

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319: Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys
--	---

COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	674.332	95.319	51.788	61.381	-	61.381	87.020	79.129	84.377	102.894	Continuing	Continuing
1555: Lt Armored Vehicle Prog	138.240	0.000	1.231	1.256	-	1.256	1.281	1.307	1.333	3.354	Continuing	Continuing
1557: Next Gen Armored Reconnaissance Vehicle (LAV replacement)	0.000	1.760	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.760
1901: MC Grnd Wpnry Prod Improvement	43.223	11.131	7.607	9.860	-	9.860	9.280	5.267	5.371	5.478	Continuing	Continuing
2086: Soldier/Marine Enhancement	36.333	2.849	2.539	2.806	-	2.806	4.621	4.007	3.585	3.657	Continuing	Continuing
2112: Lightweight 155mm Howitzer	4.969	1.731	2.000	0.000	-	0.000	2.000	0.000	0.000	0.000	0.000	10.700
2237: Amphibious Vehicle Test	14.695	2.209	2.820	2.884	-	2.884	2.945	3.005	3.066	3.127	Continuing	Continuing
2315: Training Devices/Simulators	154.930	15.442	11.561	17.486	-	17.486	26.980	22.117	19.719	20.113	Continuing	Continuing
2503: Initial Issue	53.170	5.118	5.498	5.657	-	5.657	8.445	6.490	6.011	6.126	Continuing	Continuing
2513: Body Armor	55.281	4.880	4.771	4.693	-	4.693	4.790	4.830	4.928	5.027	Continuing	Continuing
2928: Exp Indirect Fire Gen Supt Wpn Sys	16.682	21.849	0.898	0.491	-	0.491	0.500	0.498	0.497	0.507	Continuing	Continuing
3098: Fire Support System	149.983	7.724	7.773	9.697	-	9.697	7.764	7.375	15.149	30.292	Continuing	Continuing
3774: Marine Corps Ammo	0.000	1.273	1.297	1.305	-	1.305	1.314	1.326	1.352	1.379	Continuing	Continuing
3775: Family of Internally Transportable Vehicles (FITV)	0.253	0.297	2.180	2.182	-	2.182	0.234	0.239	0.244	0.249	Continuing	Continuing
4002: Family of Raid Reconnaissance	1.573	7.333	1.613	3.064	-	3.064	16.866	22.668	23.122	23.585	Continuing	Continuing
9999: Congressional Adds	5.000	11.723	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.723

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

This PE provides modification to Marine Corps Expeditionary Ground Force Weapon Systems to increase lethality, range, survivability and operational effectiveness. In addition, the PE provides for product improvements to the family of LAVs. The Amphibious Vehicle Test Branch (AVTB) provides facilities and personnel which perform

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys
---	---

a broad range of testing, repair and technical services to amphibious vehicles. This program is funded under Operational Systems Development Program Element (PE) because it encompasses engineering and manufacturing and manufacturing development for upgrades of existing systems.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	100.850	51.788	66.030	-	66.030
Current President's Budget	95.319	51.788	61.381	-	61.381
Total Adjustments	-5.531	0.000	-4.649	-	-4.649
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.686	0.000			
• SBIR/STTR Transfer	-1.846	0.000			
• Program Adjustments	0.000	0.000	69.509	-	69.509
• Rate/Misc Adjustments	0.001	0.000	-74.158	-	-74.158

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

**Project:** 9999: *Congressional Adds*

Congressional Add: *Advanced Lightweight Polymer Cased 7.62mm Ammunition*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	<b>FY 2019</b>	<b>FY 2020</b>
	11.723	0.000
	11.723	0.000
	11.723	0.000

**Change Summary Explanation**

The FY 2021 funding request was reduced by \$5.420M to account for the availability of prior year execution balances.

The net increase from FY 2020 to FY 2021 by \$9.593M is primarily attributed to the increase in funding for Project 2315 (Training Devices/Simulators) to support emerging reengineering requirements, system interoperability development/test and associated support labor. Additionally, there is an increase in funding for Project 1901 (MC Ground Weaponry Prod Improvement) for Next Gen Squad Weapon (NGSW).

Funding in this line item has been reprioritized while ensuring the Marine Corps continues to evolve toward a Force that is aligned with the National Defense Strategy.

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 1555 / Lt Armored Vehicle Prog			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
1555: Lt Armored Vehicle Prog	138.240	0.000	1.231	1.256	-	1.256	1.281	1.307	1.333	3.354	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

The Family of Light Armored Vehicles (FOLAV) consists of six fielded LAV configurations and one communications/intelligence-configured asset on an LAV chassis. The FOLAV provides a logistically self-contained, highly mobile, and lethal combined arms combat system to the Marine Air Ground Task Force (MAGTF). The LAV Product Improvement Program (PIP) funds modification and sustainment activities and the development and testing of modifications. These programs will ensure that the FOLAV is capable of conducting its assigned missions by enhancing lethality and survivability; reliability, availability, maintainability and durability; as well as reducing operations and support costs.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> LAV MODIFICATIONS	0.000	1.231	1.256	0.000	1.256
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> -Initiate the integration of a new intercom system onto the Family of Light Armored Vehicles (FOLAV). -Initiate and conduct developmental test, logistics development, and validation & verification of the new intercom system for the FOLAV prior to fielding.					
<b>FY 2021 Base Plans:</b> -Initiate the integration of the tactical communication modernization (TCM) onto the Family of Light Armored Vehicles (FOLAV). -Initiate and conduct developmental test, logistics development, and validation & verification of the new TCM system for the FOLAV prior to fielding.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The increase of \$0.025M is due to inflationary increase associated with the integration of the Tactical Communication Modernization kits to the Family of Light Armored Vehicles.					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	1.231	1.256	0.000	1.256

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1555 / Lt Armored Vehicle Prog

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

Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	
			Base	OCO	Total					Complete	Total Cost
• PMC/2038: LAV PIP	36.652	60.734	41.988	-	41.988	30.505	77.375	72.591	4.417	Continuing	Continuing
• PMC/7000: LAV Spares	5.735	5.883	0.000	-	0.000	0.000	0.000	0.000	7.735	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

The LAV Modification & Sustainment program funds important vehicle modifications, support equipment and tools, and other projects that increase LAV reliability and readiness while simultaneously reducing operations and support costs. The LAV Modification and Sustainment Team is a multi-disciplinary integrated project team that employs subject matter experts in engineering, logistics, contracting and financial management to manage modification projects.

LAV Reset is an ACAT IV(M) program. The Reset program will address the Family of Light Armored Vehicles (FOLAV) automotive system obsolescence and reduced performance due to increased Gross Vehicle Weight (GVW). The Reset program will improve fleet reliability and availability by addressing the three sub-systems (power pack, driveline and steering) that specifically account for 95% of total system downtime. The program also fields a modern driver's instrument panel and LAV-25 Slip Ring. This effort delivered 8 kits (7 installed on vehicles, 1 stand-alone kit) during the engineering & manufacturing development (EMD) phase to support developmental testing (DT), fielding, integrated logistics support (ILS) products, modification instructions (MI) and engineering change proposals (ECP).

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 7				PE 0206623M / MC Ground Cmbt Spt Arms Sys				1555 / Lt Armored Vehicle Prog							
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development (MOD)	C/CPFF	TBD : TBD	0.000	0.000		0.750	Jan 2020	0.800	Dec 2020	-		0.800	Continuing	Continuing	Continuing
ILS Data Development (MOD)	C/CPFF	TBD : TBD	0.000	0.000		0.196	Jan 2020	0.200	Dec 2020	-		0.200	Continuing	Continuing	Continuing
ILS Data Development (Reset)	C/CPFF	GDLS : London Ontario, Canada	18.399	0.000		0.000		0.000		-		0.000	0.000	18.399	-
Product Dev/Prototypes (Reset)	C/CPFF	GDLS : London Ontario, Canada	46.167	0.000		0.000		0.000		-		0.000	0.000	46.167	-
Proj 1555: Prior Years Cumulative Funding	Various	Various : Various	37.397	0.000		0.000		0.000		-		0.000	0.000	37.397	-
<b>Subtotal</b>			101.963	0.000		0.946		1.000		-		1.000	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt (Reset)	MIPR	TACOM : Warren, MI	13.994	0.000		0.000		0.000		-		0.000	0.000	13.994	-
Program Mgmt (MOD)	MIPR	TACOM : Warren, MI	0.000	0.000		0.285	Oct 2019	0.256	Oct 2020	-		0.256	Continuing	Continuing	Continuing
Proj 1555: Prior Years Cumulative Funding	Various	Various : Various	11.860	0.000		0.000		0.000		-		0.000	0.000	11.860	-
<b>Subtotal</b>			25.854	0.000		0.285		0.256		-		0.256	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Devl/Oper T&E (Reset)	MIPR	RTC : AL	3.147	0.000		0.000		0.000		-		0.000	0.000	3.147	-
Proj 1555: Prior Years Cumulative Funding	Various	Various : Various	6.105	0.000		0.000		0.000		-		0.000	0.000	6.105	-
<b>Subtotal</b>			9.252	0.000		0.000		0.000		-		0.000	0.000	9.252	N/A



**UNCLASSIFIED**

<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1555 / Lt Armored Vehicle Prog

FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
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

<b>Proj 1555</b>	
No Program Schedule-Not a Program of Record	

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1555 / Lt Armored Vehicle Prog

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 1555</b>				
No Program Schedule-Not a Program of Record	1	2019	4	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 1557 / Next Gen Armored Reconnaissance Vehicle (LAV replacement)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
1557: Next Gen Armored Reconnaissance Vehicle (LAV replacement)	0.000	1.760	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.760
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**

Starting in FY20, the ARV program moved from BA07/PE 0206623M/Project 1557 to BA04/PE 0603635M/Project 1558 in order to align the program to a BA more appropriate for its current acquisition phase.

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

The Armored Reconnaissance Vehicle (ARV) is a replacement for the legacy light armored vehicle in the Light Armored Reconnaissance (LAR) battalions within the Marine Divisions. ARV equipped LAR Battalions perform combined arms, all weather, sustained reconnaissance and security missions in support of the Ground Combat Element. The ARV is the core capability that underpins the next generation armored reconnaissance capability concept. The ARV will be a modern combat vehicle system, capable of fighting for information, that balances competing capability demands to sense, shoot, move, communicate and remain transportable as part of the naval expeditionary force.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Armored Reconnaissance Vehicle	1.760	0.000	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> N/A					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	1.760	0.000	0.000	0.000	0.000

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1557 / Next Gen Armored Reconnaissance Vehicle (LAV replacement)

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

Line Item	FY 2019	FY 2020	FY 2021			FY 2022	FY 2023	FY 2024	FY 2025	Cost To	
			Base	OCO	Total					Complete	Total Cost
• RDTEN/0603640M/2223: <i>Marine Corps Advanced Tech. Demo.</i>	19.650	13.050	1.500	-	1.500	0.000	0.000	0.000	0.000	0.000	41.537
• RDTEN/0603635M/1558: <i>Marine Corps Grnd Cmbt/Supt Sys</i>	0.000	7.700	20.199	-	20.199	36.313	76.499	78.046	79.610	0.000	298.367

**Remarks**

The Office of Naval Research (ONR) supports the next generation Armored Reconnaissance Vehicle (ARV) project utilizing the Future Naval Capability (FNC) process in order to develop and demonstrate viable and mature technologies befitting the program's envisioned operational employment. The funding listed under section C, PE 0603640M, Proj 2223 is allocated to support ARV.

**D. Acquisition Strategy**

The Armored Reconnaissance Vehicle (ARV) program will be focused on providing a base combat vehicle capable of meeting evolving threats via open systems architecture and sufficient size, weight, & power (SWAP) to accommodate future growth. Subsequent programs of record will expand the ARV capability to other mission roles and integrate capabilities that emerge from other programs to further develop and enhance LAR operations.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1557 / Next Gen Armored Reconnaissance Vehicle (LAV replacement)
--	---	--

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Mgmt - LAV	MIPR	TACOM : Warren, MI	0.000	0.119	Jan 2019	0.000		0.000		-		0.000	0.000	0.119	-
Analysis of Alternatives (AoA)	MIPR	TARDEC : Warren, MI	0.000	0.409	Jan 2019	0.000		0.000		-		0.000	0.000	0.409	-
Analysis of Alternatives (AoA)	MIPR	AMSAA : Aberdeen Proving Grds, MD	0.000	0.661	Jan 2019	0.000		0.000		-		0.000	0.000	0.661	-
<b>Subtotal</b>			0.000	1.189		0.000		0.000		-		0.000	0.000	1.189	N/A

**Remarks**  
FY19 funding used by PM-Light Armored Vehicle (LAV) program office to resource an Analysis of Alternative (AoA) effort for the Armored Reconnaissance Vehicle program.

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
AoA Support Contract	C/FFP	HII-MDIS : Huntsville, AL	0.000	0.571	Jan 2019	0.000		0.000		-		0.000	0.000	0.571	-
<b>Subtotal</b>			0.000	0.571		0.000		0.000		-		0.000	0.000	0.571	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	0.000	1.760	0.000	0.000	-	0.000	0.000	1.760	N/A

**Remarks**

**UNCLASSIFIED**

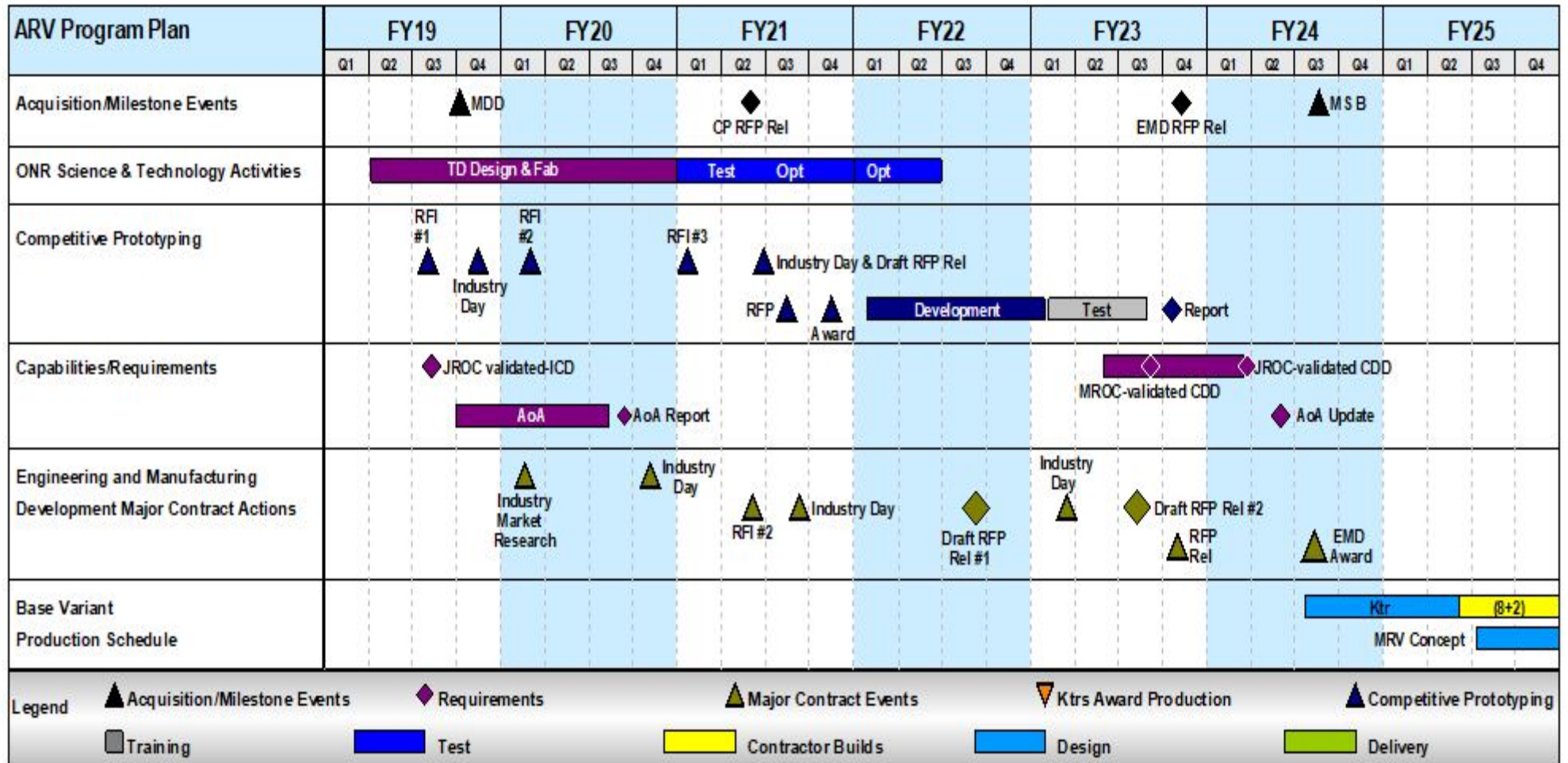
Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy

Date: February 2020

Appropriation/Budget Activity  
1319 / 7

R-1 Program Element (Number/Name)  
PE 0206623M / MC Ground Cmbt Spt Arms Sys

Project (Number/Name)  
1557 / Next Gen Armored Reconnaissance Vehicle (LAV replacement)



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1557 / Next Gen Armored Reconnaissance Vehicle (LAV replacement)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 1557</b>				
Materiel Development Decision	4	2019	4	2019
ARV Analysis of Alternatives	4	2019	3	2020
Competitive Prototype Award	4	2021	4	2021
Competitive Prototype Dev and Testing	1	2022	3	2023
RFP Release for EMD	4	2023	4	2023
Source Selection	1	2024	2	2024
MS B and EMD Contract Award	3	2024	3	2024

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
1901: MC Grnd Wpnry Prod Improvement	43.223	11.131	7.607	9.860	-	9.860	9.280	5.267	5.371	5.478	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

This project develops joint and Marine Corps unique improvements to infantry weapons technology, non-lethal systems technology, improvements for Night Vision Equipment, Rifle Combat Optics, Family of Individual Optics, and monitors national and international weapons developments.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Gunners Protection Kit	0.000	1.750	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<p><b>Description:</b> Gunners Protection Kit (GPK). Prior to FY20, GPK was funded within the Family of Infantry Weapons (FIWS). The TOGPK 2.0 is the planned upgrade and replacement for the Tube-Launched, Optically-Tracked, Wire-Guided Gunner Protection Kit (TGPK), currently in use with TOW High Mobility Multipurpose Wheeled Vehicle variants. TOGPK 2.0 affords the TOW gunner protection from small arms fire and Improvised Explosive Device fragmentation. TOGPK 2.0 addresses user concerns regarding limited workspace and TOW slew as well as improved visibility. The Reducible Height Gunners Protection Kit (RHGPK) enables Joint Light Tactical Vehicles (JLTV), Medium/Heavy Tactical Vehicle Replacement (MTVR) and Logistics Vehicle System Replacement (LVSr) to be transported in the lower vehicle stowage areas of Landing Platform/Dock (LPD 17) and Landing Helicopter Dock class ships.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- FY20 funding procures technical data package (TDP), prototypes, and tests and evaluates Reducible Height Gunners Protection Kit (RHGPK) that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels.</li> <li>- FY20 funding provides systems engineering support for the development of RHGPK.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <p>N/A</p> <p><b>FY 2021 OCO Plans:</b></p>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
N/A					
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> The decrease of \$1.750M from FY20 to FY21 is a result of the completion of all Research and Development efforts for the Gunners Protection Kit (GPK).					
<b><i>Title:</i></b> Escalation of Force-Equipment (EoF-E)	0.078	0.000	0.000	0.000	0.000
<b><i>Articles:</i></b>	-	-	-	-	-
<b><i>Description:</i></b> Escalation of Force Equipment (EoF-E) is a mod funding line to support/sustain all fielded EoF equipment and capabilities. Additionally, EoF-E supports type-classification, testing and procurement of new advancements and technologies to provide an increased capability over existing or obsolescent equipment currently in or associated with the Escalation of Force Mission Modules (EoF-MMs).					
<b><i>FY 2020 Plans:</i></b> N/A					
<b><i>FY 2021 Base Plans:</i></b> N/A					
<b><i>FY 2021 OCO Plans:</i></b> N/A					
<b><i>Title:</i></b> Combat Optics	2.700	3.955	3.750	0.000	3.750
<b><i>Articles:</i></b>	-	-	-	-	-
<b><i>Description:</i></b> Combat Optics is a program that provides for research and development, as well as ammunition to support testing and assessment of optical systems and implementation of modifications for these systems as well as life-cycle management efforts. The research and development of future capabilities include, but are not limited to variable power day optics and fused/multi-spectral (e.g., combined image intensifier, thermal imaging, and short wave infrared) optical and laser systems.					
<b><i>FY 2020 Plans:</i></b> -Continue product development, test and evaluation, and pre-EMD transition efforts for Advanced Sniper Rifle (ASR) Night Sights.					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>-Continue technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.</p> <p><b>FY 2021 Base Plans:</b>                      -Product development, test and evaluation, and pre-EMD transition efforts for Advanced Sniper Rifle (ASR) Night Sights (Integrated Clip-on Advanced Targeting System - ICATS). ICATS development efforts are scheduled to be completed in FY22. ICATS procurement will commence in FY23. The ICATS provides weapon/no weapon identification, battlefield illuminator see-spot capability, through-window targeting, and the ability to identify man-made camouflage materials to increase lethality and survivability of the Marine.                      -Technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.                      -Initiate modernization of the Electro Optical Support Facility (EOSF) to support testing and assessment of optical systems and implementation of modifications for these systems as well as life cycle management efforts.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The decrease of \$0.205M is due to reduced requirement for ASR night sight (ICATS) product development, test and evaluation funding in FY21.</p>					
<p><b>Title:</b> Company and Battalion Mortars</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> Company and Battalion Mortars is a program that provides for continuous monitoring, research and development, integration and qualification testing, certification and accreditation, assessment and implementation of multi-service and USMC unique system modifications and improvements for mortar and mortar fire control systems. Efforts include advance capability extended range mortar systems and mortar fire control systems using Android operating systems capable of digital communications, mapping and geo-location.</p> <p><b>FY 2020 Plans:</b> N/A</p> <p><b>FY 2021 Base Plans:</b> N/A</p> <p><b>FY 2021 OCO Plans:</b></p>	5.589	0.000	0.000	0.000	0.000
	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
---	----------------	----------------	---------------------	--------------------	----------------------

N/A

<b>Title:</b> Family of Infantry Weapons Systems (FIWS)	2.764	1.902	6.110	0.000	6.110
<b>Articles:</b>	-	-	-	-	-

**Description:** Family of Infantry Weapons Systems (FIWS) is a program that provides for continuous monitoring, research and development, assessment of and implementation of Joint Service and USMC unique system modifications, as well as new acquisition efforts. Efforts such as: sustain weapon capability, enhance Gunner Protection Kits (GPK), and improve the performance, maintainability, supportability, service life, ergonomics, and safety enhancements of Infantry Weapons Systems. GPK costs are separate from FIWS beginning in FY20.

**FY 2020 Plans:**

- Product Improvement Program (PIP) testing and evaluation for various emergent requirements, including Service Rifle PIP (Next Gen Carbine), M2A1 machine gun, and Lightweight Medium Machine Gun improvements through the Small Arms Weapon Systems Division of the Naval Surface Warfare Center (NSWC), Crane.
- Continue performance evaluation of various types of ammunition currently under development.
- Continue product development for the improvement of Small Arms Weapon Systems (which includes, but is not limited to) Suppressors, Sniper and Special Purpose systems, and their ancillary support equipment in order to meet established or emerging requirements. These product development efforts will be accomplished primarily through the Small Arms Weapon Systems Division of the Naval Surface Warfare Center (NSWC), Crane.
- Participate in Operational Testing of the Advanced Sniper Rifle (ASR) at the US Army Aberdeen Test Center in cooperation with Special Operations Command (SOCOM) and subsequent delta testing for Marine Corps specific requirements as required.
- Continue Government Civilian Test Management Support through NSWC Crane.

**FY 2021 Base Plans:**

- Initiate the procurement of Next Gen Carbine test articles and Developmental Testing (includes ammunition) to evaluate requirements unique to the Marine Corps' expeditionary and amphibious mission in maritime environments. This product development effort will be accomplished primarily through the Army Armament Research, Development and Engineering Center (ARDEC).
- Continue product development for the improvement of Small Arms Weapon Systems (which includes, but is not limited to) Suppressors, Sniper and Special Purpose systems, and their ancillary support equipment in order to meet established or emerging requirements. These product development efforts will be accomplished primarily through the Small Arms Weapon Systems Division of the Naval Surface Warfare Center (NSWC), Crane.

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
- Product Improvement Program (PIP) testing and evaluation for various emergent requirements, including Lightweight Medium Machine Gun (LMMG) improvements through NSWC, Crane in support of procurement in FY23. - Performance evaluation of various types of ammunition currently under development. - Evaluation of the ASR through delta testing for Marine Corps specific requirements as required. - Continue Government Civilian Test Management Support through NSWC Crane.  <b>FY 2021 OCO Plans:</b> N/A  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$4.208M from FY20 to FY21 is due to funding added to FIWS to initiate the developmental testing of the Next Gen Squad Weapon (NGSW).					
<b>Accomplishments/Planned Programs Subtotals</b>	11.131	7.607	9.860	0.000	9.860

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PMC/2220-01: Family of Infantry Weapons Systems	29.056	17.022	8.075	-	8.075	12.196	6.289	6.941	7.102	Continuing	Continuing
• PMC/2220-02: Company and Battalion Mortars	2.266	3.018	3.474	-	3.474	3.543	3.614	3.686	3.760	Continuing	Continuing
• PMC/2220-03: Escalation of Force - Equip (EoF-E)	0.228	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/4620: Combat Optics	57.739	68.422	50.492	-	50.492	51.893	52.071	65.107	66.174	Continuing	Continuing
• PMC/2220-04: Gunners Protection Kit	0.000	11.365	11.949	-	11.949	18.187	0.000	0.000	0.000	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

These programs range from off-the-shelf modifications to developmental items for safety, reliability, and technology upgrades to meet Marine Corps requirements.

Family of Infantry Weapons Systems (FIWS):

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement
<p>The FIWS program strategy is to explore, research and recommend efforts to address and identify solutions to performance, reliability and safety design issues through various means, including commercial off-the-shelf (COTS) components. This includes efforts to improve Individual and Crew Served Weapon Systems, evaluation of various types of ammunition under development, and testing of Product Improvement Programs in order to meet various emergent requirements.</p> <p><b>Combat Optics:</b>          Combat Optics acquisition, management and contracting strategies support the research, development, modification and improvement of optics, night vision and laser systems such as magnified day optics, thermal imagers, image intensifying (I2) systems, lasers, and illuminators. The Advanced Sniper Rifle (ASR) night sight is an Other Transaction Authority (OTA) development effort leading to a procurement decision in FY23. The ASR day sight acquisition strategy is Marine Corps participation in, and alignment with, the Army development effort, with procurement beginning in FY21. ASR deployment is scheduled for FY22, initially utilizing existing night sight capabilities from the sniper rifles being replaced until the fielding of the ASR night sight with its enhanced capabilities in FY23.</p> <p><b>Company and Battalion Mortars:</b>          Acquisition, management, and contracting strategies support multiservice and USMC unique system modifications and improvements for the lightweight company and battalion mortars and mortar fire control systems to provide immediate indirect fires in support of mounted and dismounted forces to the company and battalion level.</p> <p><b>Gunners Protection Kit (GPK):</b>          Acquisition, management, and contracting strategies to support a USMC unique system requirement for the Reducible Height Gunners Protection Kit (RHGPK) in support of loading and unloading vehicles aboard amphibious carriers. The RHGPK enables Joint Light Tactical Vehicles (JLTV), Medium/Heavy Tactical Vehicle Replacement (MTVR) and Logistics Vehicle System Replacement (LVSr) to be transported in the lower vehicle stowage areas of Landing Platform/Dock (LPD 17) and Landing Helicopter Dock class ships.</p>		

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement
--	---	---

<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Company and Battalion Mortars: MFCA Development	MIPR	Picatinny Arsenal : Picatinny, NJ	0.000	1.500	Oct 2018	0.000		0.000		-		0.000	0.000	1.500	-
Company and Battalion Mortars: ACERM Closeout	WR	NSWC, Dahlgren : Dahlgren, VA	0.000	0.271	Mar 2019	0.000		0.000		-		0.000	0.000	0.271	-
Company and Battalion Mortars: ACERM Closeout	MIPR	Picatinny Arsenal : Picatinny, NJ	0.000	0.703	Feb 2019	0.000		0.000		-		0.000	0.000	0.703	-
Company and Battalion Mortars: MFCA and THS V2 Integration	MIPR	AMRDEC : Huntsville, AL	0.000	1.500	Nov 2018	0.000		0.000		-		0.000	0.000	1.500	-
Company and Battalion Mortars: ERMA Propelling Charge Design	WR	NSWC, Indian Head : Indian Head, MD	0.000	1.200	Nov 2018	0.000		0.000		-		0.000	0.000	1.200	-
Gunners Protection Kit: RHGPK	MIPR	Picatinny Arsenal : Picatinny, NJ	0.000	0.000		1.108	Feb 2020	0.000		-		0.000	0.000	1.108	-
Family of Infantry Weapons Systems	MIPR	ARDEC : Picatinny, NJ	1.412	0.415	Mar 2019	0.000		4.624	Mar 2021	-		4.624	0.000	6.451	-
Family of Infantry Weapons Systems	WR	NSWC : Crane, IN	0.000	0.502	Apr 2019	0.641	Mar 2020	0.250	Jun 2021	-		0.250	0.000	1.393	-
Family of Infantry Weapons Systems	TBD	MCSC : Quantico, VA	0.000	0.000		0.110	Mar 2020	0.000		-		0.000	0.000	0.110	-
Combat Optics: ICATS	MIPR	DOTC : Picatinny, NJ	0.075	1.728	Mar 2019	2.612	Mar 2020	2.400	Mar 2021	-		2.400	0.000	6.815	-
Proj 1901: Prior Years Cum Funding (Product Dev)	Various	Various : Various	9.077	0.000		0.000		0.000		-		0.000	0.000	9.077	-
<b>Subtotal</b>			10.564	7.819		4.471		7.274		-		7.274	0.000	30.128	N/A

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnrty Prod Improvement
--	---	--

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Family of Infantry Weapons Systems	Various	Travel/GCPC : Quantico, VA	0.525	0.234	Aug 2019	0.163	Mar 2020	0.169	Feb 2021	-		0.169	Continuing	Continuing	Continuing
Combat Optics: Technical Engineering	WR	NSWC, Crane : Crane, IN	1.100	0.469	Aug 2019	0.490	Aug 2020	0.553	Aug 2021	-		0.553	Continuing	Continuing	Continuing
Combat Optics	Various	Travel/GCPC : Quantico, VA	0.059	0.059	Sep 2019	0.195	Sep 2020	0.000		-		0.000	0.000	0.313	-
Company and Battalion Mortars: Warfighter Workshops	WR	NSWC, Panama City : Panama City, FL	0.000	0.051	Jan 2019	0.000		0.000		-		0.000	0.000	0.051	-
Company and Battalion Mortars: Warfighter Workshops	WR	NSWC, Indian Head : Indian Head, MD	0.000	0.260	Feb 2019	0.000		0.000		-		0.000	0.000	0.260	-
Combat Optics: Technical Engineering	WR	NSWC, Dahlgren : Dahlgren, VA	0.000	0.000		0.265	Mar 2020	0.000		-		0.000	0.000	0.265	-
Proj 1901: Prior Years Cum Funding (Support)	Various	Various : Various	13.708	0.000		0.000		0.000		-		0.000	0.000	13.708	-
<b>Subtotal</b>			15.392	1.073		1.113		0.722		-		0.722	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Combat Optics	Various	Various : Various	0.447	0.252	Mar 2019	0.200	May 2020	0.000		-		0.000	0.000	0.899	-
Combat Optics: EOSF Modernization	WR	NSWC Crane : Crane, IN	0.000	0.000		0.000		0.747	Jan 2021	-		0.747	0.000	0.747	-
Family of Infantry Weapons Systems	WR	NSWC Crane : Crane, IN	1.075	0.796	Jan 2019	0.736	Jan 2020	0.907	Dec 2020	-		0.907	Continuing	Continuing	Continuing
Family of Infantry Weapons Systems: TOGPK 2.0 Testing	MIPR	Redstone Testing Center : Redstone, AL	0.000	0.672	Oct 2018	0.000		0.000		-		0.000	0.000	0.672	-

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement Sys
--	---	---

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Family of Infantry Weapins Systems	MIPR	Aberdeen Testing Center : Aberdeen, MD	0.000	0.000		0.100	May 2020	0.000		-		0.000	0.000	0.100	-
Company and Battalion Mortars: 60mm Direct Lay Laser Testing	WR	NSWC, Fall Brook : Fall Brook, CA	0.000	0.034	Mar 2019	0.000		0.000		-		0.000	0.000	0.034	-
Gunners Protection Kit: RHGPK	MIPR	Aberdeen Testing Center : Aberdeen, MD	0.000	0.000		0.450	May 2020	0.000		-		0.000	0.000	0.450	-
Proj 1901: Prior Years Cum Funding (T&E Eval)	Various	Various : Various	13.575	0.000		0.000		0.000		-		0.000	0.000	13.575	-
<b>Subtotal</b>			15.097	1.754		1.486		1.654		-		1.654	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Family of Infantry Weapons Systems	C/FFP	MCSC : Quantico, VA	1.086	0.145	Mar 2019	0.152	Mar 2020	0.160	Mar 2021	-		0.160	Continuing	Continuing	Continuing
Combat Optics: PM Support	C/FFP	MCSC : Quantico, VA	0.000	0.192	Mar 2019	0.193	Mar 2020	0.050	Mar 2021	-		0.050	0.000	0.435	-
Escalation of Force Equipment	C/FFP	MCSC : Quantico, VA	0.057	0.078	Feb 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Company and Battalion Mortars: Engineering Support	C/FFP	MCSC : Quantico, VA	0.000	0.070	Feb 2019	0.000		0.000		-		0.000	0.000	0.070	-
Gunners Protection Kit: RHGPK	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.192	Feb 2020	0.000		-		0.000	0.000	0.192	-
Proj 1901: Prior Years Cum Funding (Mgmt Services)	Various	Various : Various	1.027	0.000		0.000		0.000		-		0.000	0.000	1.027	-
<b>Subtotal</b>			2.170	0.485		0.537		0.210		-		0.210	Continuing	Continuing	N/A

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Navy</b>								<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 7				<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 1901 / MC Grnd Wpnry Prod Improvement			
	<b>Prior Years</b>	<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	43.223	11.131		7.607		9.860	-	9.860	Continuing	Continuing	N/A

**Remarks**



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 1901 / MC Grnd Wpny Prod Improvement

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Advanced Sniper Rifle (ASR) - Combat Optics and Family of Infantry Weapons</i></b>				
ASR Night Sight Development: Schedule Detail	2	2019	4	2022
ASR Rifle Evaluation: Schedule Detail	2	2019	2	2021
ASR Night Sight Procurement: Schedule Detail	1	2023	4	2025
ASR Rifle and Day Sight Procurement: Schedule Detail	3	2021	4	2022
ASR Deployment: Schedule Detail	1	2022	4	2023

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
2086: <i>Soldier/Marine Enhancement</i>	36.333	2.849	2.539	2.806	-	2.806	4.621	4.007	3.585	3.657	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

Marine Expeditionary Rifle Squad (MERS) mission is to manage the infantry squad, "squad as a system", by conducting integration, systems engineering, human factors, and modernization efforts across all the products that are worn, carried, and consumed by the rifle squad. Physical integration, capability analysis, modeling and simulation, ergonomics, and usability assessments are facilitated by this program in working with the various program managers and project officers in the development of their unique items that contribute to the squads overall capabilities. MERS operates and manages the Gruntworks Squad Integration Facility, including facilities sustainment, restoration and modernization of the facility, to meet mission requirements in order to support integration and assessments of equipment. MERS is engaging industry and academia in search of innovative technologies that can enhance infantry capabilities via a Partnership Intermediary Agreement. Weight and volume management are fundamental considerations in the insertion or modernization of any squad equipment. MERS works with Joint and North Atlantic Treaty Organization (NATO) soldier modernization programs to harvest new technologies to increase the capability of the rifle squad. The program also ensures the integration of the rifle squad into the various mobility platforms currently in service and being developed to ensure a Marine and his equipment can operate effectively. The Marine Corps anthropometry survey will be initiated in FY20 for completion in FY21. This program is essential to ensure the combined synergistic equipment effects enhance the war-fighting functions of the Marine rifle squad towards the strategic Marine Corps war fighting vision for the future.

Ammunition Life Cycle Management Program responsibility for Total Life Cycle Management for ground conventional munitions. Accordingly, PM Ammo is a member of the joint services Ammunition Logistics Research and Development integrated product team (ALR&D IPT). Each year the IPT solicits R&D projects from all of the services. The IPT looks for innovative ideas to enhance logistical support for munitions. Approximately 20 Ammo Logistics R&D projects are voted on each year by the IPT. They are prioritized by voting actions of the Senior Review Board and funding sources are identified. Since the funding for ammunition procurement is outpaced by annual expenditures, ammunition logistics R&D projects designed to extend the shelf life of our current inventory, provide enhanced packaging to "lighten the load" of our munitions, and other such projects will go a long way to ensure the Marine Corps can maintain combat readiness with a reliable conventional ammunition inventory into the future.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Marine Expeditionary Rifle Squad (MERS)	2.849	2.539	2.806	0.000	2.806
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b>					
-Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad.					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<ul style="list-style-type: none"> <li>-Continue to resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility.</li> <li>-Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&amp;D integration projects, prototyping, rapid assessment of technologies, and usability trials.</li> <li>-Continue investment into Gruntworks Squad Integration Facility enablers and capabilities.</li> <li>-Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics.</li> <li>-Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level.</li> <li>-Continue to support integration of body armor and load bearing systems with human factors expertise.</li> <li>-Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program and associated Policy Letters and Requirements Documents.</li> <li>-Continue to develop integrated seating solutions for combat equipped Marines for ACV, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms.</li> <li>-Continue to conduct R&amp;D on squad systems in conjunction with Army squad system projects.</li> <li>-Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment.</li> <li>-Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment.</li> <li>-Continue to evaluate and transition technologies from ONR and other S&amp;T activities that enhance capabilities of the squad or provide a desired capability.</li> <li>-Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components.</li> <li>-Continue to implement capability requirements from MERS Initial Capabilities Document (ICD), and results from Force Design.</li> <li>-Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as mediation to pursue innovation and technology.</li> <li>-Continue Marine Corps anthropometry survey in order to provide an updated database in 2020.</li> <li>-Conduct Technology research and integration in order to develop the Infantry Helmet System.</li> </ul>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>-Explore and prototype Manned- unmanned teaming capabilities for small Unmanned Air Systems (UAS) and ground applications.</p> <p><b>FY 2021 Base Plans:</b></p> <p>-Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad.</p> <p>-Continue to resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility.</p> <p>-Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&amp;D integration projects, prototyping, rapid assessment of technologies, and usability trials.</p> <p>-Continue investment into Gruntworks Squad Integration Facility enablers and capabilities.</p> <p>-Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics.</p> <p>-Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level.</p> <p>-Continue to support integration of body armor and load bearing systems with human factors expertise.</p> <p>-Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program and associated Policy Letters and Requirements Documents.</p> <p>-Continue to develop integrated seating solutions for combat equipped Marines for ACV, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms.</p> <p>-Conduct R&amp;D on squad systems in conjunction with Army, Special Operations Command (SOCOM), and Close Combat Lethality Task Force in order to leverage new technologies and capabilities to the rifle squad to include Integrated Visual Augmentation System and Enhanced Night Vision Goggle Binocular.</p> <p>-Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment.</p> <p>-Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment.</p> <p>-Continue to evaluate and transition technologies from ONR and other S&amp;T activities that enhance capabilities of the squad or provide a desired capability.</p> <p>-Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components.</p>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
-Continue to implement capability requirements from MERS Initial Capabilities Document (ICD) and results from Force Design. -Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as a mechanism to pursue innovation and technology.  <b>FY 2021 OCO Plans:</b> N/A  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The increase of \$0.267M in FY21 is required to support the integration of multiple new systems at the squad and platoon level. Specifically, the Integrated Visual Augmentation System, Enhanced Night Vision Goggle Binocular, MAGTF Common Handheld, Tactical Handheld Radio and other new technologies arriving simultaneously will require innovative methods for interoperability. The objective of this investment is to maintain and improve Marine and squad mobility with these enhanced capabilities.					
<b>Accomplishments/Planned Programs Subtotals</b>	2.849	2.539	2.806	0.000	2.806

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

N/A

**Remarks**

**D. Acquisition Strategy**

Non Developmental Item/Commercial off the Shelf (NDI/COTS).

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement
--	---	---

<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Years Cumulative Funding	Various	Marine Corps Systems Command : Quantico, VA	12.792	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
<b>Subtotal</b>			12.792	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Ammunition Life Cycle Management	WR	NSWC : Indian Head, MD	1.085	0.000		0.000		0.000		-		0.000	0.000	1.085	-
Ammunition Life Cycle Management	MIPR	ARDEC : Picatinny Arsenal, NJ	0.430	0.000		0.000		0.000		-		0.000	0.000	0.430	-
MERS Support	Various	Marine Corps Systems Command : Quantico, VA	1.075	0.160	Dec 2018	0.215	Oct 2019	0.300	Dec 2020	-		0.300	0.000	1.750	-
MERS Technical Support	Various	Various : Various	0.177	0.665	Apr 2019	0.000		0.000		-		0.000	0.000	0.842	-
MERS Technical Support	C/IDIQ	Various : Various	0.320	0.200	Mar 2019	0.100	Dec 2019	0.000		-		0.000	Continuing	Continuing	Continuing
MERS Technical Support - PIA	C/CPFF	MCSC : Quantico, VA	2.123	1.609	Dec 2018	2.000	Dec 2019	1.998	Jan 2021	-		1.998	0.000	7.730	Continuing
MERS Technical Support	C/CPFF	MCSC : Quantico, VA	0.693	0.080	Feb 2019	0.224	Jan 2020	0.225	Apr 2021	-		0.225	0.000	1.222	Continuing
MERS Prior Years Cumulative Funding	Various	Various : Various	4.785	0.000		0.000		0.000		-		0.000	0.000	4.785	-
<b>Subtotal</b>			10.688	2.714		2.539		2.523		-		2.523	Continuing	Continuing	N/A

**Remarks**  
 Various contracts, MIPRS, Work Requests and Supply Requisitions are awarded through the year for the various initiatives in the MERS programs. Contract method reflects where the majority of the funding is allocated. Contract award date reflects the first of multiple awards.

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Navy</b>											<b>Date:</b> February 2020				
<b>Appropriation/Budget Activity</b> 1319 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys					<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement				

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
MERS Developmental Test & Eval (Articles)	Various	MCSC : Quantico, VA	0.270	0.135	May 2019	0.000		0.283	Mar 2021	-		0.283	0.000	0.688	-
MERS Prior Years Cumulative Funding	Various	Various : Various	7.237	0.000		0.000		0.000		-		0.000	0.000	7.237	-
MEP Prior Years Cumulative Funding	C/FFP	MCSC : Various	5.346	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
<b>Subtotal</b>			12.853	0.135		0.000		0.283		-		0.283	Continuing	Continuing	N/A

**Remarks**  
 Various contracts, MIPRS, Work Requests and Supply Requisitions are awarded through the year for the various initiatives in the Marine Enhancement Program (MEP) and MERS programs, therefore a specific contract award date cannot be identified. Contract award date reflects the first of multiple awards. The increase in FY21 directly supports the test and evaluation requirements for the new systems scheduled for evaluation in FY21.

	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	36.333	2.849	2.539	2.806	-	2.806	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement
--	---	---

<b>Proj 2086</b>	<b>FY 2019</b>				<b>FY 2020</b>				<b>FY 2021</b>				<b>FY 2022</b>				<b>FY 2023</b>				<b>FY 2024</b>				<b>FY 2025</b>			
	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
	MERS Research/Int of Infantry Squad																											
	Marine Enhancement Prog Equipment																											

2021PB - 0206623M - 2086

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2086 / Soldier/Marine Enhancement

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 2086</b>				
MERS research/integration of Infantry Squad - No major milestones	1	2019	4	2025
Marine Enhancement Program Equipment - No major milestones	1	2019	4	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys			<b>Project (Number/Name)</b> 2112 / Lightweight 155mm Howitzer				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
2112: <i>Lightweight 155mm Howitzer</i>	4.969	1.731	2.000	0.000	-	0.000	2.000	0.000	0.000	0.000	0.000	10.700
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

LW155 (also known as the M777A2 howitzer) provides all weather, day/night direct, reinforcing, and general support fires to maneuver forces as well as direct support artillery. It is a joint program between the Marine Corps and Army, which is additionally supporting various foreign military purchases of the weapon system. The LW155 was first fielded by the Marine Corps in April 2005 and completed fielding in April 2013. The Army has fielded the system to its Stryker Brigades and Fires Brigades and completed fielding to its Infantry Brigades in September 2018. The LW155 is being significantly utilized in the Middle East in support of Operation Inherent Resolve. This budget item supports system updates to maintain and increase performance and lethality. M777A2 is the prominent weapon of the Marine indirect fires triad and currently the only cannon in the Service. Modernization efforts, to include extended range, will keep the M777 relevant to future concepts of operations. Current RDTE efforts are focused on extending the range of the M777A2 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (>40KM) as stated in the Joint US Army, USMC Operational Requirements Document (JORD) for Advanced Towed Cannon System. The USMC and US Army are leveraging technology being developed as part of the Extended Range Cannon Artillery (ERCA) program by the US Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (>70KM).

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Lightweight 155mm Howitzer Product Improvements	1.731	2.000	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> FY 2020 Baseline Appropriation Request: \$2M  -Complete Operational Assessment of M777 Extended Range (ER).					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2112 / Lightweight 155mm Howitzer

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Decrease of \$2.000M from FY 2020 to FY 2021, reflect the completion of the operational assessment in FY 2020.					
<b>Accomplishments/Planned Programs Subtotals</b>	1.731	2.000	0.000	0.000	0.000

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 2185: 155MM Ltwt Towed Howitzer	24.858	25.065	0.059	-	0.059	0.058	2.061	2.101	2.144	0.000	1,423.184

**Remarks**

**D. Acquisition Strategy**

Production and fielding of the LW155 has concluded and has now entered into the Sustainment Life Cycle Phase. Current RDTE,N efforts are focused on extending the range of the M777A2 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (>40KM) as stated in the Joint US Army, USMC Operational Requirements Document (JORD) for Advanced Towed Cannon System, but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule. The USMC and US Army are leveraging technology being developed as part of the Extended Range Cannon Artillery (ERCA) program by the US Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (>70KM). A successful Critical Design Review in FY19, paves the way for an operational assessment of the M777 Extended Range howitzer at the end of FY20 to support the decision point for procurement in support of a Urgent Materiel Release.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2112 / Lightweight 155mm Howitzer
--	---	---

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
LW155 Product Improvements	MIPR	ARDEC : Picatinny Arsenal, NJ	4.969	1.731	Oct 2018	0.000		0.000		-		0.000	0.000	6.700	Continuing
<b>Subtotal</b>			4.969	1.731		0.000		0.000		-		0.000	0.000	6.700	N/A

**Remarks**  
FY19 funding provided for M777 Extended Range objective hardware prototyping for system demonstration in FY20. Hardware items include enhanced structural components (pepper pots, road arms, yoke and buffer).

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Mobility and Firing Test	MIPR	Yuma Proving Ground : Yuma, AZ	0.000	0.000		2.000	Jun 2020	0.000		-		0.000	0.000	2.000	-
<b>Subtotal</b>			0.000	0.000		2.000		0.000		-		0.000	0.000	2.000	N/A

**Remarks**  
FY20 funding supports firing and mobility tests of Extended Range howitzer.

	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>		4.969	1.731	2.000	0.000	-	0.000	8.700	N/A

**Remarks**



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2112 / Lightweight 155mm Howitzer

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 2112</b>				
Hardware Prototype Integration	1	2019	4	2020
Critical Design Review	1	2019	1	2019
Operational Assessment	4	2020	1	2021
Long Lead Decision Point	1	2021	1	2021
CLE Redesign	1	2021	4	2021

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 2237 / Amphibious Vehicle Test			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
2237: Amphibious Vehicle Test	14.695	2.209	2.820	2.884	-	2.884	2.945	3.005	3.066	3.127	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

The Amphibious Vehicle Test Branch (AVTB) is a component of Marine Corps Systems Command (MCSC) and is responsible for the operation and management of an amphibious vehicle test facility, which is the Department of Defense's only certified amphibious vehicle test capability. The AVTB develops test plans; executes test and evaluation; and provides analysis and reporting of developmental and integrated test and evaluation events. They predominately support the development and performance validation of amphibious and expeditionary ground combat vehicle systems and equipment. The AVTB conducts and supports testing for the MCSC; Navy and other service PEOs and Program Management Offices; the Office of Naval Research; and HQMC PP&O and CD&I. The mission of the AVTB is to conduct test and evaluation of expeditionary combat vehicle systems and equipment in order to enable informed acquisition decisions.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Contracts and Test and Evaluation Support Assets	2.209	2.820	2.884	0.000	2.884
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b>					
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV):					
- ACV-P LRIP Reliability Qualification Testing					
- ACV-P Communication System Testing					
- ACV-P Water Mobility Testing					
- ACV-P Amphibious Shipping qualification Testing					
- ACV-P Supportability and Human Factors Testing					
- ACV-P Mission Role Variant Test Planning					
- Provide test support to MCOTEA in support of ACV-FoV IOT&E					
Assault Amphibious Family of Vehicles:					
- AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Hydraulic System Retrofit					
- AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Precision Navigation System					
- AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Communications Systems Upgrade					
- AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Composite Track feasibility/qualification					
- AAVR7 Engineering Change Proposal Qualification Testing Upgrade - Crane Retrofit qualification testing					
Squad Common Optic:					
- Support product comparison and down-select testing					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2237 / Amphibious Vehicle Test

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>Other Projects:</p> <ul style="list-style-type: none"> <li>- Autonomous AAV: Test planning and execution support</li> <li>- Remote AAV: Test planning and execution support</li> </ul> <p>Provide Support to projects and programs from MCSC, PEO-LS, Navy PEOs, SOCOM PEOs, ONR, MCWL and other agencies as requested/required.</p> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Continuation of ACV-P Qualification and follow on testing as required - System upgrades and platform modification.</li> <li>- Continuation of AAVP7/C7/R&amp; ECP qualification testing as required - System upgrades and platform modification.</li> <li>- ACV-30/C/R Qualification Testing) - Water Mobility, Communication System, Reliability Qualification Testing.</li> <li>- Armored Reconnaissance Vehicle - Water Mobility, Communication System, Reliability Qualification Testing.</li> <li>- Joint Light Tactical Vehicle - System upgrades and platform modification.</li> <li>- Ultra Light Task Vehicle - Land Mobility testing.</li> <li>- Unmanned Swarming Amphibious Assault Craft - Water Mobility.</li> <li>- Amphibious Surf Capability Vehicle - Water Mobility and Reliability Qualification Testing.</li> <li>- MTVR and LVS SLEP - System upgrades and platform modification.</li> </ul> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.064M from FY 2020 to FY 2021 is due to AVTBs increased utilization, growth and modernization efforts.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	2.209	2.820	2.884	0.000	2.884

<p><b>C. Other Program Funding Summary (\$ in Millions)</b> N/A</p> <p><b>Remarks</b></p> <p><b>D. Acquisition Strategy</b> The Amphibious Vehicle Test Branch supports the Department of Defense's amphibious and expeditionary combat vehicle systems and equipment testing through all stages of the acquisition life cycle. It is agile enough to conduct testing ranging from science and technology / research and development demonstrations (in order to</p>
--

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
1319 / 7	PE 0206623M / MC Ground Cmbt Spt Arms Sys	2237 / Amphibious Vehicle Test

determine program requirements and technological maturity) through verification and validation of post fielding engineering change proposals. AVTB sustainment and test support is conducted through a mix of military subject matter experts, federal civil service, support contracts, and local and supported service military personnel and equipment support requests.

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 7				PE 0206623M / MC Ground Cmbt Spt Arms Sys				2237 / Amphibious Vehicle Test							
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	2.430	0.000		0.000		0.000		-		0.000	0.000	2.430	-
<b>Subtotal</b>			2.430	0.000		0.000		0.000		-		0.000	0.000	2.430	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Facility/Test Infrastructure	C/FFP	NAVFAC, SW : Camp Pendleton, CA	0.580	0.237	Oct 2018	0.241	Oct 2019	0.246	Oct 2020	-		0.246	Continuing	Continuing	Continuing
Test Assets/Boat Operators	C/FFP	MCTSSA Camp Pend : Camp Pendleton, CA	1.307	0.460	Apr 2019	0.684	Apr 2020	0.705	Apr 2021	-		0.705	0.000	3.156	-
Test Assets/AAV Operators	C/FFP	MCTSSA Camp Pend : Camp Pendleton CA	1.572	0.445	Apr 2019	0.700	Apr 2020	0.721	Apr 2021	-		0.721	0.000	3.438	-
Vehicle Support	WR	RCO Camp Pendleton : Camp Pendleton, CA	0.295	0.086	Oct 2018	0.065	Oct 2019	0.067	Oct 2020	-		0.067	Continuing	Continuing	Continuing
Hazmat POL PPE	Various	MCTSSA Camp Pendleton : Camp Pendleton, CA	0.413	0.065	Oct 2018	0.014	Oct 2019	0.014	Oct 2020	-		0.014	0.000	0.506	-
Crane Test Support	C/IDIQ	MCTSSA Camp Pendleton : Camp Pendleton, CA	0.190	0.070	Oct 2019	0.005	Oct 2019	0.005	Oct 2020	-		0.005	0.000	0.270	-
Test article fuel (J8)	Various	AVTB : Camp Pendleton, CA	0.831	0.070	Oct 2018	0.075	Oct 2019	0.077	Oct 2020	-		0.077	0.000	1.053	-
EMS Support	C/CPFF	MCTSSA : Camp Pendleton, CA	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
Test support Fuel (Diesel)	Various	AVTB : Camp Pendleton, CA	0.740	0.010	Oct 2018	0.075	Oct 2019	0.077	Oct 2020	-		0.077	0.000	0.902	-

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
1319 / 7				PE 0206623M / MC Ground Cmbt Spt Arms Sys					2237 / Amphibious Vehicle Test						
<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Dive Team Support	C/CPFF	MCTSSA : Camp Pendleton, CA	0.302	0.000		0.000		0.000		-		0.000	0.000	0.302	-
<b>Subtotal</b>			6.380	1.443		1.859		1.912		-		1.912	Continuing	Continuing	N/A
<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Article Ops & Main	Various	AVTB : Camp Pendleton, CA	1.619	0.080	Oct 2018	0.115	Oct 2019	0.100	Oct 2020	-		0.100	Continuing	Continuing	Continuing
Test Equipment	WR	AVTB : MCTSSA Camp Pendleton	0.566	0.015	Oct 2018	0.065	Oct 2019	0.067	Oct 2020	-		0.067	0.000	0.713	-
<b>Subtotal</b>			2.185	0.095		0.180		0.167		-		0.167	Continuing	Continuing	N/A
<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Data Management	C/FFP	MCTSSA Camp Pendleton : Camp Pendleton	2.198	0.300	Nov 2018	0.320	Nov 2019	0.330	Nov 2020	-		0.330	Continuing	Continuing	Continuing
Lab and Tech Writer Supt.	C/FFP	MCTSSA Camp Pendleton : Camp Pendleton	1.502	0.371	Nov 2018	0.461	Nov 2019	0.475	Nov 2020	-		0.475	0.000	2.809	-
<b>Subtotal</b>			3.700	0.671		0.781		0.805		-		0.805	Continuing	Continuing	N/A
<b>Project Cost Totals</b>			14.695	2.209		2.820		2.884		-		2.884	Continuing	Continuing	N/A
<b>Remarks</b>															

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

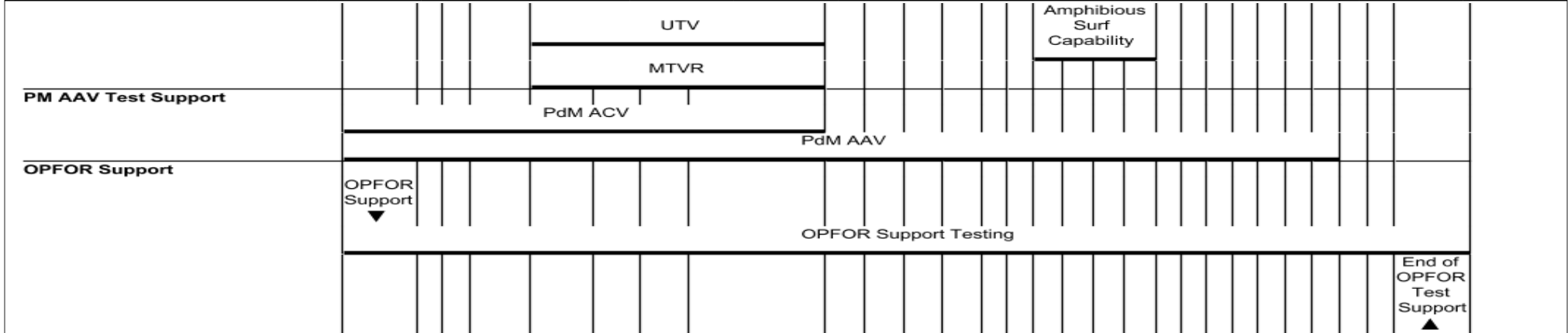
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2237 / Amphibious Vehicle Test
--	---	--

Proj 2237	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
<b>Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV)</b>																												
	ACV-P LRIP																											
	ACV-P Comm																											
	ACV-P (WM)																											
	ACV-P Shipping																											
	ACV-P HF																											
ACV-P Mission Role      ACV-FoV IOT&E																												
<b>Assault Amphibian Family of Vehicles (AAVP7/C7/R7)</b>																												
	AAVP7/C7/R7 HSR																											
	AAVP7/C7/R7 PNS																											
	AAVP7/C7/R7 CSU																											
	AAVP7/C7/R7 Track																											
	AAVP7/C7/R7 Crane																											
ACV-30/C/R																												
<b>Squad Common Optic</b>	Squad Optics																											
<b>Office of Naval Research (ONR) Projects</b>	Autonomous AAV																											
	Remote AAV																											
	Armored Reconnaissance																											
<b>Other USMC</b>	Unmanned Swarming																											
	JLTV																											

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2237 / Amphibious Vehicle Test
--	---	--



2021PB - 0206623M - 2237

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2237 / Amphibious Vehicle Test

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 2237</b>				
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV): ACV-P LRIP Reliability Qualification Testing	3	2019	1	2020
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV): ACV-P Communication System Testing	3	2019	1	2020
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV): ACV-P Water Mobility (WM) Testing	3	2019	1	2020
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV): ACV-P Amphibious Shipping qualification Testing	3	2019	1	2020
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV): ACV-P Supportability and Human Factors (HF) Testing	3	2019	1	2020
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV): ACV-P Mission Role Variant Test Planning	3	2019	1	2020
Amphibious Combat Vehicle (ACV) Family of Vehicles (FoV): Provide test support to MCOTEA in support of ACV-FoV IOT&E	2	2020	3	2020
Assault Amphibious Family of Vehicles (AAVP7/C7/R7): AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Hydraulic System Retrofit (HSR)	3	2020	4	2020
Assault Amphibious Family of Vehicles (AAVP7/C7/R7): AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Precision Navigation System (PNS)	3	2020	4	2020
Assault Amphibious Family of Vehicles (AAVP7/C7/R7): AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Communications Systems Upgrade (CSU)	1	2020	4	2020
Assault Amphibious Family of Vehicles (AAVP7/C7/R7): AAVP7/C7/R7 Engineering Change Proposal Qualification Testing - Composite Track feasibility/qualification	4	2020	4	2020
Assault Amphibious Family of Vehicles (AAVP7/C7/R7): AAVR7 Engineering Change Proposal Qualification Testing Upgrade - Crane Retrofit qualification testing	4	2020	4	2020

**UNCLASSIFIED**

**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2237 / Amphibious Vehicle Test
--	---	--

<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
Assault Amphibious Family of Vehicles (AAVP7/C7/R7): ACV-30/C/R Qualification Testing - Water Mobility, Communication System, Reliability Qualification Testing.	1	2020	4	2020
Squad Common Optic: Support product comparison and down-select testing	4	2019	4	2021
Office of Naval Research (ONR) Projects: Autonomous AAV: Test planning and execution support	4	2019	1	2020
Office of Naval Research (ONR) Projects: Remote AAV: Test planning and execution support	4	2019	1	2020
Office of Naval Research (ONR) Projects: Armored Reconnaissance Vehicle - Water Mobility, Communication System, Reliability Qualification Testing.	1	2021	4	2021
Office of Naval Research (ONR) Projects: Unmanned Swarming Amphibious Assault Craft - Water Mobility.	1	2021	4	2021
Other USMC: Joint Light Tactical Vehicle - System upgrades and platform modification.	1	2020	4	2020
Other USMC: Ultra Light Task Vehicle - Land Mobility testing.	1	2020	4	2020
Other USMC: Amphibious Surf Capability Vehicle - Water Mobility and Reliability Qualification Testing.	3	2022	2	2023
Other USMC: MTRV and LVS SLEP - System upgrades and platform modification.	1	2020	4	2020
PM AAV Test Support: Continuation of ACV-P Qualification and follow on testing as required) - System upgrades and platform modification.	1	2019	4	2020
PM AAV Test Support: Continuation of AAVP7/C7/R& ECP qualification testing as required) - System upgrades and platform modification.	1	2019	1	2025
OPFOR Support: OPFOR Support	1	2019	1	2019
OPFOR Support: OPFOR Support Testing	1	2019	4	2025
OPFOR Support: End of OPFOR Test Support	4	2025	4	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
2315: Training Devices/Simulators	154.930	15.442	11.561	17.486	-	17.486	26.980	22.117	19.719	20.113	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

(U) Training simulators supported by this program element include Combined Arms Command & Control Training Upgrade System (CACCTUS), Deployable Virtual Training Environment (DVTE), Force on Force Training Systems (FoFTS), Marine Air-Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements, Ranges and Training Area Management (RTAM) [Formerly Range Modernization/Transformation], Supporting Arms Virtual Trainer (SAVT), Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)], Tactical Decision Kits, Training Support and Training Simulation Support. These training systems provide tactical weapons and decision-making skill training from entry level through MAGTF staff level. Systems will be interoperable and will allow for mission planning, mission rehearsal and concept evaluation in a valid synthetic environment with objective and timely feedback. Through live, virtual and constructive simulation, the Marine Corps will have the means to train jointly, educate, develop doctrine and tactics, formulate and assess operational plans, assess warfighting situations, and define operational requirements.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Combined Arms Command and Control Trainer Upgrade System (CACCTUS)	2.711	1.504	5.848	0.000	5.848
<b>Articles:</b>	-	-	-	-	-
<p><b>Description:</b> CACCTUS is a combined arms staff training system that when fully fielded will enable comprehensive Marine Corps staff, unit, and team training both at home station Combined Arms Staff Training (CAST) facilities and through Distributed training involving CAST facilities across the Marine Corps. CACCTUS is an upgrade to the USMC's CAST that provides fire support training for the Marine Air-Ground Task Force (MAGTF) elements up to and including Marine Expeditionary Brigade (MEB) level. Using the system components and simulation capabilities, two dimensional (2D) and three dimensional (3D) visuals, interfaced Command, Control, Communications, Computers and Intelligence (C4I), synthetic terrain, and an After Action Review (AAR), the concept of operations for the CACCTUS system is to immerse the trainees in a realistic, scenario-driven environment to enable commands and their battle staffs to train or rehearse combined arms tactics, techniques and procedures for decision-making processes.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue integration of 3D viewer software.</li> <li>- Continue additional training system interoperability to include additional C4I devices.</li> </ul>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys		<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
<ul style="list-style-type: none"> <li>- Continue development of After Action Review (AAR) functionality.</li> <li>- Continue development to retain currency of training and readiness tasks and tactics, techniques and procedures with combined arms efforts.</li> <li>- Continue development of new architecture to support maturing hardware platforms.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue integration of 3D viewer software.</li> <li>- Continue additional training system interoperability to include additional C4I devices and Office of Naval Research (ONR) transition projects.</li> <li>- Continue development of After Action Review (AAR) functionality.</li> <li>- Continue development to retain currency of training and readiness tasks and tactics, techniques and procedures with combined arms efforts.</li> <li>- Continue development of new architecture to support maturing hardware platforms.</li> </ul> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The \$4.344M increase supports emerging requirements for system interoperability development/test and associated support labor.</p>					
<b>Title:</b> Deployable Virtual Training Environment (DVTE)					
<b>Articles:</b>					
<b>Description:</b> DVTE is a laptop Personal Computer (PC) based simulation system capable of emulating organic and supporting Infantry Battalion weapons systems and training scenarios to facilitate training and readiness based training. Its portable configuration allows Marines to train in areas where there are few options for training in garrison, aboard ship, at remote reserve locations, and deployed. DVTE training includes language and culture training, platoon and squad level tactics, employment of supporting arms, and various Recognition of Combatants (ROC) packages. DVTE is part of a Commander's "training toolkit" contributing to the building block approach to standards based training focusing on achieving an improved level of combat readiness.					
<b>FY 2020 Plans:</b>					
<ul style="list-style-type: none"> <li>- Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan.</li> </ul>					
	2.758	0.804	2.327	0.000	2.327
	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020				
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<ul style="list-style-type: none"> <li>- Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability and Combined Arms Planning Enhancements (CAPE) to replace/decrease actual live training events.</li> <li>- Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release.</li> <li>- Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release.</li> <li>- Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release.</li> <li>- Complete enhancements to Combined Arms Planning functionality that will improve the DVTE system ability to replace live events.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan.</li> <li>- Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability and Combined Arms Planning Enhancements (CAPE) to replace/decrease actual live training events.</li> <li>- Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release.</li> <li>- Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release.</li> <li>- Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release.</li> </ul> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The \$1.523M increase supports emerging requirements for system interoperability development/test and associated support labor.</p>						
<b>Title:</b> Force on Force Training Systems (FoFTS)		2.850	1.635	1.137	0.000	1.137

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Articles:</b>	-	-	-	-	-
<p><b>Description:</b> FORCE ON FORCE TRAINING SYSTEMS (FoFTS) provides realistic, non-live fire capabilities to perform force-on-force training and supports realistic, live fire force-on-target training. The program develops, fields and supports a suite of tactical engagement capabilities that enhance MAGTF training around the world and across the range of military operations. The program includes tactical training systems such as the Instrumented-Tactical Engagement Simulation System (I-TESS), Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) and advanced, instrumented, laser-based tactical engagement systems such as the that provide realistic weapons effects, position locating, instrumentation system and enhanced After Action Review (AAR) capability to support Live-Virtual-Constructive (LVC) events in the MAGTF Training Program curriculum. The Special Effects Small Arms Marking System (SESAMS) project provides weapons modification kits to fire low-velocity marking ammunition while precluding the weapon from firing live ammunition.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) development for the integration of the LAV-25, LAV-AT and M1A1 simulators.</li> <li>- Continue MFST JTAC task enhancements.</li> <li>- Continue development of the close combat instrumentation for the I-TESS III training system with a limited user evolution of new technologies to meet the urban training requirements. This will support the integration of the Mobile Fire Support Trainer (MFST) into the I-TESS III environment developing technology to allow for freedom of movement throughout the training area. These three areas of development will support the future objectives for I-TESS III by expanding the training radius, allowing for close combat effective training and augmented reality throughout the training area.</li> <li>- Continue development of a Long Term Evolution (LTE) wireless data communications network to support the Force on Force Next data backbone.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) development for the integration of the LAV-25, LAV-AT and M1A1 simulators.</li> <li>- Continue development of a Long Term Evolution (LTE) wireless data communications network to support the Force on Force Next data backbone.</li> <li>- Initiate research and development of potential laser less based Force on Force Training Systems (FoFTS).</li> </ul>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
- Travel and reimbursable/contract support personnel costs to support Operational System Development. <b>FY 2021 OCO Plans:</b> N/A <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The \$0.498M decrease from FY20 and FY21 reflects the decreased FoFTS prototype demonstration requirement.					
<b>Title:</b> Marine Air-Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements <b>Articles:</b> <b>Description:</b> The MAGTF Tactical Warfare Simulation (MTWS) is the Marine Corps' only constructive, aggregate-level simulation system used to support the training of Marine commanders and their battle staffs in MAGTF war-fighting principles/concepts and associated command and control procedures. Using complex computer-simulated behavior models, MTWS provides an interactive, decision-based, real-time, war game representing the six war-fighting functional areas of fires, command and control, force protection, logistics, maneuver, and intelligence. It's modeling breadth and flexibility enables users to represent and exercise a wide variety of combat scenarios to prepare leaders to face the military challenges of today's world. MTWS is designed to support the training of commanders and their staffs in exercises involving live and simulated land, air, and naval forces at all operational command levels. The system supports all levels of command throughout the Marine Expeditionary Force (MEF) and Joint Task Force (JTF). MTWS can be used as a multi-sided war game, including red, blue, civilian, and non-aligned sides. The system can also be used to validate specific operational plans against a variety of enemy and environmental situations. Thus command personnel may examine alternative tactical solutions on a "what if" basis. <b>FY 2020 Plans:</b> - Continue JLVC Federation annual minor release. - Continue to develop new software capabilities to meet changing operational environment. - Continue to develop Joint Live, Virtual and Constructive (JLVC) Federation capabilities. - Continue effort to re-engineer the MTWS software baseline. <b>FY 2021 Base Plans:</b> - Continue JLVC Federation annual minor release. - Continue to develop new software capabilities to meet changing operational environment. - Continue to develop Joint Live, Virtual and Constructive (JLVC) Federation capabilities.	2.642	1.156	3.275	0.000	3.275
	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
- Continue effort to re-engineer the MTWS software baseline. <b>FY 2021 OCO Plans:</b> N/A <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The \$2.119M increase supports emerging MTWS reengineering requirements, system interoperability development/test and associated support labor.					
<b>Title:</b> Ranges and Training Area Management (RTAM) <b>Description:</b> Ranges and Training Area Management (RTAM) developments are associated with modernizing live training ranges at major USMC bases and stations. This development effort enhances After Action Review (AAR) with ground truth feedback, realistic representation of Opposing Forces (OPFOR), and will upgrade the range and exercise control capabilities. RTAM integrates Live, Virtual, and Constructive training technologies, thereby, enhancing fielded live-fire, force-on-target, and force-on-force training capabilities. <b>FY 2020 Plans:</b> - Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems. - Continue enhancements of Targetry Range Automated Control and Recording (TRACR) software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon). - Continue enhancements of the Tactical Video Capture System (TVCS) Mobile (RISCon). - Initiate enhancements of TRACR and RISCon-T software for Friend-and-Foe target control and scenario development integration with Location of Miss and Hit (LOMAH) capabilities. - Initiate development of Live-fire, shoot back interactive target capabilities. <b>FY 2021 Base Plans:</b> - Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems. - Continue enhancements of Targetry Range Automated Control and Recording (TRACR) software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon). - Continue enhancements of the Tactical Video Capture System (TVCS) Mobile (RISCon).	0.075	4.119	2.861	0.000	2.861
<b>Articles:</b>	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>- Continue enhancements of TRACR and RISCon-T software for Friend-and-Foe target control and scenario development integration with Location of Miss and Hit (LOMAH) capabilities (RISCon).</p> <p>- Continue development of Live-fire, shoot back interactive target capabilities (RISCon).</p> <p>- Initiate development of Known Distance Automated Scoring system enhancements.</p> <p>- Initiate development of Trackless Mobile Infantry/Armor Targets inclusive of RISCon integration, spectrum, radio frequency and autonomous control.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The \$1.258M decrease is principally reflected in the reduction of software upgrade requirements in RISCon.</p>					
<p><b>Title:</b> Supporting Arms Virtual Trainer (SAVT)</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> SAVT will advance the training capability, operational readiness, and tactical proficiency of USMC Joint Terminal Attack Controllers (JTAC), Forward Observes (FOs), and Forward Air Controllers (FACs). The personnel will use training scenarios that require the placement of simulated tactical ordnance on selected targets using Joint Close Air Support (JCAS) procedures and observed fire procedures for Naval Surface Fire Support (NSFS), artillery and mortar fire to perform destruction, neutralization, suppression, illumination/ coordinated illumination, interdiction and harassment fire missions.</p> <p><b>FY 2020 Plans:</b> N/A</p> <p><b>FY 2021 Base Plans:</b> N/A</p> <p><b>FY 2021 OCO Plans:</b> N/A</p>	3.870	0.000	0.000	0.000	0.000
	-	-	-	-	-
<p><b>Title:</b> Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)]</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> The Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)] is an integrating construct or "toolkit" of Live, Virtual and Constructive (LVC) training capabilities used to significantly improve infantry squad operational readiness and squad leader tactical decision-making skills.</p>	0.536	1.995	2.038	0.000	2.038
	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>The collection of LVC training capabilities within SITE will enhance opportunities for squad collective training to increase tactical proficiency, confidence, and readiness for real world operations. SITE will enhance skill transfer and assessment by enabling squads to finish, test, and remediate training in preparation for a capstone exercise such as pre-deployment training.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete design and development of an AK-47 and RPK Blank Fire Only (BFO) system solution that will remain a Government owned product with complete access and full rights to the detailed, 3D parametric technical data package for use in future acquisition of additional AK-47 BFO weapon quantities.</li> <li>- Continue Mobile Immersive Training Environment development to bring immersive training capabilities to units ISO peer-near-peer training.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete validation and testing of the RPK Blank Fire Only (BFO) system solution that will meet the requirements as described within the D-UNS and subsequent Letter of Clarification (LOC).</li> <li>- Continue Mobile Immersive Training Environment development to bring immersive training capabilities to units in support of peer-near-peer training.</li> </ul> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The \$0.043M increase from FY20 and FY21 reflects RPK BFO Validation &amp; Testing to be completed in FY21.</p>					
<p><b>Title:</b> Training Simulation Support</p> <p align="right"><b>Articles:</b></p>	0.000	0.348	0.000	0.000	0.000
<p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Integration of constituent programs into the Live, Virtual, Constructive - Training Environment.</li> </ul> <p><b>FY 2021 Base Plans:</b> N/A</p> <p><b>FY 2021 OCO Plans:</b></p>	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The \$0.348M decrease is due to no planned TSS efforts in FY21.					
<b>Accomplishments/Planned Programs Subtotals</b>	15.442	11.561	17.486	0.000	17.486

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PMC/6532-01: <i>Training Devices, CACCTUS</i>	1.000	3.715	3.573	-	3.573	5.349	4.799	10.598	10.810	Continuing	Continuing
• PMC/6532-02: <i>Training Devices, DVTE</i>	3.733	1.437	4.479	-	4.479	4.294	4.241	4.326	4.413	Continuing	Continuing
• PMC/6532-03: <i>Training Devices, FoFTS</i>	25.200	53.749	37.203	-	37.203	73.138	18.931	23.264	23.737	Continuing	Continuing
• PMC/6532-04: <i>Training Devices, MTWS</i>	0.885	0.619	0.867	-	0.867	0.853	0.811	0.827	0.844	Continuing	Continuing
• PMC/6532-05: <i>Training Devices, RTAM</i>	23.026	28.018	28.518	-	28.518	30.965	31.632	33.738	34.413	Continuing	Continuing
• PMC/6532-06: <i>Training Devices, SAVT</i>	0.409	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/6532-07: <i>Training Devices, ITRS</i>	8.446	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/6532-08: <i>Training Devices, TSS</i>	0.053	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.053
• PMC/4630-04: <i>Common Computer Resources, MTWS</i>	0.000	0.000	0.000	-	0.000	0.000	0.000	1.191	1.216	Continuing	Continuing

**Remarks**  
CACCTUS FY24 PMC includes \$6.282M and FY25 includes \$6.408M for the Guam Initiative.  
FoFTS FY24 PMC includes \$13.851M and FY25 includes \$14.128M for the Guam Initiative.  
MTWS FY24 PMC includes \$1.191M and FY25 includes \$1.216M for the Guam Initiative.  
RTAM FY20 PMC includes \$13.348M, FY21 includes \$14.723M, FY23 includes \$2.045M, FY24 includes \$7.450M and FY25 includes \$7.596M for Guam Initiative.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2315 / Training Devices/Simulators

**D. Acquisition Strategy**

(U) CACCTUS - Exercise task orders via existing Riptide IDIQ contract through FY20. FY21 new Software (SW) development contract will be awarded for SW development and interoperability efforts. Reimbursable work request(s) for Navy Eng labor and contractor support.

(U) DVTE - Exercise task orders off of IDIQ contract for Virtual Battleship Space (VBS) Software (SW) Development. Reimbursable work request(s) for Navy labor and contractor support.

(U) MTWS - Exercise task orders for Software Development and Re-engineering efforts via IDIQ contract and MIPRs to Hill AFB. Reimbursable work request(s) for Navy labor and contractor support.

(U) RTAM - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract.

(U) SAVT - Funding for Product Development will be awarded via FFP contract to Riptide Software.

(U) Immersive Training Range Support (formerly SITE) - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract. AK47 and RPK Blank Fire Only (BFO) weapon development by NSWC Crane. AK47 and RPK BFO weapon validation and testing by Corona.

(U) FoFTS - MIPR to Army-PEO STRI for award on existing Consolidated Product-line Management contract; Establishing an Other Transactional Agreement (OTA) for Prototyping and follow-on Production OT through a phased approach. Initial phase is request for white papers, followed by capability demonstration with down-select to prototype demonstration. The prototype demonstration leads to a production OT for fielding the capability.

(U) Training Simulation Support - Competitive contract award for integration of Marine Air-Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) system into the Joint Live, Virtual, Constructive (JLVC) federation.

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2315 / Training Devices/Simulators							
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CACCTUS - SW Dev	C/IDIQ	Riptide Software, Inc : Orlando, FL	7.104	2.611	May 2019	1.504	Jun 2020	0.000		-		0.000	0.000	11.219	-
CACCTUS - ONR Transition Projects	TBD	TBD : TBD	0.000	0.000		0.000		1.250	May 2021	-		1.250	0.000	1.250	-
CACCTUS - System Interoperability Development	TBD	TBD : TBD	0.000	0.000		0.000		4.038	Mar 2021	-		4.038	0.000	4.038	-
DVTE - SW Dev - VBS	SS/IDIQ	Bohemia Interactive : Orlando, FL	16.097	1.522	Jul 2019	0.804	Apr 2020	1.877	Apr 2021	-		1.877	0.000	20.300	-
DVTE - SW Dev - JTAC	WR	NAWC-TSD : Orlando, FL	0.000	0.537	Nov 2019	0.000		0.000		-		0.000	0.000	0.537	-
FoFTS Software Development	MIPR	PEO STRI/TRADE : Orlando, FL	1.836	1.090	Dec 2019	1.000	Jul 2020	1.117	Jun 2021	-		1.117	0.000	5.043	-
FoFTS OTA Capability Demonstration	C/FFP	Multiple : Camp LeJeune, NC	0.000	0.260	Oct 2019	0.000		0.000		-		0.000	0.000	0.260	-
FoFTS Prototype Integration	TBD	TBD : TBD	0.000	1.500	Jun 2020	0.635	Jan 2020	0.000		-		0.000	0.000	2.135	-
MTWS - Reengineering	MIPR	Hill AFB : Utah	5.221	0.000		1.156	Feb 2020	2.000	Jun 2021	-		2.000	0.000	8.377	-
MTWS - SW Dev 1	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	8.484	1.106	May 2019	0.000		0.925	Jan 2021	-		0.925	0.000	10.515	-
MTWS - SW Dev 2	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	0.000	1.002	Dec 2019	0.000		0.000		-		0.000	0.000	1.002	-
RTAM RISCon Development	MIPR	PEOSTRI/TRADE : Orlando, FL	9.416	0.075	Sep 2019	4.104	Sep 2020	2.831	Jun 2021	-		2.831	Continuing	Continuing	Continuing
SAVT - Tech Insertion	C/FFP	Riptide Software, Inc. : Orlando, FL	2.115	3.731	Sep 2019	0.000		0.000		-		0.000	0.000	5.846	-
ITRS (SITE) - CPM	MIPR	PEOSTRI/TRADE : Orlando, FL	8.261	0.000		1.450	Jul 2020	2.028	Jun 2021	-		2.028	Continuing	Continuing	Continuing
ITRS (SITE) - AK47 BFO Development	PO	NSWC Crane : Crane, IN	0.000	0.514	Jun 2019	0.000		0.000		-		0.000	0.000	0.514	-
Training Simulation Support	C/IDIQ	TBD : TBD	0.000	0.000		0.348	Jun 2020	0.000		-		0.000	0.000	0.348	-

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
1319 / 7				PE 0206623M / MC Ground Cmbt Spt Arms Sys				2315 / Training Devices/Simulators								
<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	80.473	0.000		0.000		0.000		-		0.000	0.000	80.473	-	
<b>Subtotal</b>			139.007	13.948		11.001		16.066		-		16.066	Continuing	Continuing	N/A	
<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
MTWS/LVCTE Business Case Analysis (BCA)	C/CPFF	Kalman and Company Inc : Virginia Beach, VA	0.000	0.534	May 2019	0.000		0.000		-		0.000	0.000	0.534	-	
DVTE/LVCTE ROI Study	C/CPFF	John Hopkins University : Laurel, MD	0.000	0.535	Jul 2019	0.000		0.000		-		0.000	0.000	0.535	-	
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	15.797	0.000		0.000		0.000		-		0.000	0.000	15.797	-	
<b>Subtotal</b>			15.797	1.069		0.000		0.000		-		0.000	0.000	16.866	N/A	
<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
ITRS (SITE) - RPK BFO Validation & Testing	PO	NSWC Corona : Corona, CA	0.000	0.000		0.530	Jan 2020	0.000		-		0.000	0.000	0.530	-	
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	-	
<b>Subtotal</b>			0.002	0.000		0.530		0.000		-		0.000	0.000	0.532	N/A	

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CACCTUS - Program Support	Various	Various : Various	0.000	0.000		0.000		0.400	Oct 2020	-		0.400	0.000	0.400	-
CACCTUS - NVIG Support	MIPR	CERDEC : Ft. Belvoir, VA	0.000	0.100	Feb 2019	0.000		0.100	Dec 2020	-		0.100	0.000	0.200	-
CACCTUS - Travel	Various	DTS : Various	0.000	0.000		0.000		0.060	Oct 2020	-		0.060	0.000	0.060	-
DVTE - Program Support	Various	Various : Various	0.000	0.164	Jun 2019	0.000		0.400	Oct 2020	-		0.400	0.000	0.564	-
DVTE - Travel	Various	DTS : Various	0.000	0.000		0.000		0.050	Oct 2020	-		0.050	0.000	0.050	-
MTWS - Program Support	Various	Various : Various	0.000	0.000		0.000		0.300	Oct 2020	-		0.300	0.000	0.300	-
MTWS - Travel	Various	DTS : Various	0.000	0.000		0.000		0.050	Oct 2020	-		0.050	0.000	0.050	-
SAVT - Program Support	C/FFP	Kapili Services LLC : Orlando, FL	0.000	0.139	Jun 2019	0.000		0.000		-		0.000	0.000	0.139	-
ITRS (SITE) - Travel	Various	DTS : Various	0.124	0.022	Sep 2019	0.015	Sep 2020	0.010	Sep 2021	-		0.010	0.000	0.171	-
FoFTS - Travel	Various	DTS : Various	0.000	0.000		0.000		0.020	Sep 2021	-		0.020	0.000	0.020	-
RTAM - Travel	Various	DTS : Various	0.000	0.000		0.015	Jul 2020	0.030	Sep 2021	-		0.030	0.000	0.045	-
<b>Subtotal</b>			0.124	0.425		0.030		1.420		-		1.420	0.000	1.999	N/A

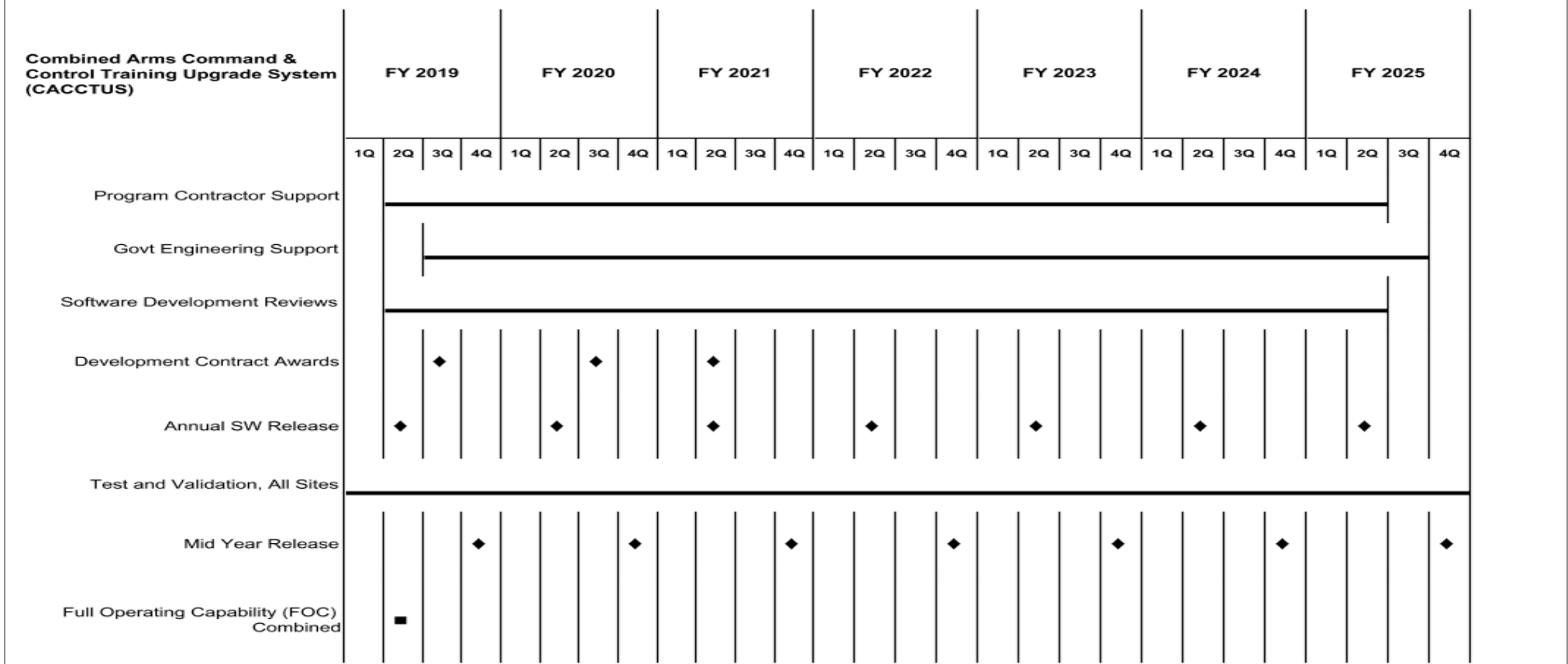
	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	154.930	15.442	11.561	17.486	-	17.486	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--



2021PB - 0206623M - 2315

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

Deployable Virtual Training Environment (DVTE)	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Software Development - Contract Award				◆			◆				◆				◆				◆				◆				◆	
Software Development Version Release - VBS				◆				◆				◆				◆				◆				◆				◆
DVTE - TACTICAL DECISION KITS (TDK)			▲																									

2021PB - 0206623M - 2315

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

<b>Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS)</b>  Program Contractor Support  MTWS IPT/CCB  Contract Award	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	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				
Program Contractor Support																																
MTWS IPT/CCB				◆				◆			◆				◆					◆								◆				
Contract Award			◆		◆	◆			◆	◆					◆	◆					◆	◆							◆			

2021PB - 0206623M - 2315

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

Ranges and Training Area Management	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
CPM RISCon Development				◆				◆				◆				◆				◆				◆				◆

2021PB - 0206623M - 2315

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

Supporting Arms Virtual Trainer (SAVT)	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
SW Development and Integration				◆																								

2021PB - 0206623M - 2315

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

<b>Immersive Training Range Support (Formally SITE)</b>	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Blank Fire Only (BFO) RPK Weapon Development					██████████																							
Blank Fire Only (BFO) RPK Weapon Testing									██████████																			
Blank Fire Only (BFO) AK47 Weapon Development																												
Blank Fire Only (BFO) AK47 Weapon Testing																												
CPM MITE																												

2021PB - 0206623M - 2315

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

Force on Force Training Systems (FoFTS)	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
CPM Contract Award (SW PDSS)				◆				◆			◆				◆				◆				◆					◆
OTA Capabilities Demo			◆		◆	◆																						

2021PB - 0206623M - 2315

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

Training Simulation Support	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	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				
LVC-TE Integration (MTWS)							◆																									

2021PB - 0206623M - 2315

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Combined Arms Command &amp; Control Training Upgrade System (CACCTUS)</b>				
Program Contractor Support: Program Contractor Support	2	2019	2	2025
Govt Engineering Support: Govt Engineering Support	3	2019	3	2025
Software Development Reviews: Software Development Reviews	2	2019	2	2025
Development Contract Awards: FY19 Contract Award	3	2019	3	2019
Development Contract Awards: FY20 Contract Award	3	2020	3	2020
Development Contract Awards: FY21Contract Award	2	2021	2	2021
Annual SW Release: Annual SW Release 2019	2	2019	2	2019
Annual SW Release: Annual SW Release 2020	2	2020	2	2020
Annual SW Release: Annual SW Release 2021	2	2021	2	2021
Annual SW Release: Annual SW Release 2022	2	2022	2	2022
Annual SW Release: Annual SW Release 2023	2	2023	2	2023
Annual SW Release: Annual SW Release 2024	2	2024	2	2024
Annual SW Release: Annual SW Release 2025	2	2025	2	2025
Test and Validation, All Sites: Test and Validation 1, All Sites	1	2019	4	2025
Mid Year Release: Mid Year Release 2019	4	2019	4	2019
Mid Year Release: Mid Year Release 2020	4	2020	4	2020
Mid Year Release: Mid Year Release 2021	4	2021	4	2021
Mid Year Release: Mid Year Release 2022	4	2022	4	2022
Mid Year Release: Mid Year Release 2023	4	2023	4	2023
Mid Year Release: Mid Year Release 2024	4	2024	4	2024
Mid Year Release: Mid Year Release 2025	4	2025	4	2025

**UNCLASSIFIED**

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy			Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
1319 / 7	PE 0206623M / MC Ground Cmbt Spt Arms Sys	2315 / Training Devices/Simulators		
Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Full Operating Capability (FOC) Combined: Full Operating Capability (FOC)/Full Development (FD)	2	2019	2	2019
<b><i>Deployable Virtual Training Environment (DVTE)</i></b>				
Software Development - Contract Award: Software Development - Contract Award 2019	4	2019	4	2019
Software Development - Contract Award: Software Development - Contract Award 2020	3	2020	3	2020
Software Development - Contract Award: Software Development - Contract Award 2021	3	2021	3	2021
Software Development - Contract Award: Software Development - Contract Award 2022	2	2022	2	2022
Software Development - Contract Award: Software Development - Contract Award 2023	2	2023	2	2023
Software Development - Contract Award: Software Development - Contract Award 2024	2	2024	2	2024
Software Development - Contract Award: Software Development - Contract Award 2025	2	2025	2	2025
Software Development Version Release - VBS: Software Development Version Release - VBS (2019)	4	2019	4	2019
Software Development Version Release - VBS: Software Development Version Release - VBS (2020)	4	2020	4	2020
Software Development Version Release - VBS: Software Development Version Release - VBS (2021)	4	2021	4	2021
Software Development Version Release - VBS: Software Development Version Release - VBS (2022)	4	2022	4	2022
Software Development Version Release - VBS: Software Development Version Release - VBS (2023)	4	2023	4	2023
Software Development Version Release - VBS: Software Development Version Release - VBS (2024)	4	2024	4	2024

**UNCLASSIFIED**

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy			Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
1319 / 7	PE 0206623M / MC Ground Cmbt Spt Arms Sys	2315 / Training Devices/Simulators		
Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Software Development Version Release - VBS: Software Development Version Release - VBS (2025)	4	2025	4	2025
DVTE - TACTICAL DECISION KITS (TDK): Authority to Operate (ATO) ends	3	2019	3	2019
<b>Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS)</b>				
Program Contractor Support: Program Contractor Support	1	2021	1	2025
MTWS IPT/CCB: MTWS IPT/CCB 2019	4	2019	4	2019
MTWS IPT/CCB: MTWS IPT/CCB 2020	3	2020	3	2020
MTWS IPT/CCB: MTWS IPT/CCB 2021	3	2021	3	2021
MTWS IPT/CCB: MTWS IPT/CCB 2022	3	2022	3	2022
MTWS IPT/CCB: MTWS IPT/CCB 2023	3	2023	3	2023
MTWS IPT/CCB: MTWS IPT/CCB 2024	3	2024	3	2024
MTWS IPT/CCB: MTWS IPT/CCB 2025	3	2025	3	2025
Contract Award: SW Contract FY19	3	2019	3	2019
Contract Award: SW Re-engineering FY20	2	2020	2	2020
Contract Award: SW Contract FY20	1	2020	1	2020
Contract Award: SW Re-engineering FY21	3	2021	3	2021
Contract Award: SW Contract FY21	2	2021	2	2021
Contract Award: SW Re-engineering FY22	3	2022	3	2022
Contract Award: SW Contract FY22	2	2022	2	2022
Contract Award: SW Re-engineering FY23	3	2023	3	2023
Contract Award: SW Contract FY23	2	2023	2	2023
Contract Award: SW Re-engineering FY24	3	2024	3	2024
Contract Award: SW Contract FY24	2	2024	2	2024
Contract Award: SW Contract FY25	2	2025	2	2025
<b>Ranges and Training Area Management</b>				
CPM RISCon Development: CPM RISCon SW Integration FY19	4	2019	4	2019

**UNCLASSIFIED**

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy			Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
1319 / 7	PE 0206623M / MC Ground Cmbt Spt Arms Sys	2315 / Training Devices/Simulators		
Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CPM RISCon Development: CPM RISCon SW Integration FY20	4	2020	4	2020
CPM RISCon Development: CPM RISCon SW Integration FY21	3	2021	3	2021
CPM RISCon Development: CPM RISCon SW Integration FY22	3	2022	3	2022
CPM RISCon Development: CPM RISCon SW Integration FY23	3	2023	3	2023
CPM RISCon Development: CPM RISCon SW Integration FY24	3	2024	3	2024
CPM RISCon Development: CPM RISCon SW Integration FY25	3	2025	3	2025
<b>Supporting Arms Virtual Trainer (SAVT)</b>				
SW Development and Integration: FY19 Task Order Award	4	2019	4	2019
<b>Immersive Training Range Support (Formally SITE)</b>				
Blank Fire Only (BFO) RPK Weapon Development: NSWC Crane RPK BFO Development	1	2020	3	2020
Blank Fire Only (BFO) RPK Weapon Testing: NSWC Corona RPK Testing	4	2020	1	2021
Blank Fire Only (BFO) AK47 Weapon Development: NSWC Crane AK47 BFO Development	3	2019	4	2019
Blank Fire Only (BFO) AK47 Weapon Testing: NSWC Corona AK47 Testing	4	2019	1	2020
CPM MITE: CPM MITE (2020)	4	2020	4	2020
CPM MITE: CPM MITE (2021)	3	2021	3	2021
CPM MITE: CPM MITE (2022)	3	2022	3	2022
CPM MITE: CPM MITE (2023)	3	2023	3	2023
CPM MITE: CPM MITE (2024)	3	2024	3	2024
CPM MITE: CPM MITE (2025)	3	2025	3	2025
<b>Force on Force Training Systems (FoFTS)</b>				
CPM Contract Award (SW PDSS): FY19 Award	4	2019	4	2019
CPM Contract Award (SW PDSS): FY20 Award	4	2020	4	2020
CPM Contract Award (SW PDSS): FY21 Award	3	2021	3	2021
CPM Contract Award (SW PDSS): FY22 Award	3	2022	3	2022

**UNCLASSIFIED**

**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2315 / Training Devices/Simulators
--	---	--

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CPM Contract Award (SW PDSS): FY23 Award	3	2023	3	2023
CPM Contract Award (SW PDSS): FY24 Award	3	2024	3	2024
CPM Contract Award (SW PDSS): FY25 Award	3	2025	3	2025
OTA Capabilities Demo: Phase I Capability Demo	4	2019	4	2019
OTA Capabilities Demo: Phase II Capability Demo	1	2020	1	2020
OTA Capabilities Demo: Phase III Capability Demo	2	2020	2	2020
<b><i>Training Simulation Support</i></b>				
LVC-TE Integration (MTWS): LVC-TE Integration (MTWS)	3	2020	3	2020

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 2503 / Initial Issue			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
2503: <i>Initial Issue</i>	53.170	5.118	5.498	5.657	-	5.657	8.445	6.490	6.011	6.126	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**

Load Bearing and Pack Systems now includes the Waterproof bag efforts previously included under Individual Warfighting Equipment.

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

This funding provides research, development, test and evaluation (RDT&E) on low cost items with an emphasis on Non-Developmental Items/Commercial-Off-the-Shelf (NDI/COTS) available items. Much of the RDT&E is conducted in coordination/concert with other services and joint organizations, and in consideration of RDT&E efforts being pursued by the other Services. Items approved for procurement will transition into Operation and Maintenance Marine Corps accounts for Infantry Combat Equipment, Family of Shelters, Combat Field Feeding Systems, and Family of Field Medical Equipment. Beginning in FY19 for the Family of Field Medical Equipment, items approved for procurement will also transition to the Procurement, Marine Corps account. The benefits will be reduced logistics, less weight, improved combat effectiveness, better echelon I and II care for Marines, improved individual and unit protection, expeditionary feeding platforms, tactical mobility, calibration and maintenance, etc. The employment of state of the art equipment will ensure Marines are equipped and supported with the best items that technology can offer.

The Infantry Combat Equipment portfolio of capabilities encompasses Marine Corps Uniforms, Cold Weather and Mountaineering, Load Bearing and Pack Systems, and Individual Warfighting Equipment research, development and testing of enhancements, upgrades and modifications to legacy systems and new developments. Funding for this capability area leverages other Services' and governmental partners' efforts to maximize returns on investment and promote coordination and cooperation for same or similar requirements and capabilities. The objective is to equip individual Marines with uniforms and combat equipment to maximize effectiveness in every environment across the full range of military operations.

The Family of Field Medical Equipment (FFME) focus is to provide state of the art medical equipment and emerging medical technology that will improve the clinical outcomes for casualties. The focus is also to replace obsolete items with those that fulfill the requirements and needs while increasing performance characteristics in the areas of energy efficiency, durability, reliability, weight, size and survivability in austere environments of a variety of climates.

The Family of Shelters and Shelters Equipment (FSSE) and The Family of Combat Field Feeding Systems (CFFS) portfolio focus is to provide high-quality and scalable expeditionary capabilities to the warfighter. The Family of Shelters provides the material solutions required to protect the Operating Forces from observation, adverse climatic environments, and combat hazards. The Family of Combat Field Feeding provides food preparation and service equipment to sustain Marines on-the-move and in a static position. The objective is to maximize fuel efficiency, reduce size and weight, and improve transportability.

The Calibration and Maintenance Program (CAMP) provides a calibration and maintenance capability supporting the calibrated tools and test equipment used by over 40,000 Marine maintainers and technicians. The calibration of tools, as simple as torque wrenches and as complex as satellite communication test equipment, is

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
--	----------------------------

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue
--	---	--

required to ensure their safe operation. This funding will be used to develop new test procedures as well as test new calibration equipment used to support weapon systems being deployed by Marine Corps forces.

Family of Expeditionary Water Systems (FEWS) is a family of systems line that contains water bath, shower, and laundry systems and well as water purification, storage, distribution, hygiene and test systems. This capability is necessary to provide safe and potable water to Marines in expeditionary environments. The family contains individual Table of Allowance Material Control Numbers which supports Marine Air Ground Tactical Force (MAGTF) operations by providing all aspects of land-based water support to include analysis, purification, reuse, storage, transfer and dispensing.

Family of Expeditionary Fuel Systems (FEFS) is a family of systems line that contains highly versatile fuel systems designed to receive, test, store, transfer and dispense fuel in support of MAGTF operations. The family contains individual Table of Allowance Material Control Numbers which supports MAGTF operations by providing all aspects of land-based fuel support to include analysis, receipt, storage, transfer and dispensing including all the components required to configure those systems.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Marine Corps Uniforms (MCU)	0.925	0.885	0.408	0.000	0.408
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b>					
- Continue research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant properties in existing uniforms. Efforts include RDT&E on lower cost, more durable, and comfortable Flame Resistant utility uniforms to increase protection of individual Marines in training and in combat.					
- Continue research and development for lighter uniforms, including footwear, and develop affordable alternatives.					
- Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development.					
- Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices.					
- Continue research, development and testing to enhance appearance and service life of Seabag issue items, which consists of initial basic training clothing, footwear, and associated individual uniform items.					
- Continue research and development of enhanced camouflage protection and signature mitigation in the Short Wave Infrared (SWIR) and thermal spectrum. Produce and analyze flame resistant and non-flame resistant materials with enhanced signature mitigation.					
- Continue testing to impart signature mitigation and flame resistant properties to non-flame resistant uniform (MCCUU) by adding chemistry in the manufacturing process.					
<b>FY 2021 Base Plans:</b>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
<ul style="list-style-type: none"> <li>- Continue research, development, testing and evaluation (RDT&amp;E) to increase effectiveness of Flame Resistant (FR) properties in existing uniforms. Efforts include RDT&amp;E on lower cost, more durable, and comfortable FR utility uniforms to increase FR protection of individual Marines in training and in combat.</li> <li>- Continue research and development for lighter uniforms, including footwear, and develop affordable alternatives.</li> <li>- Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development.</li> <li>- Continue to support Marine clothing efforts, to include field and dress uniforms certification along with associated accoutrements which includes badges, ribbons and devices.</li> <li>- Continue research, development and testing to enhance appearance and service life of Seabag issue items, which consists of initial basic training allowance of clothing, footwear, and associated individual uniform items.</li> <li>- Continue research and development of enhanced camouflage protection and mitigation of signature in the short Wave Infrared (SWIR) and thermal spectrum. Produce and analyze flame resistant and non-flame resistant materials with enhanced signature mitigation.</li> <li>- Continue testing to impart signature mitigation and flame resistant properties to non-flame resistant uniform (MCCUU) by adding chemistry in the manufacturing process. Transition the emerging properties in to producible specifications for inclusion in future procurements of the MCCUU.</li> </ul>					
<b>FY 2021 OCO Plans:</b>					
- N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>					
Decrease of \$0.477M from FY20 to FY21 is in line with requirements and resource realignment of all commodity areas and budget adjustments made by the Marine Corps.					
<b>Title:</b> Cold Weather and Mountaineering (CWM)					
<b>Articles:</b>					
	1.512	1.492	0.502	0.000	0.502
	-	-	-	-	-
<b>FY 2020 Plans:</b>					
<ul style="list-style-type: none"> <li>- Continue to conduct research and development of emerging materials and technology to further enhance existing cold weather clothing &amp; equipment effectiveness while lightening the load of the individual Marine.</li> <li>- Continue to conduct research and development for the Cold Weather clothing items to identify material solutions and product improvements for insulation layers, the Cold Weather Facemask, Cold Weather Balaclava, headwear, handwear, and trouser suspenders based upon existing requirements and to procure necessary test articles to complete a Limited User Evaluation during 2DQFY20.</li> </ul>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>- Continue validation and product improvements of ski systems and all components to include boots and clothing in order to procure an effective military ski system to full AAO.</p> <p>- Continue the comparative analysis of sister services clothing items to minimize sustainment cost.</p> <p>- Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK).</p> <p>- Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals.</p> <p>- Continue evaluation of Extreme Cold Weather boots, Intense Cold Weather boot, and overboots.</p> <p>- Continue on improvements to existing materials to include mitigation of Short Wave Infrared (SWIR) and thermal signatures, while increasing the Flame Resistance (FR) properties of cold weather and combat uniforms.</p> <p>- Continue developing material solutions for service uniforms, combat utility uniforms, cold weather clothing, boots, and equipment.</p> <p><b>FY 2021 Base Plans:</b></p> <p>- Continue to conduct research and development of emerging materials and technology to further enhance existing cold weather clothing &amp; equipment effectiveness while lightening the load of the individual Marine.</p> <p>- Continue to conduct research for the Cold Weather clothing and equipment items to identify product improvements based upon existing requirements, market research, and user input from evaluations and after action reports. Procure necessary test articles to support a Limited User Evaluation during FY21.</p> <p>- Produce and evaluate prototypes of items evaluated in FY20 for transition to procurement and fielding in FY21.</p> <p>- Continue the comparative analysis of sister services clothing items to include participation in testing and procurement in order to minimize sustainment cost.</p> <p>- Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK).</p> <p>- Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals based on pending SL-3 Change letter from CD&amp;I.</p> <p>- Continue evaluation of Extreme Cold Weather boots and Intense Cold Weather boot.</p> <p>- Continue on improvements to existing materials to include mitigation of Short Wave Infrared (SWIR) and thermal signatures, while increasing the Flame. Resistance (FR) properties of cold weather and combat uniforms.</p> <p>- Continue developing material solutions for service uniforms, combat utility uniforms, cold weather clothing, boots, and equipment.</p> <p><b>FY 2021 OCO Plans:</b></p>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys		<b>Project (Number/Name)</b> 2503 / Initial Issue	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
- N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease \$0.990M from FY20 and FY21 is in line with requirements and resource realignment of all commodity areas and budget adjustments made by the Marine Corps.					
<b>Title:</b> Load Bearing and Pack Systems (LBPS)					
<b>Articles:</b>					
	0.299	0.357	0.352	0.000	0.352
	-	-	-	-	-
<b>FY 2020 Plans:</b>					
- Continue to explore potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness. Primary focus will be to develop an adjustable Pack Frame that can be utilized with the current USMC Pack main bag, and attachments for multiple weapons systems.					
- Continue evaluations on loadbearing equipment such as Marine Corps pouch sets to implement product improvements to USMC LBPS systems.					
<b>FY 2021 Base Plans:</b>					
- Continue to explore potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness. Primary focus will be to develop an adjustable Pack Frame that can be utilized with the current USMC Pack main bag, and attachments for multiple weapons systems.					
- Continue evaluations on loadbearing equipment such as Marine Corps pouch sets to implement product improvements to USMC LBPS systems.					
<b>FY 2021 OCO Plans:</b>					
N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease of \$0.005M from FY20 to FY21 is in line with requirements and resource realignment of all commodity areas and budget adjustments made by the Marine Corps.					
<b>Title:</b> Individual Warfighting Equipment (IWE)					
<b>Articles:</b>					
	0.112	0.134	0.139	0.000	0.139
	-	-	-	-	-
<b>FY 2020 Plans:</b>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>- Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA).</p> <p>- Continue modernization of existing projects, including knee &amp; elbow pads, by leveraging the technological advances of industry.</p> <p>- Continue to conduct research for the IWE items to identify product improvements for the Marine Corps Utility Cutter (MCUC), the handheld flashlights, and the ISO mat based upon existing requirements and to procure necessary test articles to support a Limited User Evaluation during FY20.</p> <p><b>FY 2021 Base Plans:</b></p> <p>- Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA).</p> <p>- Continue modernization of existing projects, including knee &amp; elbow pads, by leveraging the technological advances of industry.</p> <p>- Continue to conduct research for the IWE items to identify product improvements for the Marine Corps Utility Cutter (MCUC), the handheld flashlights, and the ISO mat based upon existing requirements and to procure necessary test articles to support a Limited User Evaluation during FY21.</p> <p><b>FY 2021 OCO Plans:</b></p> <p>- N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>Increase of \$0.005M from FY20 to FY21 is due to minor modifications of high demand low intensity SL3 items.</p> <p><b>Title:</b> *Family of Field Medical Equipment (FFME)</p>					
<b>Articles:</b>	0.975	1.028	1.228	0.000	1.228
	-	-	-	-	-
<p><b>FY 2020 Plans:</b></p> <p>- Continue to test COTS/NDI medical equipment items for the En Route Care System (ERCS), Forward Resuscitative Surgery System (FRSS) and Shock Trauma Platoon (STP) to determine future viability in an operational environment.</p> <p>- Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment.</p> <p>- Continue testing and product development for possible application technology for insertion, such as portable patient life support systems to be employed for forward resuscitative care and casualty evacuation, consolidating currently independent equipment sets.</p>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
<ul style="list-style-type: none"> <li>- Continue collaborative testing efforts with Army for Traumatic Brain Injury (TBI) non-invasive diagnosis and treatment to determine viability in an operational environment in support of reduction of TBI effects.</li> <li>- Complete collaborative testing with Army for patient movement research.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Initiate research, development, testing and evaluation of new packing configurations of currently fielded forward surgical and trauma resuscitation capabilities to reduce the cubic foot space requirements in order to utilize limited lift capabilities. Conduct further analysis to validate the existing patient condition code requirements, and patient streams against future casualty stream estimates in the corresponding future operational environment(s) to identify material that can be removed from capabilities without impacting effectiveness.</li> <li>- Continue to test COTS/NDI medical equipment items for the ERCS, FRSS and STP to determine future viability in an operational environment.</li> <li>- Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment.</li> <li>- Continue testing and product development for possible application technology for insertion, such as: portable patient life support systems, expeditionary medical refrigeration, oxygen production, sterilization, whole blood utilization, patient warming, and standardization of currently independent equipment sets to be employed for forward resuscitative, surgical care and casualty evacuation.</li> <li>- Complete collaborative testing efforts with Army for Traumatic Brain Injury (TBI) non-invasive diagnosis and treatment to determine viability in an operational environment in support of reduction of TBI effects.</li> </ul> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.200M from FY20 to FY21 is required to transition ongoing Small Business Innovation Research (SBIR) efforts, and to conduct research and analysis to reconfigure the fielded forward surgical and trauma resuscitation capabilities into much smaller, yet fully capable packages which will be able to fit into available USMC lift platforms.</p>						
<b>Title:</b> *Family of Shelters and Shelter Equipment (FSSE)						
<b>FY 2020 Plans:</b>						
	<b>Articles:</b>	0.093	0.192	0.200	0.000	0.200
		-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>- Continue development and evaluation of energy efficient Engineering Change Proposals (ECPs) such as alternative production techniques and designs for FSSE.</p> <p><b>FY 2021 Base Plans:</b> - Continue the evaluation and development of FSSE energy efficient ECPs such as alternative production techniques and designs.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.008M from FY20 to FY21 aligns with the increased costs for ECP development.</p>						
<p><b>Title:</b> *Family of Combat Field Feeding (CFFS)</p> <p align="right"><b>Articles:</b></p> <p><b>FY 2020 Plans:</b> - Continue testing of technological improvements for use in CFFS that will reduce the overall logistics burden such as alternative field sanitation solutions and adaptation of commercial food service components.</p> <p><b>FY 2021 Base Plans:</b> - Continue to reduce the overall logistics burden by researching and testing technological improvements for CFFS components such as commercial food service and alternative field sanitation solutions.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.005M from FY20 to FY21 aligns with increased cost of researching and testing technical improvements for CFFS at the activity.</p>		0.152	0.060	0.065	0.000	0.065
		-	-	-	-	-
<p><b>Title:</b> Calibration and Maintenance Program (CAMP)</p> <p align="right"><b>Articles:</b></p> <p><b>FY 2020 Plans:</b></p>		0.250	0.250	0.250	0.000	0.250
		-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>- Continue exploration of emerging technologies to enhance technical capabilities of individual calibration equipment used within expeditionary calibration facilities by deployed Marine Corps units. New calibration standards are required to replace obsolete items.</p> <p><b>FY 2021 Base Plans:</b> - Continue exploration of emerging technologies to enhance technical capabilities of individual calibration equipment (standards) used within expeditionary calibration facilities by deployed Marine Corps units. New calibration standards are required to replace obsolete items.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> No significant changes.</p>					
<p><b>Title:</b> Family of Expeditionary Water Systems (FEWS)</p> <p align="right"><b>Articles:</b></p>	0.400	0.700	0.700	0.000	0.700
<p><b>FY 2020 Plans:</b> - Conduct on-going Market research for Grey Water Recycling research to support improvements to various Expeditionary Water Systems to include Combat Batch Laundry (CBL) and Shower systems. - Initiate market research, Squad Water Purification System and Reverse Osmosis element upgrades (Legacy POR upgrades).</p> <p><b>FY 2021 Base Plans:</b> - Development to support improvements to various Expeditionary Water Systems to include Tactical Water Purification System-Replacement and Shower systems.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> No significant changes.</p>	-	-	-	-	-
<p><b>Title:</b> Family of Expeditionary Fuel Systems (FEFS)</p> <p align="right"><b>Articles:</b></p>	0.400	0.400	1.813	0.000	1.813
<p><b>FY 2020 Plans:</b></p>	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
- Market research of fuel systems utilized by a MAGTF during operations to right size fuel systems for proper distribution, storage and test capabilities.					
<b>FY 2021 Base Plans:</b> - Initiate modernization and testing of legacy Small/Medium/Large Expeditionary Fuel Systems. Additional testing to support Expeditionary Mobile Fuel Additization capability.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$1.413M from FY20 to FY21 is due to requirements for modernization of legacy fuel systems.					
<b>Accomplishments/Planned Programs Subtotals</b>	5.118	5.498	5.657	0.000	5.657

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PMC/6522: Family of Field Medical Equipment	33.723	2.898	4.187	-	4.187	10.159	5.115	5.217	10.741	Continuing	Continuing
• PMC/4181: Calibration & Maintenance Program (CAMP).	11.916	11.817	2.861	-	2.861	2.938	0.148	0.151	0.150	Continuing	Continuing
• PMC/6670: Family of Expeditionary Water Systems (FEWS)	4.263	5.071	3.550	-	3.550	2.101	2.567	2.616	2.668	Continuing	Continuing
• PMC/6277: Family of Expeditionary Fuel Systems (FEFS)	0.054	0.052	0.501	-	0.501	1.145	6.245	14.491	24.561	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
Cold Weather and Mountaineering, Load Bearing and Pack Systems, Individual Warfighting Equipment, Marine Corps Uniforms: Items utilize various acquisition strategies. These programs leverage heavily on current developments and technology in commercial industry. As a result, the government's R&D phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate, the Naval Research Laboratory or the U.S. Army Natick Soldier Research, Development and Engineering Center via Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing Economic Order (EO) Quantities.

UNCLASSIFIED

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue

Family of Shelters: The Shelter acquisition strategy is to modify NDI to further meet the requirements of the Marine Corps, to support development of multi-service items through inter-service agreements and to adopt COTS items.

Family of Field Medical Equipment: These programs leverage heavily on current development and technology in the commercial medical industry. The field medical acquisition strategy is to modify NDI and adopt COTS items. Due to the nature of medical device development and the USMC reliance on commercial RDT&E practices, it is frequently difficult to accurately predict successful transition due in part to strict Food and Drug Administration oversight and approval processes.

Combat Field Feeding Systems: This program utilized various acquisition strategies and leverages heavily on current developments and technology in commercial industry and other Service field feeding systems. As a result, the government's RDT&E phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate or the U.S. Army Natick Soldier Research, Development and Engineering Center (DoD Executive Agent for Field Feeding) via ID/IQ contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing EO Quantities.

Calibration and Maintenance Program (CAMP): The CAMP acquisition strategy is to evaluate NDI items and ask industry for enhancements and modifications to meet technical and expeditionary requirements. This will be in concert with the Navy's calibration RDT&E efforts.

Family of Expeditionary Water Systems (FEWS): Research and development supports market research and water studies to ensure systems support current and future CONOPS and USMC O-Plans at the enterprise level. Current thrust areas are Grey Water Recycling and small unit water purification as well as upgrading/replacing legacy systems.

Family of Expeditionary Fuel Systems (FEFS): Research and development supports fuel system modularity, test kits, improved collapsible fabric tanks, and ship-to beachhead and beachhead to inland fuel distribution as well as upgrading/replacing legacy systems.

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 7				PE 0206623M / MC Ground Cmbt Spt Arms Sys				2503 / Initial Issue							
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Calibration and Maintenance Program	WR	NSWC : Corona, CA	0.000	0.250	Nov 2018	0.250	Jan 2020	0.250	Jan 2021	-		0.250	Continuing	Continuing	Continuing
Cold Weather & Mountaineering	MIPR	USA NSRDEC : Natick, MA	1.248	0.781	Feb 2019	0.737	Feb 2020	0.251	Mar 2021	-		0.251	Continuing	Continuing	Continuing
Family of Expeditionary Fuel Systems	TBD	TBD : TBD	0.000	0.000		0.000		1.813	Mar 2021	-		1.813	0.000	1.813	-
Family of Expeditionary Water Systems	Various	Various : Various	0.000	0.000		0.000		0.700	Mar 2021	-		0.700	0.000	0.700	-
Family of Field Medical	C/FFP	MCSC : Quantico, VA	0.199	0.610	Sep 2019	0.000		0.000		-		0.000	0.000	0.809	-
Family of Shelters and Shelter Equipment	MIPR	USA NSRDEC : Natick, MA	1.264	0.000		0.177	Feb 2020	0.190	Feb 2021	-		0.190	0.000	1.631	-
Individual Warfighting Equipment	MIPR	USA NSRDEC : Natick, MA	0.757	0.112	Feb 2019	0.134	Feb 2020	0.139	May 2021	-		0.139	Continuing	Continuing	Continuing
Load Bearing and Pack Systems	MIPR	MCSC : Quantico, VA	0.933	0.299	Feb 2019	0.357	Feb 2020	0.352	Feb 2021	-		0.352	Continuing	Continuing	Continuing
Marine Corps Uniforms	MIPR	USA NSRDEC : Natick, MA	5.985	0.443	Feb 2019	0.443	Dec 2019	0.206	Feb 2021	-		0.206	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	Various : Various	23.130	0.000		0.000		0.000		-		0.000	0.000	23.130	-
<b>Subtotal</b>			33.516	2.495		2.098		3.901		-		3.901	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	1.096	0.000		0.000		0.000		-		0.000	0.000	1.096	-
<b>Subtotal</b>			1.096	0.000		0.000		0.000		-		0.000	0.000	1.096	N/A

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 7				PE 0206623M / MC Ground Cmbt Spt Arms Sys				2503 / Initial Issue							
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cold Weather and Mountaineering	MIPR	USA NSRDEC : Natick, MA	2.759	0.731	Feb 2019	0.755	Mar 2020	0.251	Mar 2021	-		0.251	Continuing	Continuing	Continuing
Family of Combat Field Feeding	MIPR	ATC : Aberdeen, MD	0.172	0.052	Feb 2019	0.000		0.000		-		0.000	0.000	0.224	-
Family of Combat Field Feeding	MIPR	USA NSRDEC : Natick, MA	0.807	0.100	Dec 2018	0.060	Jan 2020	0.065	Dec 2020	-		0.065	Continuing	Continuing	Continuing
Family of Expeditionary Fuel Systems	MIPR	ARL : Aberdeen Proving Grd, MD	0.000	0.400	Mar 2019	0.400	Mar 2020	0.000		-		0.000	0.000	0.800	-
Family of Expeditionary Fuel Systems	TBD	TBD : TBD	0.000	0.000		0.000		0.000	Jun 2021	-		0.000	0.000	0.000	-
Family of Expeditionary Water Systems	MIPR	NAVFAC : Port Hueneme, CA	0.000	0.400	Jan 2019	0.400	Mar 2020	0.000		-		0.000	0.000	0.800	-
Family of Expeditionary Water Systems	MIPR	ATC : Aberdeen Proving Grd, MD	0.000	0.000		0.300	Mar 2020	0.000		-		0.000	0.000	0.300	-
Family of Field Medical	MIPR	U.S. Army Aeromedical Research Lab : Ft. Rucker, AL	0.101	0.000		0.220	Mar 2020	0.180	Jun 2021	-		0.180	0.000	0.501	-
Family of Field Medical	MIPR	NSWC : Crane, ID	0.115	0.000		0.115	Apr 2020	0.125	Mar 2021	-		0.125	0.000	0.355	-
Family of Field Medical	MIPR	Naval Surface Warfare Center : CRANE	0.000	0.121	Dec 2018	0.000		0.000		-		0.000	0.000	0.121	-
Family of Field Medical	C/FFP	MCSC : Quantico, VA	0.000	0.127	Mar 2019	0.434	Nov 2019	0.400	Jul 2021	-		0.400	0.000	0.961	-
Family of Field Medical	MIPR	AFMESA : Frederick, MD	0.000	0.000		0.000		0.210	Aug 2021	-		0.210	0.000	0.210	-
Family of Field Medical	WR	NAVAIR : Patuxent River, MD	0.000	0.000		0.000		0.075	Jul 2021	-		0.075	0.000	0.075	-
Family of Field Medical	MIPR	USAARL : Ft. Rucker, AL	1.508	0.000		0.220	Jan 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	NSWC : Dahlgren, VA	10.595	0.000		0.000		0.162	Dec 2020	-		0.162	0.000	10.757	-

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 7				PE 0206623M / MC Ground Cmbt Spt Arms Sys				2503 / Initial Issue							
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Family of Shelters and Shelter Equipment	MIPR	Naval Surface Warfare Center : Crane, ID	0.111	0.075	Feb 2019	0.000		0.000		-		0.000	0.000	0.186	-
Marine Corps Uniforms	MIPR	USA NSRDEC : Natick, MA	0.861	0.482	Feb 2019	0.442	Feb 2020	0.202	Mar 2021	-		0.202	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	Various : Various	1.128	0.000		0.000		0.000		-		0.000	0.000	1.128	-
<b>Subtotal</b>			18.157	2.488		3.346		1.670		-		1.670	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Family of Field Medical	Various	MARCORSYSCOM : Quantico, VA	0.040	0.097	Aug 2019	0.000		0.000		-		0.000	0.000	0.137	-
Family of Field Medical	Various	MCSC : Quantico, VA	0.000	0.020	Oct 2018	0.039	Oct 2019	0.076	Oct 2020	-		0.076	0.000	0.135	-
Family of Shelters and Shelter Equipment	Various	MCSC : Quantico, VA	0.000	0.018	Mar 2019	0.015	Oct 2019	0.010	Oct 2020	-		0.010	0.000	0.043	-
Prior Year Cumulative Funding	Various	Various : Various	0.361	0.000		0.000		0.000		-		0.000	0.000	0.361	-
<b>Subtotal</b>			0.401	0.135		0.054		0.086		-		0.086	0.000	0.676	N/A
<b>Project Cost Totals</b>			53.170	5.118		5.498		5.657		-		5.657	Continuing	Continuing	N/A
<b>Remarks</b>															

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue
--	---	--

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
<b>Infantry Combat Equipment (ICE)</b>																												
<b>Marine Corps Uniforms (MCU)</b>																												
Navy Natick Testing Effort Support																												
Lab Testing																												
Shade Lab Testing																												
Uniform Testing																												
Footwear Testing																												
Flame Resistant Testing																												
<b>Individual Warfighting Equipment (IWE)</b>																												
Natick Lab Testing																												
<b>Cold Weather and Mountaineering (CWM)</b>																												
Natick Testing Effort Support																												
Lab Testing																												
Extreme & Intense Cold Weather Boot																												
Marine Assault Climbers Kit (MACK)																												
Ski and Sled System																												
<b>Load Bearing and Pack Systems (LBPS)</b>																												
Lab Testing and Support																												

2021PB - 0206623M - 2503

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue
--	---	--

Calibration And Maintenance Program (CAMP)	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	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				
Develop & test emerging calibration equipment																																

2021PB - 0206623M - 2503

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2503 / Initial Issue

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Infantry Combat Equipment (ICE)</i></b>				
Marine Corps Uniforms (MCU): Navy Natick Testing Effort Support:	2	2020	4	2022
Marine Corps Uniforms (MCU): Lab Testing:	2	2020	4	2022
Marine Corps Uniforms (MCU): Shade Lab Testing:	2	2020	4	2022
Marine Corps Uniforms (MCU): Uniform Testing:	2	2020	4	2022
Marine Corps Uniforms (MCU): Footwear Testing:	2	2020	4	2022
Marine Corps Uniforms (MCU): Flame Resistant Testing:	1	2020	4	2022
Individual Warfighting Equipment (IWE): Natick Lab Testing:	2	2020	4	2024
Cold Weather and Mountaineering (CWM): Natick Testing Effort Support:	2	2020	4	2022
Cold Weather and Mountaineering (CWM): Lab Testing:	2	2020	4	2022
Cold Weather and Mountaineering (CWM): Extreme & Intense Cold Weather Boot:	2	2020	3	2022
Cold Weather and Mountaineering (CWM): Marine Assault Climbers Kit (MACK):	2	2020	4	2021
Cold Weather and Mountaineering (CWM): Ski and Sled System:	2	2020	4	2021
Load Bearing and Pack Systems (LBPS): Load Bearing and Pack Systems (LBPS)	2	2019	4	2025
<b><i>Calibration And Maintenance Program (CAMP)</i></b>				
Develop & test emerging calibration equipment:	2	2020	4	2025

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2513 / Body Armor
--	---	---

COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2513: <i>Body Armor</i>	55.281	4.880	4.771	4.693	-	4.693	4.790	4.830	4.928	5.027	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

Ballistic Protection Systems (BPS) provides the most technologically advanced protection at the lightest weight available in the world today. It provides the critical ballistic protective systems that save lives, reduce the severity of combat injuries, and increase combat effectiveness by keeping more Marines in the fight. Major BPS programs include: Plate Carrier Generation III (PC Gen III); Lightweight Plates (LWP); Enhanced Combat Helmet (ECH); Improved Ballistic Eyewear (IBE); Integrated Helmet System (IHS) and Hearing Enhancement. The major focus areas of all BPS programs are adapting ballistic protective systems to the constantly changing threat environment and leveraging emerging technologies to lighten the load and increase the mobility of each Marine.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Ballistic Protection Systems	4.880	4.771	4.693	0.000	4.693
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b>					
- Continue research with industry partners towards understanding and developing the future technology associated with next generation Personal Protective Equipment (PPE) (i.e. helmets, body armor, eyewear, and hearing protection).					
- Continue to research active and passive hearing protection products that provide situational awareness and protection.					
- Continue testing for the next generation of eyewear, specifically the capability to protect against laser threats and to adjust rapidly in varying light conditions and provide laser protection.					
- Continue to develop solutions that provide improved fit, modularity, and integration of armor systems.					
- Initiate development of systems that will integrate data and power management within body armor and helmets.					
<b>FY 2021 Base Plans:</b>					
- Continue research with industry partners towards understanding and developing the future technology associated with next generation PPE (i.e. helmets, body armor, eyewear, and hearing protection).					
- Continue to research active and passive hearing protection products that provide situational awareness and protection.					
- Continue testing for the next generation of eyewear, specifically the capability to protect against laser threats and to adjust rapidly in varying light conditions and provide laser protection.					
- Continue to develop solutions that provide improved fit, modularity, and integration of armor systems.					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2513 / Body Armor

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
- Continue development of systems that will integrate data and power management within body armor and helmets.  <b>FY 2021 OCO Plans:</b> N/A  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease of \$0.078M from FY2020 to FY2021 is due to the completion of the Body Armor/Lightweight Plate First Article Test in FY2020.					
<b>Accomplishments/Planned Programs Subtotals</b>	4.880	4.771	4.693	0.000	4.693

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

N/A

**Remarks**

**D. Acquisition Strategy**

Marine Corps Ballistic Protection Systems (BPS) research, development, testing & evaluation activities include seeking new developments in ballistic technology that feature reductions in weight, improvements in ballistic performance, enhanced operational effectiveness through improved product designs and the application of new material technologies to reduce total ownership costs by improving the expected service life of fielded systems. In order to accomplish these goals, Program Manager-Infantry Combat Equipment uses a broad array of government and contractor performers to achieve the desired end state. This includes partnerships with government entities and research and development contracts and partnership intermediaries where applicable. The Marine Corps also leverages advancements in industry capabilities to rapidly field non-developmental and commercially available off the shelf armor solutions. Performance is confirmed by characterizing ballistic performance and data collected during user evaluations.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2513 / Body Armor
--	---	---

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Ballistic Protection Systems	WR	NSWC : Dahlgren, VA	0.477	0.000		0.000		0.000		-		0.000	0.000	0.477	-
Ballistic Protection Systems	Various	MCSC CPO : Quantico, VA	0.000	0.000	Feb 2019	1.750	May 2020	1.500	May 2021	-		1.500	0.000	3.250	-
Ballistic Protection Systems	MIPR	USA NSRDEC : Natick MA	9.477	0.845	Dec 2018	0.180	Jan 2020	0.200	Dec 2020	-		0.200	0.000	10.702	-
Ballistic Protection Systems	C/FFP	NRL : Washington DC	16.861	0.400	Feb 2019	0.313	Jan 2020	0.390	Jan 2021	-		0.390	0.000	17.964	-
Ballistic Protection Systems	MIPR	AFRL : Wright Parrerson, OH	5.527	0.065	May 2019	0.220	May 2020	0.000		-		0.000	0.000	5.812	-
Ballistic Protection Systems	Various	MCSC : Quantico, VA	2.560	0.815	Dec 2018	0.765	Jan 2020	1.125	Jan 2021	-		1.125	0.000	5.265	-
<b>Subtotal</b>			34.902	2.125		3.228		3.215		-		3.215	0.000	43.470	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Ballistic Protection Systems	MIPR	NSRDEC : Natick, MA	0.871	0.700	Dec 2018	0.695	Jan 2020	0.700	Dec 2020	-		0.700	0.000	2.966	-
Ballistic Protection Systems	MIPR	MCSC : Quantico, VA	0.324	0.228	Aug 2019	0.318	Aug 2020	0.300	Aug 2021	-		0.300	0.000	1.170	-
Ballistic Protection Systems	MIPR	NCTRF : Natick, MA	0.541	0.255	Dec 2018	0.100	Jun 2020	0.100	Dec 2020	-		0.100	0.000	0.996	-
Prior Year Cumulative Funding	Various	CECOM : MITRE SUPPORT	0.054	0.000		0.000		0.000		-		0.000	0.000	0.054	-
<b>Subtotal</b>			1.790	1.183		1.113		1.100		-		1.100	0.000	5.186	N/A

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2513 / Body Armor
--	---	---

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Ballistic Protection Systems	MIPR	USA NSRDEC : Natick, MA	8.019	0.179	May 2019	0.025	Aug 2020	0.050	Mar 2021	-		0.050	0.000	8.273	-
Ballistic Protection Systems	MIPR	USA ATC : Aberdeen Prv Grnd, MD	1.625	0.576	Mar 2019	0.226	Dec 2020	0.220	Jan 2021	-		0.220	Continuing	Continuing	Continuing
Ballistic Protection Systems	WR	NRL : Washington, DC	3.415	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ballistic Protection Systems	MIPR	ARL : Various	0.718	0.275	Mar 2019	0.160	Feb 2020	0.108	Dec 2020	-		0.108	0.000	1.261	-
Ballistic Protection Systems	WR	NAVAL Health research Center : Arlington, VA	0.323	0.000		0.000		0.000		-		0.000	0.000	0.323	-
Ballistic Protection Systems	WR	NSWC : Indian Head, MD	0.188	0.000		0.000		0.000		-		0.000	0.000	0.188	-
Ballistic Protection Systems	MIPR	NAVSEA : Washington, DC	0.103	0.000		0.000		0.000		-		0.000	0.000	0.103	-
Ballistic Protection Systems	MIPR	DLA TLSP : Ft Belvior	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Ballistic Protection Systems	MIPR	AFRL : Wright Patterson, OH	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Ballistic Protection Systems	Various	MCSC : Quantico, VA	0.000	0.542	Jun 2019	0.019	Mar 2020	0.000	Mar 2021	-		0.000	0.000	0.561	-
Prior Year Cumulative Funding	Various	Various : Various	4.198	0.000		0.000		0.000		-		0.000	0.000	4.198	-
<b>Subtotal</b>			18.589	1.572		0.430		0.378		-		0.378	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
<b>Project Cost Totals</b>		55.281	4.880	4.771	4.693	-	4.693	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2513 / Body Armor
--	---	---

<b>Proj 2513</b>	<b>FY 2019</b>				<b>FY 2020</b>				<b>FY 2021</b>				<b>FY 2022</b>				<b>FY 2023</b>				<b>FY 2024</b>				<b>FY 2025</b>			
	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
Body Armor Improvements																												
Enhanced Combat Helmet																												
Integrated Helmet System																												
Hearing Protection																												
Eye Protection																												

2021DON - 0206623M - 2513

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2513 / Body Armor

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 2513</b>				
Body Armor Improvements: Body Armor Improvements	1	2019	4	2025
Enhanced Combat Helmet: Enhanced Combat Helmet	1	2019	4	2019
Integrated Helmet System: Integrated Helmet System	1	2020	4	2025
Hearing Protection: Hearing Protection	1	2019	4	2025
Eye Protection: Eye Protection	1	2019	4	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 2928 / Exp Indirect Fire Gen Supt Wpn Sys			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
2928: Exp Indirect Fire Gen Supt Wpn Sys	16.682	21.849	0.898	0.491	-	0.491	0.500	0.498	0.497	0.507	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

Expeditionary Indirect Fires provides the Ground Combat Element (GCE) systems needed to engage multiple enemy threats from land and sea. High Mobility Artillery Rocket Systems (HIMARS) which is a C-130 transportable, wheeled, indirect fire, rocket/missile system capable of firing all rockets and missiles in the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM). The system includes one launcher, two Re-Supply Systems, and the MFOM. HIMARS provides the Marine Air-Ground Task Force (MAGTF) with 24 hour ground-based, responsive General Support/General Support Reinforcing (GS/GSR) indirect fires which accurately engage targets at long range (60+km), with high volumes of lethal fire under all weather conditions throughout all phases of combat operations ashore, to include irregular warfare, distributed operations and sea control. HIMARS is a significant improvement over previously fielded ground fire support systems. Development provides for the modernization and obsolescence mitigation of the HIMARS in order to provide improved operational capabilities.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> HIMARS Expeditionary & Naval Integration Capabilities	21.849	0.898	0.491	0.000	0.491
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b>					
HIMARS Expeditionary and Naval Integration Capabilities:					
- Complete Re-supply System (RSS) radio/intercom replacement and integration.					
- Provide engineering and safety support for GMLRS Extended Range (ER) rocket motor qualification and certifications.					
<b>FY 2021 Base Plans:</b>					
HIMARS:					
- Engineering and safety support for USMC specific analysis of the GMLRS Extended Range (ER) rocket motor to achieve qualification for shipboard transport.					
<b>FY 2021 OCO Plans:</b>					
N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2928 / Exp Indirect Fire Gen Supt Wpn Sys

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Decrease of \$0.407M from FY20 to FY21 is due to the completion of the Re-supply System (RSS) radio/intercom replacement and integration.					
<b>Accomplishments/Planned Programs Subtotals</b>	21.849	0.898	0.491	0.000	0.491

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PMC/ BLI 2212: <i>High Mobility Artillery Rocket System (HIMARS)</i>	130.981	95.686	174.689	-	174.689	96.456	81.804	69.459	70.670	Continuing	Continuing
• PMC/ BLI 3025: <i>Guided Multiple Launch Rocket System (GMLRS)</i>	0.000	44.765	126.089	17.456	143.545	61.045	108.452	110.352	122.746	Continuing	Continuing

**Remarks**  
BLI 2212 allocated for procurement efforts in support of Ground Based Anti-Ship Missile and High Mobility Artillery Rocket System.

**D. Acquisition Strategy**  
Engineering support will come from multiple Army and Navy labs.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2928 / Exp Indirect Fire Gen Supt Wpn Sys
--	---	---

<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
HIMARS RSS Intercom/ Radio Integration	WR	SPAWAR : Charleston, SC	0.000	0.000		0.550	Dec 2019	0.000		-		0.000	0.000	0.550	-
HIMARS ASM Capabilities	Various	Various : Various	0.677	18.396	Jan 2019	0.000		0.000		-		0.000	0.000	19.073	-
HIMARS Safety Engineering Support	WR	NSWC : Indian Head, MD	0.000	0.000		0.098	Dec 2019	0.245	Dec 2020	-		0.245	0.000	0.343	-
HIMARS Engineering Support	WR	NSWC : Dahlgren, VA	0.000	0.000		0.250	Dec 2019	0.246	Dec 2020	-		0.246	0.000	0.496	-
Prior Years Cumulative Funding	Various	Various : Various	4.541	0.000		0.000		0.000		-		0.000	0.000	4.541	-
<b>Subtotal</b>			5.218	18.396		0.898		0.491		-		0.491	0.000	25.003	N/A

**Remarks**  
HIMARS - Decrease of 0.550M from FY20-FY21 is due to the completion of RSS intercom/radio integration.  
HIMARS - Increase of 0.147M from FY20-FY21 is due to increased engineering and safety support required for additional testing of the GMLRS Extended Range.

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
HIMARS Anti-Ship Capabilities	Various	Various : Various	0.000	3.453	Nov 2018	0.000		0.000		-		0.000	0.000	3.453	-
Prior Years Cumulative Funding	Various	Various : Various	5.820	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
<b>Subtotal</b>			5.820	3.453		0.000		0.000		-		0.000	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Years Cumulative Funding	Various	Various : Various	5.644	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing





**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 2928 / Exp Indirect Fire Gen Supt Wpn Sys

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 2928</b>				
HIMARS Development Efforts: communication replacement and integration efforts	1	2019	2	2020
HIMARS Engineering and Safety Support	1	2019	4	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 3098 / Fire Support System			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3098: <i>Fire Support System</i>	149.983	7.724	7.773	9.697	-	9.697	7.764	7.375	15.149	30.292	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

Project 3098 Fire Support System funds the development of critical United States Marine Corps (USMC) key efforts: fire support coordination, targeting, and digital interoperability systems required for the employment of air and ground fires. Fire Support Systems develop and integrate a digital networked sensor to shooter kill chain supporting the Marine Air Ground Task Force (MAGTF). Key efforts included are:

The Fire Support Mod Line (FSML) is a set of Marine Corps efforts to address critical operational and logistics deficiencies in existing, fielded fire support/weapons systems and equipment. FSML provides technical refresh and development of target acquisition, artillery survey, meteorological systems, weapon systems, and fire direction control. Provides execution of product improvements/modifications, and upgrades to system hardware and software for the Marine Artillery Survey Set (MASS), Modeled Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S) and the Improved Position Azimuth Determining System (IPADS), and the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD). Funding is also used for upgrades, engineering change proposals (ECPs), and modifications for guided munitions and fire control systems which fall within Fire Support Systems for the Marine Corps.

The Family of Artillery Munitions (FAM) funding is used to develop and mature artillery munitions for the Marine Corps and includes conducting safety and engineering analysis as well as ship compatibility studies.

The Common Laser Range Finder Integrated Capability (CLRf IC) is an association of targeting systems that provide handheld, lightweight, man portable devices supporting the employment of air and surface fires. They provide foot mobile users the ability to locate, identify, mark and designate targets in both day and night conditions for engagement by fire support and weapons platforms. CLRf IC systems support the collection and dissemination of targeting information to maneuver, fire support, and intelligence personnel via external digital devices such as the Advanced Field Artillery Tactical Data System (AFATDS) and the Target Handoff System (THS) using associated Combat Net Radios. The CLRf IC includes two major components; The CLRf IC Laser Range Finder (LRF) supports the requirement to locate and transmit targeting information while the Next Generation Hand Held Targeting System (NGHTS) combines the capabilities of the LRF with the ability to designate for specific requirements associated with laser guided munitions.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Fire Support Mods (FSM)	2.411	1.982	2.045	0.000	2.045
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Funding is used for upgrades, engineering change proposals (ECPs), and modifications to system hardware and software for the Marine Artillery Survey Set (MASS), Meteorological Information Manager (MMIM),					





**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3098 / Fire Support System

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
capabilities as well as the ability to employ laser guided munitions with significant size and weight reduction as compared to current fielded systems.					
<b>FY 2020 Plans:</b> - Continue development of NGHTS with completion planned for FY21					
<b>FY 2021 Base Plans:</b> - Complete integration of the north finding & north keeping targeting systems capability. - Integrate optical and laser designation components to support range and accuracy requirements. - Complete component integration of the NGHTS system to support the LRIP phase of the NGHTS project.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease of \$1.0M from FY 2020 to FY 2021 is due to the completion of system and configuration down select.					
<b>Accomplishments/Planned Programs Subtotals</b>	7.724	7.773	9.697	0.000	9.697

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

Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	
			Base	OCO	Total					Complete	Total Cost
• PMC/473302: Fire Support Mods	9.481	4.299	4.424	-	4.424	4.557	4.647	4.742	4.838	Continuing	Continuing
• PMC/473300: Common Laser Range Finder (CLRF)	13.786	12.955	0.954	-	0.954	23.340	23.531	34.398	34.887	0.000	169.064

**Remarks**

**D. Acquisition Strategy**

These programs range from off-the-shelf modifications to developmental items. Development will typically be conducted at government labs.

Fire Support Mods:

Leverage acquisition efforts in conjunction with the Army, Warfare Centers and Labs for existing fielded systems. Continue with the science and technology efforts between the Army's Development Command (DEVCOM), and NSWC DD for the Future Survey System replacement. Continue liaison with the Army's PM TAS in order to leverage future efforts and economies of scale with a joint procurement. Procure hardware and software refreshes for the GPSS, MASS and MMIM to ensure compliance with cybersecurity policies, address obsolescence and interoperability with other C2 systems.

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3098 / Fire Support System

**Family of Artillery Munitions (FAM):**

Program includes artillery munitions which are being developed by the Army. The Army is the lead service for these programs but continues to interact with the FAM IPT to ensure USMC requirements and capability needs are met. This allows the USMC to become users of the munition and certify the round for naval transportation. The munitions include but are not limited to; Dual Purpose Improved Conventional Munitions (DPICM), replacement and Precision Guidance Kit (PGK), 155mm rounds. USMC engineering efforts are conducted primarily at Navy Warfare Centers.

**Common Laser Range Finder (CLRF):**

The Next Generation Handheld Targeting System (NGHTS) will be developed by using competitively awarded Other Transaction Agreements (OTA) for a phased approach that will result in a competitive down select to a single vendor. After the completion of the development phase a procurement contract will be awarded to support Low Rate Initial Production, First Article Testing and Delivery Order to procure the NGHTS Approved Acquisition Objective quantity of systems and provide initial training and maintenance support.

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Navy</b>												<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys						<b>Project (Number/Name)</b> 3098 / Fire Support System			

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
FAM Development	WR	NSWC : Dahlgren, VA	0.000	0.000		0.155	Jan 2020	0.155	Dec 2020	-		0.155	0.000	0.310	-
FAM Moving Target	MIPR	NSWC : Dahlgren, VA	0.000	0.000		0.000		2.282	Dec 2020	-		2.282	0.000	2.282	-
NGHTS	MIPR	Various : Various	0.473	4.992	Feb 2019	4.711	Feb 2020	2.970	Feb 2021	-		2.970	Continuing	Continuing	Continuing
Fire Support Mods (GCFS)	WR	NAVSEA : Washington, DC	0.809	0.629	Dec 2018	0.000		0.000		-		0.000	0.000	1.438	-
Fire Support Mods (IPADS-R)	MIPR	DEVCOM : Picatinny, NJ	2.231	1.125	Dec 2018	1.011	Dec 2019	1.420	Dec 2020	-		1.420	0.000	5.787	-
Fire Support Mods (IPADS-R)	WR	NSWC : Dahlgren, VA	1.457	0.372	Nov 2018	0.691	Nov 2019	0.200	Nov 2020	-		0.200	0.000	2.720	-
Fire Support Mods (IPADS-R)	MIPR	Army Research Lab : Adelphi, MD	11.346	0.285	Nov 2018	0.000		0.000		-		0.000	0.000	11.631	-
Fires Support Mods (MMIM)	MIPR	Army Research Lab : Adelphi, MD	1.707	0.000		0.280	Dec 2019	0.082	Dec 2020	-		0.082	0.000	2.069	-
Fire Support Mods (IPADS-R)	MIPR	NIWC/LANT : Charleston, SC	0.000	0.000		0.000		0.343	Apr 2021	-		0.343	0.000	0.343	-
Prior Years Cumulative Funding	Various	Various : Various	117.783	0.000		0.000		0.000		-		0.000	0.000	117.783	-
<b>Subtotal</b>			135.806	7.403		6.848		7.452		-		7.452	Continuing	Continuing	N/A

**Remarks**

CLRF - Decrease of \$1.741M from FY2020 to FY2021 is due to the completion of system and configuration down select.  
 FAM - Increase of \$2.282M from FY2020 to FY2021 is due to the USMC focus on longer range engagement of moving surface target.

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
FAM Engineering Support	WR	NSWC : Dahlgren, VA	3.013	0.321	Jan 2019	0.225	Jan 2020	0.225	Jan 2021	-		0.225	0.000	3.784	-
FAM Program Mgt Support	SS/FFP	MCSC : Various	0.000	0.000		0.000		0.200	May 2021	-		0.200	0.000	0.200	-

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3098 / Fire Support System
--	---	--

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
FAM Safety Engineer Support	SS/FFP	NSWC : Indian Head, MD	0.000	0.000		0.000		0.180	Dec 2020	-		0.180	0.000	0.180	-
NGHTS	Various	Various : Various	0.000	0.000		0.000		0.450	Nov 2020	-		0.450	0.000	0.450	-
Prior Years Cumulative Funding	Various	Various : Various	2.615	0.000		0.000		0.000		-		0.000	0.000	2.615	-
<b>Subtotal</b>			5.628	0.321		0.225		1.055		-		1.055	0.000	7.229	N/A

**Remarks**  
FAM - Increase of \$0.380M from FY2020 to FY2021 is due to the USMC focus on longer range engagement of moving surface target and increased safety support.

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
FAM DPICM Replacement Evaluations	C/BA	NSWC : Dahlgren, VA	0.000	0.000		0.700	Jan 2020	0.899	Dec 2020	-		0.899	0.000	1.599	-
NGHTS	Various	Various : Various	0.000	0.000		0.000		0.291	Nov 2020	-		0.291	0.000	0.291	-
Prior Years Cumulative Funding: Fire Support Mods	Various	Various : Various	8.549	0.000		0.000		0.000		-		0.000	0.000	8.549	-
<b>Subtotal</b>			8.549	0.000		0.700		1.190		-		1.190	0.000	10.439	N/A

**Remarks**  
FAM - Increase of \$0.199M from FY2020 to FY2021 is due to the USMC focus on longer range engagement of moving surface target.

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
<b>Project Cost Totals</b>		149.983	7.724	7.773	9.697	-	9.697	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy

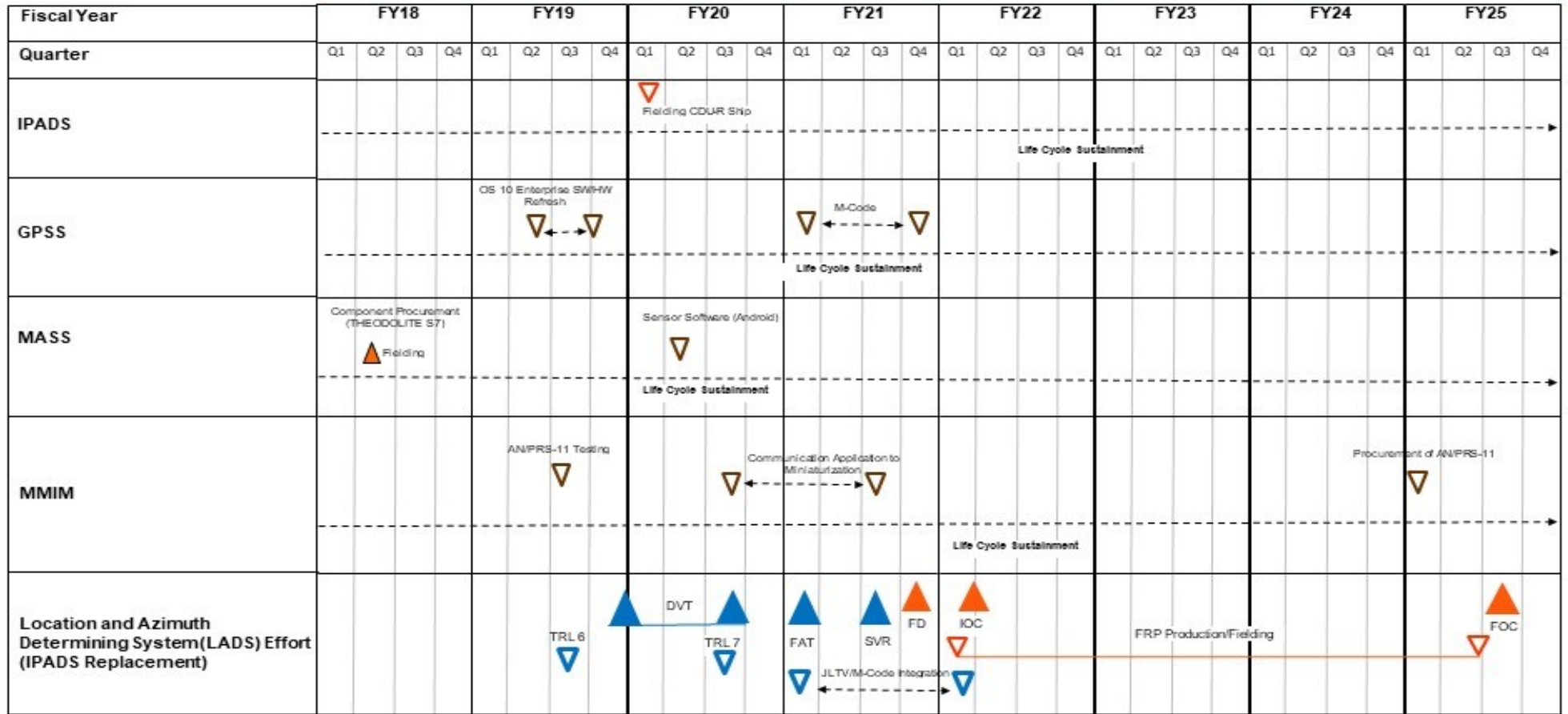
Date: February 2020

Appropriation/Budget Activity  
1319 / 7

R-1 Program Element (Number/Name)  
PE 0206623M / MC Ground Cmbt Spt Arms  
Sys

Project (Number/Name)  
3098 / Fire Support System

**Fire Support Modifications Line Portfolio Schedule**



**UNCLASSIFIED**

<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3098 / Fire Support System

Fiscal Year	FY19				FY20				FY21				FY22				FY23				FY24				FY25							
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
<b>Acquisition / Milestone Events</b>	◆ PGK (150M) SW ECP Approved				◆ PGK-AJ RFP				◆ PGK (150M) SW MIL-STD Published				◆ PGK-AJ EMD Award				◆ XM1128 (DA70) FMR				◆ XM1113 UMR				◆ PGK-AJ LRIP				◆ PGK-AJ FRP			
<b>Capabilities / Requirements</b>	Enduring DPICM Requirements Development / Qualification																															
<b>Systems Engineering / Safety</b>					■ M1122 (DA51) LDP Submitted to WSESRB				■ XM1113 (DZ12) LDP Submitted to JSWSR				■ XM1128 (DA70) LDP Submitted to JSWSR																			
<b>Major Contract Events / Deliveries</b>	★ PGK NA29 (OPTION 2)												★ M1128 (DA70)								★ M1121 (DA66)											
<b>Test &amp; Evaluation</b>	PGK-M, PGK-AJ / Qualification																															
	LRIP Production																															
<b>LEGEND</b>	◆ Army Events ■ Documentation																															

FAM Program Schedule

FAM Program Schedule\_PB21

12/12/2019



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3098 / Fire Support System

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3098</b>				
FSM: IPADS Replacement System EMD Phase	1	2019	4	2019
FSM: IPADS Replacement System M-Code, Vehcile Sensor Development, and Fixture Design/Design Tablets	1	2021	1	2022

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 3774 / Marine Corps Ammo			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3774: Marine Corps Ammo	0.000	1.273	1.297	1.305	-	1.305	1.314	1.326	1.352	1.379	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**

Beginning in FY19, Conventional Ground Ammunition funding has been realigned from project 3098, Fire Support Systems to project 3774, Marine Corps Ammo. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC Fleet Marine Forces.

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

Ammunition Life Cycle Management Program supports PM Ammo's responsibility for Total Life Cycle Management for ground conventional munitions. Accordingly, PM Ammo is a member of the joint services Ammunition Logistics Research and Development IPT (ALR&D IPT). Each year the IPT solicits R&D projects from all of the services. The IPT looks for innovative ideas to enhance logistical support for munitions. Approximately 20 Ammo Logistics R&D projects are voted on each year by the IPT. They are prioritized by voting actions of the Senior Review Board and funding sources are identified. Since the funding for ammunition procurement is outpaced by annual expenditures, ammunition logistics R&D projects are designed to extend the shelf life of our current inventory, provide enhanced packaging to "lighten the load" of our munitions, and other such projects will go a long way to ensure the Marine Corps can maintain combat readiness with a reliable conventional ammunition inventory into the future. RDT&E funds will also be used to seek a prototype for the Ammunition Inventory Management System consisting of commercially available software solution(s) with minimal customization to fully track, account, audit and manage the supply and distribution of Class V munitions worldwide.

Conventional Ground Ammunition is a project that identifies and develops Insensitive Munitions (IM) Technologies to address IM shortfalls in new Marine Corps development or improvements to legacy Conventional Ground Ammunition to meet OSD mandated IM compliance requirements. These IM Technology investments directly support the development of the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP) to address the identified IM technology needs of the Marine Corps.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Ammunition Life Cycle Management	0.771	0.776	0.776	0.000	0.776
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> RDT&E funds are required to seek a prototype for the Ammunition Inventory Management System consisting of commercially available software solution(s) with minimal customization to fully track, account, audit and manage the supply and distribution of Class V munitions worldwide.					
<b>FY 2020 Plans:</b> FY 2020 Baseline Appropriation Request: \$776K					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3774 / Marine Corps Ammo

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>FY20 funding provided support to the following efforts:</p> <ul style="list-style-type: none"> <li>-Loose Ammo Turn-in Machine Project: Develop a "coin star" type device that can rapidly inspect, segregate and count large volumes of small arms cartridges - saves manpower by eliminating the need to physically inspect each cartridge by hand.</li> <li>-Repackaging and Remarking project: Provides a better method to repackage ammunition that is returned from the field and supports the rapid shipment of that ammunition back to an ammunition supply point.</li> <li>-Ammo Inspection Tools Project: Provides Marines with automated means to count and inspect munitions. Reduces manpower needs and increases inventory accuracy.</li> <li>-Pallet Level Tracking Tool Project: Develop a tracking device that can monitor the environmental conditions and location of palletized munitions. Enhances the ability to determine the life expectancy of the munitions based on the environmental exposure experienced by each pallet.</li> <li>-Inventory Management: RDT&amp;E funds will also be used to seek a prototype for the Ammunition Inventory Management System consisting of commercially available software solution(s) with minimal customization to fully track, account, audit and manage the supply and distribution of Class V munitions worldwide.</li> </ul> <p><b>FY 2021 Base Plans:</b> FY 2021 Baseline Appropriation Request: \$776K</p> <p>FY21 funding will support:</p> <ul style="list-style-type: none"> <li>-Projects voted on by the Ammunition Logistics Research and Development IPT (ALR&amp;D IPT) Senior review board in FY20. The projects will be ones that are prioritized and deemed essential to the ammo logistics needs of the Marine Corps.</li> <li>-Continue to support the multi-year effort to develop the Loose Ammo Turn-in Machine. It's a "coin star" type device that can rapidly inspect, segregate and count large volumes of small arms cartridges - saves manpower by eliminating the need to physically inspect each cartridge by hand.</li> </ul>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3774 / Marine Corps Ammo

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Continue to support the multi-year effort to seek a prototype for the Ammunition Inventory Management System consisting of commercially available software solution(s) with minimal customization to fully track, account, audit and manage the supply and distribution of Class V munitions worldwide.  <b>FY 2021 OCO Plans:</b> N/A					
<b>Title:</b> Conventional Ground Ammunition  <b>FY 2020 Plans:</b> FY 2020 Baseline Appropriation Request: \$521K  FY20 funds continued the following: (1) Mk22 Mod 4 (J143) Rocket Motor Slow Cook-off Mitigation (Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD) Complete testing of final configuration to improve slow cook off performance.  (2) LAW FFE Particle Impact Mitigation Sleeve (Armament Research and Development Engineering Command, Picatinny NJ) Continue development of PIMS technology for LAW FFE M72E10 rounds to improve bullet/fragment impact performance. FY20 funding will be used to demonstrate final design in live fire and drop tests.  <b>FY 2021 Base Plans:</b> FY 2021 Baseline Appropriation Request: \$529K  FY21 Funding will Initiate: (1) Transitioning the J143 Rocket Motor Slow Cook-off Mitigation development design package to a final Technical Data Package to include an Engineering Change Proposal (ECP).  (2) Transitioning LAW FFE Particle Impact Mitigation Sleeve development design package to a final Technical Data Package to include an Engineering Change Proposal (ECP).	0.502	0.521	0.529	0.000	0.529
<b>Articles:</b>	-	-	-	-	-

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3774 / Marine Corps Ammo

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
(3) FY21 funding will also support projects voted on by the PM Ammunition Research and Development IPT to support efforts to enhance capabilities across the PM Ammunition Portfolio to include improving Insensitive Munitions (IM), lethality, range and cost.  <b>FY 2021 OCO Plans:</b> N/A  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase from FY20 to FY21 is due to inflation.					
<b>Accomplishments/Planned Programs Subtotals</b>	1.273	1.297	1.305	0.000	1.305

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

N/A

**Remarks**

**D. Acquisition Strategy**

Non Developmental Item/Commercial off the Shelf (NDI/COTS).





**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3774 / Marine Corps Ammo

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3774</b>				
Ammunition Life Cycle Management - no major milestones	1	2019	4	2025
Conventional Ground Ammunition - no major milestones	1	2019	4	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 3775 / Family of Internally Transportable Vehicles (FITV)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3775: Family of Internally Transportable Vehicles (FITV)	0.253	0.297	2.180	2.182	-	2.182	0.234	0.239	0.244	0.249	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

The Family of Ultra-light Tactical Vehicles (FULTV), which consists of the Utility Task Vehicle (UTV) and the future Ultra-light Tactical Vehicle (ULTV) provides deployed Marine Air-Ground Task Force (MAGTF) and Marine Expeditionary Unit (Special Operations Capable) (MEU SOC) with light weight and internally transportable vehicles, which are transportable in the V-22, CH-53E & CH53F tilt selected rotary and fixed wing aircraft. The FULTV expeditionary vehicles support over-the-horizon amphibious operations, irregular warfare and enhanced company operations. The UTV vehicles are fielded to infantry and reconnaissance communities. Speed, maneuverability, and the use of cover and concealment are the crew's primary means of survivability. ULTV will replace UTV through a procurement partnership with SOCOM PM Family of Special Operations Vehicles (FOSOV) and is scheduled to receive Milestone C in 1QFY22.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Family of Ultra-light Tactical Vehicles (ULTV) Test and Evaluation	0.297	2.180	2.182	0.000	2.182
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> Initiate efforts to support test plan development and test site preparation. Based on the updated acquisition strategy to partner with SOCOM PM FOSOV, up to 20 test articles will be purchased in support of safety, performance, and durability test requirements for the ULTV commercial of the shelf (COTS) vehicle. Operational assessment testing will shift to FY21 to accommodate the new acquisition strategy with PM FOSOV.					
<b>FY 2021 Base Plans:</b> In partnership with SOCOM PM FOSOV, complete safety, performance and durability test requirements for ULTV COTS vehicle. Initiate and complete Logistics Demonstration (LOGDEMO) & System Verification Review (SVR). Initiate and complete an operational assessment to determine Marine Corps suitability and effectiveness.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> No significant change					
<b>Accomplishments/Planned Programs Subtotals</b>	0.297	2.180	2.182	0.000	2.182

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3775 / Family of Internally Transportable Vehicles (FITV)

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

Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	Total Cost
			Base	OCO	Total					Complete	
• PMC/6545: <i>Ultra-light Tactical Vehicles (ULTV)</i>	0.606	0.647	0.678	-	0.678	5.955	8.826	0.889	9.180	0.000	138.367

**Remarks**

**D. Acquisition Strategy**

The strategy for the ULTV program is a partnership with Program Manager Family of Special Operations Vehicles (PM FOSOV) for testing and procurement. The partnership will capitalize on similar performance and testing specifications and generate efficiencies by conducting a cross-services acquisition. PM FOSOV released a full and open competitive solicitation and will award an IDIQ contract after evaluation of paper proposals. The Marine Corps and PM FOSOV will conduct joint testing including safety, performance, transportability, and durability. The Marine Corps will also complete an Operational Assessment. The results of the testing will inform a Milestone C and fielding decision in 1st Qtr FY22.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3775 / Family of Internally Transportable Vehicles (FITV)
--	---	---

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Preparation and Event	C/CPFF	NATC : Carson City, NV	0.000	0.000		2.180	Jun 2020	1.932	Jan 2021	-		1.932	Continuing	Continuing	Continuing
Operational Assessment	C/CPFF	MCOTEA : Corona, CA	0.000	0.000		0.000		0.250	May 2021	-		0.250	0.000	0.250	-
ULTV Technology Demonstrator	C/CPFF	NATC : Carson City, NV	0.253	0.297	Dec 2018	0.000		0.000		-		0.000	0.000	0.550	-
<b>Subtotal</b>			0.253	0.297		2.180		2.182		-		2.182	Continuing	Continuing	N/A

**Remarks**  
 Test preparation and event will include the purchase of up to 20 test articles in FY20 due to the updated acquisition strategy to partner with SOCOM PM FOSOV. Prior acquisition strategy included bid samples to be provided by multiple offerers. Operational assessment was previously planned for FY20 will shift to FY21 in order to align with the PM FOSOV acquisition timeline.

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	0.253	0.297	2.180	2.182	-	2.182	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy

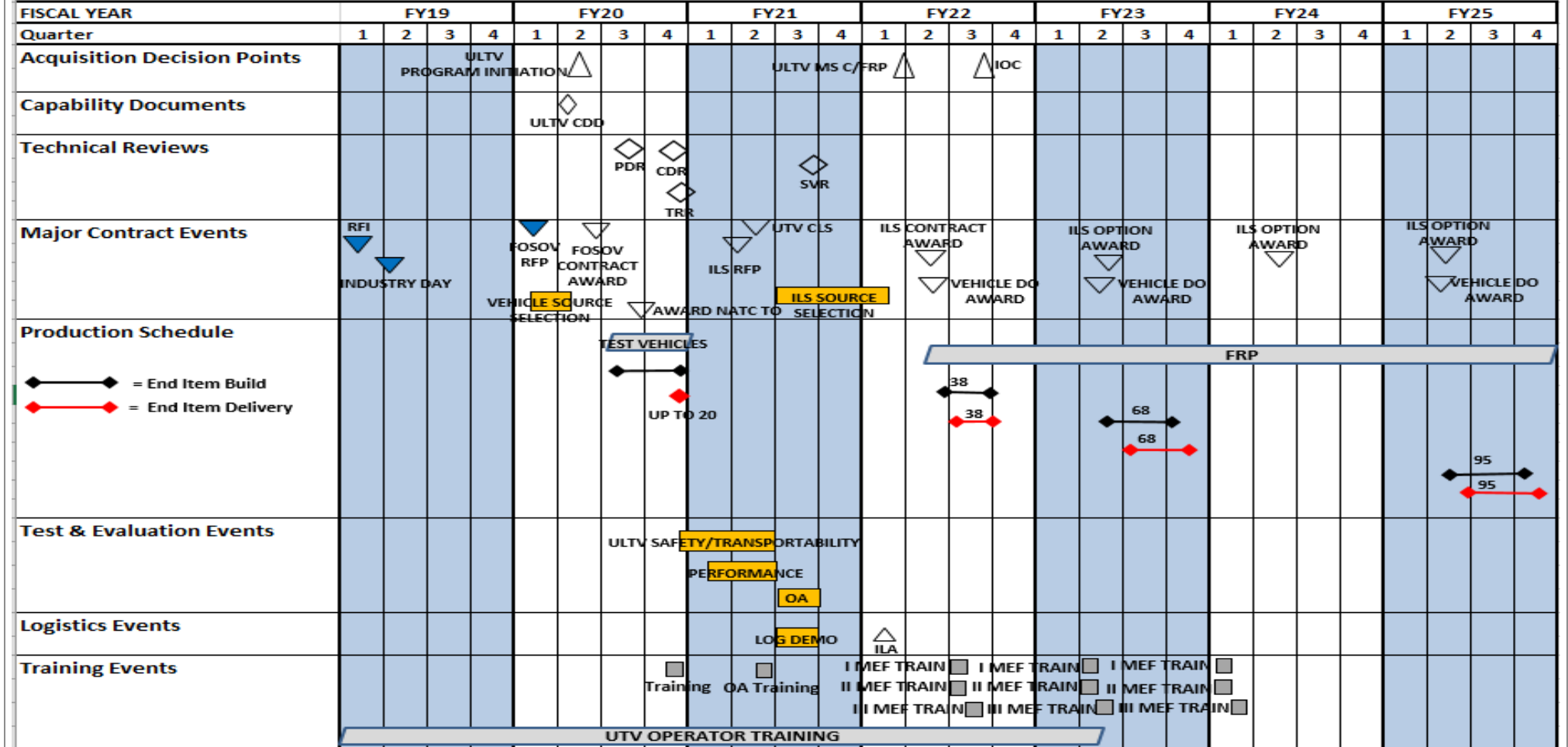
Date: February 2020

Appropriation/Budget Activity  
1319 / 7

R-1 Program Element (Number/Name)  
PE 0206623M / MC Ground Cmbt Spt Arms  
Sys

Project (Number/Name)  
3775 / Family of Internally Transportable  
Vehicles (FITV)

As of: 31DEC 2019



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 3775 / Family of Internally Transportable Vehicles (FITV)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3775</b>				
Proj 3775: Source Selection	1	2020	2	2020
Proj 3775: UTV CLS	2	2020	2	2020
Proj 3775: ULTV Program Initiation	2	2020	2	2020
Proj 3775: ULTV Safety & Transportability	4	2020	2	2021
Proj 3775: ULTV Performance Testing	1	2021	2	2021
Proj 3775: ULTV Logistics Demonstration	3	2021	3	2021
Proj 3775: ULTV Operational Assesment	3	2021	3	2021
Proj 3775: ULTV System Verification Review (SVR)	3	2021	4	2021
Proj 3775: ULTV ILA	1	2022	1	2022
Proj 3775: ULTV Milestone C/Full Rate Production (FRP)	1	2022	1	2022
Proj 3775: ULTV Vehicle Production award	2	2022	2	2022
Proj 3775: ULTV IOC	3	2022	3	2022

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys				<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
4002: <i>Family of Raid Reconnaissance</i>	1.573	7.333	1.613	3.064	-	3.064	16.866	22.668	23.122	23.585	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

Project supports multiple airborne/parachuting and specialized reconnaissance related programs focusing on immediate capability enhancements for numerous insertion and personnel equipment shortfalls currently within Marine Reconnaissance and Marine Raider units. These enhancements will improve airborne and amphibious capability, equipment and items for direct action missions, and specialized raid equipment. The project supports rapid prototyping efforts for Integration and Logistics advocated autonomous small Unmanned Logistics System-Air (ULS-A) in support of Ground Combat Element (GCE) and Logistics Combat Element (LCE) aerial resupply requirements.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Airborne Reconnaissance Equipment (ARE)	0.427	0.150	0.430	0.000	0.430
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b>					
- Continue system/technology upgrades and evaluation of emergent and reliable solutions for challenges in support of MAGTF Joint Force and USSOCOM commanders. RDTE upgrades include the High-Altitude-Opening Navigation System (HAHONAV) and the Parachutist High Altitude Oxygen System.					
- Continue research, development testing of parachuting capabilities for accessing the battlespace, including High Altitude Low Opening and Low Altitude Personnel Parachutes and related ancillary items.					
<b>FY 2021 Base Plans:</b>					
- Initiate test and evaluation of the High-Altitude-Opening Navigation System (HAHONAV), parachutist drop bag, and the Parachutist Oxygen System 2 in an operational environment with current parachute systems.					
- Continue research and development testing of parachuting capabilities for accessing the battlespace, including High Altitude Low Opening, Low Altitude Personnel Parachutes, and related ancillary items.					
- Initiate development of a replacement for the MC-6 low level parachute system.					
- Continue research and development of new airborne capabilities for accessing a battlespace defended by an integrated air defense system.					
<b>FY 2021 OCO Plans:</b>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> An increase of \$0.280M from FY20 to FY21 is due to initiating development for the MC-6 low level parachute system replacement.					
<b>Title:</b> Amphibious Reconnaissance Capability					
<b>Articles:</b>					
	0.116	0.302	0.120	0.000	0.120
	-	-	-	-	-
<b>FY 2020 Plans:</b>					
- Continue research and development of amphibious support equipment in support of MAGTF Joint Force and USSOCOM commanders to maneuver, surface or subsurface operations.					
- Initiate research and development efforts for navigation capabilities of the Enhanced Diver Propulsion Device (E-DPD).					
<b>FY 2021 Base Plans:</b>					
- Continue research and development of amphibious support equipment in support of MAGTF Joint Force and USSOCOM commanders to maneuver, surface or subsurface operations.					
- Complete research and development efforts for navigation capabilities of the Enhanced Diver Propulsion Device (E-DPD).					
- Initiate research and development efforts for the Autonomous Hydrographic Survey (AHCS) capability.					
- Initiate development of Enhanced Combat Rubber Reconnaissance Craft (E-CRRC).					
<b>FY 2021 OCO Plans:</b>					
N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The decrease of funding from FY20 to FY21 of \$0.182M is due to completion of E-DPD capability development.					
<b>Title:</b> Aerial Delivery and Autonomous Distribution Entry					
<b>Articles:</b>					
	6.790	1.161	2.514	0.000	2.514
	-	-	-	-	-
<b>FY 2020 Plans:</b>					
- Continue research and development of block upgrades for the Air Delivery Family of Systems for steerable, extended glide systems that can deliver critical supplies when employing standoff or high altitude release for tactical advantage. Research and development will enhance the accuracy of operation in a GPS-denied environment, the interoperability with personnel, the One-Time Use Modular Autonomous Guidance Unit					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>(MAGU), the modularity within aerial delivery systems and various other critical capabilities such as tracking, programming and battery diagnostics.</p> <p>- Continue research and development of Unmanned Logistics System (ULS)/Aerial Delivery and Autonomous Distribution (A2D2). Specifically, the integration and development of autonomy aspects for a distribution system of support for resupply and air drops.</p> <p><b>FY 2021 Base Plans:</b></p> <p>- Continue research and development of block upgrades for the Air Delivery Family of Systems for steerable, extended glide systems. Research and development to enhance accuracy of operation in a GPS-denied environment, the interoperability with personnel, the One-Time Use Modular Autonomous Guidance Unit (MAGU), the modularity within aerial delivery systems and various other critical capabilities such as tracking, programming and battery diagnostics.</p> <p>- Continue research and development of ULS-A to include integration and development of autonomy aspects and initial phase of rapid prototyping efforts.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The increase of funding from FY20 to FY21 of \$1.353M supports prototype procurement and increased autonomy development of the ULS-A.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	7.333	1.613	3.064	0.000	3.064

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PMC/6518: Amphibious Support Equipment	14.890	7.101	5.752	-	5.752	10.049	52.710	45.631	46.545	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
(U) Airborne Reconnaissance Equipment (ARE) acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose equipment for aerial delivery and parachuting, such as the Parachutist's High Altitude Oxygen System (PHAOS); Automatic Activation Device (AAD); and the Tandem Offset Resupply Delivery System (TORDS)/Military Tandem Tethered Bundle (MTTB) System.

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance

(U) Amphibious Reconnaissance Capability acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose and lifesaving equipment for Marine Corps diving and small craft, such as the Marine Assault Breacher's Kit (MABK), Marine Individual Assault Kit (MIAK), Enhanced Diver Propulsion Device (E-DPD), and the Enhanced Combat Rubber Raiding Craft (E-CRRC).

(U) Aerial Delivery and Autonomous Distribution (ADAD) acquisition strategy is to provide a scalable and flexible transportation (delivery, transfer and retrograde) of all classes of supply (I-IX) across the range of military operations (ROMO) for standoff/ clandestine operational requirements, such as Joint Precision Air Delivery System (JPADS), conventional and precision Heavy Equipment Air Delivery System (HEADS), conventional and precision Container Delivery System (CDS), Low-Cost Container Delivery System (LCCDS), Low-Cost Cargo Parachutes (LCCP), Family of Cargo Parachutes (FoCP) and Unmanned Logistics Systems (ULS).

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance
--	---	--

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
ARE, Jumper Testing Capability	MIPR	Yuma Proving Ground : Yuma, AZ	0.182	0.150	Apr 2019	0.000		0.000		-		0.000	0.000	0.332	-
ARE, Various	Various	MCSC : Quantico, VA	0.014	0.015	Jun 2019	0.000		0.000		-		0.000	0.000	0.029	-
ARC, AHCS	C/BA	TBD : TBD	0.000	0.000		0.000		0.050	Dec 2020	-		0.050	0.000	0.050	-
ARC, E-DPD	C/CPFF	MCSC : Quantico, VA	0.000	0.026	Dec 2018	0.192	Dec 2019	0.050	Dec 2020	-		0.050	0.000	0.268	-
ARC, Battery Charging Sys	C/FFP	MCSC : Quantico, VA	0.030	0.000		0.010	Feb 2020	0.000		-		0.000	0.000	0.040	-
ADAD Small ULS-AIR	Various	NAVAIR : Pax River, MD	0.000	1.850	May 2019	0.385	May 2020	1.314	May 2021	-		1.314	0.000	3.549	-
ADAD, ULS-AIR	MIPR	US Army RDECOM : Natick, MA	0.000	2.261	May 2019	0.226	May 2020	0.000		-		0.000	0.000	2.487	-
Prior Year Cumulative	Various	Various : Various	0.461	0.000		0.000		0.000		-		0.000	0.000	0.461	-
<b>Subtotal</b>			0.687	4.302		0.813		1.414		-		1.414	0.000	7.216	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
ARE, Sys Eng Support	C/FFP	MCSC : Quantico, VA	0.500	0.116	Mar 2019	0.000		0.160	Jan 2021	-		0.160	Continuing	Continuing	Continuing
ADAD, Sys Eng Support	C/FFP	MCSC : Quantico, VA	0.000	0.200	Mar 2019	0.000		0.100	Mar 2021	-		0.100	0.000	0.300	-
ADAD, Sys Eng Support	Various	NAVAIR : Pax River, MD	0.036	0.400	Mar 2019	0.150	Mar 2020	0.300	Mar 2021	-		0.300	0.000	0.886	-
ADAD, Sys Eng Support	MIPR	US Army RDECOM : Natick, MA	0.000	0.446	Apr 2019	0.000		0.000		-		0.000	0.000	0.446	-
ADAD Small ULS-A Support	Various	NAVAIR : Pax River, MD	0.000	0.000		0.150	Mar 2020	0.300	Mar 2021	-		0.300	0.000	0.450	-
<b>Subtotal</b>			0.536	1.162		0.300		0.860		-		0.860	Continuing	Continuing	N/A

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance
--	---	--

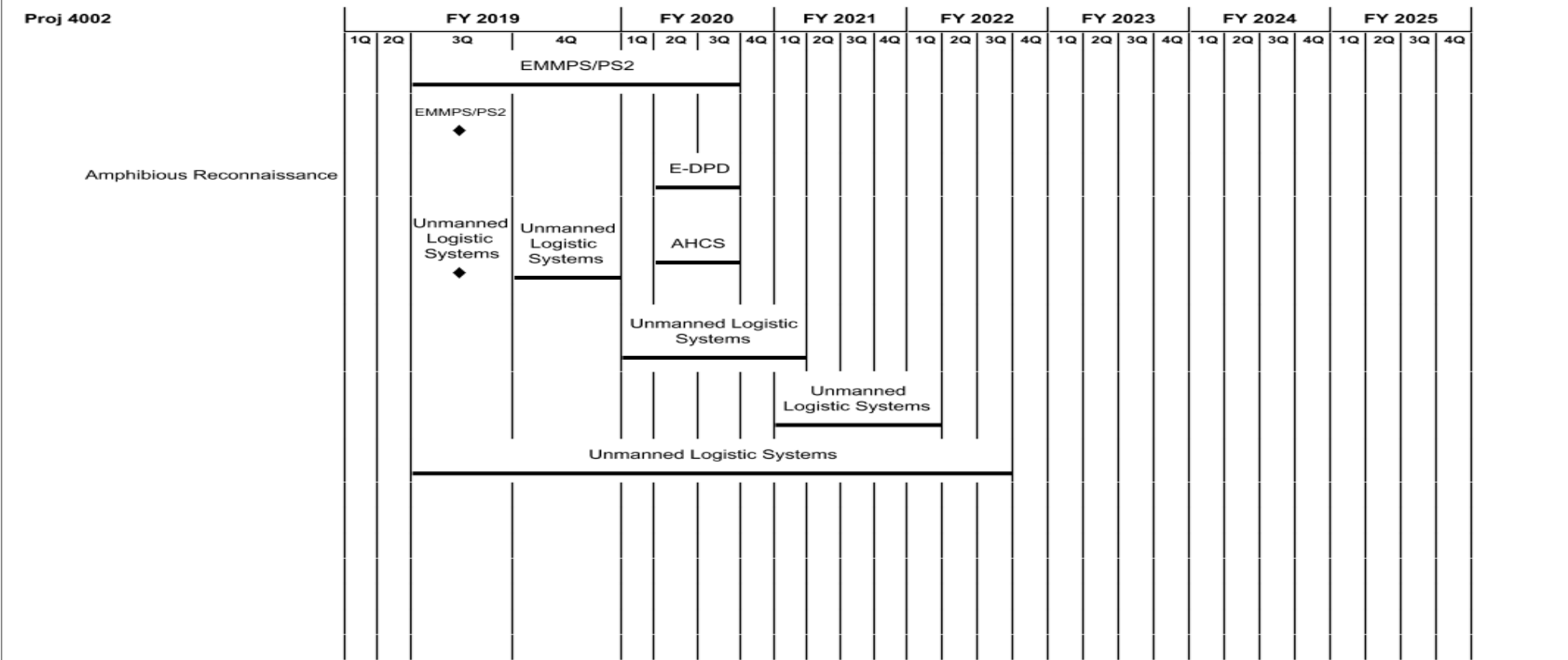
<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ARE, Various (travel)	Various	Various : Various	0.145	0.016	Sep 2019	0.056	Sep 2020	0.040	Feb 2021	-		0.040	Continuing	Continuing	Continuing
ARE, EMMPS Jumper Testing	C/FFP	MCSC : Quantico, VA	0.108	0.130	Jun 2019	0.094	Jun 2020	0.000		-		0.000	0.000	0.332	-
ARE, HAHONAV	TBD	TBD : TBD	0.000	0.000		0.000		0.230	Mar 2021	-		0.230	0.000	0.230	-
ARC, DeBatts Testing	WR	NSWC : Carderock	0.009	0.060	Dec 2018	0.060	Dec 2019	0.000		-		0.000	0.000	0.129	-
ARC, Various (travel)	Various	Various : Various	0.088	0.030	Sep 2019	0.040	Sep 2020	0.020	Feb 2021	-		0.020	0.000	0.178	-
ADAD, ULS-AIR	MIPR	US ARMY, RDECOM : Natick, MA	0.000	0.200	Aug 2019	0.000		0.000		-		0.000	0.000	0.200	-
ADAD Small ULS-AIR	TBD	NAVAIR : Pax River, MD	0.000	0.167	Aug 2019	0.250	Aug 2020	0.500	Aug 2021	-		0.500	0.000	0.917	-
ADAD, Software Testing	MIPR	NRSDEC : Natick	0.000	0.583	Feb 2019	0.000		0.000		-		0.000	0.000	0.583	-
ADAD Battery endurance	MIPR	ARDEC : Aberdeen, MD	0.000	0.683	Apr 2019	0.000		0.000		-		0.000	0.000	0.683	-
<b>Subtotal</b>			0.350	1.869		0.500		0.790		-		0.790	Continuing	Continuing	N/A
<b>Project Cost Totals</b>			1.573	7.333		1.613		3.064		-		3.064	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance
--	---	--



2021PB - 0206623M - 4002

UNCLASSIFIED

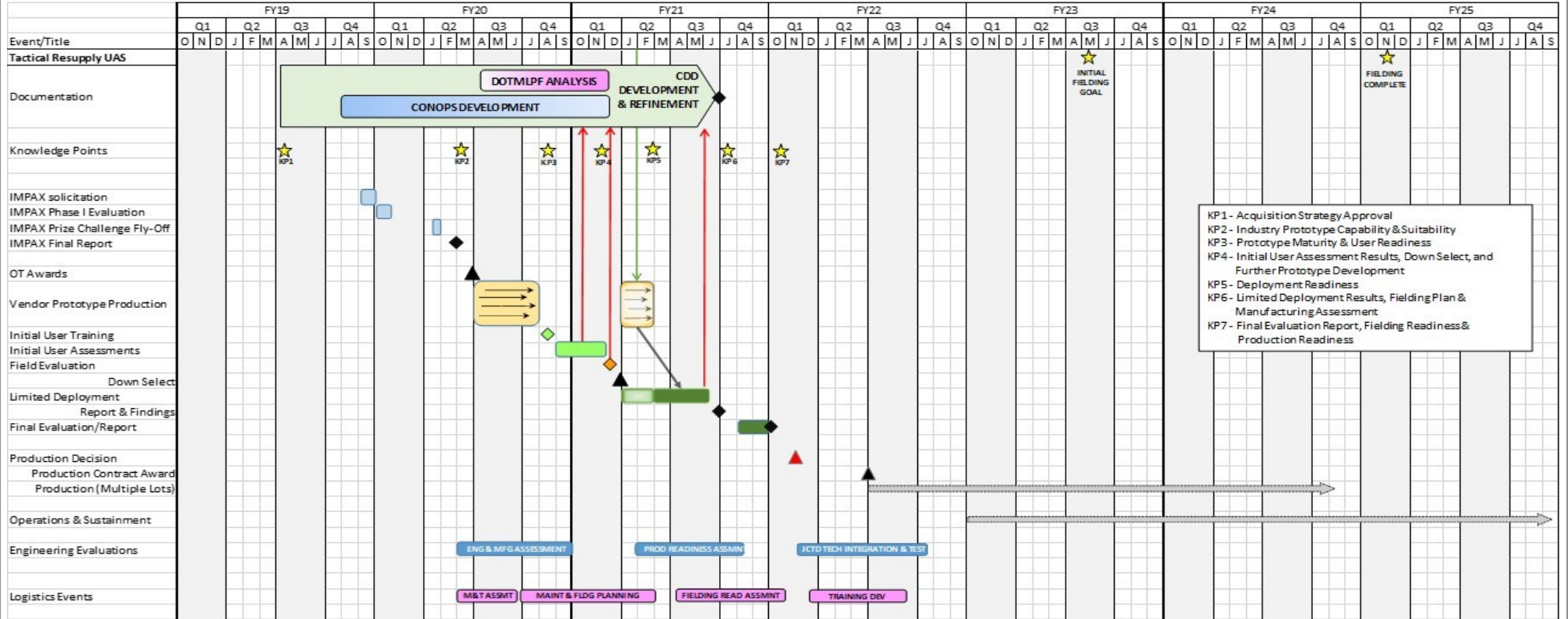
Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy

Date: February 2020

Appropriation/Budget Activity  
1319 / 7

R-1 Program Element (Number/Name)  
PE 0206623M / MC Ground Cmbt Spt Arms  
Sys

Project (Number/Name)  
4002 / Family of Raid Reconnaissance



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 4002 / Family of Raid Reconnaissance

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 4002</b>				
Air Recon: EMMPS/PS2 Jumper Testing	3	2019	3	2020
Air Recon: EMMPS/PS2 Award	3	2019	3	2019
Amphibious Reconnaissance: E-DPD	2	2020	3	2020
Amphibious Reconnaissance: AHCS	2	2021	4	2021
Amphibious Reconnaissance: Aerial Delivery and Autonomous Distribution (A2D2) Prototype	2	2020	2	2020
Amphibious Reconnaissance: A2D2 Phase I TRV Flight Developmental Test and TRV80 Operational Demo	3	2019	4	2019
Amphibious Reconnaissance: A2D2 Phase II TRV150/400 SkyFalcon Flight Developmental Test and Operational Eval	1	2020	1	2021
Amphibious Reconnaissance: A2D2 Phase III SkyFalcon and TRV Flight Developmental Test and Final Operational Eval	1	2021	1	2022
Amphibious Reconnaissance: A2D2 Small ULS-A Rapid Prototyping	3	2020	3	2022
Unmanned Logistic Systems - Air: Tactical Resupply UAS Prize Challenge	2	2020	3	2020
Unmanned Logistic Systems - Air: Initial TRUAS Prototype Procurements	3	2020	4	2020
Unmanned Logistic Systems - Air: TRUAS Field User Evaluations	4	2020	4	2021
Unmanned Logistic Systems - Air: TRUAS Production Decision	1	2022	1	2022
Unmanned Logistic Systems - Air: TRUAS Production Contract Award and Lot Deliveries	1	2022	4	2024
Unmanned Logistic Systems - Air: TRUAS Operational Test and Evaluation	4	2022	2	2023
Unmanned Logistic Systems - Air: TRUAS Operations and Maintenance	1	2023	4	2025
Unmanned Logistic Systems - Air: ULS-A Autonomy/C2/HMI Development	2	2021	4	2025

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 9999 / Congressional Adds
--	---	---

COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	5.000	11.723	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.723
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

Provide joint warfighters with lightweight ammunition and packaging savings to reduce the weight carried by personnel and mechanical vehicles. Efforts will also focus on research, prototypes and production solutions with direct impact to weight reduction that increase platform mobility (agility, time on target), increased lethality (carry more ammunition) and reduce combat load (less fatigue).

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

	FY 2019	FY 2020
<b>Congressional Add:</b> Advanced Lightweight Polymer Cased 7.62mm Ammunition	11.723	0.000
<b>FY 2019 Accomplishments:</b> FY 2019 Congressional Add: \$11.723M		
Activities and Tasks required to successfully develop and transition 7.62 lightweight cartridge case, container and link solutions to production at Lake City Army Ammunition Plant (LCAAP).		
<b>FY 2020 Plans:</b> N/A		
<b>Congressional Adds Subtotals</b>	11.723	0.000

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

N/A

**Remarks**

**D. Acquisition Strategy**

Leverage the Office of the Under Secretary of Defense for Acquisition and Sustainment (OUSD(A&S)) policy/strategy for Other Transaction Agreements (OTAs) to rapidly assess promising technology regarding Research, Prototypes and Production.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 9999 / Congressional Adds
--	---	---

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Polymer Cased Small Arms Ammunitions	C/BOA	ARDEC : Picatinny Arsenal, NJ	4.400	3.038	Mar 2020	0.000		0.000		-		0.000	0.000	7.438	-
Lightweight Small Caliber Ammunition (LSCA) Phase IIA	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.334	Jun 2019	0.000		0.000		-		0.000	0.000	0.334	-
Lightweight Small Caliber Ammunition (LSCA) Phase IIB	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.517	Jun 2019	0.000		0.000		-		0.000	0.000	0.517	-
Surface Danger Zone Test	C/FFP	NSWC Corona : Fallbrook, CA	0.000	0.091	Jun 2019	0.000		0.000		-		0.000	0.000	0.091	-
Metal Injection Molding (MIM) Process Analysis	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.618	Jun 2019	0.000		0.000		-		0.000	0.000	0.618	-
<b>Subtotal</b>			4.400	4.598		0.000		0.000		-		0.000	0.000	8.998	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Program Monitoring	MIPR	NSWC Indian Head : Indian Head, MD	0.600	0.605	Nov 2019	0.000		0.000		-		0.000	0.000	1.205	-
Lightweight Small Caliber Ammunition (LSCA) ARDEC Support	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	4.045	Feb 2019	0.000		0.000		-		0.000	0.000	4.045	-
Lightweight Small Caliber Ammunition (LSCA) USMC Support	MIPR	US Army Research Laboratory (ARL) : Adelphi, MD	0.000	0.300	Feb 2019	0.000		0.000		-		0.000	0.000	0.300	-
Lightweight Small Caliber Ammunition (LSCA) BSO Support	MIPR	Ballistic Services Office (BSO) : Independence, MO	0.000	0.075	Feb 2019	0.000		0.000		-		0.000	0.000	0.075	-
Lightweight Small Caliber Ammunition (LSCA) ATC Support	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	0.000	1.200	Feb 2019	0.000		0.000		-		0.000	0.000	1.200	-



**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 9999 / Congressional Adds
--	---	---

Proj 9999	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	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				
<b>Polymer Cased Small Arms</b>																																
<b>Advanced Light Weight Case Ammunition</b>																																

2021PB - 0206623M - 9999

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206623M / MC Ground Cmbt Spt Arms Sys	<b>Project (Number/Name)</b> 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 9999</b>				
Polymer Cased Small Arms: Aging Evaluation - no major milestones	3	2019	3	2021
Advanced Light Weight Case Ammunition: LSCA Phase IIA	2	2019	3	2019
Advanced Light Weight Case Ammunition: LSCA Phase IIB	2	2019	3	2019
Advanced Light Weight Case Ammunition: Lightweight Links	2	2019	4	2019
Advanced Light Weight Case Ammunition: Accelerated Aging	2	2019	4	2019
Advanced Light Weight Case Ammunition: Propellant Optimazation	2	2019	3	2019
Advanced Light Weight Case Ammunition: Metel Injection Molding	2	2019	3	2019