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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS							
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	124.681	65.381	-	65.381	-	-	-	-	-	-
2278: Air Defense Weapons System	0.000	0.000	118.381	57.535	-	57.535	-	-	-	-	-	-
2578: GBAD: Medium Range Intercept Capability (MRIC)	0.000	0.000	0.000	7.846	-	7.846	-	-	-	-	-	-
9999: Congressional Adds	0.000	0.000	6.300	0.000	-	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element supports the Low Altitude Air Defense (LAAD) Battalion's missions of Short Range Air Defense (SHORAD), Medium Range Air Defense and provides the Marine Air Ground Task Force (MAGTF) to include; maneuver forces, bases, posts and stations, the necessary force protection to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission, to include hostile aerial threats from Unmanned Aerial Systems (UAS). With the proliferation of both military and commercial UAS platforms, the program is pursuing and acquiring more lethal and survivable GBAD Future Weapons System platforms; such as JLTV's with armored protection and better maneuverability than a HMMWV, providing increased Counter-UAS capabilities now and continually spiraling out increasing capability for the foreseeable future. The Medium Range Intercept Capability (MRIC) will provide a capability to defend fixed and operationally fixed sites primarily against threat subsonic/supersonic cruise missiles; secondarily against UAS and other aerial threats that enter into the MRIC's Weapons Engagement Zone (WEZ). The system will be integrated into the Integrated Air Missile Defense (IAMD) Family of Systems (FoS) to facilitate a defense-in-depth against aerial threats

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	124.681	65.381	-	65.381
Total Adjustments	0.000	124.681	65.381	-	65.381
• Congressional General Reductions	-	-	-	-	-
• Congressional Directed Reductions	-	-12.671	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	137.352	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	-	-	-	-	-
• SBIR/STTR Transfer	-	-	-	-	-
• Rate/Misc Adjustments	0.000	0.000	65.381	-	65.381

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: Congressional Adds

FY 2020	FY 2021

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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Congressional Add: *L-MADIS Systems*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2020	FY 2021
	0.000	6.300
	0.000	6.300
	0.000	6.300

Change Summary Explanation

Ground Based Air Defense decreases \$59.300M from FY 2021 to FY 2022 due to the completion of development and integration of the MADIS Increment 1 to support system integration and verification tests as well as Operational Assessment (OA) in FY 2022. The decrease is also due to the completion of development and integration of the Medium Range Intercept Capability (MRIC) prototype in order to support live fire and tracking exercises in FY 2022. In FY 2022 MRIC is in a new project (PU 2578) in order to provide greater transparency. MRIC is a separate capability set and distinct from MADIS FoS.

FY 2021 delta from the previous budget submission of \$7.846M is due to the rescope of tracking and live fire exercises of the MRIC prototype as well as a reduction in quantity of missiles and canisters utilized for test.

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS				Project (Number/Name) 2278 / Air Defense Weapons System			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2278: Air Defense Weapons System	0.000	0.000	118.381	57.535	-	57.535	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Ground Based Air Defense (GBAD) includes multiple Commandant of the Marine Corps (CMC) Force Design priority items. It supports the Low Altitude Air Defense (LAAD) Battalion's missions of Short Range Air Defense (SHORAD) and provides the Marine Air Ground Task Force (MAGTF) to include; maneuver forces, bases, posts and stations, the necessary force protection to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission, to include hostile aerial threats from Unmanned Aircraft Systems (UAS). With the proliferation of both military and commercial UAS platforms, the program is pursuing and acquiring more lethal and survivable GBAD Future Weapons System platforms; such as JLTV's with armored protection and better maneuverability than a HMMWV, providing increased Counter-UAS (C-UAS) capabilities now and continually spiraling out increasing capability for the foreseeable future.

Based on an Urgent Universal Need Statement (UUNS), a Joint Urgent Operational Need (JUON), and a Joint Emergent Operational Need (JEON) the Marine Corps has aggressively pursued Counter Unmanned Aircraft Systems (CUAS) solutions in support of deployed Marines and critical facilities. The development of these solutions has been leveraged heavily by the Marine Air Defense Integrated System (MADIS) Increment 1 (Inc 1) on a Joint Light Tactical Vehicle (JLTV), the ACAT II Program of Record that will initiate at MS B in 3Q FY 2021.

Marine Air Defense Integrated System Family of Systems (MADIS FoS): The MADIS FoS provides the Marine Corps with an organic, upgradable, and state of the art capability to protect MAGTF maneuver forces, installations and other designated defended assets from Fixed/Rotary Wing (FW/RW) aircraft and Unmanned Aircraft Systems. The MAGTF is at increased risk of lethal air attack and fires coordination from next generation aircraft as well as significant advances from small UAS (sUAS) threats due to their rapid development and proliferation by the commercial sector, which has increased their nefarious use by both state and non-state actors. To address these threats, the MADIS FoS consists of mission tailored variants designed for sustained operations ashore, afloat, and aboard installations.

The MADIS FoS includes the fielded Advanced Man Portable Air Defense System (A-MANPADS) which provides close-in, low altitude, surface-to-air fires and command and control in defense of the MAGTF. It also includes the MADIS Inc 1 which is accomplished with the development, test, and installation of Government Furnished C-UAS equipment on a Joint Light Tactical Vehicle (JLTV). The MADIS Inc 1 system is comprised of two vehicles; a MK 1 (stinger variant), and a MK 2 (CUAS variant). MADIS Increment 2 (Inc 2) will focus on the development of an extended range for the Inc 1 system as well as the development of kinetic and non-kinetic capability supporting increased lethality. This includes the development of a drone on drone system, a high powered microwave capability to counter swarms and enhancements for a direct fire CUAS capability, and other yet to be identified technologies that can be integrated with the MADIS FoS. The MADIS Inc 1 will replace the AMANPADS fielded systems. The MADIS FoS also includes the Lightweight Marine Air Defense Integrated System (L-MADIS), which will be accomplished with the development, test, and installation of Government Furnished C-UAS equipment on a Ultra-Light Tactical Vehicle (ULTV). The L-MADIS Program of Record (PoR) system is comprised of two vehicles; a MK 1 (Command and Control vehicle), and a MK 2 (Early Warning / Electronic Warfare vehicle). The L-MADIS PoR will replace the systems fielded under a Joint Urgent and Emergent Operational Need Statement. The L-MADIS will provide the Marine Corps a capability different than that of the MADIS Increment

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1. The L-MADIS is transportable with organic Marine Corps assets, allowing Marines to face challenging operational scenarios during Marine Expeditionary Unit (MEU) operations. The L-MADIS will protect the maneuver force from threat of Unmanned Aircraft Systems (UAS), Fixed Wing and Rotor Wing (FW/RW), and other airborne threats throughout the operating environment while maintaining Marine Corps expeditionary requirements.

Medium Range Intercept Capability (MRIC): The MRIC will provide the Marine Corps Expeditionary Force Commander a capability to defend fixed and operationally fixed sites primarily against threat subsonic/supersonic cruise missiles; secondarily against UAS and other aerial threats that enter into the MRIC's Weapons Engagement Zone (WEZ). MRIC is designed as a system-of-systems and will be integrated with Marine Corps organic Command and Control (C2) and Joint Integrated Air and Missile Defense (IAMD) architecture. The program will enhance the expeditionary force ground based air defense (GBAD) capability to rapidly prosecute aerial threats and expand layered defense of the Expeditionary and Naval Forces. The MRIC Prototype Development will be completed 4QFY22 and comprised of missile launchers, intercept missiles, and a C2 system that are able to utilize available AN/TPS-80 G/ATOR radar for surveillance and fire control. This effort informs the investment to meet the Force Design requirements to field an MRIC Battery to each of the three LAAD Battalions in FY26, FY27 and FY28 to support operations including Expeditionary Advanced Based Operations (EABO).

Overall, Ground Based Air Defense decreases \$60.846M from FY 2021 to FY 2022 is due to the completion of development and integration of the MADIS Increment 1 to support system integration and verification tests as well as Operational Assessment (OA) in FY 2022. The decrease is also due to the completion of development and integration of the Medium Range Intercept Capability (MRIC) prototype in order to support live fire and tracking exercises in FY 2022. In FY 2022 MRIC is in a new project (PU 2578) in order to provide greater transparency. MRIC is a separate capability set and distinct from MADIS FoS.

FY 2021 delta from the previous budget submission of \$12.671M is due to the rescope of tracking and live fire exercises of the MRIC prototype as well as a reduction in quantity of missiles and canisters utilized for test.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: MADIS INC 1: Product Development	0.000	33.443	4.278	0.000	4.278
Articles:	-	-	-	-	-
FY 2021 Plans:					
-Continued development of MADIS desktop training systems, which includes the development of the software that emulates the scenarios encountered by the Marines while operating the MADIS Inc 1.					
-Initiated MADIS Inc 1 Engineering Development Model (EDM) integration by mounting a mix of legacy and technologically mature capabilities onto Joint Light Tactical Vehicles (JLTV), mitigating the risk of attacks from UAS and FW/RW aircraft, while maintaining pace with maneuver forces					
-Continued MADIS Inc 1 software development and integration efforts					
FY 2022 Base Plans:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>-Completes development of MADIS desktop training systems, which includes the development of the software that emulates the scenarios encountered by the Marines while operating the MADIS Inc 1.</p> <p>-Completes MADIS Inc 1 Engineering Development Model (EDM) integration by mounting a mix of legacy and technologically mature capabilities onto Joint Light Tactical Vehicles (JLTV), mitigating the risk of attacks from UAS and FW/RW aircraft, while maintaining pace with maneuver forces</p> <p>-Completes MADIS Inc 1 software development and integration efforts</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease of \$29.165M from FY 2021 to FY2022 is due to the completion of the MADIS Increment 1 SW and HW development and integration in 1QFY22 and the start of testing efforts leading to the MS C in 4QFY22.</p> <p>FY 2021 increase from the previous budget submission of \$14.886M is due to the additional costs associated to the integration of the MADIS Increment 1 EDM. These costs are based on ROMs received from the prime integrator, component contractors, as well as government activities</p>					
<p>Title: MADIS INC 1: Support Costs</p> <p align="right">Articles:</p> <p>Description: The Government Technical Support Team provides functions such as technical planning, execution and analysis across multi-disciplinary competencies to include; Systems Architecture, Radar/Jamming Software Engineering, Radar/Jamming Systems Engineering, Cyber Security/Information Assurance, Human Systems Integration, Safety, Configuration Management and the coordination necessary to enable a System of Systems interface with other programs in the "Cue to Slew" kill chain to ensure platform/software compatibility.</p> <p>FY 2021 Plans: -Continue New Equipment Training (NET) development support efforts for MADIS Inc 1. -Continue full logistics supportability to include Independent Logistics Assessment (ILA), provisioning conferences,</p>	0.000	14.087	10.815	0.000	10.815
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>updates of manpower and training plan and manpower task lists for MADIS Inc 1. -Continue engineering and logistics support to ensure systems meet reliability thresholds -Initiate engineering, cyber security, information assurance, and safety support required in preparation of the Operational Assessment in FY 2022.</p> <p>FY 2022 Base Plans: -Complete New Equipment Training (NET) development support efforts for MADIS Inc 1. -Will continue full logistics supportability to include Independent Logistics Assessment (ILA), provisioning conferences,updates of manpower and training plan and manpower task lists for MADIS Inc 1. -Will continue engineering, cyber security, information assurance, and safety support required in preparation of the Operational Assessment in 3Q FY 2022.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease of \$2.893M from FY 2021 to FY 2022 is due to the completion of the New Equipment Training development efforts in time to support the Operational Assessment in 3Q FY 2022.</p> <p>FY 2021 increase from the previous budget submission of \$5.434M is due to the additional engineering efforts required to support the integration of the MADIS Increment 1 EDMs prior to completion in FY 2022.</p>					
<p>Title: MADIS INC 1: Test and Evaluation</p> <p align="right">Articles:</p>	0.000 -	7.374 -	32.782 -	0.000 -	32.782 -
<p>FY 2021 Plans: -Continued Lab Testing of MADIS Increment 1 which tests configuration and enables subsystem evaluations and assessments in order to either mitigate risk, document state/status or support milestone requirements</p> <p>FY 2022 Base Plans: -Completes lab testing of MADIS Increment 1, which tests configuration and enables subsystem evaluations and assessments in order to either mitigate risk, document state/status or support milestone requirements -Initiates and completes System Integration Tests (SIT) of MADIS Inc 1 -Initiates and completes System Verification Test (SVT) of MADIS Inc 1 -Initiates and completes Operational Assessment (OA) of MADIS Inc 1</p>					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
-Initiates and completes prime ntegrator integration and test efforts to support SIT, SVT, and OA of MADIS Inc 1. FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Increase of \$25.408M from FY 2021 to FY 2022 is due to initiation of testing of the MADIS Inc 1; which includes system integration and verification testing as well as operational assessment. These events require the support of the prime integrator, government and contractor testers as well as drone pilots, safety and security personnel. The completion of these events leads to the Milestone (MS) C decision in 4Q FY 2022. FY 2021 decrease from the previous budget submission of \$17.846M is due to the additional schedule required to integrate the MADIS Increment 1 EDM. The integration will complete in 1Q FY 2022. System integration and verification tests as well as operational assessment will occur in FY 2022 and utilize FY 2022 RDTE,N funding.					
Title: MADIS INC 1: Management Services FY 2021 Plans: -Funds travel in support of development and integration of the MADIS Increment 1 FY 2022 Base Plans: -Will fund travel in support of the System Integration & Verification Tests (SIT, SVT) as well as the Operational Assessment of the MADIS Increment 1 FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Increase of \$0.193M from FY 2021 to FY 2022 is due to the increased travel requirements to support the testing events of the MADIS Increment 1.	0.000 <i>Articles:</i> -	0.302 -	0.495 -	0.000 -	0.495 -
Title: INC 2 INCREASED LETHALITY: Product Development FY 2021 Plans: -Continue development and integration efforts associated with increased lethality to support constantly evolving threats to include drone on done and high powered microwave (HPM). (BLOCK 2 MADIS Inc 1)	0.000 <i>Articles:</i> -	10.750 -	4.000 -	0.000 -	4.000 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
<p>-Initiate and complete development efforts for a Common Command and Control (C2). This includes the purchase of a test asset, test asset integration as well as SW development and integration.</p> <p>FY 2022 Base Plans: -Continues development and integration efforts associated with increased lethality to support constantly evolving threats to include drone on drone, and a high powered microwave (HPM). (BLOCK 2 MADIS Inc 1)</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease of \$6.750M from FY 2021 to FY 2022 is due to the completion of efforts associated to the development of a Common Command and Control (C2).</p> <p>FY 2021 decrease from the previous budget submission of \$2.474M is due to the Marine Corps plan to focus on the development of the high powered microwave (HPM) vice the drone on drone capability.</p>					
<p>Title: L-MADIS: Product Development</p> <p align="right">Articles:</p>					
	0.000	0.000	5.165	0.000	5.165
	-	-	-	-	-
<p>FY 2021 Plans: N/A</p> <p>FY 2022 Base Plans: -Initiates the design and architecture development of a lightweight Counter Unmanned Aircraft System (C-UAS) mobile platform utilizing government furnished C-UAS equipment on a Ultra-Light Tactical Vehicle (ULTV). -Initiates the technical manual development in order to provide the Marines the procedures required to operate, maintain, and sustain the system. -Initiates curriculum development in order to train Marines on the inherent skill set required to operate and maintain the system.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p>					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Increase of \$5.165M from FY 2021 to FY 2022 supports the initiation of the Lightweight Marine Air Defense Integrated System (L-MADIS) Program of Record and the associated costs to design a lightweight counter UAS mobile platform utilizing government furnished C-UAS equipment on an Ultra-Light Tactical Vehicle (ULTV).					
Title: MED RANGE INTERCEPT CAP (MRIC): Product Development					
	0.000	39.495	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2021 Plans:					
-Complete software architecture development (Prototype Surveillance Radar (PSR) Mode) to integrate a medium range intercept capability with the existing "Kill Chain" C2 architecture. This capability will be designed to be effective against rockets, Group 3+ Unmanned Aerial Systems, mortars, cruise missiles, precision guided missiles and rotary wing/fixed wing aircraft.					
-Initiate integration of PSR Mode into the Ground/Air Task Oriented Radar (G/ATOR) to support the MRIC prototype.					
-Complete design development of the Medium Range Intercept Capability post successful 4QF19 demonstration.					
-Initiate the development and integration of the missile launcher onto the combat vehicle platform, which includes transportability analysis and hardware required for integration.					
FY 2022 Base Plans:					
FY 2022 Product Development Plans are included in RDTE,N Project 2578.					
FY 2022 OCO Plans:					
N/A					
FY 2021 to FY 2022 Increase/Decrease Statement:					
Decrease of \$39.495M is due to the establishment of a new project (PU 2578) in FY 2022 in order to provide greater transparency of efforts associated to the Medium Range Intercept Capability. Accomplishments are provided under RDTE,N PU 2578 PE 0605520M.					
FY 2021 decrease from the previous budget submission of \$0.043M is due to Marine Corps reprioritization of efforts associated to the Fire Control Radar (FCR). Due to schedule and affordability concerns the Marine Corps is investing in the development of PSR Mode into the G/ATOR.					
Title: MED RANGE INTERCEPT CAP (MRIC): Support					
	0.000	3.753	0.000	0.000	0.000

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p align="right">Articles:</p> <p>FY 2021 Plans: -Continue the radar engineering, and modeling and simulation (M&S) in order to support development of the target statistics (trajectories, flight pattern, etc). -Initiate launcher integration engineering efforts to include information assurance and safety to support integration of the Prototype Surveillance Radar (PSR), datalink, and missile safety feature upgrades/HW.</p> <p>FY 2022 Base Plans: N/A</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease of \$3.753M is due to the establishment of a new project (PU 2578) in FY 2022 in order to provide greater transparency of efforts associated to the Medium Range Intercept Capability. Accomplishments are provided under RDTE,N PU 2578 PE 0605520M.</p> <p>FY 2021 decrease from the previous budget submission of \$0.020M based on actual cost data from government activities for effort performed.</p>	-	-	-	-	-
<p>Title: MED RANGE INTERCEPT CAP (MRIC): Test and Evaluation</p> <p align="right">Articles:</p> <p>FY 2021 Plans: -Initiate testing to support the validation and integration of the Medium Range Intercept Capability (MRIC) prototype to include G/ATOR PSR Mode. -Continue the use of White Sands Missile Range (WSMR) in order to support target tracking beginning in 4Q FY 2021. -Purchase (35) missiles, (2) launchers, and (7) canisters in support of the Early Operational Assessment in 4Q FY 2023.</p> <p>FY 2022 Base Plans:</p>	0.000	9.177	0.000	0.000	0.000
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY 2022 Plans are included within RDTE,N Project 2578.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: Decrease of \$9.177M is due to the establishment of a new project (PU 2578) in FY22 in order to provide greater transparency of efforts associated to the Medium Range Intercept Capability. Accomplishments are provided under RDTE,N PU 2578 PE 0605520M.					
FY 2021 increase from the previous budget submission of \$12.694M is due to the rescope of testing efforts and the reduction of the number of missiles and canisters required for live fire test events.					
Accomplishments/Planned Programs Subtotals	0.000	118.381	57.535	0.000	57.535

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PMC/3006: <i>Ground Based Air Defense (GBAD)</i>	147.606	17.686	9.349	-	9.349	-	-	-	-	-	-
• RDTEN/0206313M/2278: <i>Air Defense Weapons System</i>	66.766	0.000	0.000	-	0.000	-	-	-	-	-	-
• RDTEN/0206313M/2578: <i>GBAD: Medium Range Intercept Capability (MRIC)</i>	0.000	0.000	7.846	-	7.846	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

GBAD Ground Based Air Defense (GBAD): The GBAD capability will be developed in increments per the Capabilities Development Document (CDD). Increment 1 modernizes the existing GBAD legacy systems (A-MANPADS) by mounting a mix of legacy and technologically mature capabilities (leveraging UUNS related efforts) onto the Joint Light Tactical Vehicle (JLTV), mitigating the risk of attacks from UAS and FW/RW aircraft, while maintaining pace with maneuver forces. The MADIS full Increment 1 capability will be achieved via a 2 block approach. The first block will include a turret with a direct fire 30MM gun, non-kinetic (via electronic attack) UAS defeat capability, and a dual launch stinger. The second block introduces additional kinetic and non-kinetic C-UAS capability. The subsequent Increment 2 included in the CDD is not yet planned but is intended to further increase the lethality of the MADIS system. Each MADIS Inc 1 system built to the block 1 configuration, to include

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<p>Low Rate Initial Production (LRIP), will be retrofitted to include block 2 capabilities. The Marine Air Defense Integrated System (MADIS Inc 1) has been designated an ACAT II program. The MADIS Inc 1 development leverages JUON and JEON development efforts and will initiate at Milestone B 3Q FY 2021.</p> <p>The GBAD CDD defines Increment 3 as the Medium Range Intercept Capability (MRIC) which is an additional component of the defense in depth approach to aerial threats. (MRIC) is designed to defend fixed/operationally fixed assets against Cruise Missiles (CM), group 3+ UAS, Rockets, Artillery, and Mortars (RAM), and Fixed Wing / Rotary Wing threats that enter the MRIC's Weapons Engagement Zone (WEZ). To support an MRIC Material Support Decision, a concept demonstration of a proposed counter cruise missile (CM) defense system occurred in 4Q FY 2019. The MRIC received an approved Middle Tier Acquisition decision in 3Q FY 2020 placing the system into Rapid Prototyping. Design and integration efforts for a single prototype cruise missile defense capability are underway. Once the capability is successfully demonstrated during live fire testing events, a Deployment Decision will occur in 4Q FY 2022.</p> <p>The full funding requirement for the MRIC MTA prototype effort as outlined in the Report to Congress is below: FY19: \$9.9M FY20: \$15.3M FY21: \$52.4M (this exhibit) FY22: \$7.8M</p> <p>The total cost of the MRIC MTA prototyping effort is \$85.4M, and is fully funded in RDT&E.</p> <p>L-MADIS is fully leveraging JUON efforts and will have an approved CDD annex in FY 2022. The L-MADIS will develop a C-UAS capability on the new Ultra-Light Tactical Vehicle (ULTV) and produce Low Rate Initial Production (LRIP) vehicles for testing in FY 2023. It is anticipated that the L-MADIS will be designated as an ACAT IVT program with MS C scheduled for 4Q FY 2022.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2278 / Air Defense Weapons System
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
MADIS Inc 1 SW Development	C/IDIQ	MCSC : Quantico, VA	0.000	0.000		8.494	Jun 2021	3.178	Jun 2022	-		3.178	-	-	-
MADIS Inc 1 EDM Integration	Various	NIWC : Charleston, SC	0.000	0.000		18.302	May 2021	0.000		-		0.000	-	-	-
MADIS Inc 1 Desktop Trainer Development	Various	NSWC : Dahlgren, VA	0.000	0.000		1.658	Mar 2021	1.100	Mar 2022	-		1.100	-	-	-
MADIS Inc 1 Remote Weapon Station Integration	C/CPFF	MCSC : Quantico, VA	0.000	0.000		4.989	Nov 2020	0.000		-		0.000	-	-	-
Inc 2 Kinectic Kill Development	MIPR	ARL : Adelphi, MD	0.000	0.000		2.000	Jun 2021	4.000	Jun 2022	-		4.000	-	-	-
Inc 2 Common C2-SW Develop	C/IDIQ	MCSC : Quantico, VA	0.000	0.000		2.979	Jun 2021	0.000		-		0.000	-	-	-
Inc 2 Common C2 - Test Asset	MIPR	DLA : Philadelphia, PA	0.000	0.000		3.304	Jun 2021	0.000		-		0.000	-	-	-
Inc 2 Common C2 - Integration	Various	NSWC : Crane, IN	0.000	0.000		2.467	May 2021	0.000		-		0.000	-	-	-
L-MADIS Design and Architecture	TBD	TBD : TBD	0.000	0.000		0.000		5.165	Dec 2021	-		5.165	-	-	-
MRIC SW Architecture (PSR Mode)	C/FFP	DMEA : McClellan, CA	0.000	0.000		5.845	May 2021	0.000		-		0.000	-	-	-
MRIC System Develop & Integration/HW	C/IDIQ	DMEA : McClellan, CA	0.000	0.000		30.907	Jun 2021	0.000		-		0.000	-	-	-
MRIC C2 SW Integration	C/FFP	MCSC : Quantico, VA	0.000	0.000		2.743	Jun 2021	0.000		-		0.000	-	-	-
Subtotal			0.000	0.000		83.688		13.443		-		13.443	-	-	N/A

Remarks

Overall decrease of \$70.245M from FY 2021 to FY 2022 is comprised of:
MADIS Inc 1 SW Development decrease of \$5.316M due to completion of the development of the MADIS Increment 1 and only the remaining SW efforts required for testing.
MADIS Inc 1 Integration decrease of \$18.302M due to completion of integration of the MADIS Increment 1 EDMs.
MADIS Inc 1 Desktop Trainer Development decrease of \$0.558M due to completion of the desktop trainer development in time for OA.
MADIS Inc 1 Remote Weapons Station Integration decrease of \$4.989M due to completion of integration of the MADIS Inc 1 EDMs.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEF ENSE WEAPONS SYS	Project (Number/Name) 2278 / Air Defense Weapons System
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Inc 2 Kinetic Kill Development increase of \$2.000M due to ramp up of efforts associated to MADIS Increment 1 Block 2 (HPM). Inc 2 Common C2 Development decrease of \$8.750M in line with completion of OSD directed requirement to standardize Command and Control systems. LMADIS Design & Architecture Development increase of \$5.165M required for the initiation of the Program of Record and the associated design efforts required to integrate CUAS equipment on an Ultra Light Tactical Vehicle (ULTV). MRIC SW Architecture (PSR Mode) Development decrease of \$5.845M due to completion of SW architecture development and movement into development and integration of a prototype system. MRIC System Development & Integration decrease of \$30.907M due to completion of development and integration of a prototype capability MRIC C2 SW Integration decrease of \$2.743M due to completion of integration effort and movement into testing															

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
MADIS Inc 1 HSI	Various	NSWC : Dahlgren	0.000	0.000		1.000	Nov 2020	0.599	Nov 2021	-		0.599	-	-	-
MADIS Inc 1 NET Development	C/FFP	Lumbee Tribe Enterprises : Pembroke, NC	0.000	0.000		3.646	Feb 2021	2.240	Feb 2022	-		2.240	-	-	-
MADIS Inc 1 Test Support	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.552	Mar 2021	0.611	Jan 2022	-		0.611	-	-	-
MADIS Inc 1 Integrated Logistics Spt	Various	Various : Various	0.000	0.000		1.113	Nov 2020	1.730	Nov 2021	-		1.730	-	-	-
MADIS Inc 1 Eng/Cyber Support	Various	NSWC : Dahlgren, VA	0.000	0.000		2.266	Mar 2021	2.619	Nov 2021	-		2.619	-	-	-
MADIS Inc 1 Engineering Spt	C/FFP	Lumbee Tribe Enterprises : Pembroke, NC	0.000	0.000		4.979	Feb 2021	2.138	May 2022	-		2.138	-	-	-
MADIS Inc 1 Eng/Cyber Support	Various	NSWC : Crane, IN	0.000	0.000		0.000		0.878	Nov 2021	-		0.878	-	-	-
MADIS Inc 1 Technical Spt	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.531	Apr 2021	0.000		-		0.000	-	-	-
MRIC Threat Analysis Spt, M&S	Various	Various : Various	0.000	0.000		1.512	May 2021	0.000		-		0.000	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2278 / Air Defense Weapons System
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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
MRIC IA/Safety/Eng Spt	Various	NSWC : Dahlgren, VA	0.000	0.000		2.241	Jun 2021	0.000		-		0.000	-	-	-
Subtotal			0.000	0.000		17.840		10.815		-		10.815	-	-	N/A

Remarks
 Total decrease of \$7.025M from FY 2021 to FY 2022 supports the following:
 MADIS Inc 1 Test/Eng Spt decrease of \$1.551M supports the efforts required within engineering, cyber security, IA and safety to support the MADIS Inc 1 OA.
 MADIS Inc 1 HSI decrease of \$0.401M supports the completion of the integration of the MADIS Increment 1 Engineering Development Model.
 MADIS Inc 1 NET Develop Spt decrease of \$1.406M due to the mid year completion of the development of the NET required for the MADIS Increment 1.
 MADIS Inc 1 Tech Spt/ILS increase of \$0.086M supports the technical and logistics efforts required for the planning of the MADIS Inc 1 OA.
 MRIC Threat Analysis Spt/C2 Eng Integ/IA/Safety decrease of \$3.753M is due to the completion of the integration of the prototype in FY22.

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
MADIS Inc 1 Component/ Lab Testing	WR	NSWC : Corona, CA	0.000	0.000		0.676	Mar 2021	0.545	Mar 2022	-		0.545	-	-	-
MADIS Inc 1 System Integ Test	WR	NSWC : Crane, IN	0.000	0.000		0.250	Jul 2021	0.650	Nov 2021	-		0.650	-	-	-
MADIS Inc 1 Safety Certification Test	MIPR	ATC : Aberdeen, MD	0.000	0.000		0.523	Jul 2021	0.150	Nov 2021	-		0.150	-	-	-
MADIS Inc 1 Test Pilots	WR	NAWCWD : China Lake, CA	0.000	0.000		0.505	Mar 2021	1.169	Jan 2022	-		1.169	-	-	-
MADIS Inc 1 MCOTE A	TBD	MCOTE A : Quantico, VA	0.000	0.000		0.000		0.631	Jan 2022	-		0.631	-	-	-
MADIS Inc 1 Component/ Lab Testing	Various	NSWC : Dahlgren, VA	0.000	0.000		5.420	Nov 2020	3.100	Nov 2021	-		3.100	-	-	-
MADIS Inc 1 Live Fire Testing	Various	TBD : TBD	0.000	0.000		0.000		1.057	Nov 2021	-		1.057	-	-	-
MADIS Inc 1 SIT/SVT/OA Test Spt	C/FFP	Lumbee Tribe : Pembroke, NC	0.000	0.000		0.000		3.864	Nov 2021	-		3.864	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2278 / Air Defense Weapons System
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Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
MADIS Inc 1 Integrator Spt to OA	C/CPFF	DMEA : McClellan, CA	0.000	0.000		0.000		21.616	Jan 2022	-		21.616	-	-	-
MRIC Test Ranges	MIPR	WSMR : White Sands, NM	0.000	0.000		0.325	Jun 2021	0.000		-		0.000	-	-	-
MRIC Missiles (QTY 35) & Canisters (QTY 7)	C/FFP	DMEA : McClellan, CA	0.000	0.000		7.046	May 2021	0.000		-		0.000	-	-	-
MRIC Expeditionary Launcher (QTY 2)	C/FFP	DMEA : McClellan, CA	0.000	0.000		1.806	Jun 2021	0.000		-		0.000	-	-	-
Subtotal			0.000	0.000		16.551		32.782		-		32.782	-	-	N/A

Remarks
Total increase of \$16.231M from FY 2021 to FY 2022 supports Marine Air Defense Integrated System Increment 1 shift from development and integration into System Integration & Verification Testing as well as Operational Assessment.

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
MADIS FoS Travel	Various	Various : Various	0.000	0.000		0.302	Sep 2021	0.495	Sep 2022	-		0.495	-	-	-
Subtotal			0.000	0.000		0.302		0.495		-		0.495	-	-	N/A

Remarks
Funds increase of \$0.193M from FY 2021 to FY 2022 due to additional travel required to support System Integration & Verification Tests as well as Operational Assessment of the MADIS Increment 1.

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	118.381	57.535	-	57.535	-	-	N/A

Remarks
Overall, Ground Based Air Defense decreases \$60.846M from FY 2021 to FY 2022 is due to the completion of development and integration of the MADIS Increment 1 to support system integration and verification tests as well as Operational Assessment (OA) in FY 2022. The decrease is also due to the completion of development and

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy	Date: May 2021
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / <i>MARINE CORPS AIR DEFENSE WEAPONS SYS</i>	Project (Number/Name) 2278 / <i>Air Defense Weapons System</i>
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	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
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integration of the Medium Range Intercept Capability (MRIC) prototype in order to support live fire and tracking exercises in FY 2022. In FY 2022 MRIC is in a new project (PU 2578) in order to provide greater transparency. MRIC is a separate capability set and distinct from MADIS FoS. FY 2021 delta from PB21 to PB22 of \$12.671M is due to the rescope of tracking and live fire exercises of the MRIC prototype as well as a reduction in quantity of missiles and canisters utilized for test.

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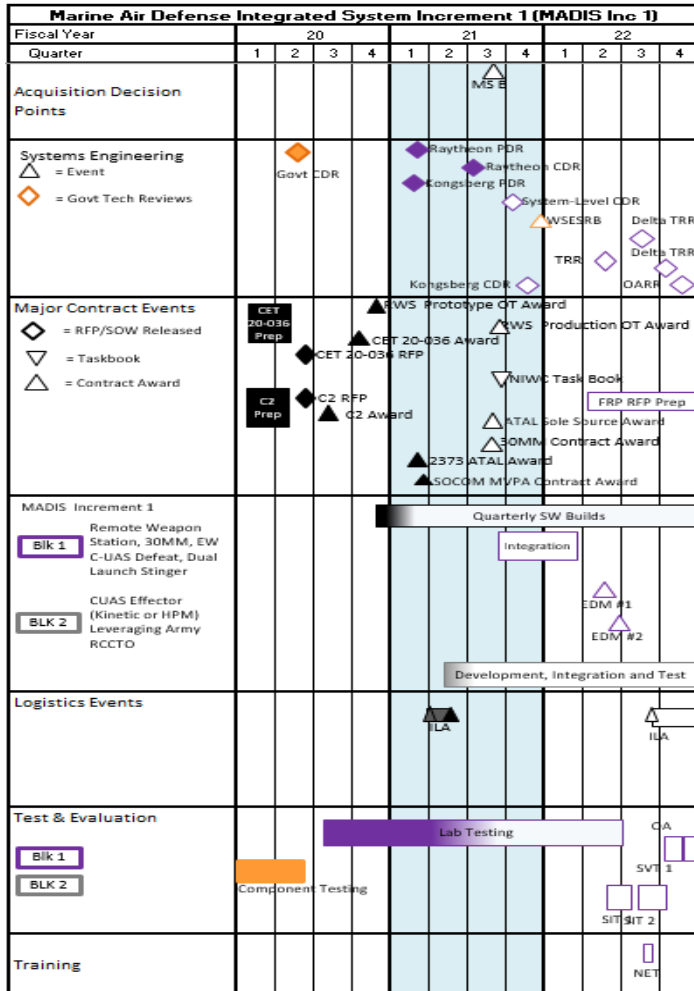
Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy

Date: May 2021

Appropriation/Budget Activity
1319 / 7

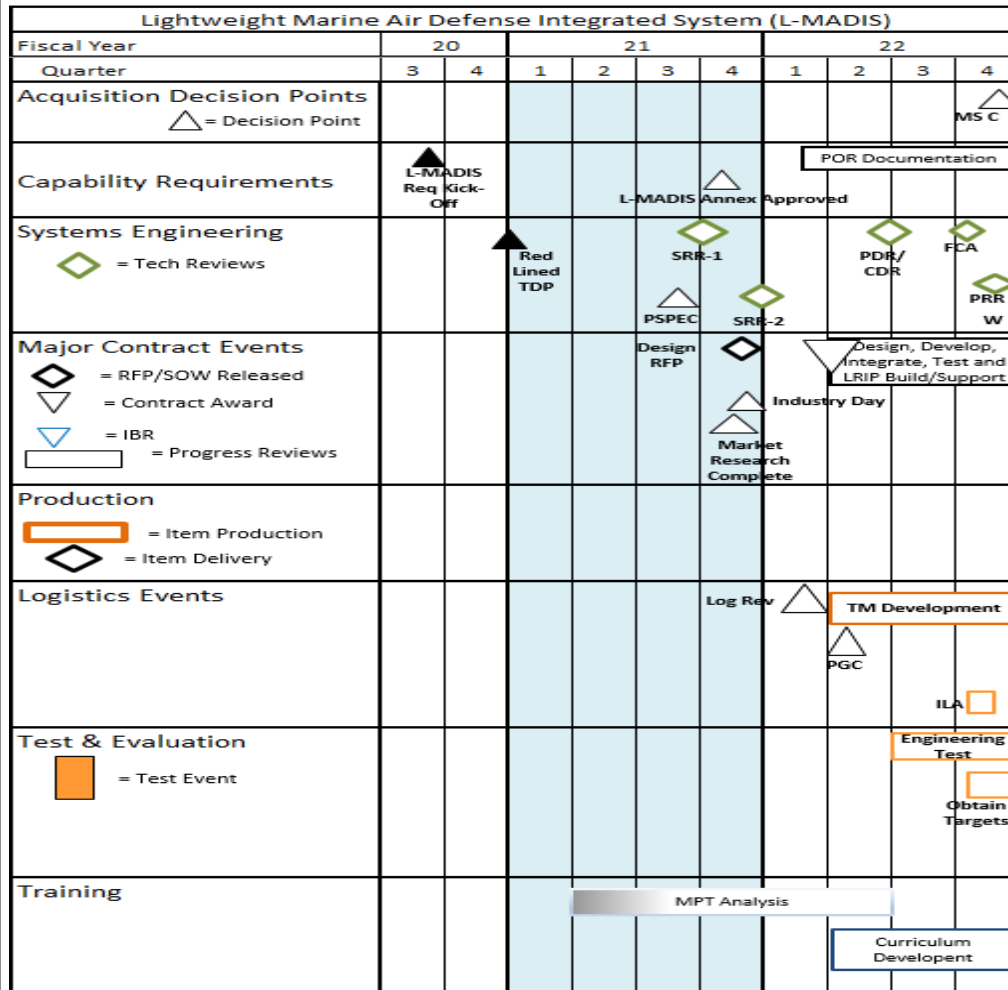
R-1 Program Element (Number/Name)
PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS

Project (Number/Name)
2278 / Air Defense Weapons System



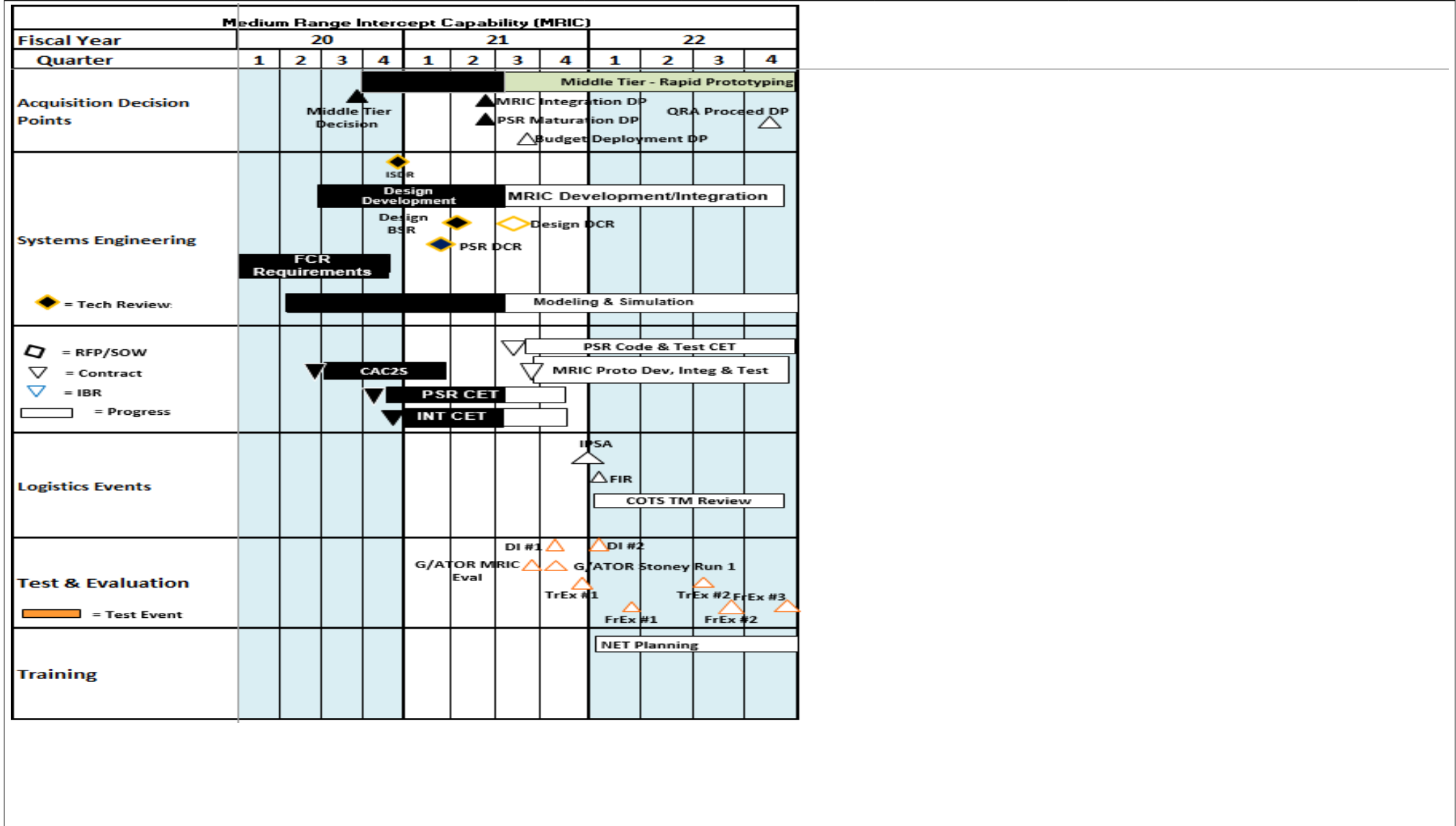
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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2278 / Air Defense Weapons System



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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2278 / Air Defense Weapons System



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2278 / Air Defense Weapons System

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2278				
MADIS INCREMENT 1: MS "B"	3	2021	3	2021
MADIS INCREMENT 1: OPERATIONAL ASSESSMENT	4	2022	4	2022
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): MIDDLE TIER PROTOTYPE DECISION	3	2020	3	2020
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): MRIC DEVELOPMENT/ INTEGRATION	3	2021	4	2022
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): TRACKING EXERCISE (TR EX #1)	4	2021	4	2021
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): LIVE FIRE TEST (FIREX #1)	1	2022	1	2022
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): TRACKING EXERCISE (TR EX #2)	3	2022	3	2022
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): LIVE FIRE TEST (FIREX #2)	3	2022	3	2022
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): LIVE FIRE TEST (FIREX #3)	4	2022	4	2022
MEDIUM RANGE INTERCEPT CAPABILITY (MRIC): MRIC DEPLOYMENT DECISION	4	2022	4	2022
L-MADIS: MILESTONE C	1	2020	4	2022
L-MADIS: DESIGN/DEVELOP/INTEGRATE/LRIP BUILD	1	2020	4	2022
L-MADIS: CRITICAL DESIGN REVIEW	1	2020	4	2022
L-MADIS: FULL RATE PRODUCTION DECISION	1	2020	4	2022
L-MADIS: INITIAL OPERATIONAL CAPABILITY (IOC)	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS				Project (Number/Name) 2578 / GBAD: Medium Range Intercept Capability (MRIC)			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2578: GBAD: Medium Range Intercept Capability (MRIC)	0.000	0.000	0.000	7.846	-	7.846	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This is not a new start.

Prior to FY 2022 MRIC, was budgeted in PE: 0206313M/RDTE,N Project 2278. In support of increased program transparency; beginning in FY 2022 funds for MRIC have been moved to PE: 0605520M/RDTE,N Project 2578.

A. Mission Description and Budget Item Justification

The Medium Range Intercept Capability (MRIC) is a CMC Force Design program and it will provide the Marine Corps Expeditionary Force Commander a capability to defend forward deployed forces primarily against threat subsonic/supersonic cruise missiles; secondarily against UAS and other aerial threats that enter into the MRIC's Weapons Engagement Zone (WEZ). MRIC is designed as a system-of-systems and will be integrated with Marine Corps organic Command and Control (C2) and Joint Integrated Air and Missile Defense (IAMD) architecture. The program will enhance the expeditionary force ground based air defense (GBAD) capability to rapidly prosecute aerial threats and expand layered defense of the Expeditionary and Naval Forces. The MRIC Prototype Development will be completed 4QFY22 and comprised of missile launchers, intercept missiles, and a C2 system that are able to utilize available AN/TPS-80 G/ATOR radar for surveillance and fire control. This effort informs the investment to meet the Force Design requirements to field an MRIC Battery to each of the three LAAD Battalions in FY26, FY27 and FY28 to support operations including Expeditionary Advanced Based Operations (EABO)

MRIC, previously budgeted in Project 2278, is moved to Project 2578 in FY 2022 to provide increased transparency.

Decrease of \$44.579M from FY 2021 PU 2278 to FY 2022 PU 2578 due to completion of the MRIC prototype development and integration leading to a 4Q FY 2022 deployment decision.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Medium Range Intercept Capability (MRIC) Test and Evaluation	0.000	0.000	2.881	0.000	2.881
Articles:	-	-	-	-	-
FY 2021 Plans: FY 2021 Accomplishments are within RDTE,N Project 2278.					
FY 2022 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2578 / GBAD: Medium Range Intercept Capability (MRIC)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>-Funds the planning, target operations, on site test efforts, range fees and post event analysis and reporting for live fire testing events (FrEX)</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Increase under RDTE,N Project 2578 of \$2.881M from FY 2021 to FY 2022 is due to the establishment of a new project for the MRIC in order to provide transparency. MRIC is a separate capability set and distinct from MADIS FoS under project 2278.</p> <p>Program History Note: The MRIC previous budget request of \$52.425M is currently under RDTE,N project 2278. Of that request \$9.177M is for MRIC test and evaluation. The transition actually reflects a decrease of \$6.296M from FY 2021 RDTE,N Project 2278 test and evaluation, to FY 2022 RDTE,N Project 2578 test and evaluation. This is due to completion of test asset purchases supporting tracking and live fire exercises. Assets were procured in FY 2021 due to delivery lead time in order to meet test event timelines in FY 2022.</p>					
<p>Title: Medium Range Intercept Capability (MRIC) Support</p> <p align="right">Articles:</p> <p>FY 2021 Plans: N/A</p> <p>FY 2022 Base Plans: -Initiates support required for the tracking and live fire exercises. This support includes tracking simulations, radar modeling and simulation, information assurance, and safety support.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Increase under RDTE,N Project 2578 of \$4.965M from FY 2021 to FY 2022 is due to the establishment of a new project for the MRIC in order to provide transparency. MRIC is a separate capability set and distinct from MADIS FoS under project</p>	0.000	0.000	4.965	0.000	4.965
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2578 / GBAD: Medium Range Intercept Capability (MRIC)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
2278. Program History Note: The MRIC previous budget request of \$52.425M is currently under RDTE,N project 2278. Of that request \$3.753M is for MRIC support. The transition actually reflects an increase of \$1.212M from FY 2021 RDTE,N Project 2278 support, to FY 2022 RDTE,N Project 2578 support. This is due to the need for additional support to the tracking and live fire exercises through out FY 2022. This includes tracking simulations, radar modeling and simulation, information assurance, and safety support.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	7.846	0.000	7.846

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PMC/3006: Ground Based Air Defense (GBAD)	147.606	17.686	9.349	-	9.349	-	-	-	-	-	-
• RDTE/0206313M/2278: Air Defense Weapons System	66.766	0.000	0.000	-	0.000	-	-	-	-	-	-

Remarks

MRIC PMC begins in FY23 and is only a portion of the GBAD PMC funding line under BLI 3006.
MRIC FY20 RDT&E is only a portion of the GBAD RDT&E funding line under PU 2278.

D. Acquisition Strategy

To support a MRIC Material Support Decision, a concept demonstration of a proposed counter cruise missile (CM) defense system occurred in 4Q FY 2019. The MRIC received an approved Middle Tier Acquisition decision in 3Q FY 2020 placing the system into Rapid Prototyping. Design and integration development of a single prototype cruise missile defense capability are underway. Once the capability is successfully demonstrated during live fire testing events, a Deployment Decision will occur in 4Q FY 2022. Prototype efforts support the anticipated development of a capability that meets Force Design requirements providing an MRIC Battery to each of the three USMC LAAD Battalions in FY 2026, FY 2027, and FY 2028, and to support Expeditionary Advanced Base Operations (EABO) planning.

The full funding requirement for the MRIC MTA prototype effort as outlined in the Report to Congress is below:

FY19: \$9.9M
FY20: \$15.3M

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / <i>MARINE CORPS AIR DEFENSE WEAPONS SYS</i>	Project (Number/Name) 2578 / <i>GBAD: Medium Range Intercept Capability (MRIC)</i>
FY21: \$52.4M FY22: \$7.8M (this exhibit) The total cost of the MRIC MTA prototyping effort is \$85.4M, and is fully funded in RDT&E.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEF ENSE WEAPONS SYS	Project (Number/Name) 2578 / GBAD: Medium Range Intercept Capability (MRIC)
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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
MRIC Radar Spt, M&S	Various	NSWC : Dahlgren, VA	0.000	0.000		0.000		2.905	Nov 2021	-		2.905	-	-	-
MRIC IA/Safety/Eng Spt	Various	NSWC : Dahlgren, VA	0.000	0.000		0.000		2.060	Nov 2021	-		2.060	-	-	-
Subtotal			0.000	0.000		0.000		4.965		-		4.965	-	-	N/A

Remarks
 Increase of \$2.405M from FY 2021 (under PU 2278) to FY 2022 in MRIC Radar and Modeling and Simulation due to the finalization of the development and integration of the MRIC prototype required to support the tracking and live fire exercises in FY 2022.
 -Increase of \$1.320M from FY 2021 (under PU 2278) to FY 2022 in MRIC Information Assurance, Safety, and Engineering support required in order to support tracking and live fire exercises through out FY 2022.

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Live Fire Test Event Range Operations	MIPR	WSMR : White Sands, NM	0.000	0.000		0.000		2.611	Dec 2021	-		2.611	-	-	-
Live Fire Test Event Planning/Reporting	Various	NSWC : Corona, CA	0.000	0.000		0.000		0.270	Dec 2021	-		0.270	-	-	-
Subtotal			0.000	0.000		0.000		2.881		-		2.881	-	-	N/A

Remarks
 Increase of \$2.611M from FY 2021 (under PU 2278) to FY 2022 in live fire test event range operations due to the costs required to reserve the range time and associated labor for the required live fire events in support of MRIC.
 -Increase of \$0.270M from FY 2021 (under PU 2278) to FY 2022 in live fire test event planning and reporting required for the live fire test events occurring in FY 2022 and the needed data analysis and reporting to successfully complete the events

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	7.846	-	7.846	-	-	N/A

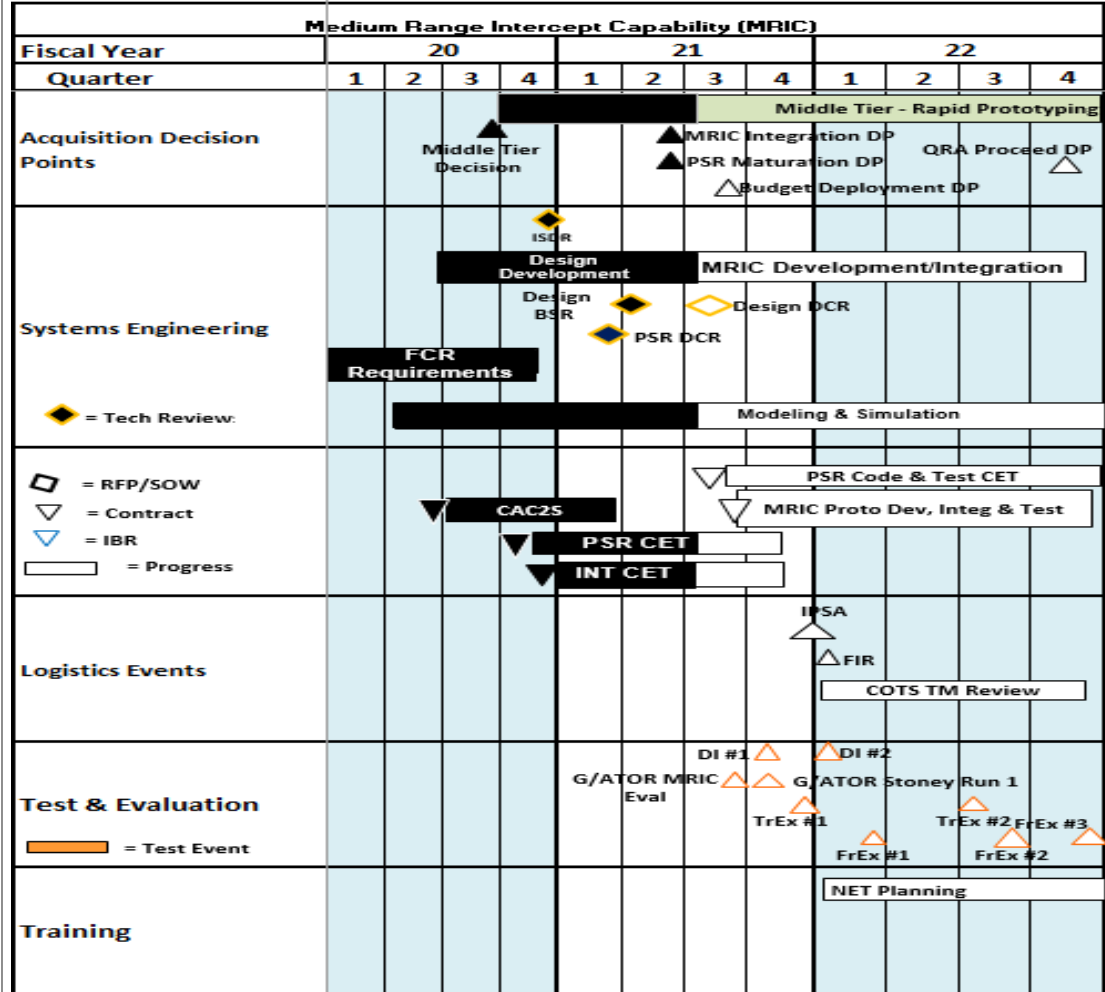
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy							Date: May 2021			
Appropriation/Budget Activity 1319 / 7			R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS			Project (Number/Name) 2578 / GBAD: Medium Range Intercept Capability (MRIC)				
	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 MRIC, previously budgeted in Project 2278, is moved to Project 2578 in FY 2022 to provide increased transparency.
 Decrease of \$44.579M from FY 2021 PU 2278 to FY 2022 PU 2578 due to completion of the MRIC prototype development and integration leading to a 4QFY22 deployment decision.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 2578 / GBAD: Medium Range Intercept Capability (MRIC)



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEF ENSE WEAPONS SYS	Project (Number/Name) 2578 / GBAD: Medium Range Intercept Capability (MRIC)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2578				
Acquisition Decisions: Middle Tier Decision	3	2020	3	2020
Acquisition Decisions: Deployment Decision	4	2022	4	2022
Systems Engineering: Design Development	2	2020	3	2021
Systems Engineering: Radar Modeling and Simulation	2	2020	4	2022
Systems Engineering: MRIC Development/Integration	2	2021	4	2022
Contracting: SW Design Development	2	2020	2	2020
Contracting: PSR Mode Development	4	2020	4	2020
Contracting: PSR Mode Development and Test	3	2021	3	2021
Contracting: MRIC Prototype Develop, Integ, Test	3	2021	3	2021
Logistics: Integrated Product Support Assessment (IPSA)	1	2022	1	2022
Logistics: Facilities Impact Report (FIR)	1	2022	1	2022
Logistics: Commercial Off the Shelf (COTS) Technical Manual Review	1	2022	4	2022
Test and Evaluation: Digital Integration #1	4	2021	4	2021
Test and Evaluation: Target Tracking Exercise #1	4	2021	4	2021
Test and Evaluation: Digital Integration #2	1	2022	1	2022
Test and Evaluation: Live Firing Exercise #1	1	2022	1	2022
Test and Evaluation: Target Tracking Exercise #2	3	2022	3	2022
Test and Evaluation: Live Firing Exercise #2	3	2022	3	2022
Test and Evaluation: Live Firing Exercise #3	4	2022	4	2022
Training: NET Planning	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEFENSE WEAPONS SYS	Project (Number/Name) 9999 / Congressional Adds
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	0.000	6.300	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Lightweight-Marine Air Defense Integrated System (L-MADIS) is a part of the MADIS Family of Systems (FoS) and protects maneuver forces from the threat of unmanned aircraft systems (UAS), Fixed Wing and Rotor Wing (FW/RW), and other airborne threats throughout the operating environment while maintaining Marine Corps expeditionary requirements.

The L-MADIS utilizes non-kinetic counter-unmanned aircraft systems (C-UAS) capabilities, a beyond-line-of-sight (BLOS) gateway with radio frequency link-16 capability, and a 360 degree radar onto a fighting pair of MRZR's. L-MADIS currently falls under Urgent Statement of Need, Central Command (CC) 0558 supporting operations within the Central Command area of operations as well as both east and west coast Marine Expeditionary Units (MEU). L-MADIS is currently the only C-UAS forward deployed system within the MEU construct to have proven effects on targets.

The expeditionary nature that L-MADIS brings to the battlefield greatly increases the C-UAS capability, extending range well beyond other similar capabilities. The ability to transport L-MADIS via MV-22 Osprey or larger aircraft greatly increases tactical flexibility that a commander has to employ a C-UAS capability.

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

	FY 2020	FY 2021
Congressional Add: L-MADIS Systems	0.000	6.300
FY 2020 Accomplishments: N/A		
FY 2021 Plans: -Completed purchase of components required to build (2) L-MADIS (2 systems = 4 vehicles) in order to meet requirements under Joint Urgent Operational Needs (JUON) CC-0558 -Integrates components onto (4) MRZR's in order to complete the build of (2) L-MADIS systems		
Congressional Adds Subtotals	0.000	6.300

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

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• PMC/3006: Ground Based Air Defense (GBAD)	147.606	17.686	9.349	-	9.349	-	-	-	-	-	-
• RDTE/0605520M/2278: Air Defense Weapons System	0.000	118.381	57.535	-	57.535	-	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEF ENSE WEAPONS SYS	Project (Number/Name) 9999 / Congressional Adds

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

The L-MADIS Program of Record (PoR) will initiate in FY22 and is only a portion of the Project 2278 and BLI 3006 budget FY22-26.

D. Acquisition Strategy

Components will be procured via DLA orders and will be integrated onto the MRZR platform by NSWC Crane.

In FY 2022, the L-MADIS will have an approved CDD annex and will initiate a PoR under project 2278. Fully leveraging the JUON, the L-MADIS will develop a C-UAS capability on the ULTV and produce Low Rate Initial Production (LRIP) vehicles for testing in FY 2023. It is anticipated that the L-MADIS will be designated as an ACAT IVT program with Milestone (MS) C scheduled for 4Q FY 2022.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEF ENSE WEAPONS SYS	Project (Number/Name) 9999 / Congressional Adds
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
L-MADIS Hardware (2 Systems)	MIPR	DLA : Philadelphia, PA	0.000	0.000		5.029	Apr 2021	0.000		-		0.000	-	-	-
L-MADIS Integration Labor	Various	NSWC : Crane, IN	0.000	0.000		1.271	Apr 2021	0.000		-		0.000	-	-	-
Subtotal			0.000	0.000		6.300		0.000		-		0.000	-	-	N/A

Remarks
Decrease of product development from FY21 to FY22 in the amount of \$6.3M is due to the completion of L-MADIS builds tied to JUON CC-0558. In FY22 the L-MADIS PoR initiates under project 2278.

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	6.300	0.000	-	0.000	-	-	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date: May 2021**

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEF ENSE WEAPONS SYS	Project (Number/Name) 9999 / Congressional Adds
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Proj 9999	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026							
	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				
Production						System Integration																										
Test and Evaluation																																

2022PB - 0605520M - 9999

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0605520M / MARINE CORPS AIR DEF ENSE WEAPONS SYS	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Production: System Integration	2	2021	2	2022
Test and Evaluation: Government Acceptance Test (GAT)	2	2022	2	2022