRIP	4	2019	1	2023
Production: MAGTF EW Production	2	2023	4	2025
Engineering: Link 16 COMSEC Integration/NSA Approval	1	2019	4	2020
Systems Engineering: TIMS/PMR/SRR2/TRR	2	2019	2	2021
Test & Evaluation: CYBER/E3/TEMPEST	3	2021	2	2022
Test & Evaluation: DT GND/FLT	2	2022	4	2022
Test & Evaluation: DT/OT Tran Report/OTTR	4	2022	3	2023
Test & Evaluation: OT/OT Report	4	2023	3	2024
Test & Evaluation: JTIC/Test Report	2	2023	2	2024
SRP Sprial 3 Systems Engineering: SPIRAL 3 Requirements Analysis/Functional Analysis	1	2019	1	2025