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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604777N / <i>Navigation/Id System</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	373.280	48.237	50.037	53.209	-	53.209	45.063	44.838	44.429	45.131	Continuing	Continuing
0253: <i>Nav & Electro-Optical Supt</i>	127.866	35.926	37.091	50.109	-	50.109	39.051	39.535	40.173	40.799	Continuing	Continuing
0676: <i>Improve ID Development</i>	54.893	10.558	10.263	1.244	-	1.244	3.700	3.188	2.230	2.269	Continuing	Continuing
1253: <i>Combat Ident System</i>	190.521	1.753	1.483	1.856	-	1.856	2.312	2.115	2.026	2.063	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	0.000	1.200	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.200

A. Mission Description and Budget Item Justification

Reliable and secure navigation and positive identification (ID) systems are essential elements of battle management in the naval environment. The Photonics Imaging System (0253) is a non-hull penetrating replacement for existing optical periscopes. The Photonics Imaging System exploits a wide portion of the electro-magnetic spectrum utilizing advanced Electro-Optic/thermal imaging, and communications intercept/Electronic Warfare Support (ES). The Integrated Submarine Imaging System (ISIS) (0253) is a back fit system to integrate all imaging capabilities on existing submarine classes. The Combat Identification System (CIS) project (1253) for Mark XIIA, and Improved Identification Development (0676) for AN/UPX-29(V), covers the Mark XIIA Mode 5 upgrade to the existing Mark XII family of systems that is Joint and North Atlantic Treaty Organization (NATO) interoperable. Per Office Secretary of Defense (OSD) direction, NATO participation is encouraged and performance data is exchanged to ensure the opportunity for interoperability with allied identification systems is maximized. In addition to distinguishing friend from foe for weapons employment, the Navy requires secure, jam resistant Identification Friend or Foe (IFF) systems for battle group air defense management and air traffic control. Identification is multifaceted and includes information received from several sensors (both cooperative and non-cooperative systems).

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	49.862	48.837	0.000	-	0.000
Current President's Budget	48.237	50.037	53.209	-	53.209
Total Adjustments	-1.625	1.200	53.209	-	53.209
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	1.200			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.015	0.000			
• SBIR/STTR Transfer	-1.610	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	53.209	-	53.209

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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604777N / <i>Navigation/Id System</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: Navy micro interrogator

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	0.000	1.200
	0.000	1.200
	0.000	1.200

Change Summary Explanation

FY2023 funding request was reduced by 2.768 million to account for the availability of prior year execution balances.

FY2023 increase driven by the Signature Reduction Mast Prototype. Effort supports development a low profile mast engineering development model, including tests and evaluations of various capabilities using advanced signature control techniques to reduce risk of counter detection.

FY2021 decrease of \$1.625 million due to SBIR (\$1.610M) and Cancelled Account Liabilities (\$0.015M).

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System				Project (Number/Name) 0253 / Nav & Electro-Optical Supt			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
0253: Nav & Electro-Optical Supt	127.866	35.926	37.091	50.109	-	50.109	39.051	39.535	40.173	40.799	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

AN/BVY-1 Integrated Submarine Imaging System (ISIS) will continue to add new capabilities via Technical Insertion (TI)/Advanced Processing Build (APB) process while working across Submarine Warfare Federated Tactical System (SWFTS) programs to develop according to Development Security Operations (DevSecOps) software processes and a cloud based architecture. The Navy is pursuing a transformation across SWFTS (PE 0604503N Project 0219, PE 0604562N Project 0236, PE 0604777N Project 0253 and PE 0604503N Project 0775) to maximize cyber-resiliency and the speed of capability delivery. FY23 maintains the investment in imaging sensors and algorithms to improve submarine operations in high intensity littoral environments, intelligence gathering, real time imagery and support the safe and effective employment of surveillance and weapons systems. The \$13.018M FY23 increase includes a \$11.416M Signature Reduction Mast prototype effort to reduce the risk of counter detection and an inflationary increase to support longstanding RDT&E investments. Furthermore, this funding will continue to develop the Type 24 mast, improve the software algorithms and inboard hardware for processing outboard mast data, and support non-recurring inboard hardware engineering activities which develop the Technical Insertion kits installed in all submarine classes. Finally, FY23 funds the TI-22/APB-21 DT and other tests that verify software improvements funded in previous fiscal years.

The Navigation and Electro-Optical (E-O) program enables littoral operations by procuring ISIS, production of low profile masts (Low Profile Photonics Mast (LPPM), Type 20, and Type 24), maintenance and sustainment of periscope and legacy photonic masts, production and sustainment of Universal Modular Mast Systems and Dip Loops, and development of the ISIS inboard processing component of Submarine Warfare Federated Tactical Systems (SWFTS). The Department of the Navy established the ISIS to rapidly field the Type 18 periscope, RADAR rangefinder, Type 8 Mod 4 Infra-Red (IR) periscope systems, and integrate existing periscope imagery systems into a single imaging system for installation on board SSN 688 class and SEAWOLF class submarines. The ISIS baseline also includes the Imaging System with the Photonics mast (PM) and all configurations of low profile masts onboard VIRGINIA and Photonics Mast Variant (PMV) onboard SSGN class submarines and ISIS on SSBN class submarines. The PM, LPPM, and PMV design exploit a wide portion of the electro-magnetic spectrum through advanced E-O and thermal imaging and Electronic Warfare Support (ES)/communications intercept. The Common Submarine Imaging System (CSIS) capability development document (CDD), that covers both ISIS and Legacy Imaging systems was approved 22 Dec 2011 with an updated CDD approved on 15 Mar 2018. The CDD Annex for Low Profile Digital Photonics Mast, approved on 02 Dec 2019, provides additional specifications for the development of low profile masts within the ISIS system.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: ISIS and Photonics common software and hardware capabilities development and obsolescence	26.313	27.648	26.742	0.000	26.742
Articles:	-	-	-	-	-
FY 2022 Plans:					

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0253 / Nav & Electro-Optical Supt

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Funding continue the development of TI-22 capabilities which includes the engineering, technical program, project and configuration management for the hardware and software baseline and modifying the ISIS architecture to support rapid insertion of new war fighting capabilities and enhanced cyber security protection.</p> <p>FY 2023 Base Plans: Commence the TI-24 capability development process which provides the necessary engineering, technical program, project and configuration management of the hardware and software baseline to incorporate additional sensitive software imaging algorithms, while concluding the development of TI-22. Continue the development of the ISIS architecture with DEVSECOPS which will both rapidly insert of new war fighting capabilities and enhance cyber security protections.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The \$0.906M decrease is due to concluding development of TI-22.</p>					
<p>Title: Imaging Systems Test Efforts</p> <p align="right">Articles:</p> <p>FY 2022 Plans: Inflationary increase to fund ISIS and mast system testing including the TI18/APB19 OT and the TI-20/APB-19 OT.</p> <p>FY 2023 Base Plans: Inflationary increase to fund ISIS and mast system testing including the TI-22/APB-21 DT.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The \$0.04M increase is an inflation adjustment which will fund the design, management, and evaluation results of the TI-22/APB-21 DT test for modernizing boats.</p>	0.724 -	0.738 -	0.778 -	0.000 -	0.778 -
<p>Title: Type 20 Mast</p> <p align="right">Articles:</p> <p>FY 2022 Plans: Funding required for completing Type 20 Mast Capability Enhancement development efforts including: - Test and evaluation of Type 20 enhancements.</p>	8.889 -	3.203 -	0.000 -	0.000 -	0.000 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
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<p>- Design finalization.</p> <p>FY 2023 Base Plans: N/A</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The \$3.203M decrease is due to design finalization.</p>					
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<p>Title: Type 24 Mast</p> <p align="right">Articles:</p>	0.000	5.502	11.173	0.000	11.173
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<p>FY 2022 Plans: Design, develop, fabricate, and verify testing of the Type 24 mast. Development will add additional capability to the baseline established in Type 20. Specific efforts include:</p> <ul style="list-style-type: none"> - Start development of the Type 24 technical data package - Execute design reviews - Start developing of the test plans - Execute initial test events and environmental qualification testing <p>FY 2023 Base Plans: Expand the design, development, fabrication, and testing of the Type 24 mast effort begun in Q4 FY22. Specific efforts include:</p> <ul style="list-style-type: none"> - Continue development of the Type 24 technical data package - Refine design reviews - Continue development of the test plans - Execute additional test events and environmental qualification testing <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The \$5.671M increase is due to expanding the design and development of the Type 24 mast. This mast will include increased imaging capabilities and more resilient design. More specifically, this mast will leverage advanced development activities to combine capabilities in a low profile form factor which will increase</p>	-	-	-	-	-
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0253 / Nav & Electro-Optical Supt
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
situational awareness (particularly in high contact density littoral operations) to improve combat effectiveness, safety of navigation, and tactical decision making, while reducing probability of counter detection.					
Title: Signature Reduction Mast Prototype	0.000	0.000	11.416	0.000	11.416
Articles:	-	-	1	-	1
FY 2022 Plans: N/A					
FY 2023 Base Plans: Development and procurement of a prototype photonics mast which implements a holistic approach to susceptibility reduction in order to outpace adversary threats and minimize probability of counter detection throughout submarine operations. The effort funds new development of an engineering development model (EDM) in addition to tests and evaluations of various capabilities using advanced signature control techniques. Prototype will assess the capability and operational tradeoffs needed for reducing vulnerability to counter detection by implementing advanced signature control techniques not available on existing masts. Additional information is available at the classified level.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: The \$11.416M increase is for production of an Engineering Development Model (EDM) including the test and evaluation activities to accelerate the development of low profile masts that have advanced capabilities to prevent counter-detection.					
Accomplishments/Planned Programs Subtotals	35.926	37.091	50.109	0.000	50.109

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/0840: Sub Periscope, Imaging Equip. and Supt Equip Program	190.954	234.932	266.300	-	266.300	260.386	278.706	260.756	265.972	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / <i>Navigation/Id System</i>	Project (Number/Name) 0253 / <i>Nav & Electro-Optical Supt</i>

D. Acquisition Strategy

The Acquisition Strategy for AN/BVY-1 Integrated Submarine Imaging System (ISIS) is dated 07 Jul 2003. The Single Acquisition Management Plan (SAMP) for the LPPM is dated 01 Jul 2013. The ISIS will provide mission critical, all weather, visual, and electronic search, digital image management, indication, warning, and platform architecture interface capabilities for SSN 688, SSN 21, SSN 774 and SSGN class submarines. The Single Acquisition Management Plan (SAMP) for the Type 20 Mast is dated 07 Jul 2017.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 5				PE 0604777N / Navigation/Id System				0253 / Nav & Electro-Optical Supt							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/CPIF	Lockheed Martin : Manassas, VA	30.267	12.129	Dec 2020	11.978	Dec 2021	11.408	Dec 2022	-		11.408	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC : Newport, RI	21.099	3.374	Dec 2020	4.756	Nov 2021	4.973	Nov 2022	-		4.973	Continuing	Continuing	Continuing
Hardware Development	C/CPIF	Lockheed Martin : Manassas, VA	23.356	10.761	Dec 2020	10.864	Dec 2021	10.308	Dec 2022	-		10.308	Continuing	Continuing	Continuing
Hardware Development - Type 20/Mast Capability Enhancements	C/CPIF	Lockheed Martin : Manassas, VA	41.361	8.889	Dec 2020	3.203	Dec 2021	0.000		-		0.000	0.000	53.453	-
Hardware Development - Type 24	C/CPIF	L-3 KEO : Northampton, MA	0.000	0.000		5.502	Jun 2022	11.173	Jan 2023	-		11.173	Continuing	Continuing	Continuing
Signature Reduction Mast Prototype	C/CPIF	L-3 KEO : Northampton, MA	0.000	0.000		0.000		11.416	Jan 2023	-		11.416	0.000	11.416	-
Subtotal			116.083	35.153		36.303		49.278		-		49.278	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NUWC : Newport, RI	9.123	0.453	Oct 2020	0.462	Oct 2021	0.487	Oct 2022	-		0.487	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	1.940	0.271	Oct 2020	0.276	Oct 2021	0.291	Oct 2022	-		0.291	Continuing	Continuing	Continuing
Subtotal			11.063	0.724		0.738		0.778		-		0.778	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA : Washington, DC	0.720	0.049	Oct 2020	0.050	Oct 2021	0.053	Oct 2022	-		0.053	Continuing	Continuing	Continuing
Subtotal			0.720	0.049		0.050		0.053		-		0.053	Continuing	Continuing	N/A

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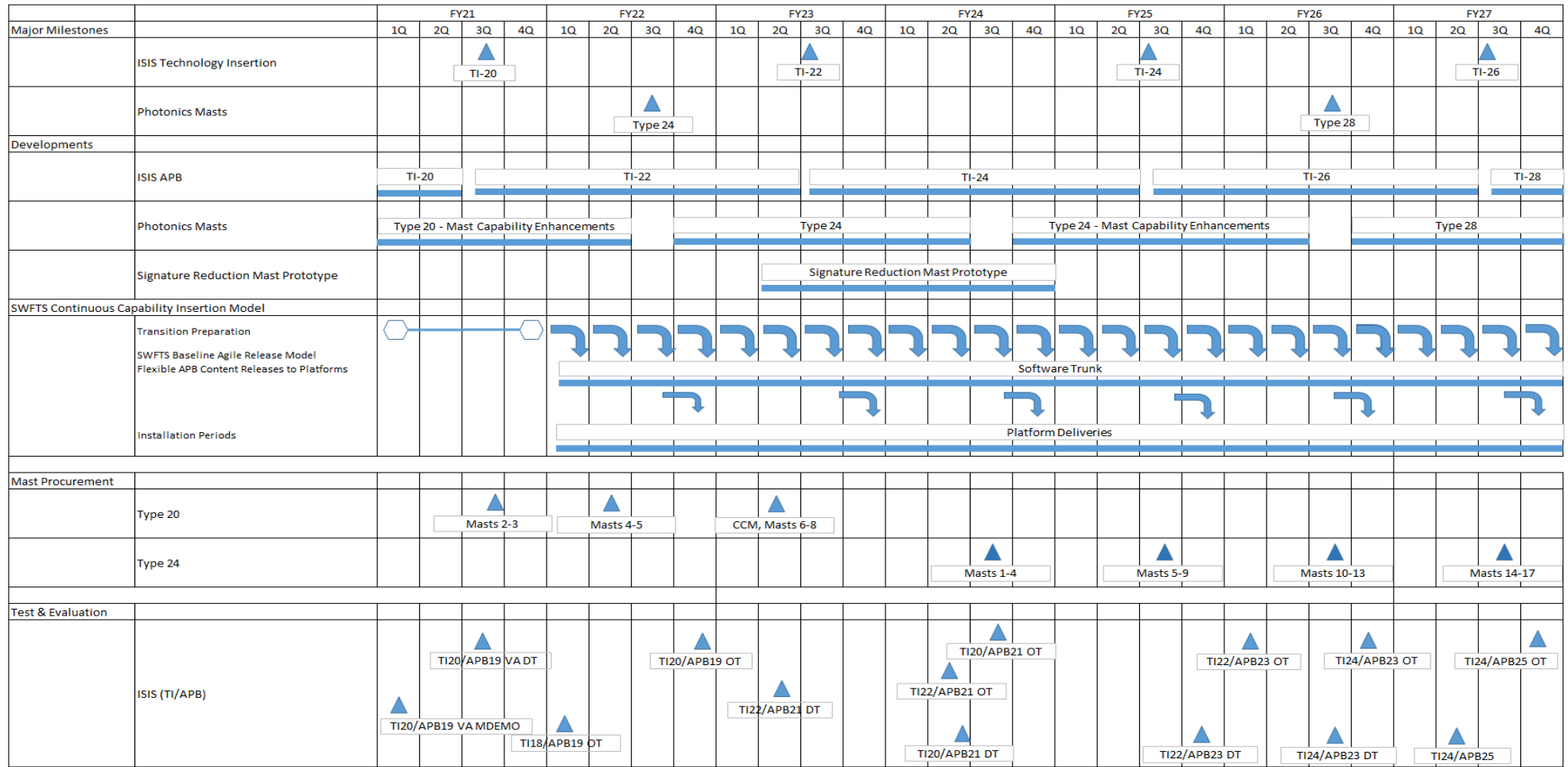
Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy

Date: April 2022

Appropriation/Budget Activity
1319 / 5

R-1 Program Element (Number/Name)
PE 0604777N / Navigation/Id System

Project (Number/Name)
0253 / Nav & Electro-Optical Supt



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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0253 / Nav & Electro-Optical Supt

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Nav & Electro-Optical Supt				
Major Milestones: ISIS Technology Insertion: ISIS Technology Insertion Fielding (TI-22)	3	2023	3	2023
Major Milestones: ISIS Technology Insertion: ISIS Technology Insertion Fielding (TI-24)	3	2025	3	2025
Major Milestones: ISIS Technology Insertion: ISIS Technology Insertion Fielding (TI-26)	3	2027	3	2027
Developments: ISIS APB: ISIS TI-20	1	2021	2	2021
Developments: ISIS APB: ISIS TI-22	3	2021	2	2023
Developments: ISIS APB: ISIS TI-24	3	2023	2	2025
Developments: ISIS APB: ISIS TI-26	3	2025	2	2027
Developments: ISIS APB: ISIS TI-28	3	2027	4	2027
Developments: ISIS APB: Developments: Signature Reduction Mast Prototype	2	2023	4	2024
Developments: Mast Development: Type 20 Mast Capability Enhancements (MCE)	1	2021	2	2022
Developments: Mast Development: Type 24	4	2022	2	2024
Mast Procurement: Type 20 (Buy): POR Masts 2-3	3	2021	3	2021
Mast Procurement: Type 20 (Buy): POR Masts 4-5	2	2022	2	2022
Mast Procurement: Type 20 (Buy): CCM / POR Masts 6-8	2	2023	2	2023
Mast Procurement: Type 20 (Buy): POR Masts 1-4	3	2024	3	2024
Mast Procurement: Type 20 (Buy): POR Masts 5-9	3	2025	3	2025
Mast Procurement: Type 20 (Buy): POR Masts 10-13	3	2026	3	2026
Mast Procurement: Type 20 (Buy): POR Masts 14-17	3	2027	3	2027
Test & Evaluation: ISIS (TI/APB): TI20/APB19 VA MDEMO	1	2021	1	2021
Test & Evaluation: ISIS (TI/APB): TI-20/APB-19 VA DT	3	2021	3	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / <i>Navigation/Id System</i>	Project (Number/Name) 0253 / <i>Nav & Electro-Optical Supt</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Test & Evaluation: ISIS (TI/APB): TI-18/APB-19 OT	1	2022	1	2022
Test & Evaluation: ISIS (TI/APB): TI-20/APB-19 OT	4	2022	4	2022
Test & Evaluation: ISIS (TI/APB): TI-22/APB-21 DT	2	2023	2	2023
Test & Evaluation: ISIS (TI/APB): TI-22/APB-21 OT	2	2024	2	2024
Test & Evaluation: ISIS (TI/APB): TI-20/APB-21 DT	2	2024	2	2024
Test & Evaluation: ISIS (TI/APB): TI-20/APB-21 OT	3	2024	3	2024
Test & Evaluation: ISIS (TI/APB): TI-22/APB-23 DT	4	2025	4	2025
Test & Evaluation: ISIS (TI/APB): TI-22/APB-23 OT	1	2026	1	2026
Test & Evaluation: ISIS (TI/APB): TI-24/APB-23 DT	3	2026	3	2026
Test & Evaluation: ISIS (TI/APB): TI-24/APB-23 OT	4	2026	4	2026
Test & Evaluation: ISIS (TI/APB): TI-24/APB-25 DT	2	2027	2	2027
Test & Evaluation: ISIS (TI/APB): TI-24/APB-25 OT	4	2027	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System				Project (Number/Name) 0676 / Improve ID Development			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
0676: <i>Improve ID Development</i>	54.893	10.558	10.263	1.244	-	1.244	3.700	3.188	2.230	2.269	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Reliable and secure navigation and positive identification (ID) systems are essential elements of battle management in the naval environment. In addition to providing platform identification for weapons employment, the Navy requires secure, jam resistant Identification Friend or Foe (IFF) systems for battle group air defense management and Air Traffic Control. The Improved ID Development project addresses the Mark XIIA Mode 5 and Mode S upgrades to the existing AN/UPX-29(V) Mark XII family of systems that is Joint and North Atlantic Treaty Organization interoperable, as well as modernization of the DDG 1000 Zumwalt Class IFF Sensor Suite . The AN/UPX-29(V) Interrogator System is comprised of the Interrogator Set AN/UPX-24(V), OE-120()/UPX Antenna Group, and Mark XII or Mark XIIA equipment such as AN/UPX-37, AN/UPX-41(C) or AN/UPX-45(C) Digital Interrogators and associated equipment. The DDG 1000 IFF Sensor Suite is comprised of three electronically scanned array (ESA) antennas, one UPX-42(C) Interrogator, and three RT-1912(C)/APX Transponders. Additionally, the Improved ID Development project may include product improvements designed to be installed through upgrade and deficiency correction studies, which in turn become engineering changes to other IFF solutions.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: AN/UPX-29 (V) - OE-120()/UPX Antenna Tech Refresh	1.080	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Engineering and integration development for antenna group OE-120()/UPX antenna tech refresh. Develop design studies and Analysis of Alternatives, draft specifications, and perform system development and integration efforts and support mission requirements, to include engineering investigations and Engineering Change Proposal (ECP) development to support mission readiness for IFF systems.					
FY 2022 Plans: N/A					
FY 2023 Base Plans: N/A					
FY 2023 OCO Plans: N/A					
Title: Mark XIIA Mode 5 and Mode S Improvement for AN/UPX-29(V)	0.672	0.692	0.229	0.000	0.229
Articles:	-	-	-	-	-
Description: Engineering, development, and integration of improvements to Mark XIIA Shipboard Identification Friend or Foe (IFF) Systems, including, but not limited to 1) AN/UPX-29(V) Interrogator System, which is					

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0676 / Improve ID Development
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
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comprised of the Interrogator Set AN/UPX-24, OE-120()/UPX Antenna Group, and Mark XII or Mark XIIA equipment such as AN/UPX-41, AN/UPX-45 or AN/UPX-50 Digital Interrogators, and 2) AN/UPX-46(V) Interrogator System which is comprised reduced form factor Interrogator Set, generic rotating IFF Antennas, and Mark XII or Mark XIIA equipment such as AN/UPX-41, AN/UPX-45 or AN/UPX-50 Digital Interrogators. Funds development and integration of Mark XIIA Mode 5 and Mode Select (S) Improvements to the AN/UPX-29(V) systems on CG47, DDG51, LHD1, LPD17, LHA6, and CVN68, CVN78, and future ship classes. Funds development and integration of Mark XIIA Mode 5 and Mode Select (S) Improvements to the AN/UPX-46 Systems on LCS1, LCS2, LSD41 and LSD49 Ship Classes. Correct software and performance deficiencies from Integrated Test and Operational Test, Aegis, and other Combat System Integration events to support Combat System integration with Aegis Weapon Systems (AWS), Ship Self Defense System (SSDS), Component-Based Total-Ship System - 21st Century (COMBATSS-21), Advanced Combat Direction System (ACDS), or Air Traffic Control Systems using Mark XIIA equipment to include engineering investigations, Engineering Change Proposal development, and testing. Provides core Integrated Logistics Support documentation; formalizes hardware/software configuration: finalizes technical/ design data, resolves testing anomalies, and integrates with shipboard training systems.

FY 2022 Plans:
Continue AN/UPX-29(V) Interrogator System integration testing with Mode 5/Mode S capable AN/UPX-45 Digital Interrogator in preparation for deployment to Aegis platforms. Continue planning for and conducting integration testing on Ship Self Defense System (SSDS) platforms. Evaluate inter-operability test data to validate planned combat system software design changes

FY 2023 Base Plans:
Continue AN/UPX-29(V) Interrogator System integration testing with Mode 5/Mode S Capable AN/UPX-45 Digital Interrogator obsolescence upgrades in preparation for deployment to Aegis and Ship Self Defense System (SSDS) Platforms. Commence AN/UPX-46(V) Interrogator System integration testing with Mode 5/ Mode S Capable AN/UPX-45 Digital Interrogator obsolescence upgrades in preparation for deployment to COMBATSS-21 Platforms. Evaluate inter-operability test data to validate planned combat systems design changes and capability updates.

FY 2023 OCO Plans:
N/A

FY 2022 to FY 2023 Increase/Decrease Statement:

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0676 / Improve ID Development
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Decrease due to end of RD TEN phase.					
<p>Title: AN/UPX-29(V) Management Support</p> <p align="right">Articles:</p> <p>Description: Engineering and Program Management of the AN/UPX 29(V) and AN/UPX-46(V) Interrogator Systems. Perform related system integration efforts.</p> <p>FY 2022 Plans: Continue logistics and technical data management for the AN/UPX 29(V) Mode 5/Mode S integration. Develop and submit ship change documents for OE-120 and AN/UPX-45 retro-fit. Implement designs and implementations of cyber security controls.</p> <p>FY 2023 Base Plans: Continue logistics and technical data management for the AN/UPX 29(V) Mode 5/Mode S integration. Implement improved Cyber designs and cyber security controls. Resolve OE-120 and AN/UPX-45 retro-fit related ship change document issues. Assume management of AN/UPX-46(V) ship change documents for LCS 1 and LCS 2 ship classes.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease due to management costs moving to procurement funds.</p>	0.681	0.695	0.228	0.000	0.228
<p align="right">Articles:</p>	-	-	-	-	-
<p>Title: DDG 1000 Modernization</p> <p align="right">Articles:</p> <p>Description: The IFF System will transition from a Contractor Furnished Equipment (CFE) suite to a government (organically) supported IFF System. Establish engineering support and Integrated Product Support (IPS) elements for transition of the DDG 1000 ship class' Contractor Furnished Equipment (CFE) IFF sensor suite to an organically supported and documented system.</p> <p>FY 2022 Plans: Continue to develop IPS elements, artifacts, and plans needed to transition DDG 1000 IFF sensor suite to organic support. Evaluate Diminishing Manufacturing Sources and Material Shortages (DMSMS), obsolescence, and performance risks.</p> <p>FY 2023 Base Plans:</p>	1.600	1.600	0.000	0.000	0.000
<p align="right">Articles:</p>	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease due to transition to procurement.					
Title: UPX-36 Engineering Change Proposal - Mode 5 Capable	1.483	1.817	0.183	0.000	0.183
Articles:	-	-	-	-	-
Description: Upgrade the AN/UPX-36(V) from Mark XII to Mark XIIA with Mode 5 capability. The AN/UPX-36(V) is a centralized Identification Friend or Foe (IFF) interrogator system consisting of a processor, dedicated IFF antennas, and Mark XII interrogation capability providing identification of friendly and neutral contacts via cooperative means. System installations are limited to the 12 LSD41/49 class ships currently in-service.					
FY 2022 Plans: Commence planning for system integration testing with LSD 41 and LSD 49 class combat system integration testing. Schedule inter-operability tests at land based test sites to validate introduction of Mode 5 IFF capability with corresponding combat system software design changes. Develop Ship Change Documents for review and approval by NAVSEA.					
FY 2023 Base Plans: Conclude system integration efforts. Provide technical documentation to support combat system certification with SSDS or ACDS combat system for LSD 41 and LSD 49 ship classes as configured.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease due to transition to procurement.					
Title: Radar Track Discriminator System (RTDS) UPX-34A ECP Part I	5.042	5.459	0.604	0.000	0.604
Articles:	-	-	-	-	-
Description: Capability upgrades to the AN/UPX-34A(V) RTDS, which is installed on CG47 Class Aegis Cruisers and provides high fidelity, long range, Non-cooperative Target Recognition (NCTR) capability to support the Air-Sea battle by providing timely tactical engagement decisions by Aegis action officers.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy	Date: April 2022
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0676 / Improve ID Development
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>FY 2022 Plans: Continue hardware updates to reduce Rules of Engagement (ROE) concerns. Coordinate with Aegis Weapon System Baseline Managers to implement upgrades to related external combat system elements. Plan and Schedule inter-operability tests at land based test sites to validate RTDS updates with corresponding combat system design changes. Develop Ship Change Documents for review and approval by NAVSEA.</p> <p>FY 2023 Base Plans: Conclude system integration efforts. Provide technical documentation to support combat system certification of RTDS upgrades with Aegis combat system on CG47 ship class.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease due to transition to procurement.</p>					
Accomplishments/Planned Programs Subtotals	10.558	10.263	1.244	0.000	1.244

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/2851: ID Systems	23.815	46.918	59.226	-	59.226	59.022	60.126	61.431	62.621	73.452	808.657

Remarks

D. Acquisition Strategy
The acquisition strategy is to develop Mode 5 Engineering Change Proposals for modern Mark XII Identification Friend or Foe (IFF) equipment and integrate into all Navy Combat Weapons systems platforms and augment the Navy's Cooperative Identification Capability to include Mode 5.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0676 / Improve ID Development
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWCAD : St Inigoes, MD	9.625	1.118	Nov 2020	0.625	Nov 2021	0.200	Nov 2022	-		0.200	Continuing	Continuing	Continuing
Ship Integration	WR	NAWCAD : St Inigoes, MD	2.579	0.120	Nov 2020	0.122	Nov 2021	0.124	Nov 2022	-		0.124	0.000	2.945	-
Systems Engineering	WR	NAWCAD : St Inigoes, MD	6.533	0.774	Nov 2020	0.789	Nov 2021	0.204	Nov 2022	-		0.204	0.000	8.300	-
DDG 1000 Development	C/FFP	Raytheon : Tewksbury, MA	0.000	1.262	Dec 2020	1.287	Nov 2021	0.000		-		0.000	0.000	2.549	-
OE-120 Tech Refresh	SS/FFP	BAE : Nashua, NH	18.810	0.000		0.000		0.000		-		0.000	0.000	18.810	15.483
RTDS UPX-34A ECP Part I	WR	NAWCAD : St Inigoes, MD	0.000	4.842	Nov 2020	5.022	Nov 2021	0.125	Nov 2022	-		0.125	0.000	9.989	-
UPX-36 ECP Part I	WR	NAWCAD : St Inigoes, MD	0.000	1.283	Nov 2020	1.239	Nov 2021	0.171	Nov 2022	-		0.171	0.000	2.693	-
Subtotal			37.547	9.399		9.084		0.824		-		0.824	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAWCAD : St Inigoes, MD	0.169	0.000		0.000		0.000		-		0.000	0.000	0.169	-
ILS	WR	NAWCAD : St Inigoes, MD	2.937	0.078	Nov 2020	0.080	Nov 2021	0.082	Nov 2022	-		0.082	0.000	3.177	-
Software Development	WR	NAWCAD : St Inigoes, MD	5.933	0.297	Nov 2020	0.303	Nov 2021	0.108	Nov 2022	-		0.108	0.000	6.641	-
Technical Data	WR	NAWCAD : St Inigoes, MD	2.169	0.103	Nov 2020	0.105	Nov 2021	0.076	Nov 2022	-		0.076	0.000	2.453	-
Training	WR	NAWCAD : St Inigoes, MD	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Engineering	WR	NAWCAD : PAX River, MD	0.244	0.000		0.000		0.000		-		0.000	0.000	0.244	-
Subtotal			11.652	0.478		0.488		0.266		-		0.266	0.000	12.884	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Year T&E costs no longer funded in FYDP	WR	NAWCAD : St Inigoes, MD	2.559	0.000		0.000		0.000		-		0.000	0.000	2.559	-
Subtotal			2.559	0.000		0.000		0.000		-		0.000	0.000	2.559	N/A

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support	C/CPFF	Various : California, MD	3.135	0.681	Nov 2020	0.691	Nov 2021	0.154	Nov 2022	-		0.154	0.000	4.661	2.813
Subtotal			3.135	0.681		0.691		0.154		-		0.154	0.000	4.661	N/A

Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract			
Project Cost Totals			54.893	10.558	10.263	1.244	-	1.244	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0676 / Improve ID Development
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	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Mode 5 Improv Identification Dev																												
Acquisition Milestones																												
Milestones																												
Test & Evaluation Milestones																												
Deliveries																												
	Mode 5 Prod. Line Insertion																											
	Mode 5 SCDs																											
	Mode 5 Host Platform Integration																											
	Mode 5 FRP Deliveries																											
System Development																												
Platform integration testing																												
RTDS UPX-34A																												
	System Development (UPX-34A ECP)																											
UPX-36																												
	System Development (UPX-36 ECP)																											
DDG 1000 Modernization																												
Development of Integrated Product Support elements																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 0676 / Improve ID Development
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Mode 5 Improv Identification Dev</i>				
Deliveries: Mode 5 - Production Line Insertion	1	2021	4	2027
Deliveries: Mode 5 - Prepare and Evaluate ECPs/SCDs	1	2021	4	2027
Deliveries: Mode 5 - Host Platform Integrations	1	2021	4	2027
Deliveries: Mode 5 - FRP Deliveries	1	2021	4	2027
System Development: Platform integration testing	1	2021	2	2021
RTDS UPX-34A: System Development (UPX-34A ECP)	1	2021	4	2027
UPX-36: System Development (UPX-36 ECP)	1	2021	4	2027
DDG 1000 Modernization: Development of Integrated Product Support elements	1	2021	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System				Project (Number/Name) 1253 / Combat Ident System			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
1253: <i>Combat Ident System</i>	190.521	1.753	1.483	1.856	-	1.856	2.312	2.115	2.026	2.063	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MARK (MK) XIIA Mode 5 provides improved secure cooperative combat identification via Identification Friend or Foe (IFF). Mode 5 is developed in cooperation with North Atlantic Treaty Organization, with the DoD implementation governed by AIMS 03-1000A, AIMS 03-1000B and USN requirements defined in ORD # 577-06-01. IFF product improvements are designed to be installed through upgrade and deficiency correction studies, which in turn, become engineering changes to IFF interrogators and transponders and their associated cryptographic material.

The Navy MK XIIA Mode 5 program was approved for entry in Systems Development and Demonstration phase in August 2003 and into the Production and Deployment Phase and Low Rate Initial Production in July 2006, and Full Rate Production July 2012. The Navy Mode 5 program achieved Initial Operational Capability (IOC) in 2012 in accordance with the ORD. Mode 5 capable equipment was fielded in USN/USMC platforms in accordance with Joint Requirements Oversight Council Memorandums (047-07, 122-08 and 108-13) in support of Joint Mode 5 IOC in 2014 and Joint Full Operational Capability in FY2020.

RDT&E articles include Mode 5 cryptographic modules and associated hardware and software changes for IFF interrogators and transponders, including, but not limited to: AN/APX-118/123, AN/APX-119, and AN/APX-111 equipment. RDT&E units are required for government and contractor labs to support aircraft and ship integrations, test sites, test aircraft, and unmanned aircraft systems.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Mode 5 Systems Engineering and Integrated Logistics Support (ILS)	0.237	0.239	0.241	0.000	0.241
Articles:	-	-	-	-	-
Description: Performed systems engineering and analysis in support of Mode 5 hardware/software development and engineering change proposals on Identification Friend or Foe (IFF) interrogators and transponders, including but not limited to: AN/APX-123 Common Digital Transponder, AN/APX-119 Transponder, AN/APX-111 Combined Interrogator Transponder, Cryptographic Modules, Mode 5 Engineering Test Equipment, and Mode 5 support equipment.					
FY 2022 Plans: Continue research and development of APX-123 modernization to address cyber security, protective technologies, compliance with updated standards, and hardware obsolescence redesign.					
FY 2023 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 1253 / Combat Ident System

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Continue research and development of APX-123 modernization to address cyber security, protective technologies, compliance with updated standards, and hardware obsolescence redesign. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to inflation.					
Title: Mode 5 Upgrade Developmental Test & Operational Test Description: Perform Mode 5 integrated and operational test phases for AN/APX-123 Common Transponder, AN/APX-119 Transponder, small form factor IFF for unmanned aircraft systems, and AN/APX-111 Combined Interrogator Transponder. FY 2022 Plans: Continue small form factor IFF transponder testing. Continue testing of Mode 5 mitigating solutions for deploying platforms that did not meet Joint Full Operational Capability (JFOC). FY 2023 Base Plans: Continue small form factor IFF transponder testing. Continue testing of Mode 5 mitigating solutions for deploying platforms that did not meet Joint Full Operational Capability (JFOC). FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to increased testing of small form factor IFF for unmanned aircraft systems.	1.516	1.244	1.615	0.000	1.615
Articles:	-	-	-	-	-
Accomplishments/Planned Programs Subtotals	1.753	1.483	1.856	0.000	1.856

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPN/2851: ID Systems	23.815	46.918	59.226	-	59.226	59.022	60.126	61.431	62.621	73.452	808.657
• APN/0582: ID Sys	35.938	13.154	3.828	-	3.828	13.510	7.494	5.212	5.327	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / <i>Navigation/Id System</i>	Project (Number/Name) 1253 / <i>Combat Ident System</i>
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D. Acquisition Strategy

The Acquisition Strategy is to develop Mode 5 Engineering Change Proposals to modernize Mark XII Identification Friend or Foe (IFF) equipment or insert Mode 5 into existing platforms by JROC memorandums (047-07, 122-08 and 108-13). After integration into all Navy Combat Weapons systems platforms, the Navy will transition Cooperative Identification Capability to Mode 5.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 1253 / Combat Ident System
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	WR	NAWCAD : PAX River, MD	16.096	0.006	Nov 2020	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : St Inigoes, MD	15.481	0.231	Nov 2020	0.239	Nov 2021	0.241	Nov 2022	-		0.241	Continuing	Continuing	Continuing
Primary Hardware Development	Various	Sikorsky : Stratford, CT	3.872	0.000		0.000		0.000		-		0.000	0.164	4.036	4.200
Prior Year Prod Dev Services costs no longer funded in FYDP	Various	Various : Various	90.857	0.000		0.000		0.000		-		0.000	0.000	90.857	43.213
Subtotal			126.306	0.237		0.239		0.241		-		0.241	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ILS	Various	Various : Various	5.344	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Support Services costs no longer funded in FYDP	Various	Various : Various	2.761	0.000		0.000		0.000		-		0.000	0.000	2.761	2.761
Subtotal			8.105	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental T & E	WR	NAWCAD : PAX River, MD	31.344	1.516	Nov 2020	1.244	Nov 2021	1.615	Nov 2022	-		1.615	7.705	43.424	-
Prior Year T&E costs no longer funded in FYDP	Various	Various : Various	20.370	0.000		0.000		0.000		-		0.000	0.000	20.370	3.456
Subtotal			51.714	1.516		1.244		1.615		-		1.615	7.705	63.794	N/A

Remarks
Increase from FY22 to FY23 is due to increased testing requirements of the small form factor IFF transponder.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 1253 / Combat Ident System
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Combat Identification Systems	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquisition Milestones																												
Milestones																												
Systems Development																												
Hardware Development	ECPs and SCDs																											
Software Development Integration																												
Test and Evaluation																												
Technical Evaluation																												
Small Form Factor																												
Operational Evaluation	Follow-on T & E																											
Production Milestones																												
Contract Awards																												
Deliveries																												
FRP Deliveries	FRP Deliveries																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / <i>Navigation/Id System</i>	Project (Number/Name) 1253 / <i>Combat Ident System</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Combat Identification Systems</i>				
Systems Development: Hardware Development: Prepare & Evaluate ECPs/SCDs	1	2021	4	2027
Test and Evaluation: Technical Evaluation: Small Form Factor	4	2021	2	2022
Test and Evaluation: Operational Evaluation: Follow-on Test and Evaluation	1	2021	4	2027
Deliveries: FRP Deliveries	1	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	1.200	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.200
Quantity of RDT&E Articles		-	-	5	-	5	-	-	-	-		

A. Mission Description and Budget Item Justification

MARK (MK) XIIA Mode 5 provides improved secure cooperative combat identification via Identification Friend or Foe (IFF). Mode 5 is developed in cooperation with North Atlantic Treaty Organization, with the DoD implementation governed by AIMS 03-1000A, AIMS 03-1000B and USN requirements defined in ORD # 577-06-01. Research, development, and acquisition to support a micro IFF transponder/interrogator with Mode 5 in order to meet the space, weight, and power (SWaP) requirements for Group 2 and 3 Unmanned Aerial Vehicles (UAVs), and other unmanned systems.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022
Congressional Add: Navy micro interrogator	0.000	1.200
FY 2021 Accomplishments: N/A		
FY 2022 Plans: Phase 3 Small Business Innovation Research (SBIR) Contract award		
Congressional Adds Subtotals	0.000	1.200

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Acquisition Strategy is to develop a micro IFF transponder/interrogator solution through Small Business Innovation Research (SBIR) and other government development organizations.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / Navigation/Id System	Project (Number/Name) 9999 / Congressional Adds
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Navy micro interrogator	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027											
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q								
Development								Phase 3 ◆				Preliminary/Critical Design Review (P/CDR) ◆				Prototype Delivery ◆				Prototype Testing ◆																

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / <i>Navigation/Id System</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Navy micro interrogator</i>				
Development: Preliminary/Critical Design Review (P/CDR)	2	2023	2	2023
Development: Phase 3 Contract	4	2022	4	2022
Development: Prototype Delivery	3	2023	3	2023
Development: Prototype Testing	4	2023	4	2023