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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603254N *I ASW Systems 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
Total Program Element	136.238	6.877	7.172	15.719	-	15.719	18.205	16.654	17.509	20.768	Continuing	Continuing
1292: *Adv ASW Sensors & Proc*	136.238	6.877	7.172	15.719	-	15.719	18.205	16.654	17.509	20.768	Continuing	Continuing

A. Mission Description and Budget Item Justification

Includes RDT&E funds for advanced development and developmental testing of airborne anti-submarine warfare (ASW) systems, including aircraft, equipment, and devices for use against all types of submarine targets.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	7.044	7.172	7.298	-	7.298
Current President's Budget	6.877	7.172	15.719	-	15.719
Total Adjustments	-0.167	0.000	8.421	-	8.421
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.167	0.000			
• Program Adjustments	0.000	0.000	8.323	-	8.323
• Rate/Misc Adjustments	0.000	0.000	0.098	-	0.098

Change Summary Explanation

Technical: Not applicable.

Schedule: Next Generation Airborne Passive System (NGAPS) - Additional component maturation required for NGAPS Future Naval Capability resulting in a two year delay.

Funding: FY21 increase for Undersea Advantage prototype system development and at-sea demonstration for the next generation of Multistatic Active Coherent (MAC) system components addresses gaps in critical, wide area search capabilities against fielded and emerging advanced ASW threats.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 1292 / *Adv ASW Sensors & Proc*	

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
1292: *Adv ASW Sensors & Proc*	136.238	6.877	7.172	15.719	-	15.719	18.205	16.654	17.509	20.768	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides Air Anti-Submarine Warfare (ASW) effectiveness through development and maturation of advanced hardware and software associated with airborne acoustic and non-acoustic systems. This includes sensors and components, processing, post-processing, data recording and display capabilities to address regional threat scenarios against surfaced or submerged conventionally and nuclear powered submarines. Key objectives are platform accommodations of advanced active and passive sensors and components, improved detection, classification, localization and tracking; and increased capacity and flexibility to handle multi-sensor data loads. Furthermore, technologies that can be affordably implemented as payloads across fixed wing, rotary and unmanned platforms engaged in ASW will be pursued. Technology evaluations include Over the Horizon (OTH) communications, sonobuoy communication link to/from aircraft, Distributed Netted Sensors, transient signals, and source and receiver improvement technologies that will enhance passive and multistatic active sensor systems capabilities. Programs being funded during the FYDP will provide for the development and maturation of persistent tactical search technologies that will allow transition to the localization and attack phase in all operationally relevant environments. In addition, the program will provide for the development and subsequent experimentation, including data collection and engineering measurement, of the next generation of Multistatic Active Coherent (MAC) sources and receivers, laser technologies, electro-optical and multi-spectral camera technologies, radar, and Magnetic Anomaly Detection (MAD) sensors. Those technologies that are deemed mature and provide increased operational capability will be approved for transition, maturation, and implementation in a production Rapid Capability Insertion (RCI) build. The test articles, which consist of sensors, components and associated processors, will support at-sea trials and experiments.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: System performance assessments	6.877	7.172	15.719	0.000	15.719
Articles:	100	100	100	-	100
FY 2020 Plans: Design, mature, and prototype test articles, models, processors, and algorithms for laboratory and at-sea demonstrations to validate technical maturity and operational performance. Conduct sensor and system performance assessments for the next generation of airborne wide area search. Evaluate advancements in passive sensing for deep ocean ASW operations. Employ effects chain gap analysis and performance modeling to verify capability improvements for acoustic and non-acoustic technologies. Conduct data analyses to evaluate and mature the prototype hardware and signal processing algorithms leveraging science and technology, research and development, and operational fleet-collected data.					
FY 2021 Base Plans: Undersea Advantage funding to develop and validate an air-deployable prototype sensor as the next generation multistatic receiver. Conduct sensor and system performance assessments, gap analyses of the effects-					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 1292 / *Adv ASW Sensors & Proc*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
chains, rapid prototyping, and demonstration of the next generation of Multi-Static Active Coherent (MAC) system components, advancements in passive sensing and other acoustic and non-acoustic enhancements for traditional and high altitude ASW operations. Develop and mature prototype signal processing and hardware for data collections and at-sea experimentation. Employ the related test articles, models, processors and algorithms in at-sea demonstrations and related laboratory or in-water experiments to validate technical maturity and operational performance. Conduct data analyses to evaluate and mature the prototype hardware and signal processing algorithms leveraging science and technology, research and development, and operational fleet-collected data. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY21 increase for Undersea Advantage prototype system development and at-sea demonstration for the next generation of Multistatic Active Coherent (MAC) system components addresses gaps in critical, wide area search capabilities against fielded and emerging advanced ASW threats. Specifically, this effort includes development and fabrication of additional representative prototype sonobuoys, the design and maturation of the related signal processing algorithms, and the verification of the associated phenomenology in the open-ocean operating environment and through modeling and simulation. The FY21 increase will also fund additional critical at-sea demonstrations to collect data to further enhance our ability to transition this capability to the Fleet. Collectively, this FY21 effort directly supports a documented capability gap for Airborne ASW. At-sea data gathering events will be conducted in FY20 to identify Critical Technology Elements (CTEs) and associated contributions for the development of signal processing, the development of a sonobuoy specification in parallel with system development, and the identification and establishment of contractual vehicles to facilitate rapid prototyping and mature prototype signal processing and hardware.					
Accomplishments/Planned Programs Subtotals	6.877	7.172	15.719	0.000	15.719

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
• RDT&E/0480: *ASW Sensors & Proc*	37.635	43.045	43.215	-	43.215	44.001	47.557	46.705	47.641	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 1292 / *Adv ASW Sensors & Proc*

D. Acquisition Strategy

Develop and mature promising acoustic and non-acoustic ASW technologies that have high potential for meeting documented capability gaps and Fleet requirements. As funding permits, transition those technologies into acquisition programs of record for eventual Fleet release on ASW platforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 1292 / *Adv ASW Sensors & Proc*	

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	Various	Various : Various	4.530	1.134	Dec 2018	1.622	Dec 2019	5.002	Dec 2020	-		5.002	Continuing	Continuing	Continuing
		Subtotal	4.530	1.134		1.622		5.002		-		5.002	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAWCAD : PATUXENT RIVER, MD	6.307	1.050	Dec 2018	1.075	Dec 2019	3.610	Dec 2020	-		3.610	0.000	12.042	-
Studies & Analysis	WR	NAWCAD : PATUXENT RIVER, MD	8.871	1.100	Dec 2018	0.880	Dec 2019	1.925	Dec 2020	-		1.925	Continuing	Continuing	Continuing
		Subtotal	15.178	2.150		1.955		5.535		-		5.535	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
Dev Test & Eval	Various	Various : Various	25.780	2.000	Dec 2018	1.911	Dec 2019	3.058	Dec 2020	-		3.058	Continuing	Continuing	Continuing
		Subtotal	25.780	2.000		1.911		3.058		-		3.058	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Spt	Various	Various : Various	22.483	1.000	Dec 2018	1.050	Dec 2019	1.276	Dec 2020	-		1.276	Continuing	Continuing	Continuing
ENG & TECH SVCS (NON-FFRDC)	Various	Various : Various	3.094	0.100	Dec 2018	0.100	Dec 2019	0.100	Dec 2020	-		0.100	Continuing	Continuing	Continuing
MGT & PROF SVCS (FFRDC)	Various	Various : Various	1.557	0.100	Dec 2018	0.100	Dec 2019	0.100	Dec 2020	-		0.100	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 1292 / *Adv ASW Sensors & Proc*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	63.452	0.385	Dec 2018	0.426	Dec 2019	0.640	Dec 2020	-		0.640	Continuing	Continuing	Continuing
Travel	Various	VARIOUS : VARIOUS	0.164	0.008	Dec 2018	0.008	Dec 2019	0.008	Dec 2020	-		0.008	Continuing	Continuing	Continuing
		Subtotal	90.750	1.593		1.684		2.124		-		2.124	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	136.238	6.877		7.172		15.719		-		15.719	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 1292 / *Adv ASW Sensors & Proc*

PMA-264 Advanced ASW Sensors & Processing (1292)

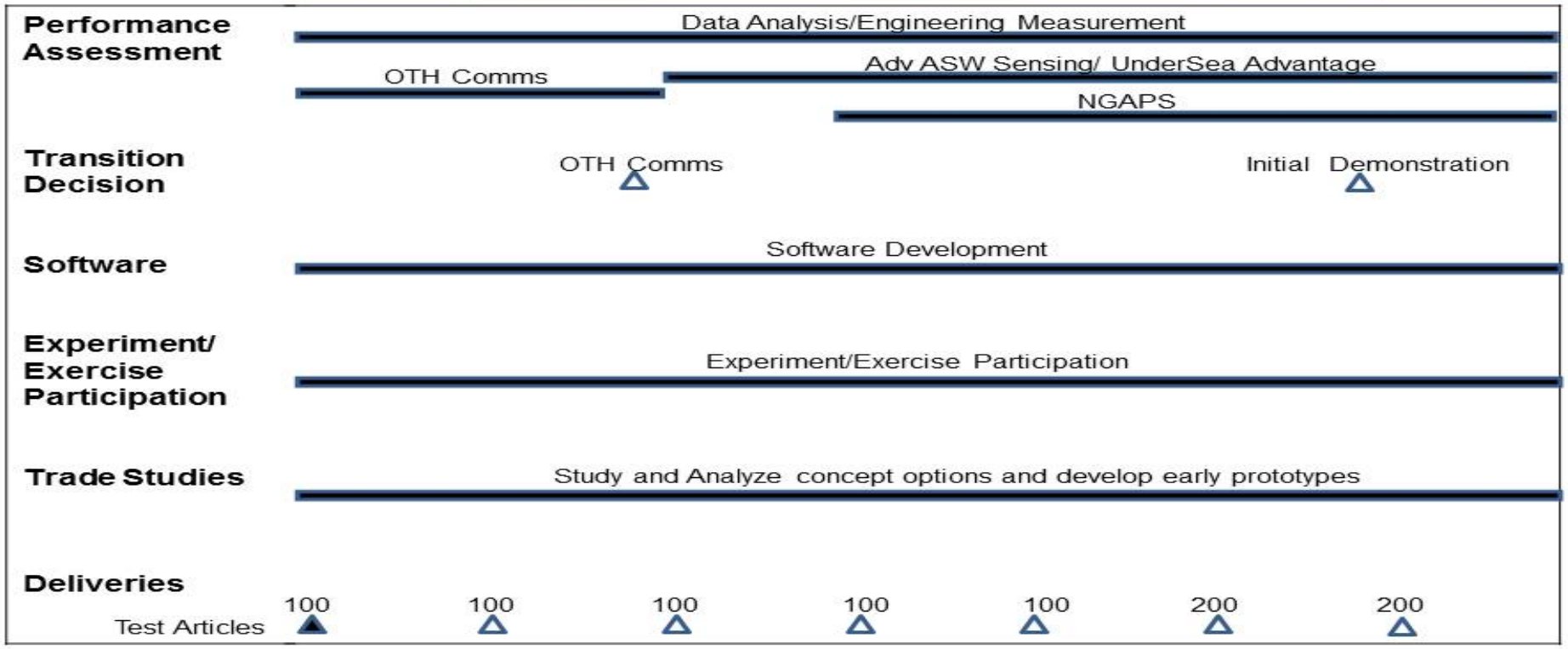

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 1292 / *Adv ASW Sensors & Proc*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj: 1292 - Adv ASW Sensors & Processors				
Performance Assessment: Data Analysis/Engineering Measurement	1	2019	4	2025
Performance Assessment: OTH Comms	1	2019	4	2020
Performance Assessment: Advanced ASW sensing / Undersea Advantage	1	2021	4	2025
Performance Assessment: Next Generation Airborne Passive System	1	2022	4	2025
Transition Decision: OTH Comms	4	2020	4	2020
Transition Decision: Initial Demonstration	4	2024	4	2024
Software: Software Development	1	2019	4	2025
Experiment/Exercise Participation: Experiment/Exercise Participation	1	2019	4	2025
Trade Studies: Trade Studies	1	2019	4	2025
Deliveries: Test Articles: Test Article Deliveries (8)	1	2019	1	2019
Deliveries: Test Articles: Test Article Deliveries (9)	1	2020	1	2020
Deliveries: Test Articles: Test Article Deliveries (10)	1	2021	1	2021
Deliveries: Test Articles: Test Article Deliveries (11)	1	2022	1	2022
Deliveries: Test Articles: Test Article Deliveries (12)	1	2023	1	2023
Deliveries: Test Articles: Test Article Deliveries (13)	1	2024	1	2024
Deliveries: Test Articles: Test Article Deliveries (14)	1	2025	1	2025