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

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial 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	0.000	0.000	16.167	96.883	-	96.883	92.085	82.153	35.839	24.083	Continuing	Continuing
3448: <i>Marine Group 5 UAS Development</i>	0.000	0.000	16.167	96.883	-	96.883	92.085	82.153	35.839	24.083	Continuing	Continuing

**Note**

The FY 2023 MALE program funding, PE 0603128N, addresses Tier 1 capability gaps identified in the October 2016 MUX ICD and April 2020 MUX Requirements Clarification document.

**A. Mission Description and Budget Item Justification**

Project 3448 - The first Marine Air Ground Task Force (MAGTF) Unmanned Aircraft System (UAS) Expeditionary (MUX) Family of Systems (FoS) element is Medium-Altitude, Long-Endurance (MALE), a land-based Group 5 UAS based on the MQ-9A weapon system.

Male provides Intelligence, Surveillance and Reconnaissance (ISR) in support of Expeditionary Advanced Base Operations (EABO), Littoral Operations in Contested Environments (LOCE), and Distributed Maritime Operations (DMO) and an advanced, unmanned, multi-mission capability for the MAGTF and Marine Littoral Regiment.

MALE will award contracts for initial MQ-9A mission capabilities (payloads/sensors) design, development and integration with payloads supporting Tier 1 mission capabilities. Increment 1 payload/sensor capabilities consists of Talon Thresher Common Operating and Intelligence Picture (COP/CIP) development and integration. Increment 2 payload/sensor capabilities consists of Detect and Avoid System (DAAS), SkyTower II Airborne Network Extension (ANE), RDESS/SOAR Electronic Warfare (EW), and Airborne Early Warning (AEW)/Maritime Domain Awareness (MDA).

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	0.000	16.879	0.000	-	0.000
Current President's Budget	0.000	16.167	96.883	-	96.883
Total Adjustments	0.000	-0.712	96.883	-	96.883
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-0.712			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• 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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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2023 Navy	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>
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• Adjustments to Budget Year	-	-	96.883	-	96.883
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**Change Summary Explanation**

Change Summary Explanation: Not applicable.  
 Technical: Not applicable.  
 Schedule: Not applicable.

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 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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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>				<b>Project (Number/Name)</b> 3448 / <i>Marine Group 5 UAS Development</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3448: <i>Marine Group 5 UAS Development</i>	0.000	0.000	16.167	96.883	-	96.883	92.085	82.153	35.839	24.083	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Note: The FY 2023 MALE program funding, PE 0603128N, addresses Tier 1 capability gaps identified in the October 2016 MUX ICD and April 2020 MUX Requirements Clarification document.

Project 3448 - The first Marine Air Ground Task Force (MAGTF) Unmanned Aircraft System (UAS) Expeditionary (MUX) Family of Systems (FoS) element is Medium-Altitude, Long-Endurance (MALE), a land-based Group 5 UAS based on the MQ-9A weapon system.

Male provides Intelligence, Surveillance and Reconnaissance (ISR) in support of Expeditionary Advanced Base Operations (EABO), Littoral Operations in Contested Environments (LOCE), and Distributed Maritime Operations (DMO) and an advanced, unmanned, multi-mission capability for the MAGTF and Marine Littoral Regiment.

MALE will award contracts for initial MQ-9A mission capabilities (payloads/sensors) design, development and integration. Payloads support Tier 1 mission capability integration work include: Airborne Network Extension(ANE), Airborne Early Warning(AEW)/Maritime Domain Awareness(MDA), Electronic Warfare (EW), and Detect and Avoid System(DAAS).

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
<b>Title:</b> MALE Primary Hardware/Software Development/Integration	0.000	14.215	53.451	0.000	53.451
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Funding supports the development and integration of mission system payloads supporting medium altitude long endurance concept identified within the MUX Initial Capabilities Document (ICD).					
<b>FY 2022 Plans:</b> MUX MALE will pursue a discrete AEW & ASuW sensor Acquisition Strategy, award contracts for sensor selection, technical requirements generation, conduct initial MQ-9A Block 5 integration studies, and maintain and operate air vehicle test assets.					
<b>FY 2023 Base Plans:</b> MALE will initiate contract award for MQ-9A capability and payload development, capability integration studies, design work, technical requirements generation and full integration of sensors into the system.					
<b>FY 2023 OCO Plans:</b>					

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

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>	<b>Project (Number/Name)</b> 3448 / <i>Marine Group 5 UAS Development</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A					
<p><b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b>                      FY23 funding increased \$39.236 to support hardware/software design, development and integration. Payloads support Tier 1 mission capability integration work include: Airborne Network Extension(ANE), Airborne Early Warning(AEW)/Maritime Domain Awareness(MDA), Electronic Warfare (EW), and Detect and Avoid System(DAAS).</p>					
<p><b><i>Title:</i></b> MALE Program Support</p> <p align="right"><b><i>Articles:</i></b></p> <p><b><i>Description:</i></b> Funding provided for support costs associated with mission system payloads supporting medium altitude long endurance concept identified within the MUX Initial Capabilities Document (ICD).</p> <p><b><i>FY 2022 Plans:</i></b>                      Program support to pursue a discrete AEW &amp; ASuW sensor Acquisition Strategy, award contracts for sensor selection, technical requirements generation, conduct initial MQ-9A Block 5 integration studies, and maintain and operate air vehicle test assets.</p> <p><b><i>FY 2023 Base Plans:</i></b>                      Program, engineering and logistics support for contract award for MQ-9A capability and payload development, capability integration studies, design work, technical requirements generation and full integration of sensors into the system.</p> <p><b><i>FY 2023 OCO Plans:</i></b>                      N/A</p> <p><b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b>                      FY23 funding increased \$24.749 to support contractor and government for the design, development and integration of Airborne Network Extension(ANE), Airborne Early Warning(AEW)/Maritime Domain Awareness(MDA), Electronic Warfare (EW), and Detect and Avoid System(DAAS).</p>	0.000	1.952	26.701	0.000	26.701
	-	-	-	-	-
<p><b><i>Title:</i></b> MALE Developmental and Operational Test</p> <p align="right"><b><i>Articles:</i></b></p> <p><b><i>Description:</i></b> Funding supports the development and operational testing of mission system payloads supporting medium altitude long endurance concept identified within the MUX Initial Capabilities Document (ICD).</p> <p><b><i>FY 2022 Plans:</i></b></p>	0.000	0.000	16.731	0.000	16.731
	-	-	-	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>	<b>Project (Number/Name)</b> 3448 / <i>Marine Group 5 UAS Development</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
N/A					
<b><i>FY 2023 Base Plans:</i></b> FY23 Test plan consists of Environmental Electronic Effects, Electro Magnetic Interference, P-Static (Precipitation Static) Condition, Electromagnetic Radiation Hazards Testing, Emitter verification Direct Inject ID and Geolocation, Sensitivity testing of DAAS pod, RDESS/SOAR AEW sensor, and SkyTower II ANE pod.					
<b><i>FY 2023 OCO Plans:</i></b> N/A					
<b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b> FY23 funding increased \$16.731 to support DT/OT test for the design, development and integration of Airborne Network Extension(ANE), Airborne Early Warning(AEW)/Maritime Domain Awareness(MDA), Electronic Warfare (EW), and Detect and Avoid System(DAAS).					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	16.167	96.883	0.000	96.883

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• APN/0452: <i>Marine Group 5 UAS (MALE)</i>	0.000	233.686	103.882	-	103.882	89.081	14.919	9.760	10.212	78.650	540.190
• APN/0507: <i>Marine Group 5 UAS (MALE) Mods</i>	0.000	1.982	86.116	-	86.116	145.518	115.418	160.316	117.819	0.000	627.169

**Remarks**

**D. Acquisition Strategy**

The MALE sensor acquisition strategy leverages existing developmental programs with mature technology readiness level (TRL) Airborne Network Extension(ANE), Airborne Early Warning(AEW)/Maritime Domain Awareness(MDA), Electronic Warfare (EW), and Detect and Avoid System(DAAS) capabilities for transition and integration on the MQ-9A UAS. The MALE capabilities (payloads/sensor) acquisition strategy uses organic government resources, competitive and sole-source contract awards, and assisted acquisition approaches to develop, acquire, and integrate the discrete capabilities.

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

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>	<b>Project (Number/Name)</b> 3448 / <i>Marine Group 5 UAS Development</i>
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<b>Product Development (\$ in Millions)</b>				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			
Primary Development (Hardware/Software) Detect and Avoid System(DAAS)	C/CPIF	General Atomics : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	23.937
Primary Development (Hardware/Software) SkyTower II Comms Pod	TBD	TBD : TBD	0.000	0.000		0.000		14.923	Apr 2023	-		14.923	33.774	48.697	-
Primary Development (Hardware/Software) RDESS/SOAR Pod	C/CPIF	General Atomics/L3 : Various	0.000	0.000		0.000		15.703	Mar 2023	-		15.703	Continuing	Continuing	Continuing
Primary Development (Hardware/Software) Airborne Early Warning (AEW) Sensor	C/BA	TBD : Various	0.000	0.000		0.000		9.716	Mar 2023	-		9.716	3.677	13.393	-
DAAS Sensor Integration	C/CPIF	General Atomics : Various	0.000	0.000		0.000		0.844	Feb 2023	-		0.844	0.704	1.548	11.127
SkyTower II Integration	TBD	TBD : TBD	0.000	0.000		0.000		3.590	Apr 2023	-		3.590	39.751	43.341	-
RDESS/SOAR Integration	C/CPIF	General Atomics/L3 : Various	0.000	0.000		0.000		8.675	Mar 2023	-		8.675	3.962	12.637	-
AEW Integration	Various	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	6.501	6.501	-
Primary Development / Integration Talon Thresher	C/CPIF	General Atomics : Various	0.000	0.000		14.215	Apr 2022	0.000		-		0.000	0.000	14.215	-
<b>Subtotal</b>			0.000	0.000		14.215		53.451		-		53.451	Continuing	Continuing	N/A

**Remarks**  
 FY23 funding increased \$39.236 to support increased level of payload/sensor development for SkyTower II Airborne Network Extension (ANE), RDESS/SOAR Electronic Warfare (EW), and Airborne Early Warning (AEW)/Maritime Domain Awareness (MDA) for the MALE system. The Detect and Avoid System (DAAS) sensor hardware development is an ongoing USAF effort, which the USMC will leverage. A majority of the USMC effort for DAAS involves test, engineering support and integration.

<b>Support (\$ in Millions)</b>				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			
Development Support	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	3.710	3.710	-

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

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<b>Support (\$ in Millions)</b>				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			
Engineering Support	Various	Various : Various	0.000	0.000		0.091	Nov 2021	0.000		-		0.000	3.710	3.801	-
Integrated Logistics Support	Various	Not Specified : Not Specified	0.000	0.000		0.000		8.687	Apr 2023	-		8.687	14.072	22.759	-
<b>Subtotal</b>			0.000	0.000		0.091		8.687		-		8.687	21.492	30.270	N/A

**Remarks**  
FY23 funding increased by \$8.596 to support development and engineering costs to support the prime vendor systems engineering efforts during the integration of four sensor capabilities on the MALE. Development and engineering costs support prime vendor as well as other qualified vendors associated with overall systems development for air vehicle and sensor capability packages.

<b>Test and Evaluation (\$ in Millions)</b>				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 and Evaluation DAAS	WR	Various : Various	0.000	0.000		0.000		7.640	Jan 2023	-		7.640	3.676	11.316	-
Test and Evaluation SkyTower II	WR	Various : Various	0.000	0.000		0.000		1.070	Jan 2023	-		1.070	21.182	22.252	-
Test and Evaluation RDESS/SOAR	WR	Various : Various	0.000	0.000		0.000		8.021	Jan 2023	-		8.021	5.482	13.503	-
<b>Subtotal</b>			0.000	0.000		0.000		16.731		-		16.731	30.340	47.071	N/A

**Remarks**  
FY23 funding increased by \$16.731 to support required system level development and testing for the integration of mission system payloads on MALE.

<b>Management Services (\$ in Millions)</b>				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			
Gov Engineering	C/BA	Not Specified : Not Specified	0.000	0.000		1.861	Nov 2021	13.480	Nov 2022	-		13.480	59.568	74.909	-
Program Management Support	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		4.459	Nov 2022	-		4.459	20.959	25.418	-

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

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>	<b>Project (Number/Name)</b> 3448 / <i>Marine Group 5 UAS Development</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			
Travel	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.075	Nov 2022	-		0.075	370.000	370.075	-
<b>Subtotal</b>			0.000	0.000		1.861		18.014		-		18.014	450.527	470.402	N/A

**Remarks**  
 FY23 funding increased by \$16.153 for Government and contractor support costs, along with travel to support increased workload associated with management of the MALE Mission Sensors development and integration across three sensor systems.

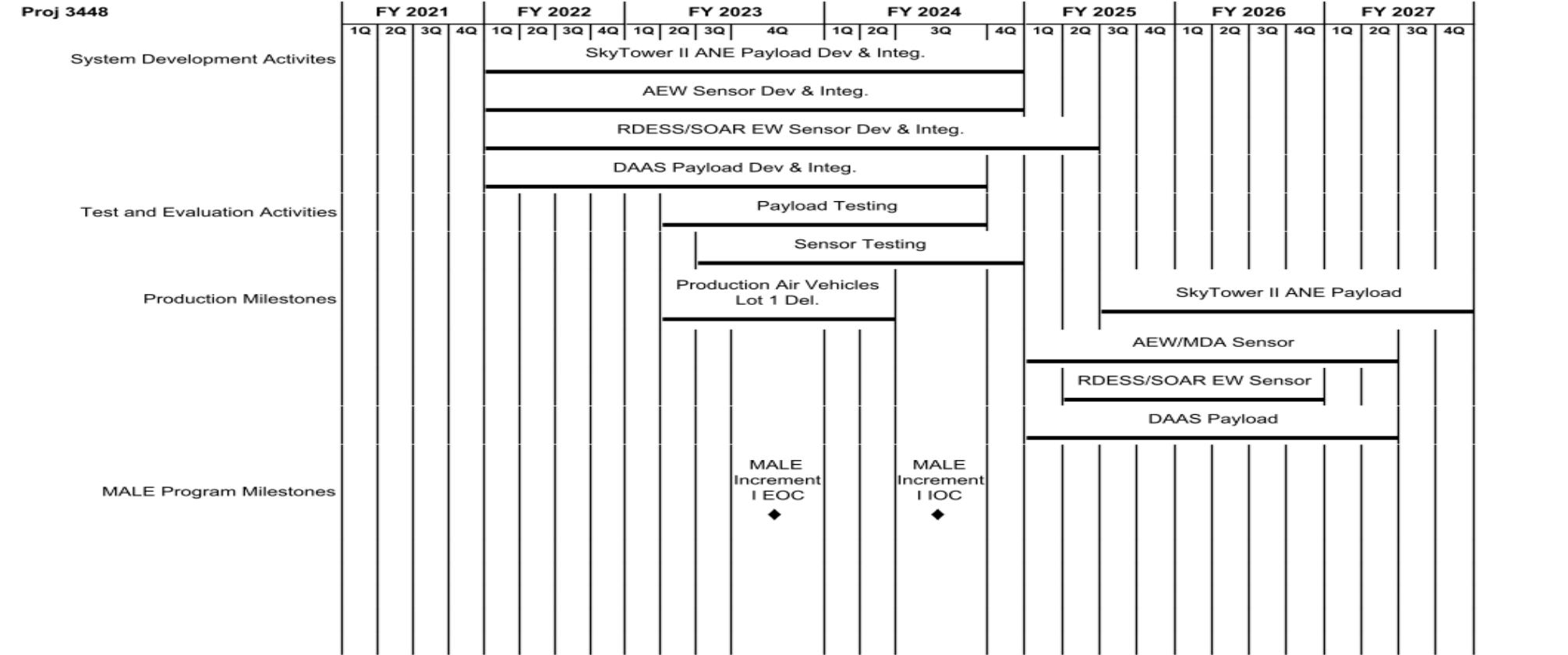
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	0.000	0.000	16.167	96.883	-	96.883	Continuing	Continuing	N/A

**Remarks**

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

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>	<b>Project (Number/Name)</b> 3448 / <i>Marine Group 5 UAS Development</i>
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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Navy		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603128N / <i>Unmanned Aerial System</i>	<b>Project (Number/Name)</b> 3448 / <i>Marine Group 5 UAS Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3448</b>				
System Development Activites: Airborne Network Extension(ANE)	1	2022	4	2024
System Development Activites: Airborne Early Warning (AEW) and Maritime Domain Awareness (MDA) Sensor integration	1	2022	4	2024
System Development Activites: Electronic Warfare (EW) sensor production	1	2022	2	2025
System Development Activites: Detect and Avoid System (DAAS)	1	2022	3	2024
Test and Evaluation Activities: Electronic Warfare (EW) and Airborne Early Warning (AEW) sensor integration	2	2023	3	2024
Test and Evaluation Activities: Detect and Avoid System (DAAS) and Airborne Network Extension(ANE)	3	2023	4	2024
Production Milestones: Production Air Vehicles Lot 1 (6 AV's)	2	2023	2	2024
Production Milestones: Airborne Network Extension(ANE)	3	2025	4	2027
Production Milestones: Airborne Early Warning(AEW)/Maritime Domain Awareness(MDA)	1	2025	2	2027
Production Milestones: Electronic Warfare (EW) sensor production	2	2025	4	2026
Production Milestones: Detect and Avoid System (DAAS)	1	2025	2	2027
MALE Program Milestones: Early Operational Capability (EOC)	4	2023	4	2023
MALE Program Milestones: Initial Operational Capability (IOC)	3	2024	3	2024