Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy											Date: May 2021	
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 0603382N *I Advanced Combat Systems Tech*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	108.631	56.464	52.381	32.310	-	32.310	-	-	-	-	-	-
0324: *Adv Combat System Technology*	70.348	1.728	1.299	1.566	-	1.566	-	-	-	-	-	-
2480: *SSL-TM*	0.000	4.649	11.857	5.342	-	5.342	-	-	-	-	-	-
3422: *SHARC Surface Platform*	9.055	5.552	14.645	3.742	-	3.742	-	-	-	-	-	-
3423: *LOCUST*	1.892	2.871	2.208	3.371	-	3.371	-	-	-	-	-	-
3437: *EMW/SEWIP/SSEE Accelerator*	14.389	23.156	21.382	18.289	-	18.289	-	-	-	-	-	-
3438: *Innovative Naval Prototype (INP) Transition (6.4)*	12.947	18.508	0.990	0.000	-	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Open architecture sets standards for technology fields to promote interoperability. For defense systems, standards enable interconnectivity across services and in coalition operations at machine-to-machine speeds. Reducing barriers associated with proprietary software speeds development and delivery of warfighting advantage. The Advanced Combat System Technology line is to evolve the technical and business practices for programs to change to an open architecture construct. The program was constructed to mature both technical and business model integration for C5I systems programs of record in an open architecture environment. The priority was incorporating the principles of modular design and design disclosure, reusable application software, interoperability and secure information exchange, lifecycle affordability and encouraging competition and collaboration.

Project Unit 0324: Funding is to implement of the Naval Open Systems Architecture (OSA) strategy. The implementation of this strategy provides the tools and leadership for assisting programs and the Naval Research and Development Establishment through the technical, business and cultural transition to OSA. The primary tools and assistance will be established through a set of technical reference frameworks for a Naval Digital Warfighting Platform (DWP) with consistent contract language guidance, Intellectual Property strategies and improvements in transparency of design disclosure and information exchange on past and current investments to support portfolio management and cross-program reuse. Applicable small business technologies such as Automated Test/Re-Test will also be leveraged to facilitate the Navy's implementation of OSA. The OSA transformation effort will be applied to programs of record. Those elements include ensuring that naval systems, families of systems, programs and prototypes move to modular OSA in accordance with DoD Instruction 5000.01 of 7 Jan 2015 which mandates that all DoD programs utilize Modular OSA to field affordable and interoperable systems. This project facilitates a strategic shift in the technical and business methods to establish cooperation and cross-domain/COI business relationships. This improves innovation and economies of scale throughout the Navy and Marine Corps. This project includes identification of business cases and return on investment for moving the Navy towards an open systems approach, supported by the development of open systems technologies and integrated best business and technical practices for open systems development within Naval acquisition. This project also supports Systems engineering and acquisition services to deliver capabilities through acquisition, development, integration, production, test, deployment and sustainment of interoperable command,

control, communication, computers, intelligence, surveillance reconnaissance, cyber, and information technology capabilities enabling Information Warfare; and other functions. Naval OSA ensures Navy-wide system architectures become extensible and scalable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, reuse methodologies, and extensible product lines.

Project Unit 2480: The efforts described in this mission area address the advanced component development and prototype demonstration associated with the Navy's Solid State Laser Technology Maturation (SSL-TM) Innovative Naval Prototypes (INP) Program and the Leap Ahead Technology (LA-Tech) investments. The SSL-TM program is developing an integrated Laser Weapons System Demonstrator (LWSD). SSL-TM will provide a new capability to the Fleet to address known capability gaps against asymmetric threats (UAS, small boats, and ISR sensors) and will inform future acquisition strategies, system designs, integration architectures, and fielding plans for laser weapon systems.

Project Unit 3422: The SHARC Surface Platforms demonstration project is part of the Department of Defense Third Offset Strategy as one element in the Sensor Grid category for 24/7 autonomy infused Situational Awareness (SA). This project will purchase Commercial-off-the-Shelf SHARC Platforms (wave gliders) and integrate four (4) unique Government-owned classified mission payloads focused on the detection of threats. These capabilities will enable CONOPS development in an operationally relevant environment to demonstrate how these technologies can improve the SA to the battlespace Commanders.

Project Unit 3423: The LOCUST demonstration is part of the Department of Defense Third Offset Strategy as one element in the Effector Grid category for small autonomous systems. LOCUST leverages the BA-3 Innovative Naval Prototype program developing and demonstrating swarming technology. The BA-3 effort is developing both the air vehicle, UAS swarming behaviors, and miniaturized sensor systems. ONR has demonstrated an autonomous system capable of launching 33 UASs in 40 seconds and flying them in a coordinated swarm. This BA-4 effort is trailing the BA-3 demonstration of technologies by a fiscal quarter and then demonstrating the technology in operationally relevant environments with military mission applications.

Project Unit 3424: The Heterogeneous Collaborative Unmanned Systems (HCUS) demonstration is part of the Department of Defense Third Offset Strategy as one element in the Effector Grid category for small autonomous systems. HCUS provides autonomous, tactical monitoring of an adversary's port-sized littoral area for an extended period of time with capability to apply limited offensive effects on-demand. Vehicles and sensors are intended to be used in contested environments - employing local communications nets, autonomous vehicle behavior, low bandwidth command links and local navigation with no requirement for GPS input.

HCUS systems can be encapsulated and deployed as a single payload, or a small number of payload packages designed for specific missions. The payloads can be carried into theater by various manned or unmanned platforms depending on the degree of stealth required. A week-long project demonstration will simulate covert deployment, operations of autonomous UAVs over the area of interest, data exfiltration to a remote operator, autonomous UAV recharging via USVs and/or UUVs, deployment of unmanned ground sensors for persistent sensing, and remote operator on-demand offensive attack on a simulated target.

Project 3437: The EMW/SEWIP/SSEE Accelerator is part of the Department of Defense Third Offset Strategy to improve real time Electro-Magnetic Maneuver Warfare operations. This effort will develop integrated cross platform active and passive sensing solutions, next generation network and real time spectrum operations.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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 0603382N *I Advanced Combat Systems Tech*

Project 3438: This activity addresses the advanced component development and prototype demonstration associated with ONR's Innovative Naval Prototypes (INP) Program and the Leap Ahead Technology (LA-Tech) investments. INP and LA-Tech investments represent game changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature as they would dramatically change the way naval forces fight. INPs and LA-Techs push the imagination of our nation's technical talent to deliver transformational warfighting capabilities. Investments may include such mission areas as Unmanned and Autonomous Systems, Directed Energy / Electric Weapons, Electromagnetic Maneuver Warfare, Cyber Warfare, and Undersea Warfare.

Advanced Component Development and Prototypes (ACD&P) efforts necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment are funded in this PE. Most of the work in this PE can be classified between Technology Readiness Level (TRL) 6 (system/subsystem model or prototype demonstration in a relevant environment) and TRL 7 (system prototype demonstration in an operational environment).

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	57.947	70.218	49.000	-	49.000
Current President's Budget	56.464	52.381	32.310	-	32.310
Total Adjustments	-1.483	-17.837	-16.690	-	-16.690
• Congressional General Reductions	-	-0.299			
• Congressional Directed Reductions	-	-17.538			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.483	0.000			
• Program Adjustments	0.000	0.000	-16.040	-	-16.040
• Rate/Misc Adjustments	0.000	0.000	-0.650	-	-0.650

Change Summary Explanation

The FY 2022 funding request was reduced by 1.352 million to account for the availability of prior year execution balances.

FINANCIAL: The decrease in funding from FY2021 to FY2022 is due to the various completion of parts of the SHARC program and HIJENKS. The reduced testing requirements of the HIJENKS advanced airborne payload which removed the need for related activities of flight platform modeling, simulation and certification. Therefore, the platform modification activities, system test activities, environmental system testing, associated flight modeling and simulation and program management oversight tasking associated with platform modification and certification no longer exists. The SHARC program completed development, integration and testing of over half the platforms that meet mission requirements.

Project Unit 0324 - FINANCIAL: The overall program funding in FY22 was increased by (+$0.267M) from Previous to Current President's Budget to account for various program adjustments. TECHNICAL: Mission Description, Budget Item Justifications and accomplishments/program plan descriptions updated to better show synchronization of Project 0324 activities in support of Project Overmatch and digital warfighting transformation objectives. SCHEDULE: Activities

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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 0603382N *I Advanced Combat Systems Tech*

and milestones clarified to better show synchronization of Project 0324 activities and deliverables in support of Project Overmatch as well as digital warfighting transformation objectives.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy											Date: May 2021	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*				Project (Number/Name) 0324 / *Adv Combat System Technology*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
0324: *Adv Combat System Technology*	70.348	1.728	1.299	1.566	-	1.566	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding is to implement of the Naval Open Systems Architecture (OSA) strategy. The implementation of this strategy provides the tools and leadership for assisting programs and the Naval Research and Development Establishment through the technical, business and cultural transition to OSA. The primary tools and assistance will be established through a set of technical reference frameworks for a Naval Digital Warfighting Platform (DWP) with consistent contract language guidance, Intellectual Property strategies and improvements in transparency of design disclosure and information exchange on past and current investments to support portfolio management and cross-program reuse. Applicable small business technologies such as Automated Test/Re-Test will also be leveraged to facilitate the Navy's implementation of OSA.

The OSA transformation effort will be applied to programs of record. Those elements include ensuring that naval systems, families of systems, programs and prototypes move to modular OSA in accordance with DoD Instruction 5000.01 of 7 Jan 2015 which mandates that all DoD programs utilize Modular OSA to field affordable and interoperable systems. This project facilitates a strategic shift in the technical and business methods to establish cooperation and cross-domain/COI business relationships. This improves innovation and economies of scale throughout the Navy and Marine Corps. This project includes identification of business cases and return on investment for moving the Navy towards an open systems approach, supported by the development of open systems technologies and integrated best business and technical practices for open systems development within Naval acquisition.

This project also supports Systems engineering and acquisition services to deliver capabilities through acquisition, development, integration, production, test, deployment and sustainment of interoperable command, control, communication, computers, intelligence, surveillance reconnaissance, cyber, and information technology capabilities enabling Information Warfare; and other functions. Naval OSA ensures Navy-wide system architectures become extensible and scalable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, reuse methodologies, and extensible product lines.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Title: Align the Naval Enterprise Across All Domains to Implement OA	0.499	0.199	0.464	0.000	0.464
Articles:	-	-	-	-	-
FY 2021 Plans: The FY21 budget will be utilized to generate Web-accessible reference resource providing OA-related policy and guidance.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Efforts include an updated contracting guidebook, interface standards, or proprietary data rights. ***FY 2022 Base Plans:*** - Continue to coordinate the development and scaling of supporting OSA enablers that include the Navy's Integrated Model Environment (IME) and Digital Warfighting Platform (DWP), with associated open standards and policy guidance development that enable application development conforming to open software development kits and application programming interfaces. - Continue to coordinate the prototyping, demonstration, and transition of OSA technologies to validate performance metrics, models, design, and system-of system requirements to meet fleet requirements. - Continue to coordinate the development of open standards and interfaces supported by the Automated Test/ Retest (ATRT) tool suite to enable further integration of third party tools and capabilities leveraging OSA. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 required to further coordinate development and scaling Modular Open Systems Architecture capabilities and policies.					
Title: Implement OSA on the Digital Warfighting Platform (DWP)	1.229	1.100	1.102	0.000	1.102
Articles:	-	-	-	-	-
FY 2021 Plans: The FY 2021 budget will be utilized to continue to execute the FY 2020 plan supporting the initiated Modular Open Systems Architecture projects in conjunction with platform/ system block upgrades. Additionally, it will promote policy changes and standards development that support the implementation and standardization of Modular Open Systems Architecture for POR interoperability efforts. This includes the implementation and standardization of and to award new projects aligning with strategic imperatives and project transition opportunities in conjunction with platform/system block upgrades. Anticipated areas of emphasis will be OA support to Distributed Maritime Operations. Provide systems engineering and acquisition services to deliver capabilities through acquisition, development, integration, production, test, deployment and sustainment of					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
interoperable command, control, communication, computers, intelligence, surveillance, reconnaissance, cyber, and information technology capabilities. ***FY 2022 Base Plans:*** - Integrate Modular Open Systems Architecture capabilities and standards into the Navy's Digital Warfighting Platform (DWP), with associated software development practices, policy changes, and standards development that enable improved test and evaluation, validation, verification, and certification of naval systems. - Leverage OSA implemented on the DWP, as supported by systems engineering subject matter expert support and enabling technologies such as Automated Test/Re-Test (ATRT), to further scale prototyping, experimentation, demonstration, analysis, implementation and adoption of OSA for various Battle Management Aids (BMAs) / Mission Planning Aids (MPs) / Tactical Decision Aids (TDAs) that include Artificial Intelligence / Machine Learning (AI/ML) applications, Networking capabilities, C2, data and track management tools and other common services, and related supporting hardware compute infrastructure solutions. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No significant change from FY 2021 to FY 2022.					
Accomplishments/Planned Programs Subtotals	1.728	1.299	1.566	0.000	1.566

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTEN/0307577N: *Intelligence Mission Data (IMD)*	0.000	0.000	0.907	-	0.907	-	-	-	-	-	-
• RDTEN/0604027N: *Digital Warfare*	35.551	35.480	46.769	-	46.769	-	-	-	-	-	-
• RDTEN/0603597N: *Automated Test & Analysis*	41.412	34.766	7.805	-	7.805	-	-	-	-	-	-
• RDTEN/0308601N: *Modeling & Simulation Support*	11.672	8.683	9.772	-	9.772	-	-	-	-	-	-
• OMN/4B3N: *Acquisition, Logistics, and Oversight*	1.512	5.316	6.342	-	6.342	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

This effort synergizes with and leverages/supports other funded efforts including Intelligence Mission Data (IMD) (RDTEN/PE 0307577N), Digital Warfare (RDTEN/PE 0604027N), Automated Test & Re-Test (RDTEN/PE 0603597N) and Modeling & Simulation Support (RDTEN/PE 0308601N, OMN/4B3N) to support Project Overmatch and warfighting digital transformation efforts.

D. Acquisition Strategy

This is a non-ACAT program. This project has been a Navy Acquisition Executive directed effort to fundamentally alter the business, technical and policy environment for warfare systems acquisition to result in improved affordability, increased access to innovation, entreprenurialship, a reduction in time to field, improved operational availability, agility, and promote cultural environment change. The Navy's OSA Enterprise effort built off past successes such as the Acoustic Rapid Commercial-off-the-Shelf Insertion (ARCI) program policy statement dated 5 August 2004, the Deputy Chief of Naval Operations (DCNO) requirement dated 23 December 2005, and the Naval OSA Strategy of 2011) and is now being extended and scaled for applicability across the Department of the Navy to enable open, affordable and rapid integrated capability development. This effort continues to expand into and enable related strategic support for Rapid Prototyping, Experimentation and Demonstration and the leveraging of large and small business capabilities, the defense industrial base, government laboratories, and academia partnered with agile contracting approaches to support the evolution of the business, technical and policy landscape for warfare systems acquisition.

This effort synergizes with and leverages / supports other funded efforts including Automated Test & Re-Test (PE 0603597N), Digital Warfare (PE 0604027N), Modeling & Simulation Support (PE 0308601N), and Intelligence Mission Data (IMD) (PE 0307577N) to support Project Overmatch and warfighting digital transformation efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Signal Processing	Various	Various : Various	31.116	0.000		0.000		0.000		-		0.000	-	-	-
OA Domain Alignment	Various	Various : Various	11.931	0.000		0.000		0.000		-		0.000	-	-	-
Align the Naval Enterprise Across All Domains to Implement OA	C/FP	WFCs : Various	3.111	0.341	Jun 2020	0.450	Mar 2021	0.464	Mar 2022	-		0.464	-	-	-
Implement OSA on the Digital Warfighting Platform (DWP)	C/FP	NSWC, NRL, NUWC, NAWC WD; NAWC AD, VARIOUS : Various	1.572	0.861	Jun 2020	0.499	Apr 2021	0.841	Apr 2022	-		0.841	-	-	-
Align the Naval Enterprise Across All Domains to Implement OA	C/FP	NAWC AD : Patuxent River, MD	0.000	0.158	May 2020	0.000		0.000		-		0.000	-	-	-
Implement OSA on the Digital Warfighting Platform (DWP)	C/BA	PSNS NSY : Bremerton, WA	0.000	0.015	May 2020	0.000		0.000		-		0.000	-	-	-
		Subtotal	47.730	1.375		0.949		1.305		-		1.305	-	-	N/A

Remarks

Increase of $356K from FY 2021 to FY 2022 reflects scaling and expansion of OSA technologies and capabilities upon the Digital Warfighting Platform (DWP) leveraging large and small business capabilities, the defense industrial base, government laboratories, and academia.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Industry Development	C/FP	IBM, ANGLE, TBD (New IET Contract) : VARIOUS	9.805	0.000		0.000		0.000		-		0.000	-	-	-
Technical Data-Academia	WR	NPS-Monterey/DAU : MONTEREY, CA	2.348	0.000		0.000		0.000		-		0.000	-	-	-
Software Development	C/FP	TRIDENT, ASSET : VARIOUS	0.309	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 0324 / *Adv Combat System Technology*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	12.462	0.000		0.000		0.000		-		0.000	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	WR	NSWC/DD : DAHLGREN, VA	2.216	0.000		0.000		0.000		-		0.000	-	-	-
OA Asset Repository (SBIR Account)	WR	Miscellaneous : VARIOUS	0.150	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	2.366	0.000		0.000		0.000		-		0.000	-	-	N/A

Management Services ($ in Millions)

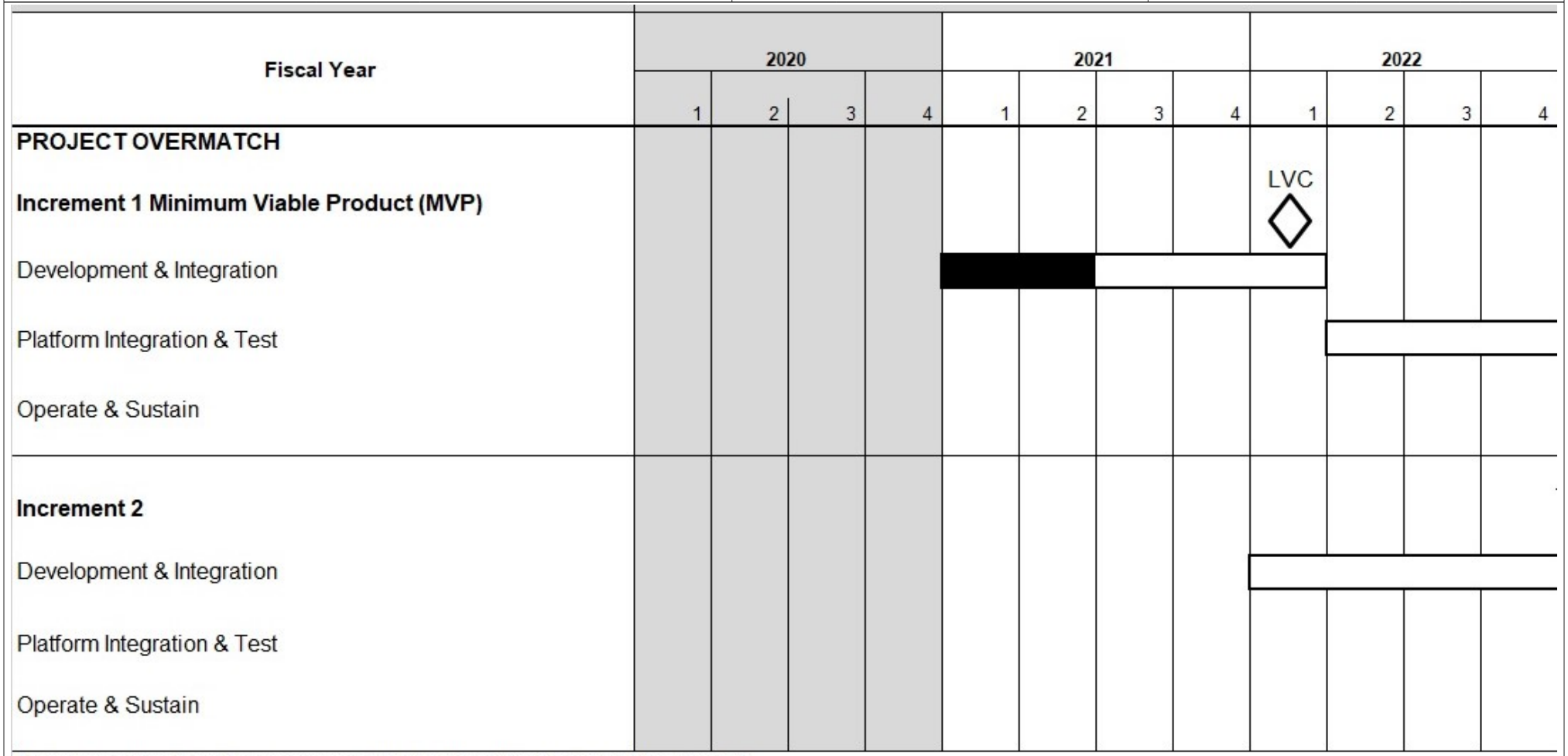
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	Miscellaneous : VARIOUS	3.021	0.353	May 2020	0.350	Mar 2021	0.261	Mar 2022	-		0.261	-	-	-
SBIR Assessment (Cong Add)	WR	NSWC/DD : DAHLGREN, VA	4.748	0.000		0.000		0.000		-		0.000	-	-	-
DAWDF	TBD	TBD : TBD	0.021	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	7.790	0.353		0.350		0.261		-		0.261	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	70.348	1.728		1.299		1.566		-		1.566	-	-	N/A

Remarks

Increase of $267K from FY 2021 to FY 2022 required to further develop and scale Modular Open Systems Architecture capabilities, technologies, and policies.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*



Note: Specifics have been removed due to Classified nature of the Project

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0324				
Increment 1 Minimum Viable Product: Development & Integration	1	2021	4	2022
Increment 1 Minimum Viable Product: Development and Integration: Live, Virtual, and Constructive Test Event	1	2022	1	2022
Increment 1 Minimum Viable Product: Platform Integration & Test	1	2022	4	2022
Increment 2: Development & Integration	1	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy											Date: May 2021	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*				Project (Number/Name) 2480 / *SSL-TM*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
2480: *SSL-TM*	0.000	4.649	11.857	5.342	-	5.342	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This PU 2480 includes Solid State Laser Technology Maturation (SSL-TM) resources and associated plans intended to provide advanced component development and prototyping for selected SSL-TM technologies maturing out of ONR's supporting Innovative Naval Prototype (INP) BA3 portfolio.

A. Mission Description and Budget Item Justification

The efforts described in this mission area address the advanced component development and prototype demonstration associated with the Navy's Solid State Laser Technology Maturation (SSL-TM) Innovative Naval Prototypes (INP) Program investments. The SSL-TM program is developing an integrated Laser Weapons System Demonstrator (LWSD). SSL-TM will provide a new capability to the Fleet to address known capability gaps against asymmetric threats (UAS, small boats, and ISR sensors) and will inform future acquisition strategies, system designs, integration architectures, and fielding plans for laser weapon systems.

INP and LA-Tech investments represent game changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature as they would dramatically change the way naval forces fight. INPs and LA-Techs push the imagination of our nation's technical talent to deliver transformational warfighting capabilities. Successful demonstrations are intended to present the Department of the Navy with a programmatic challenge as these new capabilities can lead to the obsolescence of existing capabilities and significant decisions as to the path forward for integrating the new technological capabilities into the warfighting systems of the future.

ONR manages a continuum of INP and LA-Tech development from BA2 to BA3 to BA4. The goal of these BA4 investments is to further mature development and expend efforts necessary to evaluate integrated technologies, representative modes or prototype systems in high fidelity and realistic operating environments. This BA4 investment includes system specific efforts that help expedite technology transition from the laboratory to operational use. Emphasis is on proving component and subsystem maturity prior to integration in major and complex systems and may involve risk reduction initiatives. Projects in this category involve efforts prior to Milestone B and are referred to as advanced component development activities and include technology demonstrations. It is the goal of these projects to achieve Technology Readiness Levels 6 or 7. Successful experimentation and demonstration highlights the viability of new technological capabilities that could be implemented if an acquisition program were to be established to support further development. The portfolio is periodically refreshed through the selection of new INPs and LA-Tech investments as existing ones are completed.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Solid State Laser Technology Maturation (SSL-TM)	4.649	11.857	5.342	0.000	5.342
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 2480 / *SSL-TM*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Description: The Solid State Laser Technology Maturation (SSL-TM) Program is developing an integrated Laser Weapons System Demonstrator (LWSD) that will be installed on USS Portland (LPD-27) during FY 2019 with investments funded in the BA3 Innovative Naval Prototypes Program Element 0603801N. The investment programmed in Program Element 0603382N, Advanced Combat Systems Technology, funds costs for extended at-sea experimentation, operations, and support of the installed system on LPD-27 in the Pacific operating areas. SSL-TM will provide a new capability to the Fleet to address known capability gaps against asymmetric threats (UAS, small boats, and ISR sensors) and will inform future acquisition strategies, system designs, integration architectures, and fielding plans for laser weapon systems. ***FY 2021 Plans:*** Continue extended experimentation and laser weapons system capability demonstrations on USS Portland during fleet operations and experiments. Develop lesson learned and document system technical performance during operations, demonstrations and experiments. Groom events will include detailed inspection of LWSD system on ship to determine material condition and identify any repairs that are needed. Operators and maintenance personnel will be trained prior to deployment. System sustainment will be provided by deployed sailors with support from contractor and government maintenance experts as well as reach-back capability to address questions and issues beyond deployed maintenance team capability. A test team will be deployed during demonstrations and experiments to support coordination of demonstration and test execution, data collection and report writing requirements. The system will be available to support daily operational mission requirements and two (2) focused demonstration /experimentation events are planned during 2 and 3 Quarters of 2021. The scheduled will be adjusted as additional information about the USS Portlands schedule is defined. ***FY 2022 Base Plans:*** Continue activities in support of fleet operations, sustainment, experimentation and laser weapons demonstrations on the USS Portland which began in FY 2021. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in funding from FY 2021 to FY 2022 due to completion of integration and test activities but provides continued support for system operation, sustainment, operations, experimentation and demonstrations.					
Accomplishments/Planned Programs Subtotals	4.649	11.857	5.342	0.000	5.342

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 2480 / *SSL-TM*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The projects identified for execution are non-acquisition programs. The Office of Naval Research will provide Government oversight to the projects. Each project will develop a project plan to support execution. Project plans will include a schedule and the necessary technical requirements and objectives to measure and evaluate performance. Additionally, each project will be subjected to experimentation then demonstrated in operationally relevant environments to assess their ability to meet warfighter requirements. Project deliverables will include the actual integrated hardware/software prototype systems, test reports, and technical data, necessary to support decision making. These decisions include the transition of technologies to acquisition, further refinement of the technology, or termination and reinvestment of remaining funds to other technologies that add military value.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 2480 / *SSL-TM*	

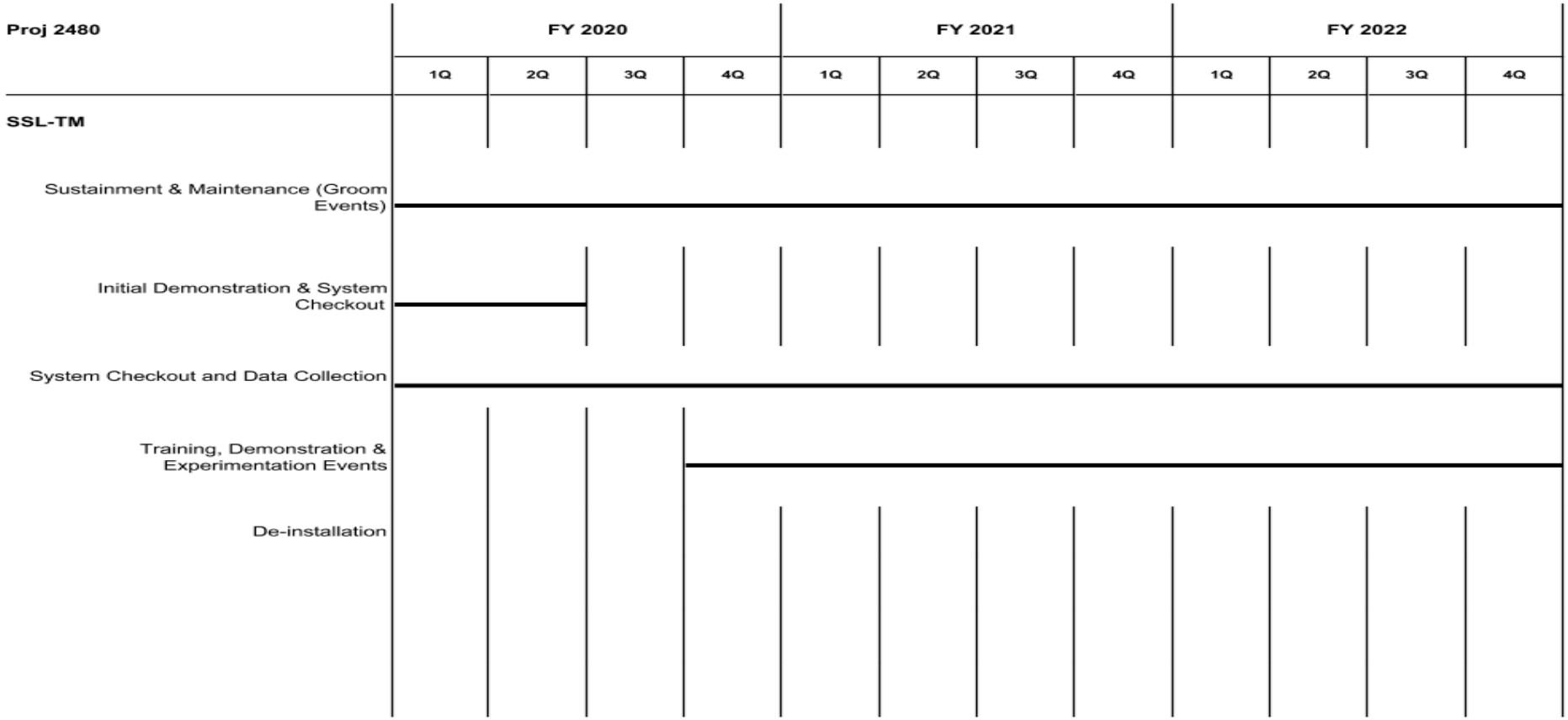
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SSL-TM Experimentation and Testing	WR	Naval Surface Warfare Center Dahlgren Division : Dahlgren, VA	0.000	1.882	Oct 2019	1.759	Oct 2020	0.600	Oct 2021	-		0.600	-	-	-
SSL-TM Experimentation and Sustainment	WR	Naval Surface Warfare Center, Port Hueneme Divisio : Port Hueneme, CA	0.000	0.970	Oct 2019	7.098	Oct 2020	2.830	Oct 2021	-		2.830	-	-	-
SSL-TM Technical and Engineering T&E	C/CPFF	Northrup Grumman : Redondo Beach, CA	0.000	1.462	Oct 2019	3.000	Oct 2020	1.000	Oct 2021	-		1.000	-	-	-
SSL-TM Technical and Engineering T&E	WR	Naval Surface Warfare Center Crane Division : Crane, IN	0.000	0.000		0.000		0.150	Oct 2021	-		0.150	-	-	-
SSL-TM Technical and Engineering T&E	MIPR	MITRE : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.050	Oct 2021	-		0.050	-	-	-
SSL-TM Technical and Engineering T&E	C/CPFF	RCT Systems Inc : Baltimore, MD	0.000	0.000		0.000		0.462	Oct 2021	-		0.462	-	-	-
SSL-TM Technical and Engineering T&E	C/CPFF	Gryphon Technologies : Washington, DC	0.000	0.000		0.000		0.250	Oct 2021	-		0.250	-	-	-
Need IteSSL-TM Technical and Engineering T&Em Text	C/CPFF	Naval Surface Warfare Center, Port Hueneme Divisio : Port Hueneme, CA	0.000	0.335	Oct 2019	0.000		0.000		-		0.000	-	-	-
		Subtotal	0.000	4.649		11.857		5.342		-		5.342	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.649		11.857		5.342		-		5.342	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 2480 / *SSL-TM*



2022PB - 0603382N - 2480

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 2480 / *SSL-TM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2480				
SSL-TM: Sustainment & Maintenance (Groom Events): Sustainment & Maintenance (Groom Events)	1	2020	4	2022
SSL-TM: Initial Demonstration & System Checkout: Initial Demonstration & System Checkout	1	2020	2	2020
SSL-TM: System Checkout and Data Collection: System Checkout and Data Collection	1	2020	4	2022
SSL-TM: Training, Demonstration & Experimentation Events: Training, Demonstration & Experimentation Events	4	2020	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3422 / *SHARC Surface Platform*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3422: *SHARC Surface Platform*	9.055	5.552	14.645	3.742	-	3.742	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Sensor Hosting Autonomous Remote Craft (SHARC) Surface Platforms demonstration project is part of the Department of Defense Third Offset Strategy as one element in the Sensor Grid category for 24/7 autonomy infused Situational Awareness (SA). This project will purchase Unmanned Surface Vehicle (USV), autonomous wave gliders, and integrate four (4) unique Government-owned classified mission payloads focused on the detection of threats. The successful demonstration of one particular payload integration to support a high priority warfighting mission area will be followed by a prototype operational event. The full mission cannot be executed without the full array / mission set quantity. Without full mission execution, this will jeopardize our armed forces security by degrading and delaying a critical joint capability. These capabilities will enable Concepts of Operation (CONOPS) development in an operationally relevant environment to demonstrate how these technologies can improve the SA to the battlespace Commanders. This includes persistent, autonomous SA and early warning of submarines or related submarine activity as well as broad area, clandestine implementation of capabilities that enhance Intelligence Preparation of the Battlefield (IPB) and strike missions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Sensor Hosting Autonomous Remote Craft (SHARC)	5.552	14.645	3.742	0.000	3.742
Articles:	-	-	-	-	-
Description: This project will demonstrate the warfighting utility of multiple, long endurance platforms with classified payloads conducting critical Intelligence, Surveillance and Reconnaissance (ISR) missions with simultaneous, wideband data links for signal and imagery data transmission between host assets and Operational level processing systems. Emerging technologies and engineering innovations from Naval/DoD research and development and industry, will be integrated to demonstrate secure and reliable collection, analysis, tactical level access to host asset ISR data and fusion of ISR and targeting data from organic assets and sensors.					
FY 2021 Plans: - Complete development, integration and testing of twelve (12) SHARC platforms, payload systems, and associated subsystems for a total of sixteen (16) SHARC systems by the end of FY21. The full mission test requires a total of 20 SHARC systems to demonstrate the capability for priority IPB Prototype Operations to meet PACOM ISR mission requirements. Additional information is available at higher classification Levels. - Finalize C2, IA/Cybersecurity implementation for payload integration and IPB prototype mission execution and Complete CONOPS.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3422 / *SHARC Surface Platform*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Conduct full up prototype mission testing, payload performance evaluation, analysis and assessment. - Incorporate engineering modifications based on system design, build, test, and analysis/assessment. - Execute government acceptance testing for all systems. - Develop design specifications and purchase support equipment to include storage and transport systems. - Complete design and build of the initial Rapid Deployment Systems (RDS). The RDS includes support equipment that will enable minimal manning for rapid deployment of the wave glider from multiple ships/vessels to meet mission requirements. - Full system integration, test and delivery of twenty prototype ready-for-issue systems to COCOM. - Design and build planned variants for baseline system to meet stakeholder CONOPS Additional information available at higher classification levels. ***FY 2022 Base Plans:*** -Complete final full mission set operational demonstration and evaluation (a mission system set consists of 16 to 20 units/nodes). -Refurbishment of units after final full system demonstration -Complete logistical plan and documentation of system for delivery of full mission set and transition of program. -Transition to OPNAV N2N6F3 and associate program office of record. Additional information available at higher classification levels. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 is due to the completed development, integration and testing of over half the SHARC platforms that meet mission requirements.					
Accomplishments/Planned Programs Subtotals	5.552	14.645	3.742	0.000	3.742

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

FY 2019: T&E Milestone: Developmental Test (DT) and assessment of initial payloads installed on USV wave glider platforms

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3422 / *SHARC Surface Platform*

FY 2020: T&E Milestone: DT and assessment of additional payloads installed on USV wave glider platforms
FY 2021: T&E Milestone: Build and validate readiness of integrated Prototype Operational units
FY 2022: T&E and Transition Milestone: COCOM Final Full Mission System Set Operational Demonstration and Transition to OPNAV N2N6F3.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3422 / *SHARC Surface Platform*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and CONOPS Development	MIPR	Naval Undersea Warfare Center (NUWC) : Keyport, WA	0.675	0.600	Oct 2019	0.500	Oct 2020	0.400	Oct 2021	-		0.400	-	-	-
System & Payload Design, Engineering, and Integration	MIPR	Space and Naval Warfare System Center Pacific (SSC : San Diego, CA	3.551	1.740	Oct 2019	4.976	Oct 2020	0.950	Oct 2021	-		0.950	-	-	-
Purchase COTS SHARC platforms	C/FFP	Space and Naval Warfare System Center Pacific (SSC : San Diego, CA	3.774	1.772	Oct 2019	7.175	Dec 2020	0.920	Dec 2021	-		0.920	-	-	-
		Subtotal	8.000	4.112		12.651		2.270		-		2.270	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation Phase	MIPR	PMS-485 Maritime Surveillance Systems, SSCPAC : San Diego, CA	0.403	0.480	Mar 2020	1.014	Apr 2021	0.413	Nov 2021	-		0.413	-	-	-
		Subtotal	0.403	0.480		1.014		0.413		-		0.413	-	-	N/A

Management Services ($ in Millions)

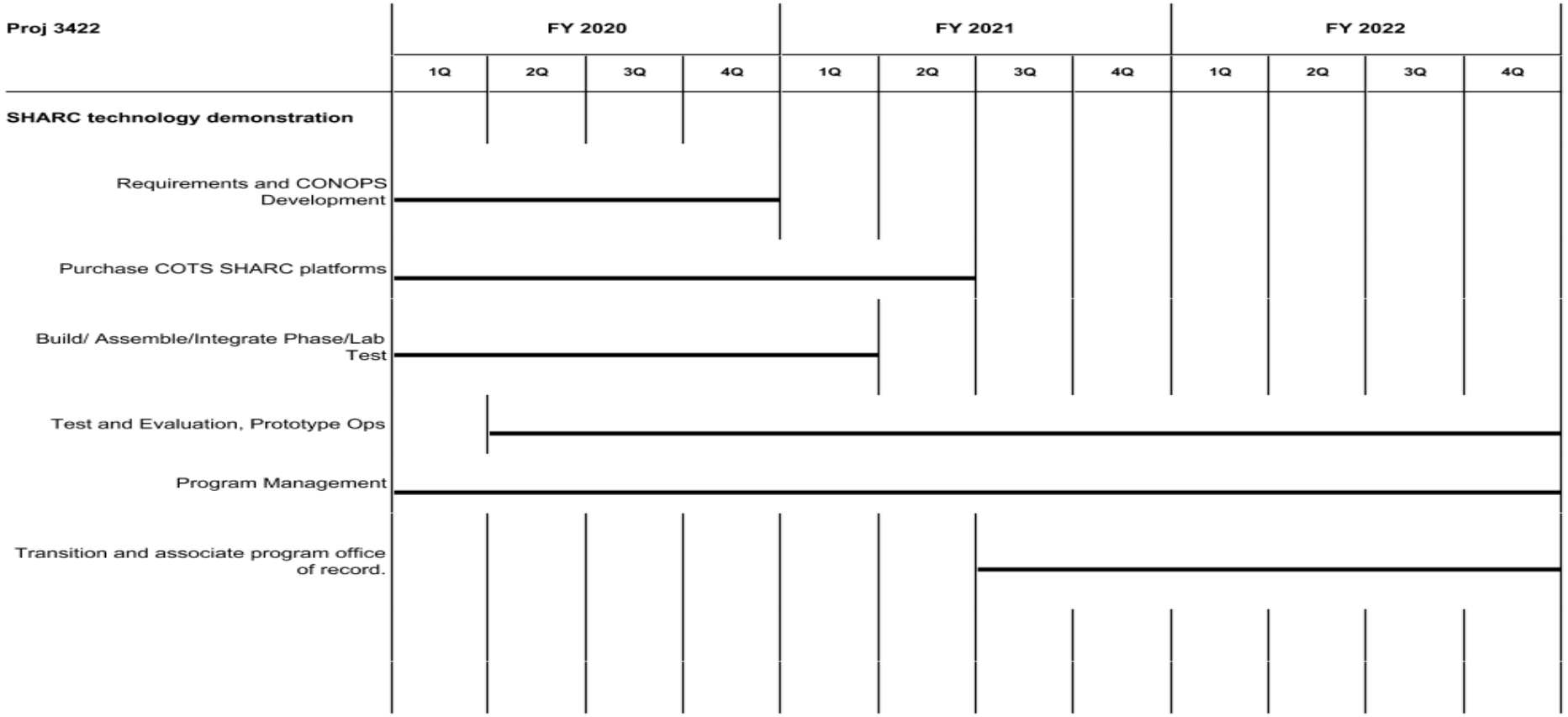
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PMS-485 Maritime Surveillance Systems, SSCPAC : San Diego, CA	0.652	0.960	Oct 2019	0.980	Oct 2020	1.059	Oct 2021	-		1.059	-	-	-
		Subtotal	0.652	0.960		0.980		1.059		-		1.059	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3422 / *SHARC Surface Platform*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.055	5.552		14.645		3.742		-		3.742	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3422 / *SHARC Surface Platform*



2022PB - 0603382N - 3422

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3422 / *SHARC Surface Platform*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3422				
SHARC technology demonstration: Requirements and CONOPS Development: Requirements and CONOPS Development	1	2020	4	2020
SHARC technology demonstration: Purchase COTS SHARC platforms: Purchase COTS SHARC platforms	1	2020	2	2021
SHARC technology demonstration: Build/ Assemble/Integrate Phase/Lab Test: Build/ Assemble/Integrate Phase/Lab Test	1	2020	1	2021
SHARC technology demonstration: Test and Evaluation, Prototype Ops: Test and Evaluation, Prototype Ops	2	2020	4	2022
SHARC technology demonstration: Program Management: Program Management	1	2020	4	2022
SHARC technology demonstration: Transition and associate program office of record.: Transition and program office of record.	3	2021	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3423 / *LOCUST*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3423: *LOCUST*	1.892	2.871	2.208	3.371	-	3.371	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Low-Cost Uav Swarming Technology (LOCUST) demonstration is part of the Department of Defense (DOD) Third Offset Strategy as one element in the Effector Grid category for small autonomous systems. LOCUST leverages the BA-3 Innovative Naval Prototype program developing and demonstrating swarming technology. The BA-3 effort is developing both the air vehicle, UAS swarming behaviors, and miniaturized sensor systems. ONR has demonstrated an autonomous system capable of launching 33 UASs in 40 seconds and flying them in a coordinated swarm. This BA-4 effort is trailing the BA-3 demonstration of technologies by a fiscal quarter and then demonstrating the technology in operationally relevant environments with military mission applications. Due to limitation of funding, FY 2018 accomplishments were limited to just the planned warfighter workshops and program planning.

To achieve ability to operative in relevant environment with military applications, the LOCUST effort is ruggedizing the air platform to survive extended deployments in high shock and vibration environments while in the launchers as well as in-flight for adverse electromagnetic and weather conditions. Significant additional effort is being done to integrate the air platform, command and control, and launchers into and onto several different manned and unmanned host platforms for mission deployment. Scale-up considerations for manufacturing and supply-chain assurance/vulnerability are being pursued.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Low-Cost Uav Swarming Technology (LOCUST)	2.871	2.208	3.371	0.000	3.371
Articles:	-	-	-	-	-
Description: This Project focuses on demonstration of mixed-initiative UAV swarming behaviors, enabling the development of payload appropriate CONOPS/TTPs for Many Vehicle/Many Salvo swarms, and provides unmanned system capability to degrade threat Integrated Air Defense Systems (IADS) in support of follow-on manned system operations.					
FY 2021 Plans: In FY 2021, the LOCUST efforts will continue activities initiated in FY2020 and conduct an operational demonstration of one mission scenario involving operator in-the-loop autonomous strike missions against adversary threat systems that will be completed in 2QFY2021. Activities will initiate towards a second mission relevant scenario addressing counters to adversary defensive systems. Additional technology areas being addressed are improved mission planning to minimize/reduce operator workload and manned/unmanned					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3423 / *LOCUST*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
operations. Hardware procurements to support increased flight testing and complexity of demonstration scenarios is also planned. ***FY 2022 Base Plans:*** In FY22, LOCUST will continue activities towards a second mission relevant scenario addressing counters to adversary defensive systems. Hardware procurements to support increased flight testing and complexity of demonstration scenarios is planned as are operations that involved close coordination with manned operational assets in the scenario execution. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY21 to FY22 supports increasing hardware investments supporting flight testing.					
Accomplishments/Planned Programs Subtotals	2.871	2.208	3.371	0.000	3.371

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTEN/0602792N/3423: *LOCUST*	0.000	21.950	8.031	-	8.031	-	-	-	-	-	-
• RDTEN/0603801N/3423: *LOCUST*	0.000	12.695	3.386	-	3.386	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

There are multiple phases for this non-acquisition project.

Phase 1 - Marine Corps Warfighting Laboratory (MCWL) Air Combat Element (ACE) will lead the Phase I effort in FY 2018 & FY 2019. MCWL will procure additional launchers, LOCUST platforms and payloads. MCWL will work with the Common Launch Tube Program of Record to procure the multiple missile Common Launch Tube. MCWL will task NAWC AD to help integrate the launcher system onto the MV-22 and support flight test and flight certification. MCWL will use a supporting Warfare Center to integrate the launcher onto a Marine Corps Polaris Corporation M-RZR vehicle or M-RZR trailer. MCWL ACE will closely coordinate with the BA-3 LOCUST program manager to procure the new 6" diameter, additive manufactured, air frame (purchase through BA-3 activity contract). MCWL Experimental Division will define CONOPS/TTPs, the experimental parameters and measures of effectiveness, and operational experiments suitable to apply the capability in a relevant operational environment to evaluate the military utility of the system to a small Marine Corps maneuver element. The Center for Naval Analysis will consolidate the post demonstration report for the systems military utility.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3423 / *LOCUST*

Phase II -ONR execute a multi-domain swarm effort in FY 2020-2023 to demonstrate the advantages of small swarming UAVs against adversary defenses. ONR will work with the Naval Warfare Development Center (NWDC) to develop CONOPS / TTPS for this mission capability and fleet experimentation. NSWC Panama City Division (NSWC PCD) will provide operational and logistics support for the launch and recovery of the vehicles. Initiation of Phase II in FY2020 intentionally follows the 6.3 INP by two fiscal years to allow the INP to develop and mature the miniaturized payloads required for an operational demo. Additionally, close coordination and involvement with acquisition community through these NWDC events and well as simulation exercises and the objective experiments and demonstrations is being done to shape requirements and budget submissions

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3423 / *LOCUST*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Rotor Platform Procur	MIPR	NRL : Wash, DC	0.013	0.000		0.000		0.000		-		0.000	-	-	-
Multi-Rotor Platform Payload	MIPR	MITRE : Mclean, VA	0.350	0.000		0.000		0.000		-		0.000	-	-	-
Payload Procurement	C/CPFF	Raytheon : Tucson, AZ	0.704	0.000		0.400	Nov 2020	0.800	Nov 2021	-		0.800	-	-	-
Multi-Rotor Tests	MIPR	NSWC : Indian Head, MD	0.025	0.000		0.000		0.000		-		0.000	-	-	-
Fixed-Wing Procurement	C/CPFF	Raytheon : Tuxson, AZ	0.800	0.000		1.370	Nov 2020	2.171	Nov 2021	-		2.171	-	-	-
Platform Specific Launcher Development	Various	Various : Various	0.000	1.201	Nov 2019	0.000		0.000		-		0.000	-	-	-
Command and Control Integration	Various	Various : Various	0.000	0.560	Nov 2019	0.000		0.000		-		0.000	-	-	-
Fixed Wing Tests	Various	Various : Various	0.000	0.950	Jun 2020	0.338	May 2021	0.300	Nov 2021	-		0.300	-	-	-
		Subtotal	1.892	2.711		2.108		3.271		-		3.271	-	-	N/A

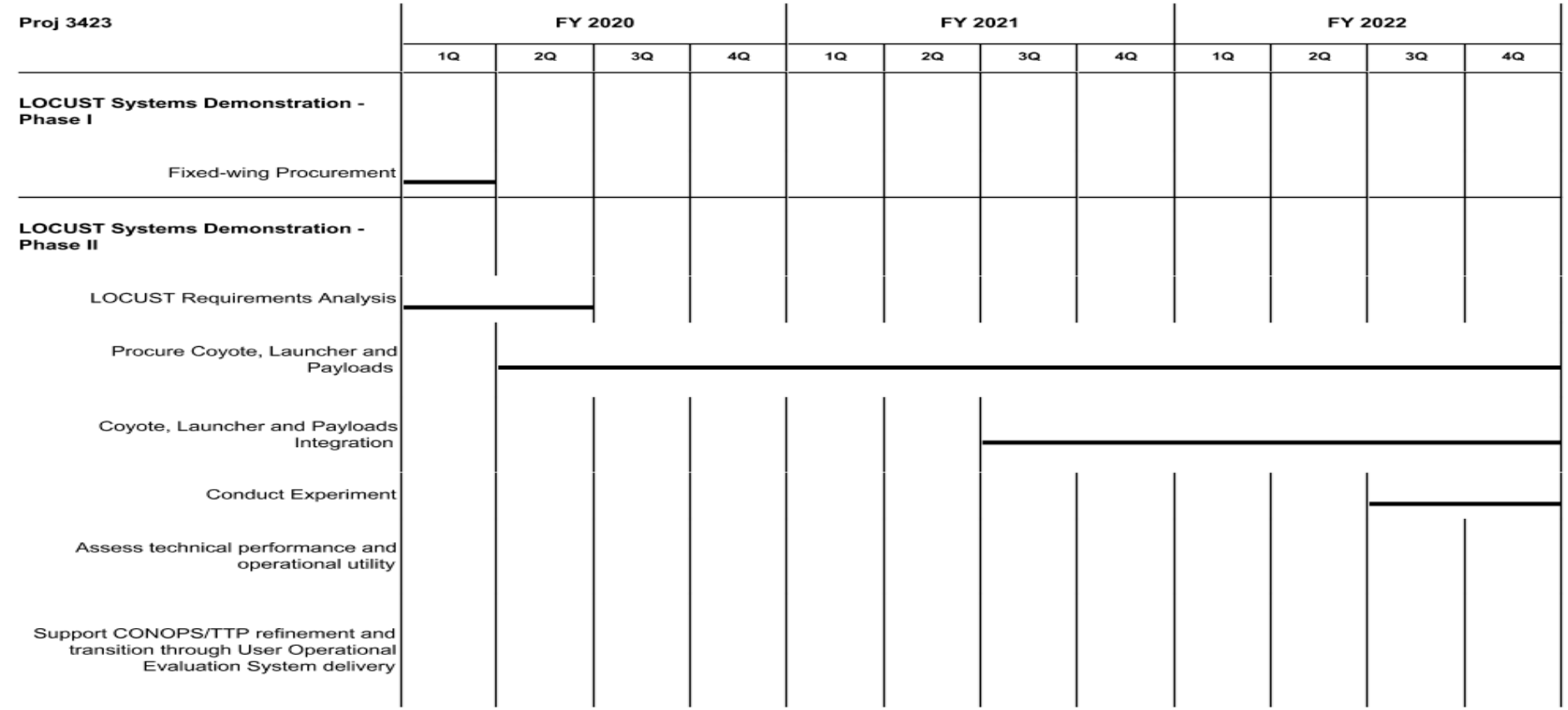
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	TBD	Not Specified : Not Specified	0.000	0.160	Oct 2019	0.100	Oct 2020	0.100	Nov 2021	-		0.100	-	-	-
		Subtotal	0.000	0.160		0.100		0.100		-		0.100	-	-	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.892	2.871		2.208		3.371		-		3.371	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3423 / *LOCUST*



2022PB - 0603382N - 3423

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3423 / *LOCUST*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3423				
LOCUST Systems Demonstration - Phase I: Fixed-wing Procurement: Fixed-wing Procurement	1	2020	1	2020
LOCUST Systems Demonstration - Phase II: LOCUST Requirements Analysis: LOCUST Requirements Analysis	1	2020	2	2020
LOCUST Systems Demonstration - Phase II: Procure Coyote, Launcher and Payloads: Procure Coyote, Launcher and Payloads	2	2020	4	2022
LOCUST Systems Demonstration - Phase II: Coyote, Launcher and Payloads Integration: Coyote, Launcher and Payloads Integration	3	2021	4	2022
LOCUST Systems Demonstration - Phase II: Conduct Experiment: Conduct Experiment	3	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3437 / *EMW/SEWIP/SSEE Accelerator*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3437: *EMW/SEWIP/SSEE Accelerator*	14.389	23.156	21.382	18.289	-	18.289	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Electromagnetic Maneuver Warfare/Surface Electronic Warfare Improvement Program/Ship's Signals Exploitation Equipment (EMW/SEWIP/SSEE) Accelerator is part of the Department of Defense Third Offset Strategy to improve real time Electro-Magnetic Maneuver Warfare operations. EMW/SEWIP/SSEE Accelerator leverages the S&T Budget Activity (BA)-3 Electro-Magnetic Maneuver Warfare technology developments specifically in cross platform operations. The BA-3 effort is developing high speed sensor and electro-magnetic networking, real time spectrum operations and passive targeting technologies. ONR has demonstrated elements of next generation networking, passive tracking, and cross platform combat system coordination. This BA-4 effort is trailing the BA-3 demonstration of technologies deploying and demonstrating the technology in operationally relevant environments with military mission applications. The deployment will allow the ONR to significantly reduce risk, incorporate early warfighter improvements and test with real world data and scenarios.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: EMW/SEWIP/SSEE Accelerator	23.156	21.382	18.289	0.000	18.289
Articles:	-	-	-	-	-
Description: EMW/SEWIP/SSEE accelerator builds off of two BA-3 efforts: Surface platform arrays, radios and control software were developed under the Multi-Link CDL System Future Naval Capability and airborne relay were developed within the High Altitude Relay and Routing Future Naval Capability. To date ONR has demonstrated 4-beam CDL surface arrays, radios and controls via land based motion simulators, while the airborne relay functionality has been demonstrated on a P-3 platform in a relevant environment.					
FY 2021 Plans: - Continue developing the directional networking waveform to include routing along with dynamic spectrum allocation. A frequency division overlay will be incorporated into the waveform which will allow greater node capacity and reduced latency. The addition of software-defined networking capabilities will enable distributed sensor data dissemination and interoperability with legacy platforms that use nonstandard networking protocols. -Acquire additional hardware for expanded at sea testing aboard deployed surface platforms and continue the development of airborne systems.					
FY 2022 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3437 / *EMW/SEWIP/SSEE Accelerator*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Continue developing the directional networking waveform to include air borne node with routing along with dynamic spectrum allocation and intelligent directional pointing. Incorporate enhanced waveform utilizing the directionality of the apertures. Modify software-defined networking capabilities to include priority based routing. Continue experimentation support of three naval combatants. Acquire additional hardware to include air borne assets to enable testing with deployed surface platforms. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects the programmatic wind down of this INP, which is estimated to finish BA4 development in FY 2024.					
Accomplishments/Planned Programs Subtotals	23.156	21.382	18.289	0.000	18.289

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Projects identified for execution under this project number are non-acquisition programs. Each project will develop a project plan to support project execution. Project plans will include a project schedule and technical requirements and objectives to measure project performance. Based on prior BA-3 work prototype contracts are in place and can be used to develop hardware for at sea trials. Software and ship installation are expected to use a combination of existing shipyard contracts and government field activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3437 / *EMW/SEWIP/SSEE Accelerator*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Development	MIPR	NSWC : various	6.056	12.792	Oct 2019	11.637	Oct 2020	2.630	Oct 2021	-		2.630	-	-	-
Prototype Development	PO	NAWC : various	3.333	6.629	Oct 2019	6.145	Oct 2020	3.761	Oct 2021	-		3.761	-	-	-
Prototype Development	MIPR	SUPSHIP : Bath Maine	2.000	1.867	Oct 2019	1.800	Oct 2020	0.874	Oct 2021	-		0.874	-	-	-
Prototype Development	MIPR	NRL : Washington, DC	3.000	1.868	Oct 2019	1.800	Oct 2020	2.624	Oct 2021	-		2.624	-	-	-
Prototype Development	C/CPFF	Vectrus and BAE : various	0.000	0.000		0.000		4.465	Oct 2021	-		4.465	-	-	-
Prototype Demonstration	C/CPFF	LEIDOS : various	0.000	0.000		0.000		3.935	Oct 2021	-		3.935	-	-	-
		Subtotal	14.389	23.156		21.382		18.289		-		18.289	-	-	N/A

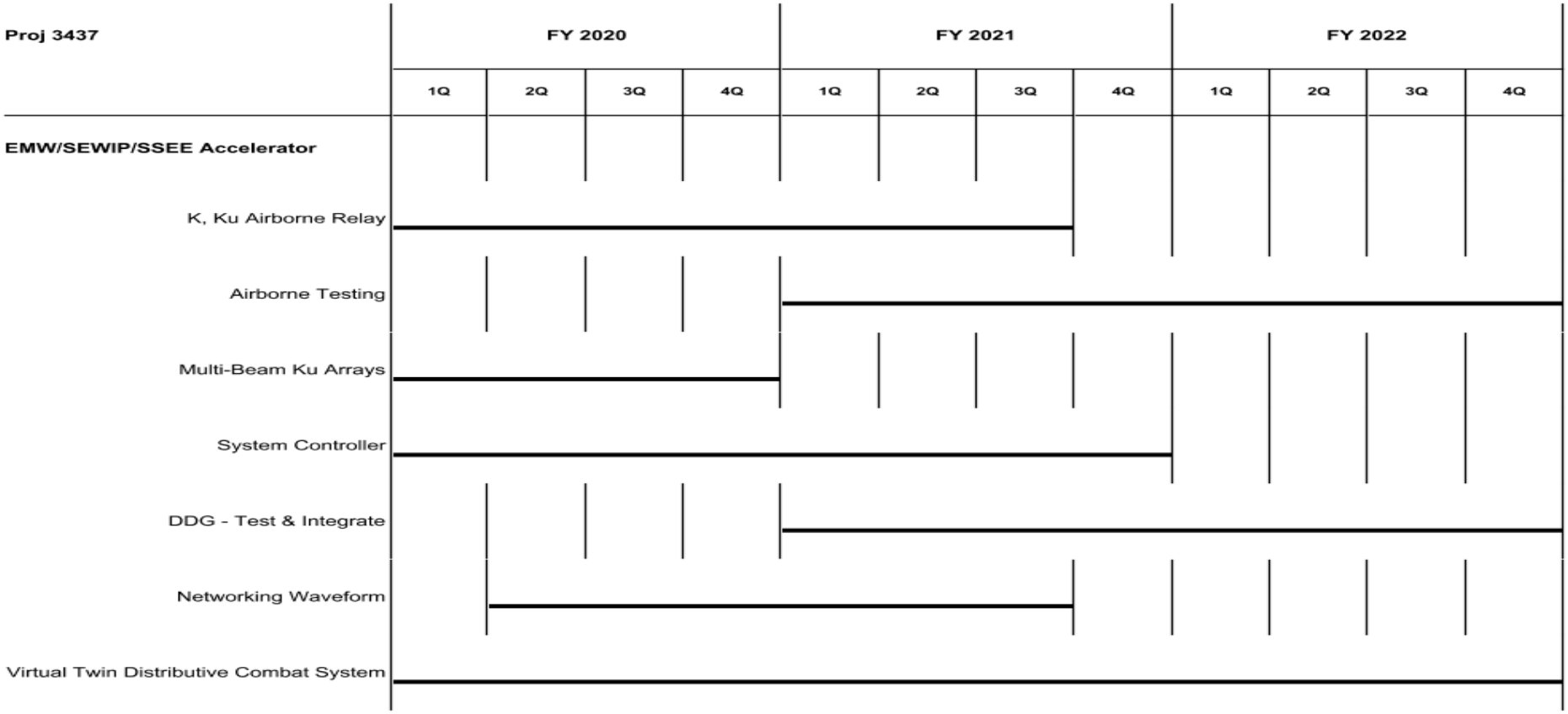
Remarks

NSWC: Prototype development of shipboard next generation networking apertures and EMW cross platform software.
NAWC: Prototype development of airborne next generation apertures and networking software.
SUPSHIP: Installation and testing of Cross platform EMW accelerator prototype on 2 Navy test vessels.
NRL: Installation and testing of Cross platform EMW accelerator prototype on Navy maritime patrol aircraft.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.389	23.156		21.382		18.289		-		18.289	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3437 / *EMW/SEWIP/SSEE Accelerator*



2022PB - 0603382N - 3437

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3437 / *EMW/SEWIP/SSEE Accelerator*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3437				
EMW/SEWIP/SSEE Accelerator: K, Ku Airborne Relay: K, Ku Airborne Relay	1	2020	3	2021
EMW/SEWIP/SSEE Accelerator: Airborne Testing: Airborne Testing	1	2021	4	2022
EMW/SEWIP/SSEE Accelerator: Multi-Beam Ku Arrays: Multi-Beam Ku Arrays	1	2020	4	2020
EMW/SEWIP/SSEE Accelerator: System Controller: System Controller	1	2020	4	2021
EMW/SEWIP/SSEE Accelerator: DDG - Test & Integrate: DDG - Test & Integrate	1	2021	4	2022
EMW/SEWIP/SSEE Accelerator: Networking Waveform: Networking Waveform	2	2020	3	2021
EMW/SEWIP/SSEE Accelerator: Virtual Twin Distributive Combat System: Virtual Twin Distributive Combat System	1	2020	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3438: *Innovative Naval Prototype (INP) Transition (6.4)*	12.947	18.508	0.990	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The efforts described in this mission area address the advanced component development and prototype demonstration associated with ONR's Innovative Naval Prototypes (INP) Program and the Leap Ahead Technology (LA-Tech) investments. INP and LA-Tech investments represent game changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature as they would dramatically change the way naval forces fight. INPs and LA-Techs push the imagination of our nation's technical talent to deliver transformational warfighting capabilities. Successful demonstrations are intended to present the Department of the Navy with a programmatic challenge as these new capabilities can lead to the obsolescence of existing capabilities and significant decisions as to the path forward for integrating the new technological capabilities into the warfighting systems of the future.

ONR manages a continuum of INP and LA-Tech development from BA2 to BA3 to BA4. The goal of these BA4 investments is to further mature development and expend efforts necessary to evaluate integrated technologies, representative modes or prototype systems in high fidelity and realistic operating environments. This BA4 investment includes system specific efforts that help expedite technology transition from the laboratory to operational use. Emphasis is on proving component and subsystem maturity prior to integration in major and complex systems and may involve risk reduction initiatives. Projects in this category involve efforts prior to Milestone B and are referred to as advanced component development activities and include technology demonstrations. It is the goal of these projects to achieve Technology Readiness Levels 6 or 7. Successful experimentation and demonstration highlights the viability of new technological capabilities that could be implemented if an acquisition program were to be established to support further development. The portfolio is periodically refreshed through the selection of new INPs and LA-Tech investments as existing ones are completed.

INP, LA-Tech, and supporting technology investments may include R-2 Activities mission areas such as Unmanned and Autonomous Systems, Directed Energy / Electric Weapons, Electromagnetic Maneuver Warfare, Cyber Warfare, and Undersea Warfare.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Unmanned and Autonomous Systems: Advanced ASW sensor array package for medium sized unmanned surface vehicles.	5.167	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: This project began in FY 2019 and developed, integrate, experiment and demonstrate onboard a medium sized unmanned surface vehicle an advanced ASW sensor array package. This package is intended to be used on a platform being developed with Innovative Prototype (INP) and Leap Ahead Technology (LA-Tech)					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
investments. That platform will serve as host for a wide variety of operationally focused capability payloads such as the advance ASW sensor array package being developed in this activity. These warfighter focused packages will enable Unmanned and Autonomous Systems platforms to support the requirement to augment manned systems with less expensive, unmanned, fully autonomous systems that can operate in all domains. ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:*** N/A					
Title: Unmanned and Autonomous Systems: Advanced ASW kinetic effects package for medium sized unmanned surface vehicle. ***Articles:*** ***Description:*** This project began in FY 2019 and developed, integrate, experiment and demonstrate onboard a medium sized unmanned surface vehicle an advanced ASW kinetic effects package. This capability package is intended to be used on a platform being developed with Innovative Prototype (INP) and Leap Ahead Technology (LA-Tech) investments. That platform will serve as host for a wide variety of operationally focused capability payloads such as the advance ASW kinetic effects package being developed in this activity. These warfighter focused packages will enable Unmanned and Autonomous Systems platforms to support the requirement to augment manned systems with less expensive, unmanned, fully autonomous systems that can operate in all domains. ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:***	5.653 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A					
Title: Unmanned and Autonomous Systems: Advanced aerial lift package for medium sized unmanned surface vehicle. ***Articles:*** ***Description:*** This project began in FY 2019 and developed, integrate, experiment and demonstrate onboard a medium sized unmanned surface vehicle an advanced aerial lift package. This capability package will dramatically increase the range of regard of various sensor payloads that will be carried aloft. It is intended to be used on a platform being developed with Innovative Prototype (INP) and Leap Ahead Technology (LA-Tech) investments. That platform will serve as host for a wide variety of operationally focused capability payloads such as the advance aerial lift package being developed in this activity. These warfighter focused payloads will enable Unmanned and Autonomous Systems platforms to support the requirement to augment manned systems with less expensive, unmanned, fully autonomous systems that can operate in all domains. ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:*** N/A	3.857 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: HIJENKS Operational Acceleration ***Articles:*** ***Description:*** HIJENKS System Integration, T&E and Alternate Platform development and test activity focus on software development for integration of new High Power Microwave (HPM) capabilities into control systems and mission planning software. Technical objectives of HIJENKS focus on improving the robustness of HPM systems in new airborne platforms and improving the mission planning capability for HPM engagement scenarios. The prototype will mature several of these areas to enable operational capability in a phased approach for multi-platform integration and demonstration combined with validation/certification paths of software and hardware architectures. Activities are	3.831 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
intended as risk reduction, operational analysis, and system level environmental test in order to reduce transition program cost for platform capability. Phase 1 FY 2020 The first phase of the prototype will focus on initiating platform integration activities for software, mission planning and environmental hardening and alternate platform analysis ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:*** N/A					
Title: Advanced Long Range Targeting (ALRT) ***Articles:*** ***Description:*** This is a new effort beginning in FY 2021 that transitioned out of 6.3 FNC into 6.4 INP. This effort will remain in INP transition for a period of one year for integration experimentation and demonstration of an Advanced Long Range Targeting (ALRT) capability. This capability will utilize a family of systems that will dramatically increase the range at which the U.S. Navy can provide targeting solutions and hold targets at risk. It will cross multiple platforms, sensors and warfare domains and leverage technology developments from a broad set of Future Naval Capability (FNC) and Innovative Prototype (INP) investments. It will perform integration, experimentation and demonstration of sensors, communications and battle management command and control (BMC2) technologies to enable integrated and distributed forces that are capable of dynamic synchronized actions. ***FY 2021 Plans:*** Efforts will focus on planning for the integration, experimentation and demonstration activities including obtaining the needed certifications and technology. ***FY 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:***	0.000 -	0.990 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 is due to the realignment of resources from the Advanced Long Range Targeting (ALRT) Activity and Project Unit 3438 in this PE to a stand-alone Project Unit 3443 beginning in FY 2023.					
Accomplishments/Planned Programs Subtotals	18.508	0.990	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The projects identified for execution are non-acquisition programs. The Office of Naval Research will provide Government oversight to the projects. Each project will develop a project plan to support execution. Project plans will include a schedule and the necessary technical requirements and objectives to measure and evaluate performance. Additionally, each project will be subjected to experimentation then demonstrated in operationally relevant environments to assess their ability to meet warfighter requirements. Project deliverables will include the actual integrated hardware/software prototype systems, test reports, and technical data, necessary to support decision making. These decisions include the transition of technologies to acquisition, further refinement of the technology, or termination and reinvestment of remaining funds to other technologies that add military value.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced ASW sensor payload	MIPR	NUWC : Newport, Rhode Island	1.200	1.340	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced ASW sensor payload	MIPR	JHU-APL : Columbia, Maryland	2.100	1.340	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced ASW sensor payload	MIPR	SSC-PAC : San Diego, California	0.890	1.302	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced ASW sensor payload	MIPR	NASA Jet Propulsion Lab : Pasedena, California	1.157	1.333	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced ASW kinetic payload	MIPR	PSU -ARL : State College, Pennsylvania	4.000	2.490	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced ASW kinetic payload	MIPR	SSC-PAC : San Diego, California	1.400	1.026	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced ASW kinetic payload	MIPR	NASA Jet Propulsion Lab : Pasedena, California	0.312	0.900	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced aerial lift payload	MIPR	NSWC-CD : Bethesda, Maryland	0.200	1.336	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced aerial lift payload	MIPR	NASA Jet Propulsion Lab : Pasedena, California	0.000	1.335	Oct 2019	0.000		0.000		-		0.000	-	-	-
Advanced aerial lift payload	MIPR	SSC-PAC : San Diego, California	1.688	1.296	Oct 2019	0.000		0.000		-		0.000	-	-	-
HIJENKS Mission Planning Software Development	WR	NAVAIR : Patuxent River, Md	0.000	0.330	Jan 2020	0.000		0.000		-		0.000	-	-	-
HIJENKS Launch System Software/Hardware Integration	WR	NAVAIR : Patuxent River, Md	0.000	0.500	Nov 2019	0.000		0.000		-		0.000	-	-	-
HIJENKS System Requirements and CONEMPS	WR	NAVAIR : Patuxent River, Md	0.000	0.250	Oct 2019	0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HIJENKS Airborne Launch Study	C/CPFF	Platform Prime : TBD	0.000	0.500	Apr 2020	0.000		0.000		-		0.000	-	-	-
HIJENKS Mission Analysis	FFRDC	JH APL : Laurel, MD	0.000	0.303	Oct 2019	0.000		0.000		-		0.000	-	-	-
HIJENKS T&E Launcher	C/CPFF	Platform Prime : TBD	0.000	0.300	Apr 2020	0.000		0.000		-		0.000	-	-	-
HIJENKS Safe and Arm Design	C/FFP	Platform Prime : TBD	0.000	0.500	Jan 2020	0.000		0.000		-		0.000	-	-	-
HIJENKS Environmentally Hardened Payload Activities	C/UCA	DOTC - Multiple Awards : Various	0.000	0.500	Mar 2020	0.000		0.000		-		0.000	-	-	-
HIJENKS Target Procurement and Testing	WR	NRL : Washington, DC	0.000	0.500	Oct 2019	0.000		0.000		-		0.000	-	-	-
HIJENKS Hard Tube Capability	C/CPFF	Multiple Awards - Various : TDB	0.000	0.000		0.000		0.000		-		0.000	-	-	-
HIJENKS T&E Platform Payload Source Devlopment	C/UCA	DOTC - Multiple Awards : Various	0.000	0.927	Nov 2019	0.000		0.000		-		0.000	-	-	-
HIJENKS T&E Platform-Payload Source Development	C/BPA	Lockheed Martin, : Grand Prairie, TX	0.000	0.000		0.000		0.000		-		0.000	-	-	-
HIJENKS Program Support	WR	NSWCDD and NAWCWD : Dahlgren, VA	0.000	0.200	Oct 2019	0.000		0.000		-		0.000	-	-	-
HIJENKS T&E Platform-Payload Source Development	C/BPA	General Atomics : San Diego, CA	0.000	0.000		0.000		0.000		-		0.000	-	-	-
HIJENKS T&E Platform-Payload Source Development	WR	Raytheon, Albuquerque, NM : Albuquerque, NM	0.000	0.000		0.000		0.000		-		0.000	-	-	-
NSWCDD Government Pulsed Power GFE Hardware	WR	NSWCDD Dahlgren, VA : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	-	-	-
ALRT BMC2 Integration	C/CPFF	TBD : TBD	0.000	0.000		0.396	Oct 2020	0.000		-		0.000	-	-	-
ALRT Program Support	WR	TBD : TBD	0.000	0.000		0.200	Oct 2020	0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*	

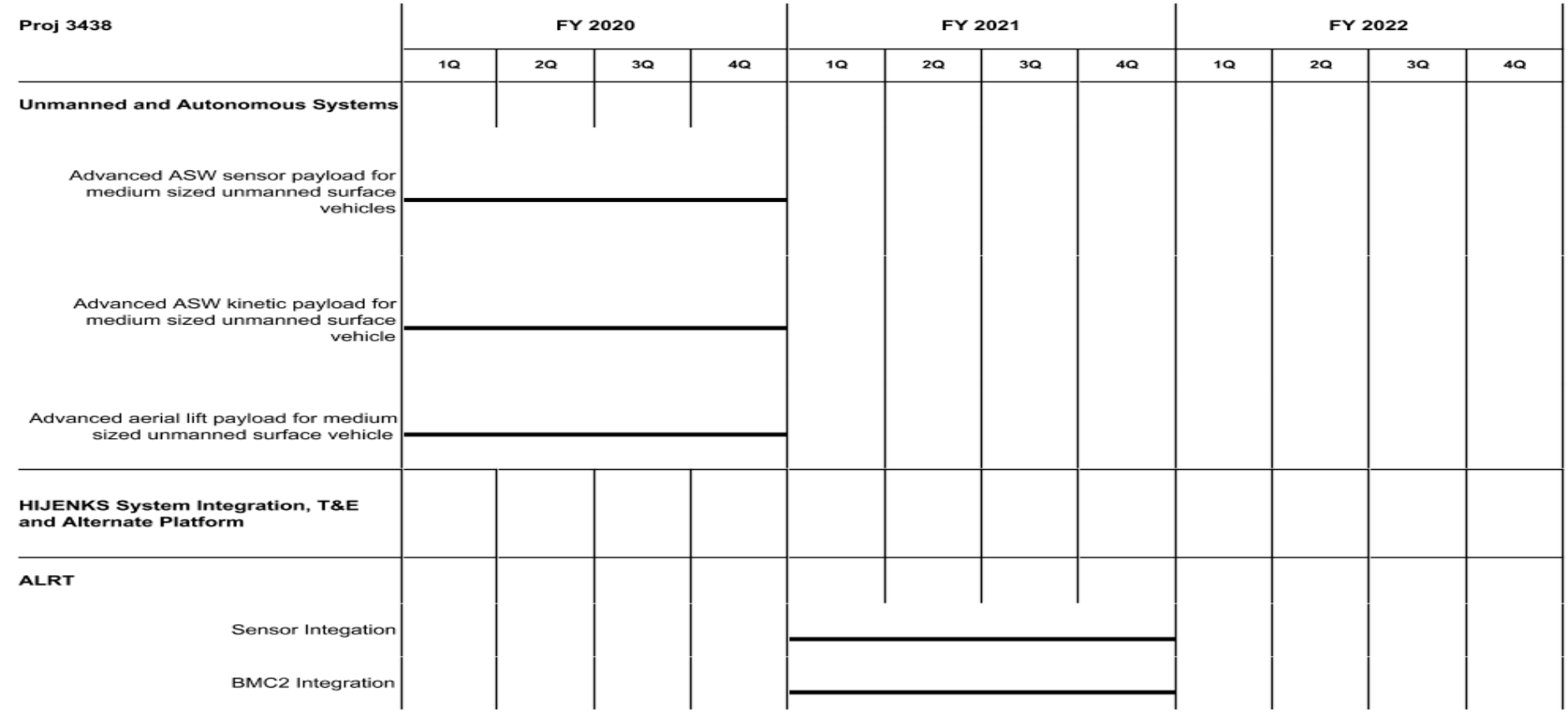
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALRT Sensor IntegrationALRT Sensor Integration	C/CPFF	TBD : TBD	0.000	0.000		0.394	Jan 2021	0.000		-		0.000	-	-	-
Prototype Development	WR	NRL : Washington, DC	0.000	0.000		0.000	Oct 2020	0.000		-		0.000	-	-	-
		Subtotal	12.947	18.508		0.990		0.000		-		0.000	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.947	18.508		0.990		0.000		-		0.000	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*



2022PB - 0603382N - 3438

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 3438 / *Innovative Naval Prototype (INP) Transition (6.4)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3438				
Unmanned and Autonomous Systems: Advanced ASW sensor payload for medium sized unmanned surface vehicles: Advanced ASW sensor payload for medium sized unmanned surface vehicles	1	2020	4	2020
Unmanned and Autonomous Systems: Advanced ASW kinetic payload for medium sized unmanned surface vehicle: Advanced ASW kinetic payload for medium sized unmanned surface vehicle	1	2020	4	2020
Unmanned and Autonomous Systems: Advanced aerial lift payload for medium sized unmanned surface vehicle: Advanced aerial lift payload for medium sized unmanned surface vehicle	1	2020	4	2020
ALRT: Sensor Integation: Sensor Integration	1	2021	4	2021
ALRT: BMC2 Integration: BMC2 Integration	1	2021	4	2021