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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 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</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	3.030	2.518	5.529	7.438	-	7.438	8.430	14.014	14.208	8.169	Continuing	Continuing
2073: <i>DRAKE 2.0 C-UAS Afloat</i>	0.000	0.000	0.000	6.018	-	6.018	6.565	12.666	12.853	6.836	Continuing	Continuing
3241: <i>Counter Unmanned Aircraft Systems (C-UAS)</i>	3.030	2.518	5.529	1.420	-	1.420	1.865	1.348	1.355	1.333	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter Unmanned Aircraft System (C-UAS) program employs integrated C-UAS solution sets designed to protect high value or critical Naval assets from surveillance, espionage, or hostile threats posed from the inadvertent or unlawful misuse of unmanned aircraft systems (UAS). The C-UAS program provides an integrated Family of Systems (FoS) employing advanced target discrimination and defeat capabilities to meet fleet requirements. More details available at a higher classification level.

FY 2023 funding is requested to continue management and implementation of system assessment. Provide program management and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, and prototype development for integration into the C-UAS FoS.

Continues refinement of open architecture solution and interoperability standards for a C-UAS FoS. In partnership with the Joint C-UAS Office (JCO), will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, and Program Executive Officer for Unmanned Aviation and Strike Weapons (PEO(U&W)) C-UAS Acquisition program office, continued development, implementation and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Continues efforts to improve interoperability between ashore and afloat C-UAS systems.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	2.598	5.529	0.000	-	0.000
Current President's Budget	2.518	5.529	7.438	-	7.438
Total Adjustments	-0.080	0.000	7.438	-	7.438
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.080	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

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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 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>		
• Adjustments to Budget Year	-	-	7.438
			7.438
<u>Change Summary Explanation</u>			
The FY 2023 funding request was reduced by \$0.576M to account for the availability of prior year execution balances.			
Schedule for integration of external sensor capabilities has been re-baselined to match system development funding profile.			

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 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 2073 / <i>DRAKE 2.0 C-UAS Afloat</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
2073: <i>DRAKE 2.0 C-UAS Afloat</i>	0.000	0.000	0.000	6.018	-	6.018	6.565	12.666	12.853	6.836	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

DRAKE Counter Unmanned Aircraft Systems (CUAS) provides the afloat naval forces with an Electronic Warfare (EW) Force Protection system that detects, IDs, tracks, and defeats small Unmanned Aircraft Systems (sUAS). DRAKE will be upgraded with improved radios, processors and display unit to meet the non-kinetic requirements established in the OPNAV Top Level Requirement (TLR) for Afloat CUAS.

Program will develop, test, and integrate COTS-based hardware, software, and advanced techniques into DRAKE, thus improving its current capability to detect, identify, and defeat sUAS that are potential threats to afloat ships. Increment 1 upgrades includes core technology refresh replacing the legacy hardware with the latest COTS processors/controllers significantly increasing signal processing speed and bandwidth (i.e. NextGen SDR), allowing the system to efficiently counter against more advanced commercial sUAS. A COTS tablet-like Graphical User Interface (aka CDU 2.0) replaces the legacy Control Display Unit (CDU), providing enhanced visual tracking and identification data of UAS, ultimately improve situational awareness, and signal analysis for the warfighter. Increment 2 will enable integration with ships Command and Control to improve ships situational awareness and prosecution of UAS threats.

Prior to FY23, DRAKE C-UAS funding can be found in PE 0603654N/Project 3177.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: DRAKE	0.000	0.000	6.018	0.000	6.018
Articles:	-	-	-	-	-
FY 2022 Plans: N/A					
FY 2023 Base Plans: Complete integration of Increment 1 NextGen SDR hardware and software, and CDU 2.0. Develop and test advanced techniques to address evolving advanced threats. Begin testing and evaluation of NextGen SDR hardware and software, and CDU 2.0.					
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 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 2073 / <i>DRAKE 2.0 C-UAS Afloat</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY23 increase reflects realignment of DRAKE 2.0 funding from PE 0603654N and establishment of coordinated requirements across Surface Warfare Enterprise, Undersea Warfare Enterprise, Air Warfare Enterprise and Expeditionary Warfare Enterprise for Navy Counter-sUAS. FY23 will fund increased integration and testing COTS-based hardware, software, and advanced techniques into DRAKE.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	6.018	0.000	6.018

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

N/A

Remarks

D. Acquisition Strategy

Develop, integrate, test, and field hardware and software upgrades, and advanced techniques in DRAKE systems through the Technology Insertion and Technology Refresh process. Technology insertion candidates include the techniques, hardware and software performance improvements developed by United States Government (USG) laboratories, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and the JCREW prime contractor. Hardware and software updates will be integrated, tested, and implemented in DRAKE via Engineering Change Proposals (ECPs).

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 2073 / <i>DRAKE 2.0 C-UAS Afloat</i>
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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			
System Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.662	Jan 2023	-		0.662	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.602	Jan 2023	-		0.602	Continuing	Continuing	Continuing
Software Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.722	Jan 2023	-		0.722	Continuing	Continuing	Continuing
System Integration	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.602	Jan 2023	-		0.602	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		2.588		-		2.588	Continuing	Continuing	N/A

Remarks
FY22 to FY23 increase due to development of Increment 1 capability.

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			
Loadset Development	Various	NSWC : Various	0.000	0.000		0.000		0.751	Nov 2022	-		0.751	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Various	0.000	0.000		0.000		1.354	Nov 2022	-		1.354	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		2.105		-		2.105	Continuing	Continuing	N/A

Remarks
FY22 to FY23 increase associated with load set development and testing for Increment 1.

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			
Test & Evaluation	Various	Various : Various	0.000	0.000		0.000		1.325	Nov 2022	-		1.325	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		1.325		-		1.325	Continuing	Continuing	N/A

Remarks
FY 22 to FY23 increase associated with testing of Increment 1 hardware and software.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 2073 / <i>DRAKE 2.0 C-UAS Afloat</i>

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2073																												
Inc 1 Development and Integration																												
Inc 1 Test and Evaluation																												
Inc 2 Development and Integration																												
Inc 2 Test and Evaluation																												
Advanced Techniques Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 2073 / <i>DRAKE 2.0 C-UAS Afloat</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2073				
Inc 1 Development and Integration	1	2023	4	2023
Inc 1 Test and Evaluation	4	2023	3	2024
Inc 2 Development and Integration	3	2024	3	2025
Inc 2 Test and Evaluation	3	2025	2	2026
Advanced Techniques Development	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>				Project (Number/Name) 3241 / <i>Counter Unmanned Aircraft Systems (C-UAS)</i>			
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
3241: <i>Counter Unmanned Aircraft Systems (C-UAS)</i>	3.030	2.518	5.529	1.420	-	1.420	1.865	1.348	1.355	1.333	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counter Unmanned Aircraft System (C-UAS) program employs integrated C-UAS solution sets designed to protect high value or critical Naval assets from surveillance, espionage, or hostile threats posed from the inadvertent or unlawful misuse of unmanned aircraft systems (UAS). The C-UAS program provides an integrated Family of Systems (FoS) employing advanced target discrimination and defeat capabilities to meet fleet requirements. More details available at a higher classification level.

FY 2023 funding is requested to continue management and implementation of system assessment. Provide program management and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, and prototype development for integration into the C-UAS FoS.

Continues refinement of open architecture solution and interoperability standards for a C-UAS FoS. In partnership with the Joint C-UAS Office (JCO) will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, and Program Executive Officer for Unmanned Aviation and Strike Weapons (PEO(U&W)) C-UAS Acquisition program office, continued development, implementation and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Continues efforts to improve interoperability between ashore and afloat C-UAS 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: C-UAS System Development and Integration	2.518	5.529	1.420	0.000	1.420
Articles:	-	-	-	-	-
FY 2022 Plans:					
Continue management and implementation of system assessment. Provide program management, and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, development for integration into the C-UAS FoS. Continue management and technical support for C-UAS Systems Integration Lab (SIL). In partnership with the Joint C-UAS Office (JCO) will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, and Program Executive Officer for Unmanned Aviation and Strike Weapons (PEO(U&W)) C-UAS Acquisition program office, continue development, implementation					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 3241 / <i>Counter Unmanned Aircraft Systems (C-UAS)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Develop efforts to improve interoperability between ashore and afloat C-UAS systems. Funding provides for continued development of data fusion architecture for external sensor integration into a C-UAS common Command and Control (C2).</p> <p><i>FY 2023 Base Plans:</i> Continue management and implementation of system assessment. Provide program management, and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, development for integration into the C-UAS FoS. Continue management and technical support for C-UAS Systems Integration Lab (SIL). In partnership with the Joint C-UAS Office (JCO) will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, and Program Executive Officer for Unmanned Aviation and Strike Weapons (PEO(U&W)) C-UAS Acquisition program office, continue development, implementation and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Develop efforts to improve interoperability between ashore and afloat C-UAS systems. Funding provides for continued development of data fusion architecture for external sensor integration into a C-UAS common Command and Control (C2).</p> <p><i>FY 2023 OCO Plans:</i> N/A</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Reduction due to a transition of requirements to Joint C-UAS Office.</p>					
Accomplishments/Planned Programs Subtotals	2.518	5.529	1.420	0.000	1.420

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy The Navy's acquisition strategy capitalizes on prior Rapid Development Capability efforts while leveraging JCO investments with the Program Office acting as Lead Systems Integrator. This acquisition strategy maintains commonality of current C-UAS solutions while continuing to evaluate, improve, and implement layered defense capabilities into the integrated FoS to defeat evolving threats. More details available at a higher classification level.

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 3241 / <i>Counter Unmanned Aircraft Systems (C-UAS)</i>
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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			
System Development	Various	Various : Not Specified	0.000	0.000		1.892	Jan 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		1.892		0.000		-		0.000	Continuing	Continuing	N/A

Remarks
FY 2023 decrease reflects the removal of DRAKE funds from PU 3241.L19.

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			
Material solutions and assessments	Various	Various : Not Specified	1.750	1.209	Dec 2020	1.761	Dec 2021	0.211	Jan 2023	-		0.211	Continuing	Continuing	Continuing
Subtotal			1.750	1.209		1.761		0.211		-		0.211	Continuing	Continuing	N/A

Remarks
FY23 Supports minimal threat assessments planned.

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	Various	Various : Not Specified	0.550	0.567	Oct 2020	0.781	Oct 2021	0.607	Oct 2022	-		0.607	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWC, Patuxent River, MD : Not Specified	0.680	0.693	Oct 2020	1.035	Oct 2021	0.541	Oct 2022	-		0.541	Continuing	Continuing	Continuing
Travel	WR	Various : Not Specified	0.050	0.049	Oct 2020	0.060	Oct 2021	0.061	Oct 2022	-		0.061	Continuing	Continuing	Continuing
Subtotal			1.280	1.309		1.876		1.209		-		1.209	Continuing	Continuing	N/A

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 3241 / <i>Counter Unmanned Aircraft Systems (C-UAS)</i>
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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			

Remarks
FY 2023 Management Services decrease due to transition of requirements to Joint C-UAS Office(JCO)

	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	3.030	2.518	5.529	1.420	-	1.420	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 / 4	R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>	Project (Number/Name) 3241 / <i>Counter Unmanned Aircraft Systems (C-UAS)</i>
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Proj 3241.L19	FY 2021				FY 2022				FY 2023			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
System Development												
					C2 Enhancement							
					SIL Enhancement							
Technology Maturation												
	Follow-on Threat Assessment 1				Follow-on Threat Assessment 2							
Test and Evaluation												

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3241.L19				
System Development: C2 Architecture Capability	2	2022	4	2023
System Development: SIL Enhancement	1	2022	4	2022
Technology Maturation: Follow-on Threat Assessment 1	1	2021	4	2021
Technology Maturation: Follow-on Threat Assessment 2	1	2022	4	2027