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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	615.156	68.941	100.850	51.788	-	51.788	66.030	74.485	73.391	74.845	Continuing	Continuing
1555: Lt Armored Vehicle Prog	125.847	12.393	0.000	1.231	-	1.231	5.694	3.160	3.224	3.288	Continuing	Continuing
1557: Next Gen Armored Reconnaissance Vehicle (LAV replacement)	0.000	0.000	1.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.500
1901: MC Grnd Wpnry Prod Improvement	40.797	3.217	19.589	7.607	-	7.607	5.469	5.181	5.279	5.384	Continuing	Continuing
2086: Soldier/Marine Enhancement	32.915	3.418	3.353	2.539	-	2.539	4.037	3.886	3.516	3.586	Continuing	Continuing
2112: Lightweight 155mm Howitzer	4.969	0.000	1.800	2.000	-	2.000	0.000	2.000	0.000	0.000	0.000	10.769
2237: Amphibious Vehicle Test	10.323	4.372	2.297	2.820	-	2.820	2.886	2.947	3.007	3.067	Continuing	Continuing
2315: Training Devices/ Simulators	135.514	22.979	16.060	11.561	-	11.561	24.815	23.179	19.674	20.067	Continuing	Continuing
2503: Initial Issue	48.877	4.291	5.412	5.498	-	5.498	5.756	5.845	5.938	6.055	Continuing	Continuing
2513: Body Armor	51.076	4.205	4.970	4.771	-	4.771	4.696	4.793	4.833	4.930	Continuing	Continuing
2928: Exp Indirect Fire Gen Supt Wpn Sys	13.791	2.981	22.748	0.898	-	0.898	0.490	0.500	0.500	0.500	Continuing	Continuing
3098: Fire Support System	149.717	5.559	5.999	7.773	-	7.773	6.856	3.100	3.183	3.246	Continuing	Continuing
3774: Marine Corps Ammo	0.000	0.000	1.321	1.297	-	1.297	1.306	1.314	1.326	1.353	Continuing	Continuing
3775: Family of Internally Transportable Vehicles (FITV)	0.253	0.000	0.245	2.180	-	2.180	2.183	0.235	0.240	0.245	Continuing	Continuing
4002: Family of Raid Reconnaissance	1.077	0.526	7.556	1.613	-	1.613	1.842	18.345	22.671	23.124	Continuing	Continuing
9999: Congressional Adds	0.000	5.000	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.000
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												

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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0206623M / <i>MC Ground Cmbt Spt Arms Sys</i>
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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. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	66.009	97.152	127.665	-	127.665
Current President's Budget	68.941	100.850	51.788	-	51.788
Total Adjustments	2.932	3.698	-75.877	-	-75.877
• Congressional General Reductions	-	-0.185			
• Congressional Directed Reductions	-	-4.117			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.639	0.000			
• SBIR/STTR Transfer	-1.706	0.000			
• Program Adjustments	0.000	0.000	-39.456	-	-39.456
• Rate/Misc Adjustments	-0.001	0.000	-36.421	-	-36.421

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

Project: 9999: *Congressional Adds*

 Congressional Add: *Polymer Cased Small Arms Ammunitions*

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

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

FY 2018	FY 2019
5.000	0.000
0.000	8.000
5.000	8.000
5.000	8.000

Change Summary Explanation

The FY2020 funding request was reduced by \$7.60M to account for the availability of prior year execution balances.

The net decrease from FY19 to FY20 attributed to a combination of the following programmatic events: Funds from project 2928 (HIMARS) realigned from BA7 in FY19 to BA4 in FY20 to support the Anti-Ship Missile (ASM) capability developmental and testing efforts and the realignment of development funding in project 1901 (Company and Battalion Mortars) to PE 0603635M, Project 7400 - Organic Precision Fires (OPF) in FY20. Additionally, there is a decrease in funding for Project 4002 (Aerial Delivery and Autonomous Distribution Entry) due to completion of testing of Unmanned Logistics System (ULS)/Aerial Delivery and Autonomous Distribution (A2D2) testing.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1555 / Lt Armored Vehicle Prog			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1555: Lt Armored Vehicle Prog	125.847	12.393	0.000	1.231	-	1.231	5.694	3.160	3.224	3.288	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)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: LAV Reset Program Articles: FY 2019 Plans: N/A FY 2020 Base Plans: N/A FY 2020 OCO Plans: N/A								12.393	0.000	0.000	0.000	0.000
								-	-	-	-	-
Title: LAV MODIFICATIONS Articles: FY 2019 Plans: N/A FY 2020 Base Plans: -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. FY 2020 OCO Plans:								0.000	0.000	1.231	0.000	1.231
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019							
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 1555 / Lt Armored Vehicle Prog							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)											
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total					
N/A											
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The increase of \$1.231M supports the integration of a new intercom system onto the FOLAV. The new intercom is required to address obsolescence issues with the legacy intercom system, meet future USMC Tactical Communication Modernization and NSA compliance requirements, and address the number one communication issue reported by the Light Armored Reconnaissance (LAR) community. Specific activities include developmental testing, logistics support, and validation & verification of the system prior to fielding.											
Accomplishments/Planned Programs Subtotals		12.393	0.000	1.231	0.000	1.231					
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• PMC/2038: LAV PIP	7.322	36.652	60.734	-	60.734	67.581	58.125	88.367	81.500	Continuing	Continuing
• PMC/7000: LAV Spares	0.000	5.735	5.884	-	5.884	6.043	5.813	11.082	11.410	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).											
E. Performance Metrics											
Milestone Reviews											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1555 / Lt Armored Vehicle Prog					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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		0.000		0.750	Jan 2020	-		0.750	Continuing	Continuing	Continuing
ILS Data Development(MOD)	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.196	Jan 2020	-		0.196	Continuing	Continuing	Continuing
ILS DATA DEV (Reset)	C/CPFF	GDLS : London Ontario, Canada	16.053	2.346	Dec 2017	0.000		0.000		-		0.000	0.000	18.399	-
PRODUCT DEV/ PROTOTYPES (Reset)	C/CPFF	GDLS : London Ontario, Canada	40.252	5.915	Dec 2017	0.000		0.000		-		0.000	0.000	46.167	-
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	37.397	0.000		0.000		0.000		-		0.000	0.000	37.397	-
Subtotal			93.702	8.261		0.000		0.946		-		0.946	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	11.860	0.000		0.000		0.000		-		0.000	0.000	11.860	-
Program Mgmt (Reset)	MIPR	TACOM : Warren, MI	11.477	2.517	Dec 2017	0.000		0.000		-		0.000	0.000	13.994	-
Program Mgmt (MOD)	MIPR	TACOM : Warren, MI	0.000	0.000		0.000		0.285	Oct 2019	-		0.285	Continuing	Continuing	Continuing
Subtotal			23.337	2.517		0.000		0.285		-		0.285	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	6.105	0.000		0.000		0.000		-		0.000	0.000	6.105	-
Devl/Oper T&E (Reset)	MIPR	RTC : AL	1.593	1.554	Jan 2018	0.000		0.000		-		0.000	0.000	3.147	-
Subtotal			7.698	1.554		0.000		0.000		-		0.000	0.000	9.252	N/A

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Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1555 / Lt Armored Vehicle Prog					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Scheduler (Reset)	C/FFP	FEDITC, LLC : Rockville, MD	0.030	0.061	Mar 2018	0.000		0.000		-		0.000	0.000	0.091	-
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	1.080	0.000		0.000		0.000		-		0.000	0.000	1.080	-
Subtotal			1.110	0.061		0.000		0.000		-		0.000	0.000	1.171	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			125.847	12.393		0.000		1.231		-		1.231	Continuing	Continuing	N/A
Remarks															

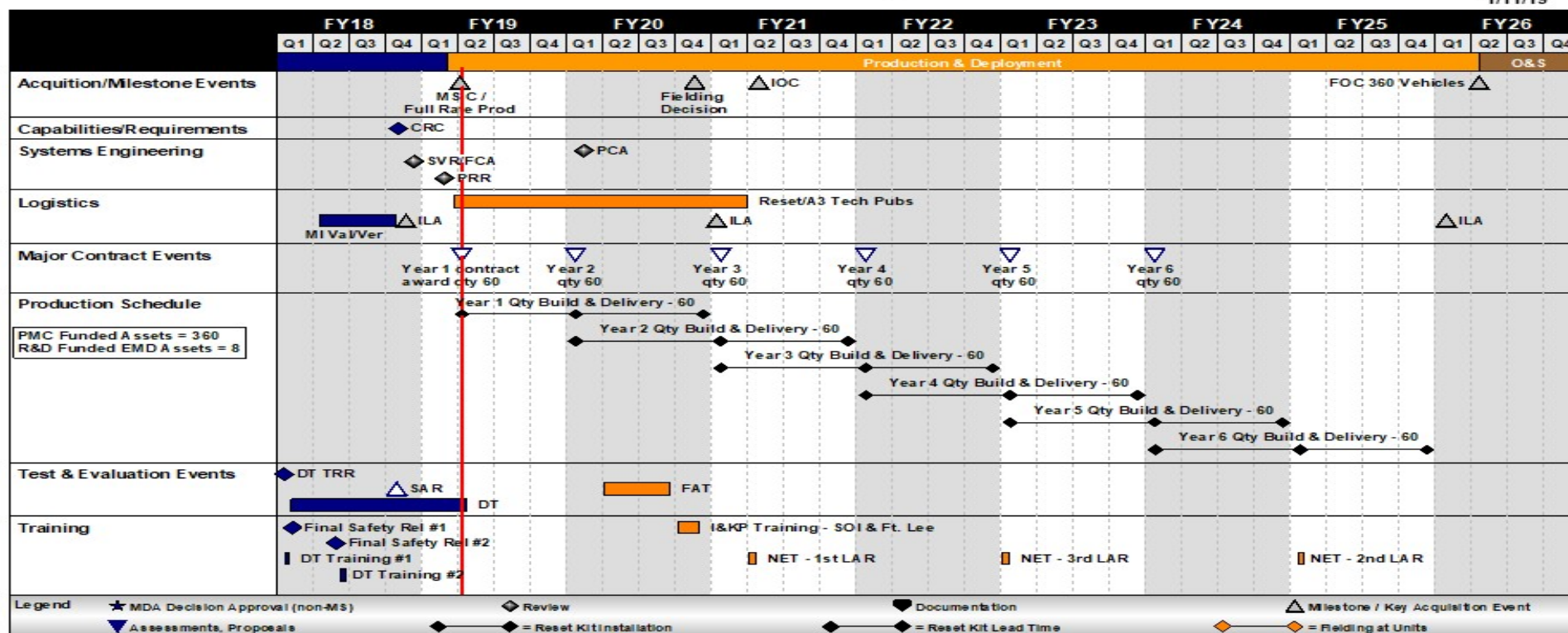
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PE 0206623M: MC Ground Cmbt Spt Arms Sys
Navy

R-1 Line #230

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys
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Project (Number/Name)	1555 / Lt Armored Vehicle Prog
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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019	
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 1555 / Lt Armored Vehicle Prog

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LAV Reset				
Integration Contract	1	2018	1	2019
TM Development	1	2018	1	2019
EMD Vehicle Delivery	1	2018	2	2018
Developmental Testing	1	2018	2	2019
Mod Instruction Val/Ver	2	2018	4	2018
MS-C	2	2019	2	2019
Base Contract Award	2	2019	2	2019
Year 2 Award	1	2020	1	2020
Fielding Decision	4	2020	4	2020
IOC	2	2021	2	2021
Year 3 Award	1	2021	1	2021
Year 4 Award	1	2022	1	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
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)			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1557: Next Gen Armored Reconnaissance Vehicle (LAV replacement)	0.000	0.000	1.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.500
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note This Project is a New Start for FY 2019. 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)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Armored Reconnaissance Vehicle Articles: FY 2019 Plans: -Initiate analysis of alternatives (AoA) to assess critical technology elements for future Light Armored Reconnaissance capabilities including: technology maturity, integration risk, and manufacturing feasibility. The initial capabilities document (ICD) is currently in development. FY 2020 Base Plans: N/A FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement:								0.000	1.500	0.000	0.000	0.000
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019				
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)		

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
The decrease of \$1.500M is the result of ARV funding realigned from program element 0206623M/BA-7 to program element 0603635M/BA-4.					
Accomplishments/Planned Programs Subtotals	0.000	1.500	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RD TEN/0603640M/2223: Marine Corps Advanced Tech. Demo.	7.087	19.650	13.050	-	13.050	1.500	0.000	0.000	0.000	0.000	41.537
• RD TEN/0603635M/1558: Marine Corps Grnd Cmbt/Supt Sys	0.000	0.000	15.087	-	15.087	20.241	36.351	76.571	78.107	0.000	226.357

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.

E. Performance Metrics

Milestone Reviews

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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)					

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 - LAV	MIPR	TACOM : Warren, MI	0.000	0.000		0.119	Jan 2019	0.000		-		0.000	0.000	0.119	-
Analysis of Alternatives (AoA)	MIPR	TARDEC : Warren, MI	0.000	0.000		0.120	Jan 2019	0.000		-		0.000	0.000	0.120	-
Analysis of Alternatives (AoA)	MIPR	AMSAA : Aberdeen Proving Grds, MD	0.000	0.000		0.661	Jan 2019	0.000		-		0.000	0.000	0.661	-
Subtotal			0.000	0.000		0.900		0.000		-		0.000	0.000	0.900	N/A

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

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
AoA Support Contract	C/FFP	HII-MDIS : Huntsville, AL	0.000	0.000		0.600	Jan 2019	0.000		-		0.000	0.000	0.600	-
Subtotal			0.000	0.000		0.600		0.000		-		0.000	0.000	0.600	N/A

			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		1.500		0.000		-		0.000	0.000	1.500	N/A

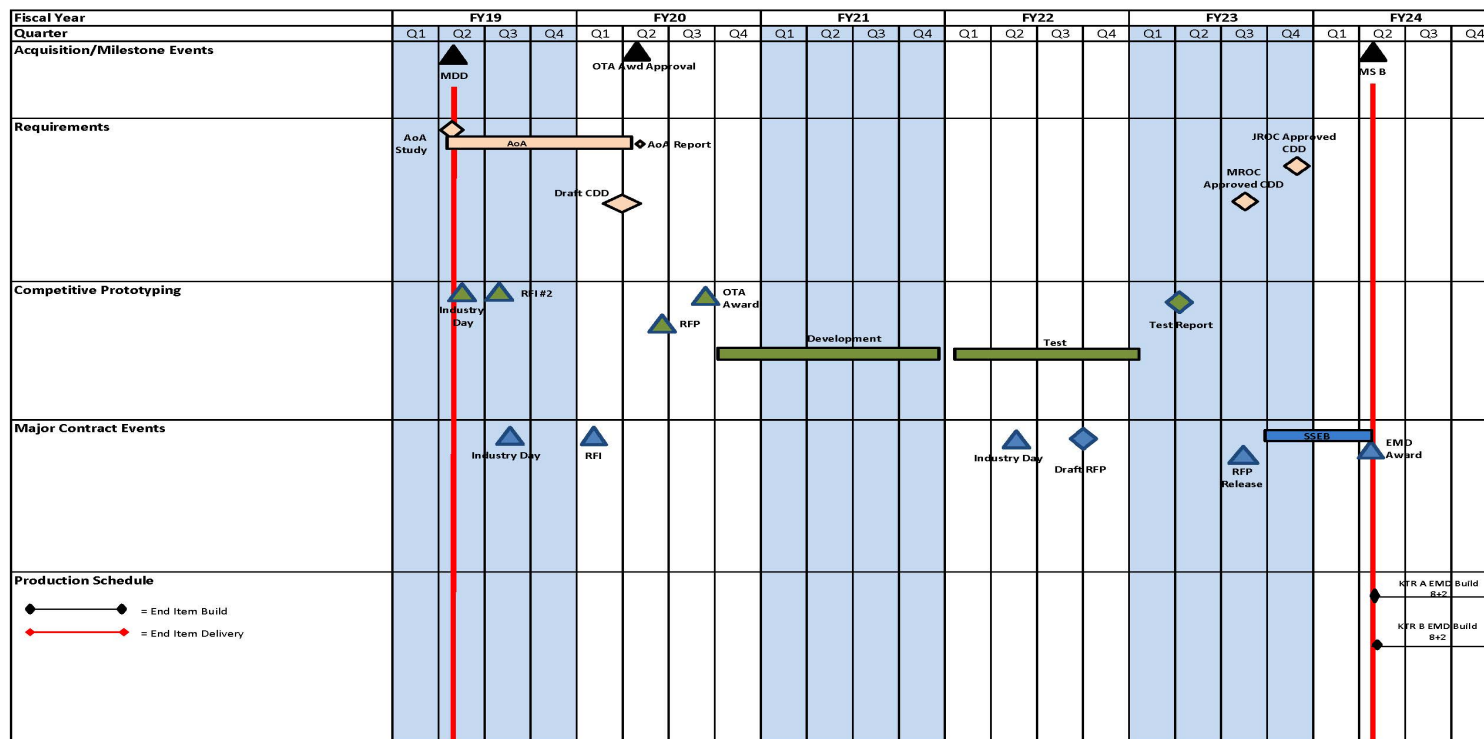
Remarks

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Appropriation/Budget Activity
1319 / 7

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

Armored Reconnaissance Vehicle



ARV Program Plan FY19-24 10 Jan 2019.xlsx

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
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)	

Schedule Details

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

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Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1901: MC Grnd Wpnry Prod Improvement	40.797	3.217	19.589	7.607	-	7.607	5.469	5.181	5.279	5.384	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)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Gunners Protection Kit								0.000	0.000	1.750	0.000	1.750
								Articles: -	-	-	-	-
Description: 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.												
								FY 2019 Plans:				
								N/A				
								FY 2020 Base Plans:				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: This effort began under the Family of Infantry Weapons (FIWS) line in FY18 continuing through FY19 with the completion of the final few TOGPK 2.0 development efforts in FY19. FY20 funding increased \$1.75M to invest in the development of the next GPK variant--the Reducible Height GPK.						
Title: Escalation of Force-Equipment (EoF-E) Articles: Description: 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). FY 2019 Plans: - Continue to assess upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities. FY 2020 Base Plans: N/A FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The USMC decided to terminate the Escalation of Force Equipment program in order to better align with the National Defense Strategy.		0.057 -	0.078 -	0.000 -	0.000 -	0.000 -
Title: Combat Optics Articles: Description: 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. FY 2019 Plans:		1.091 -	2.927 -	3.955 -	0.000 -	3.955 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>- Increase of \$1.205M in FY19 is required to initiate product development, test and evaluation, and pre-EMD transition efforts for Advanced Sniper Rifle (ASR) Day and Night Sights.</p> <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>-Complete evaluation of potential solutions for variable power Squad Common Optic.</p> <p>FY 2020 Base Plans:</p> <p>-Continue product development, test and evaluation, and pre-EMD transition efforts for Advanced Sniper Rifle (ASR) Day and Night Sights.</p> <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>-Initiate development of the optical fire control system for the Next Generation Squad Weapon.</p> <p>FY 2020 OCO Plans:</p> <p>N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>-Increase of \$1.028M in FY20 is required to initiate development of the optical fire control system for the Next Generation Squad Weapon.</p>						
<p>Title: Company and Battalion Mortars</p> <p align="right">Articles:</p> <p>Description: 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>FY 2019 Plans:</p> <p>Advanced Capability Extended Range Mortar (ACERM) Plans:</p> <p>-Type qualify the Extended Range Mortar Ammunition (ERMA) propellant charge for ACERM. ERMA addresses the increased mass of the ACERM cartridge and is compliant with Insensitive Munition requirements.</p> <p>-Develop a Navy Munitions Document (NMD) for ERMA. NMD is required for weapons safety review.</p> <p>-Miniature Mission Setter development and integration with ACERM. ACERM requires a precision weapon pre-launch programming device.</p>		0.379 -	14.686 -	0.000 -	0.000 -	0.000 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>-Lightweight Handheld Mortar Ballistic Calculator/Mortar Fire Control Application integration with ACERM. Required to compute aero-ballistic calculations for ACERM.</p> <p>-Design and development of mortar round packaging. Necessary to accommodate ACERM dimensional differences and environmental requirements.</p> <p>Other plans:</p> <p>-Continue LHMBBC software upgrades to maintain legacy system configuration baseline.</p> <p>-Complete Mortar Fire Control Application (MFCA) development, qualification testing, certification and accreditation to achieve IOC.</p> <p>-Conduct MFCA integration testing against evolving common Marine Corps hardware solutions.</p> <p>-Initiate development, qualification testing, certification and accreditation of MFCA Increment 2 system Net-Ready key performance parameters required for digital communication, mapping and geo-location services.</p> <p>-Purchase Non-Developmental Items (NDI)for testing and evaluation of candidate systems and modifications for company and battalion mortar fire control systems.</p> <p>FY 2020 Base Plans: N/A</p> <p>FY 2020 OCO Plans: N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: The USMC decided to pursue a different technological solution to close this extended range precision fire capability gap.</p>						
<p>Title: Family of Infantry Weapons Systems (FIWS)</p> <p align="right">Articles:</p> <p>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 separated from FIWS beginning in FY20.</p> <p>FY 2019 Plans:</p>		1.690 -	1.898 -	1.902 -	0.000 -	1.902 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019			
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>-Continue Product Improvement Program (PIP) testing for various emergent requirements, including Service Rifle PIP, and Advanced Sniper Rifle Development.</p> <p>-Continue efforts to analyze, design, develop, and field modifications.</p> <p>-Continue performance evaluation of various types of ammunition currently under development.</p> <p>-Continue product improvement of Sniper and Special Purpose systems and their ancillary support equipment in order to meet established or emerging requirements.</p> <p>GPK has its own funding line beginning in FY20. The following FY19 efforts will transition from FIWS to GPK:</p> <p>-Continue efforts to analyze, design, develop, and field modifications (to include GPKs).</p> <p>-Continue product improvement of TGPk and/or TOGPK 2.0 in order to meet requirements outlined in Requirements Memorandum for GPK.</p> <p>-Continue efforts to analyze, design, and develop a Reducible Height GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels.</p> <p>FY 2020 Base Plans:</p> <p>-Continue Product Improvement Program (PIP) testing for various emergent requirements, including Service Rifle PIP (Next Gen Carbine), and Machine Gun Improvements.</p> <p>-Continue performance evaluation of various types of ammunition currently under development.</p> <p>-Continue product improvement of Small Arms Weapon Systems (which includes, but is not limited to) Sniper and Special Purpose systems, and their ancillary support equipment in order to meet established or emerging requirements.</p> <p>FY 2020 OCO Plans:</p> <p>N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>Increase of \$0.004M from FY19 to FY20 is due to additional requirements for travel in support of ammunition development.</p>						
Accomplishments/Planned Programs Subtotals		3.217	19.589	7.607	0.000	7.607

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019	
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• PMC/2220-01: Family of Infantry Weapons Systems	9.108	28.292	17.022	-	17.022	8.970	13.088	7.983	8.142	Continuing	Continuing
• PMC/2220-02: Company and Battalion Mortars	0.810	2.666	3.018	-	3.018	3.474	3.543	3.614	3.686	Continuing	Continuing
• PMC/2220-03: Escalation of Force - Equip (EoF-E)	0.000	0.228	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/4620: Combat Optics	36.264	59.052	98.122	-	98.122	75.094	52.504	52.684	53.737	Continuing	Continuing
• PMC/2220-04: Gunners Protection Kit	0.000	0.000	11.365	-	11.365	13.149	19.312	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): 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.											
Combat Optics: 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.											
Company and Battalion Mortars: 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. Efforts include: 1) participation in a Future Naval Capability (FNC) effort to transition the Advanced Capability Extended Range Mortar (ACERM), developed/ demonstrated by the Office of Naval Research, to extend the maximum range and precision of 81mm high explosive munitions and provide greater lethality at ranges out to 20 km, and 2) an Android-based Mortar Fire Control Application (MFCA) allowing mortar crews to send and receive digital call-for-fire messages, calculate ballistic solutions, and navigate.											
Gunners Protection Kit (GPK):											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement
Acquisition, management, and contracting strategies to support a USMC unique system requirement for the Reducible Height Gunners Protection Kit in support of loading and unloading vehicles aboard amphibious carriers.		
E. Performance Metrics Milestone Reviews		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Company and Battalion Mortars	MIPR	Picatinny Arsenal : Picatinny, NJ	2.722	0.379	Apr 2018	3.208	Feb 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Company and Battalion Mortars	WR	NSWC, Crane : Crane, IN	0.000	0.000		7.850	Feb 2019	0.000		-		0.000	0.000	7.850	-
Company and Battalion Mortars	WR	NSWC, Dahlgren : Dahlgren, VA	0.000	0.000		3.628	Feb 2019	0.000		-		0.000	0.000	3.628	-
Gunners Protection Kit	C/CPIF	MCSC : Quantico, VA	0.000	0.000		0.000		1.750	Dec 2019	-		1.750	Continuing	Continuing	Continuing
Family of Infantry Weapons Systems	MIPR	ARDEC : Picatinny, NJ	0.821	0.591	Jun 2018	1.000	Mar 2019	0.500	Feb 2020	-		0.500	0.000	2.912	-
Family of Infantry Weapons Systems	C/FFP	MCSC : Quantico, VA	0.000	0.479	Sep 2018	0.000		0.000		-		0.000	0.000	0.479	-
Family of Infantry Weapons Systems	WR	NSWC : Crane, IN	0.000	0.000		0.250	Apr 2019	0.350	Mar 2020	-		0.350	0.000	0.600	-
Combat Optics	MIPR	ARDEC : Picatinny, NJ	0.000	0.075	Apr 2018	1.728	Mar 2019	2.612	Mar 2020	-		2.612	0.000	4.415	-
Proj 1901: Prior Years Cum Funding (Product Dev)	Various	Various : Various	5.497	0.000		0.000		0.000		-		0.000	0.000	5.497	-
Subtotal			9.040	1.524		17.664		5.212		-		5.212	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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/IMPAC : Quantico, VA	0.414	0.111	Sep 2018	0.145	Aug 2019	0.174	Mar 2020	-		0.174	Continuing	Continuing	Continuing
Combat Optics	WR	NSWC : Crane, IN	0.839	0.261	Dec 2017	0.257	Jul 2019	0.770	Jul 2020	-		0.770	Continuing	Continuing	Continuing
Combat Optics	Various	Travel/IMPAC : Quantico, VA	0.000	0.059	Jul 2018	0.000		0.000		-		0.000	0.000	0.059	-
Proj 1901: Prior Years Cum Funding (Support)	Various	Various : Various	13.708	0.000		0.000		0.000		-		0.000	0.000	13.708	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Subtotal			14.961	0.431		0.402		0.944		-		0.944	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	WR	NSWC : Crane, IN	0.184	0.443	Jan 2018	0.000		0.523	Apr 2020	-		0.523	0.000	1.150	-
Combat Optics	MIPR	Army : Aberdeen, MD	0.109	0.055	Jun 2018	0.000		0.000		-		0.000	0.000	0.164	-
Combat Optics	MIPR	DLA : Philadelphia, PA	0.249	0.198	Aug 2018	0.892	Mar 2019	0.000		-		0.000	0.000	1.339	-
Family of Infantry Weapons Systems	WR	NSWC Crane : Crane, IN	0.875	0.200	Dec 2017	0.399	Jan 2019	0.726	Jan 2020	-		0.726	Continuing	Continuing	Continuing
Family of Infantry Weapons Systems	WR	NSWC : Crane, IN	0.452	0.150	Dec 2017	0.000		0.000		-		0.000	0.000	0.602	-
Proj 1901: Prior Years Cum Funding (T&E Eval)	Various	Various : Various	12.973	0.000		0.000		0.000		-		0.000	0.000	12.973	-
Subtotal			14.842	1.046		1.291		1.249		-		1.249	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	C/FFP	MCSC : Quantico, VA	0.927	0.159	Mar 2018	0.104	Mar 2019	0.152	Mar 2020	-		0.152	Continuing	Continuing	Continuing
Combat Optics	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.050	Mar 2019	0.050	Mar 2020	-		0.050	0.000	0.100	-
Escalation of Force Equipment	C/FFP	MCSC : Quantico, VA	0.000	0.057	Mar 2018	0.078	Mar 2019	0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy													Date: March 2019		
Appropriation/Budget Activity 1319 / 7							R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement				

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
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	-
Subtotal			1.954	0.216		0.232		0.202		-		0.202	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	40.797	3.217		19.589		7.607		-		7.607	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys			Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement				

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Advanced Sniper Rifle (ASR) - Combat Optics and Family of Infantry Weapons																												
ASR Day and Night Sight Development: Schedule Detail																												
ASR Rifle Development: Schedule Detail																												
ASR Day and Night Sight Procurement: Schedule Detail																												
ASR Rifle Procurement: Schedule Detail																												
ASR Deployment: Schedule Detail																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 1901 / MC Grnd Wpnry Prod Improvement

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Advanced Sniper Rifle (ASR) - Combat Optics and Family of Infantry Weapons</i>				
ASR Day and Night Sight Development: Schedule Detail	2	2019	4	2020
ASR Rifle Development: Schedule Detail	2	2019	4	2020
ASR Day and Night Sight Procurement: Schedule Detail	1	2021	4	2022
ASR Rifle Procurement: Schedule Detail	1	2021	1	2022
ASR Deployment: Schedule Detail	4	2021	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2086 / Soldier/Marine Enhancement			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2086: Soldier/Marine Enhancement	32.915	3.418	3.353	2.539	-	2.539	4.037	3.886	3.516	3.586	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 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 FY18 for completion in FY20. 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 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 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)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Marine Expeditionary Rifle Squad (MERS)	2.622	3.353	2.539	0.000	2.539
Articles:	-	-	-	-	-
FY 2019 Plans:					
-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.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019			
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2086 / Soldier/Marine Enhancement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>-Continue to resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility. This includes resourcing minor construction for facilities sustainment, restoration and modernization efforts, below the MILCON threshold.</p> <p>-Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&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 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms.</p> <p>-Continue to conduct R&D on squad systems in conjunction with Army squad system projects.</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&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> <p>-Continue to implement capability requirements from MERS Initial Capabilities Document (ICD).</p> <p>-Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as mediation to pursue innovation and technology.</p> <p>-Continue Marine Corps anthropometry survey in order to provide an updated database in 2020.</p> <p>FY 2020 Base Plans:</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>						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019			
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2086 / Soldier/Marine Enhancement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>-Continue to resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility. This includes resourcing minor construction for facilities sustainment, restoration and modernization efforts, below the MILCON threshold.</div> <div>-Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&D integration projects, prototyping, rapid assessment of technologies, and usability trials.</div> <div>-Continue investment into Gruntworks Squad Integration Facility enablers and capabilities.</div> <div>-Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics.</div> <div>-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.</div> <div>-Continue to support integration of body armor and load bearing systems with human factors expertise.</div> <div>-Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program and associated Policy Letters and Requirements Documents.</div> <div>-Continue to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms.</div> <div>-Continue to conduct R&D on squad systems in conjunction with Army squad system projects.</div> <div>-Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment.</div> <div>-Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment.</div> <div>-Continue to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability.</div> <div>-Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components.</div> <div>-Continue to implement capability requirements from MERS Initial Capabilities Document (ICD).</div> <div>-Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as mediation to pursue innovation and technology.</div> <div>-Continue Marine Corps anthropometry survey in order to provide an updated database in 2020.</div> <div>-Conduct Technology research and integration in order to develop the Infantry Helmet System.</div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019			
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2086 / Soldier/Marine Enhancement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
-Explore and prototype Manned- unmanned teaming capabilities for small Unmanned Air Systems (UAS) and ground applications. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The FY 2020 funding request was reduced to account for the availability of prior year execution balances.						
Title: Ammunition Life Cycle Management FY 2019 Plans: Funds transferred to Project 3774. FY 2020 Base Plans: N/A FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: N/A		Articles: 0.796 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals		3.418	3.353	2.539	0.000	2.539
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Non Developmental Item/Commercial off the Shelf (NDI/COTS).						
E. Performance Metrics N/A						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2086 / Soldier/Marine Enhancement					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	Marine Corps Systems Command : Quantico, VA	12.792	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			12.792	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Ammunition Life Cycle Management	WR	NSWC : Indian Head, MD	0.719	0.366	Mar 2018	0.000		0.000		-		0.000	0.000	1.085	-
Ammunition Life Cycle Management	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	0.430	Mar 2018	0.000		0.000		-		0.000	0.000	0.430	-
MERS Support	Various	Marine Corps Systems Command : Quanico, VA	0.926	0.149	Oct 2018	0.160	Dec 2018	0.215	Oct 2019	-		0.215	0.000	1.450	-
MERS Technical Support	TBD	TBD : Norfolk, VA	0.000	0.177	Sep 2018	1.040	Apr 2019	0.000		-		0.000	0.000	1.217	-
MERS Technical Support	C/IDIQ	Various : Various	0.320	0.000		0.200	Mar 2019	0.100	Dec 2019	-		0.100	Continuing	Continuing	Continuing
MERS Technical Support - PIA	C/CPFF	MCSC : Quantico, VA	1.128	0.995	Jan 2018	1.738	Dec 2018	2.000	Dec 2019	-		2.000	0.000	5.861	Continuing
MERS Technical Support	C/CPFF	MCSC : Quantico, VA	0.000	0.693	Apr 2018	0.080	Feb 2019	0.224	Jan 2020	-		0.224	0.000	0.997	Continuing
MERS Prior Years Cumulative Funding	Various	Various : Various	4.785	0.000		0.000		0.000		-		0.000	0.000	4.785	-
Subtotal			7.878	2.810		3.218		2.539		-		2.539	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.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2086 / Soldier/Marine Enhancement					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
MERS Developmental Test & Eval	MIPR	DLA : Philadelphia, PA	0.395	0.423	May 2018	0.000		0.000		-		0.000	0.000	0.818	-
MERS Developmental Test & Eval	MIPR	AFB : Hanscom	0.291	0.065	Sep 2018	0.000		0.000		-		0.000	0.000	0.356	-
MERS Developmental Test & Eval (Articles)	Various	MCSC : Quantico, VA	0.150	0.120	Feb 2018	0.135	May 2019	0.000		-		0.000	0.000	0.405	-
MERS Prior Years Cumulative Funding	Various	Various : Various	6.063	0.000		0.000		0.000		-		0.000	0.000	6.063	-
MEP Prior Years Cumulative Funding	C/FFP	MCSC : Various	5.346	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			12.245	0.608		0.135		0.000		-		0.000	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.															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			32.915	3.418		3.353		2.539		-		2.539	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy										Date: March 2019																			
Appropriation/Budget Activity 1319 / 7										R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys										Project (Number/Name) 2086 / Soldier/Marine Enhancement									

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2086																												
MERS research/integration of Infantry Squad - No major milestones																												
Marine Enhancement Program Equipment - No major milestones																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2086 / Soldier/Marine Enhancement

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2086				
MERS research/integration of Infantry Squad - No major milestones	1	2018	4	2024
Marine Enhancement Program Equipment - No major milestones	1	2018	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2112 / Lightweight 155mm Howitzer			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2112: <i>Lightweight 155mm Howitzer</i>	4.969	0.000	1.800	2.000	-	2.000	0.000	2.000	0.000	0.000	0.000	10.769
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 the concept of operations (distributed units operating with increased dispersion) envisioned in the Marine Operating Concept. 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)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Lightweight 155mm Howitzer Product Improvements	0.000	1.800	2.000	0.000	2.000
Articles:	-	-	-	-	-
FY 2019 Plans: -Initiate acquisition of prototyped recoil and structural hardware components such as pepper pots, yoke, road arms, and buffers in order to integrate the larger cannon (55 caliber vs current 39 caliber) onto the M777 Extended Range (M777ER) howitzer platform.					
FY 2020 Base Plans: -Operational Assessment of M777 Extended Range (ER) scheduled for 4th Quarter FY20.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019							
Appropriation/Budget Activity 1319 / 7			R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys			Project (Number/Name) 2112 / Lightweight 155mm Howitzer					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	
Increase of \$0.200M from FY19 to FY20 accounts for transportability and mobility assessment of M777ER.											
Accomplishments/Planned Programs Subtotals						0.000	1.800	2.000	0.000	2.000	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 2185: 155MM Ltwt Towed Howitzer	20.259	47.158	25.065	-	25.065	0.072	0.074	2.075	2.116	0.000	1,443.398
Remarks											
D. Acquisition Strategy											
Production and fielding of the LW155 has concluded and has now entered into the Sustainment Life Cycle Phase. 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, 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.											
E. Performance Metrics											
N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy													Date: March 2019		
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2112 / Lightweight 155mm Howitzer					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
LW155 Product Improvements	MIPR	ARDEC : Picatinny Arsenal, NJ	4.969	0.000		1.800	Oct 2018	0.000		-		0.000	0.000	6.769	Continuing
Subtotal			4.969	0.000		1.800		0.000		-		0.000	0.000	6.769	N/A
Remarks FY17 funding provided for the M777 Extended Range Muzzle Brake prototyping. 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).															
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Mobility and Firing Test	MIPR	Yuma Proving Ground : Yuma, AZ	0.000	0.000		0.000		2.000	Jun 2020	-		2.000	0.000	2.000	-
Subtotal			0.000	0.000		0.000		2.000		-		2.000	0.000	2.000	N/A
Remarks FY20 funding supports firing and mobility tests of Extended Range howitzer.															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			4.969	0.000		1.800		2.000		-		2.000	0.000	8.769	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																Date: March 2019			
Appropriation/Budget Activity 1319 / 7								R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys								Project (Number/Name) 2112 / Lightweight 155mm Howitzer			

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2112																												
Muzzle Brake Prototype																												
Hardware Prototype Integration																												
Critical Design Review																												
Opertional Assessment																												
Long Lead Decision Point																												
Safety Release																												
Urgent Materiel Release																												
System Qualification																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2112 / Lightweight 155mm Howitzer	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2112				
Muzzle Brake Prototype	1	2018	2	2019
Hardware Prototype Integration	1	2019	4	2020
Critical Design Review	1	2019	1	2019
Opertional Assessment	4	2020	1	2021
Long Lead Decision Point	1	2021	1	2021
Safety Release	2	2022	2	2022
Urgent Materiel Release	1	2023	1	2023
System Qualification	2	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2237 / Amphibious Vehicle Test			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2237: Amphibious Vehicle Test	10.323	4.372	2.297	2.820	-	2.820	2.886	2.947	3.007	3.067	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 the amphibious vehicle test facility, which is the Department of Defense's only certified amphibious vehicle test capability. The AVTB generates test plans, executes, analyzes and reports results of developmental and integrated test and evaluation events. They predominately support the development and performance validation of amphibious and ground combat vehicle system capabilities. The AVTB conducts and supports testing for the MCSC; Navy PEOs and Program Management Offices; the Office of Naval Research; and HQMC PP&O and CD&I, as directed. The AVTB mission is to plan, execute, analyze and report developmental and integrated test and evaluation of USMC and Joint Service tracked, wheeled and ground combat vehicles and other demonstration events in order to characterize the performance of amphibious and ground combat vehicle systems and enable informed acquisition decisions for the future warfighting capabilities.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Contracts and Test and Evaluation Support Assets Articles: FY 2019 Plans: -Continue to test other MCSC, Navy PEOs, and Joint Service programs. -Complete ACV 1.1 Test Readiness Review -Initiate ACV 1.1 Water Mobility testing, Communications Testing, Supportability/Human Factor testing, and Reliability Qualification Testing, Logistics Demonstration (PD Phase) FY 2020 Base Plans: -Continue to test other MCSC, Navy PEOs, and Joint Service programs. -Complete ACV 1.1 Water Mobility testing, Communications Testing, Supportability/Human Factor testing, Reliability Qualification Testing, and Logistics Demonstration (PD Phase) -Initiate ACV 1.1 Initial Operational Test and Evaluation (IOT&E) FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY 2019 to FY 2020 accounts for the initiation of IOT&E for ACV 1.1.								4.372	2.297	2.820	0.000	2.820
								-	-	-	-	-
Accomplishments/Planned Programs Subtotals								4.372	2.297	2.820	0.000	2.820

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2237 / Amphibious Vehicle Test
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Work will be led in-house by the Amphibious Vehicle Test Branch (AVTB). As DoD's only certified amphibious test and evaluation capability, AVTB will provide technical and user information regarding the performance of amphibious and ground combat vehicles during developmental testing, capabilities demonstrations and assessments, integrated and follow-on test evaluations events for Marine Corps and Joint Service Program Managers of system activities to support future warfighting capabilities. Required DT&E test assets will be resourced organically with military and civilian personnel, and as required contracted by the MCSC, such as boat operations and maintenance, professional data collection and reduction, test instrumentation and test-peculiar programming and technical writing.		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2237 / Amphibious Vehicle Test					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	-
Subtotal			2.430	0.000		0.000		0.000		-		0.000	0.000	2.430	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.483	0.097	Oct 2017	0.325	Oct 2018	0.317	Oct 2019	-		0.317	Continuing	Continuing	Continuing
Test Assets/Boat Operators	C/FFP	MCTSSA Camp Pend : Camp Pendleton, CA	0.637	0.670	Apr 2018	0.905	Apr 2019	0.909	Apr 2020	-		0.909	0.000	3.121	-
Test Assets/AAV Operators	C/FFP	MCTSSA Camp Pend : Camp Pendleton CA	0.624	0.948	Apr 2018	0.000		0.000		-		0.000	0.000	1.572	-
Vehicle Support	WR	RCO Camp Pendleton : Camp Pendleton, CA	0.065	0.230	Oct 2017	0.086	Oct 2018	0.093	Oct 2019	-		0.093	Continuing	Continuing	Continuing
Hazmat POL PPE	Various	MCTSSA Camp Pendleton : Camp Pendleton, CA	0.330	0.083	Oct 2017	0.065	Oct 2018	0.084	Oct 2019	-		0.084	0.000	0.562	-
Crane Test Support	C/IDIQ	MCTSSA Camp Pendleton : Camp Pendleton, CA	0.085	0.105	Oct 2018	0.070	Oct 2019	0.074	Oct 2019	-		0.074	0.000	0.334	-
Test article fuel (J8)	Various	AVTB : Camp Pendleton, CA	0.681	0.150	Oct 2017	0.070	Oct 2018	0.094	Oct 2019	-		0.094	0.000	0.995	-
EMS Support	C/CPFF	MCTSSA : Camp Pendleton, CA	0.000	0.150	Aug 2018	0.000	Dec 2018	0.000	Dec 2019	-		0.000	0.000	0.150	-
Test support Fuel (Diesel)	Various	AVTB : Camp Pendleton, CA	0.600	0.140	Oct 2017	0.010	Oct 2018	0.083	Oct 2019	-		0.083	0.000	0.833	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2237 / Amphibious Vehicle Test					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.150	0.152	Mar 2018	0.000	Dec 2018	0.000	Dec 2019	-		0.000	0.000	0.302	-
Subtotal			3.655	2.725		1.531		1.654		-		1.654	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Pendelton, CA	1.433	0.186	Oct 2017	0.080	Oct 2018	0.201	Oct 2019	-		0.201	Continuing	Continuing	Continuing
Test Equipment	WR	AVTB : MCTSSA Camp Pendleton	0.315	0.251	Oct 2017	0.015	Oct 2018	0.095	Oct 2019	-		0.095	0.000	0.676	-
Subtotal			1.748	0.437		0.095		0.296		-		0.296	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	1.618	0.580	Nov 2017	0.300	Nov 2018	0.409	Nov 2019	-		0.409	Continuing	Continuing	Continuing
Lab and Tech Writer Supt.	C/FFP	MCTSSA Camp Pendleton : Camp Pendleton	0.872	0.630	Dec 2017	0.371	Nov 2018	0.461	Nov 2019	-		0.461	0.000	2.334	-
Subtotal			2.490	1.210		0.671		0.870		-		0.870	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			10.323	4.372		2.297		2.820		-		2.820	Continuing	Continuing	N/A
Remarks															

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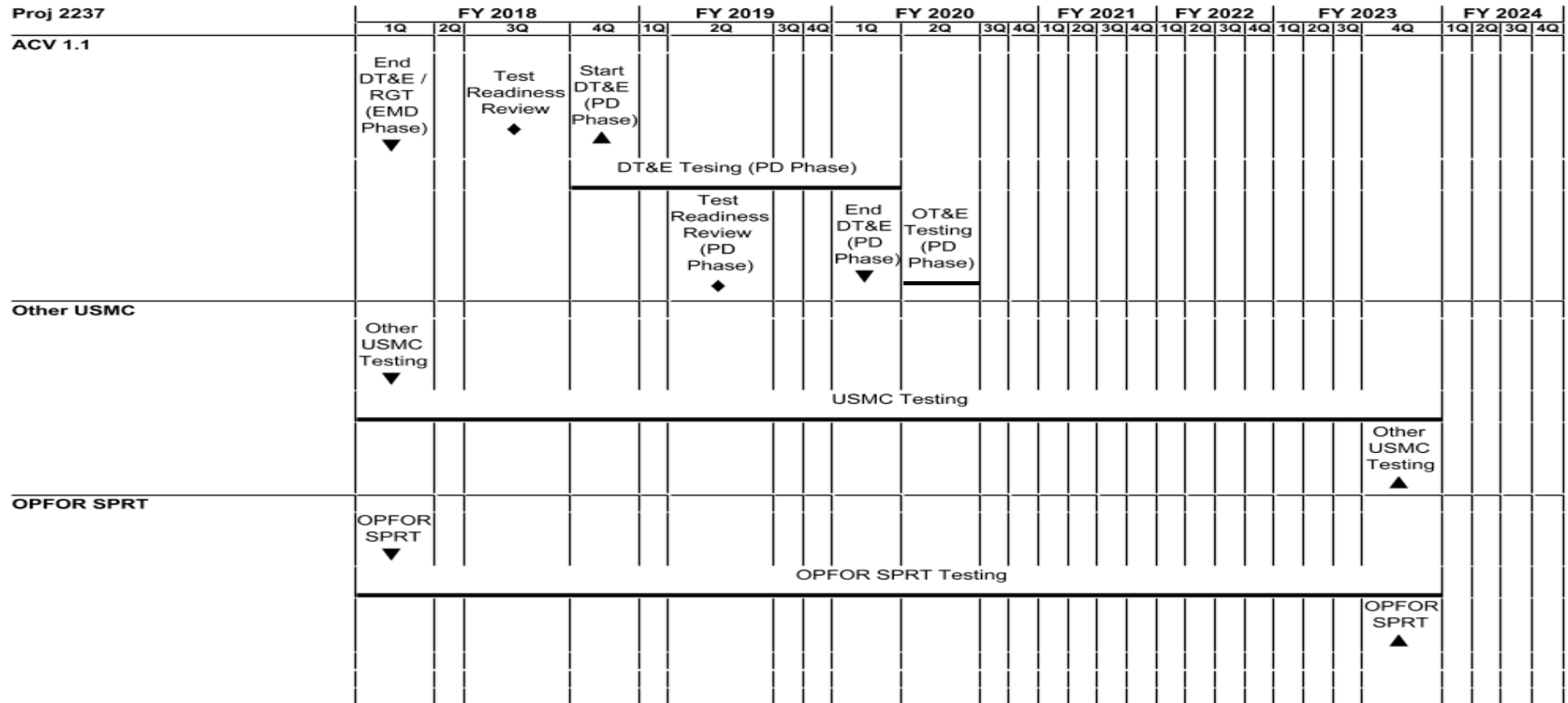
Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity
1319 / 7

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

Project (Number/Name)
2237 / Amphibious Vehicle Test



2020OSD - 0206623M - 2237

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2237 / Amphibious Vehicle Test	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2237				
ACV 1.1: FY18 End DT&E / RGT (EMD Phase)	1	2018	1	2018
ACV 1.1: FY18 (1) Test Readiness Review	3	2018	3	2018
ACV 1.1: FY18 Start DT&E (PD Phase)	4	2018	4	2018
ACV 1.1: FY 19 DT&E Tesing (PD Phase)	4	2018	1	2020
ACV 1.1: FY19 End DT&E (PD Phase)	1	2020	1	2020
ACV 1.1: FY19 (2) Test Readiness Review (PD Phase)	2	2019	2	2019
ACV 1.1: FY 20 OT&E Testing (PD Phase)	2	2020	2	2020
Other USMC: Other USMC Testing	1	2018	1	2018
Other USMC: USMC Testing	1	2018	4	2023
Other USMC: End of Other USMC Testing	4	2023	4	2023
OPFOR SPRT: OPFOR Support	1	2018	1	2018
OPFOR SPRT: OPFOR Support Testing	1	2018	4	2023
OPFOR SPRT: End of OPFOR Support	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
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			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2315: Training Devices/ Simulators	135.514	22.979	16.060	11.561	-	11.561	24.815	23.179	19.674	20.067	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)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Combined Arms Command and Control Trainer Upgrade System (CACCTUS)	5.215	3.021	1.504	0.000	1.504
Articles:	-	-	-	-	-
<p>Description: 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>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Continue integration of 3D viewer software. - Continue additional training system interoperability to include additional C4I devices. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>- Continue development of After Action Review (AAR) functionality.</div> <div>- Initiate development to retain currency of training and readiness tasks and tactics, techniques and procedures with combined arms efforts.</div> <div>- Complete transition to a new communications environment.</div> <div>- Continue development of new architecture to support maturing hardware platforms.</div> <div>FY 2020 Base Plans:</div> <div>- Continue integration of 3D viewer software.</div> <div>- Continue additional training system interoperability to include additional C4I devices.</div> <div>- Continue development of After Action Review (AAR) functionality.</div> <div>- Continue development to retain currency of training and readiness tasks and tactics, techniques and procedures with combined arms efforts.</div> <div>- Continue development of new architecture to support maturing hardware platforms.</div> <div>FY 2020 OCO Plans:</div> <div>N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div> <div>Decrease of \$1.517M is due to completion of transition to new communications environment and reduced development efforts for new architecture supporting hardware platforms.</div>						
<div>Title: Deployable Virtual Training Environment (DVTE)</div> <div>Articles:</div> <div>Description: 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.</div> <div>FY 2019 Plans:</div> <div>- Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan.</div>		2.284 -	2.408 -	0.804 -	0.000 -	0.804 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019				
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				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>- 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.</div> <div>- Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release.</div> <div>- 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.</div> <div>- Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release.</div> <div>- Continue enhancements to Combined Arms Planning functionality that will improve the DVTE system ability to replace live events.</div> <div>FY 2020 Base Plans:<div>- Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan.</div><div>- 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.</div><div>- Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release.</div><div>- 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.</div><div>- Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release.</div><div>- Complete enhancements to Combined Arms Planning functionality that will improve the DVTE system ability to replace live events.</div></div> <div>FY 2020 OCO Plans: N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div>							

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019					
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				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Decrease of \$1.604M is due to reduced scope of enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS).								
Title: Force on Force Training Systems (FoFTS)				1.836	4.182	1.635	0.000	1.635
Articles:				-	-	-	-	-
Description: 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 for a suite of tactical engagement systems that allow Marines to receive feedback in non-live fire FOF training by using low velocity projectiles or advanced, instrumented, laser-based tactical engagement systems.								
FY 2019 Plans:								
- Continue the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) development for the integration of the LAV-25, LAV-AT and M1A1 simulators.								
- Continue MFST JTAC task enhancements.								
- Initiate development of the close combat instrumentation for the Instrumented Tactical Engagement Simulation system (I-TESS) III training system with a limited user evolution of new technologies to meet the urban training requirements for within 10 m range engagements. This will support the integration of the 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.								
- Initiate development of a Long Term Evolution (LTE) wireless data communications network to support the Force on Force Next data backbone.								
The \$2.346M increase from FY18 to FY19 provided additional capabilities to test out the expanded Long Term Evolution (LTE) wireless data communication network for Range 220 (29 Palms, CA) large scale exercises with communications back haul.								
FY 2020 Base Plans:								
- Continue the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) development for the integration of the LAV-25, LAV-AT and M1A1 simulators.								
- Continue MFST JTAC task enhancements.								
- 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 for within 10m range engagements. This will support the integration of the Mobile Fire Support Trainer (MFST) into the I-TESS III environment developing								

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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. - Continue development of a Long Term Evolution (LTE) wireless data communications network to support the Force on Force Next data backbone. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The \$2.547M decrease from FY19 to FY20 is due to the test completion of the expanded Long Term Evolution (LTE) wireless data communication network for Range 220 (29 Palms, CA) large scale exercises with communications back haul.						
Title: Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements Articles: Description: 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. FY 2019 Plans: - Complete development to increase levels of software capability. - Continue to develop new software capabilities to meet changing operational environments. - Continue development of Joint Live, Virtual and Constructive (JLVC) federation capabilities.		7.447 -	2.995 -	1.156 -	0.000 -	1.156 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>- Continue JLVC Federation annual minor release.</div> <div>- Continue effort to re-engineer the MTWS software baseline.</div> <div>FY 2020 Base Plans:</div> <div>- Complete JLVC Federation annual minor release.</div> <div>- Continue to develop new software capabilities to meet changing operational environment.</div> <div>- Continue to develop Joint Live, Virtual and Constructive (JLVC) Federation capabilities.</div> <div>- Continue effort to re-engineer the MTWS software baseline.</div> <div>FY 2020 OCO Plans:</div> <div>N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div> <div>Decrease of \$1.839M is due to the reduced development efforts of the current software capability.</div>						
<div>Title: Ranges and Training Area Management (RTAM)</div> <div>Articles:</div> <div>Description: 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.</div> <div>FY 2019 Plans:</div> <div>- 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.</div> <div>- Continue enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon).</div> <div>- Continue the Tactical Video Capture System (TVCS) Mobile (RISCon) enhancements.</div> <div>FY 2020 Base Plans:</div> <div>- 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.</div> <div>- Continue enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon).</div>		1.057 -	1.068 -	4.119 -	0.000 -	4.119 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>- Continue enhancements of the Tactical Video Capture System (TVCS) Mobile (RISCon).</div> <div>- 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.</div> <div>- Initiate development of Live-fire, shoot back interactive target capabilities.</div> <div>FY 2020 OCO Plans: N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement: The \$3.051M increase from FY19 to FY20 supports integration with Location of Miss and Hit (LOMAH) capabilities and the development of Live-fire, shoot back interactive target capabilities.</div>						
<div>Title: Supporting Arms Virtual Trainer (SAVT)</div> <div>Articles: -</div> <div>Description: The SAVT will advance the training capability, operational readiness, and tactical proficiency of USMC Joint Terminal Attack Controllers (JTACS), Forward Observers (FOs), and Forward Air Controllers (FACs). The personnel will use training scenarios that require the placement of 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.</div> <div>FY 2019 Plans: - Utilize FY18 RDTE in FY19 to initiate and complete Information Assurance and networkability in order to interoperate with other Simulations in Live Virtual Constructive (LVC).</div> <div>FY 2020 Base Plans: N/A</div> <div>FY 2020 OCO Plans: N/A</div>		2.115 -	0.000 -	0.000 -	0.000 -	0.000 -
<div>Title: Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)]</div> <div>Articles: -</div>		2.716 -	2.386 -	1.995 -	0.000 -	1.995 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>Description: 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. 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>FY 2019 Plans:</p> <p>- Continue to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability.</p> <p>- Complete virtual integration tasks for CCS, SAVT, DVTE gateways and database commonality.</p> <p>FY 2020 Base Plans:</p> <p>- Continue to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability.</p> <p>FY 2020 OCO Plans:</p> <p>N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>The \$0.391M decrease from FY19 to FY20 is due to the completion of the virtual integration tasks.</p>						
<p>Title: Training Support</p> <p>Articles:</p> <p>Description: Provide training solution development efforts for the modernization of training systems by providing high fidelity, immersive simulations and capabilities. Integrates existing live, virtual, and constructive training capabilities to provide fully coordinated Marine Air Ground Training Force (MAGTF) training exercises that realistically simulate the operating environment.</p> <p>FY 2019 Plans:</p>		0.309 -	0.000 -	0.000 -	0.000 -	0.000 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019		
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	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A					
FY 2020 Base Plans: N/A					
FY 2020 OCO Plans: N/A					
Title: Training Simulation Support	0.000	0.000	0.348	0.000	0.348
Articles:	-	-	-	-	-
FY 2019 Plans: N/A					
FY 2020 Base Plans: - Initiate integration of the Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) into the Joint Live, Virtual and Constructive Federation.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: FY20 increase is to integrate Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) into the Joint Live, Virtual and Constructive Federation.					
Accomplishments/Planned Programs Subtotals	22.979	16.060	11.561	0.000	11.561

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• PMC/6532-01: Training Devices, CACCTUS	3.671	2.909	3.715	-	3.715	4.992	4.498	4.231	10.598	Continuing	Continuing
• PMC/6532-02: Training Devices, RTAM	16.646	22.476	28.022	-	28.022	26.507	25.326	27.868	33.720	Continuing	Continuing
• PMC/6532-03: Training Devices, SAVT	4.212	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.631
• PMC/6532-04: Training Devices, DVTE	1.072	0.947	1.437	-	1.437	4.479	4.294	4.241	4.326	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019	
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			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• PMC/6532-05: Training Devices, Force on Force Training Systems	16.335	20.942	53.749	-	53.749	61.175	58.968	9.518	23.399	Continuing	Continuing
• PMC/6532-06: Training Devices, Immersive Training Range Support/SITE	18.759	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.759
• PMC/6532-07: Training Devices, MTWS	0.426	0.752	0.619	-	0.619	0.867	0.853	0.811	0.827	Continuing	Continuing
Remarks											
FoFTS FY24 PMC includes \$13.851M for the Guam Initiative.											
D. Acquisition Strategy											
(U) CACCTUS - MIPRs to Army and exercise task orders via IDIQ contract.											
(U) DVTE - Exercise task orders off of IDIQ contract for Virtual Battleship Space (VBS) Software (SW) Development.											
(U) MTWS - Exercise task orders for Software Development and Re-engineering efforts via IDIQ contract.											
(U) RTAM - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract.											
(U) SAVT - New competitive (C/FFP) contract supporting the Joint Terminal Attack Controller (JTAC) Memorandum of Agreement (MOA) awarding Base contract in December 2017 and awarding task order to support this effort in Mar 2018.											
(U) Immersive Training Range Support (formerly SITE) - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract.											
(U) Training Support - Extended existing contract 9 months in order to continue activities in support of federate status with the Joint Live Virtual Constructive (JLVC) federation v.8, and complete in-process enhancements forUlchi Freedom Guardian-15 (UFG-15); Exercise task order on new competitive contract (C-IDIQ).											
(U) FoFTS - MIPR to Army-PEO STRI for award on existing Consolidated Product-line Management contract; New competitive I-TESS-III award planned for August 2019.											
(U) Tactical Decision Kits - awarded prime contract to Tuva, LLC, Herndon, VA.											
(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.											
E. Performance Metrics											
Program Management Reviews are conducted on all PM TRASYS programs on a quarterly basis to assess program status.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 TO 3	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.554	1.408	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CACCTUS - SW Dev TO 4	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.596	3.646	Aug 2018	1.700	May 2019	0.000		-		0.000	0.000	5.942	-
CACCTUS - SW Dev TO 5	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.739	0.161	Apr 2018	1.321	May 2019	0.000		-		0.000	0.000	2.221	-
CACCTUS - SW Dev TO 6	C/IDIQ	Riptide Software, Inc. : Orlando, FL	0.000	0.000		0.000		1.504	Jun 2020	-		1.504	0.000	1.504	-
DVTE - SW Dev - VBS	SS/IDIQ	Bohemia Interactive : Orlando, FL	13.813	2.284	May 2018	2.408	May 2019	0.804	Apr 2020	-		0.804	Continuing	Continuing	Continuing
Tactical Decision Kit	C/FFP	Tuva : Herndon, VA	7.200	0.000		0.000		0.000		-		0.000	0.000	7.200	-
MTWS - SW Dev Task 2	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	2.294	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MTWS - SW Dev Task 3	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.150	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MTWS - SW Dev Task 4	C/IDDQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
MTWS - SW Dev Task 5	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.097	0.000		0.000		0.000		-		0.000	0.000	0.097	-
MTWS - SW Dev Task 6	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.948	0.000		0.000		0.000		-		0.000	0.000	0.948	-
MTWS - SW Dev Task 7	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	2.217	0.000		0.000		0.000		-		0.000	0.000	2.217	-
MTWS - SW Dev Task 8	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.552	0.000		0.000		0.000		-		0.000	0.000	0.552	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 - Reengineering	C/IDIQ	RECOMPETE : TBD NEW VENDOR	0.000	5.221	Jun 2018	2.995	Aug 2019	1.156	Feb 2020	-		1.156	0.000	9.372	-
MTWS - SWDev Task 9	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	0.000	0.932	Jul 2018	0.000		0.000		-		0.000	0.000	0.932	-
MTWS - SWDev Task 10	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	0.000	0.382	Jun 2018	0.000		0.000		-		0.000	0.000	0.382	-
MTWS - SWDev Task 11	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	0.000	0.912	Mar 2018	0.000		0.000		-		0.000	0.000	0.912	-
RTAM RISCon Development	MIPR	PEOSTRI/TRADE : Orlando, FL	8.359	1.057	Dec 2017	1.068	Jul 2019	4.119	Dec 2019	-		4.119	Continuing	Continuing	Continuing
SAVT - Tech Insertion	C/FFP	Riptide Software, Inc. : Orlando, FL	0.000	2.115	Mar 2019	0.000		0.000		-		0.000	0.000	2.115	-
ITRS (SITE) - Live Core System Upgrades	C/FFP	Cubic Defense : San Diego, CA	3.563	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
ITRS (SITE) - Consolidated Product Line Dev	MIPR	PEOSTRI/TRADE : Orlando, FL	5.574	2.687	Dec 2017	2.361	Jul 2019	1.995	Dec 2019	-		1.995	Continuing	Continuing	Continuing
Training Support - MTWS - SW Dev Task 2	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.294	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Training Support - LVC-TE AoA	FFRDC	NAVSEA : Washington, DC	0.675	0.309	Jul 2018	0.000		0.000		-		0.000	0.000	0.984	-
Training Simulation Support	C/IDIQ	TBD : TBD	0.000	0.000		0.000		0.348	Jun 2020	-		0.348	0.000	0.348	-
FoFTS SW Development	MIPR	PEOSTRI/TRADE : Orlando, FL	0.000	1.836	Apr 2018	4.182	Jul 2019	1.635	Jul 2020	-		1.635	0.000	7.653	-
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	71.995	0.000		0.000		0.000		-		0.000	0.000	71.995	-
Subtotal			119.620	22.950		16.035		11.561		-		11.561	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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) - Travel	Various	DTS : Various	0.095	0.029	Sep 2018	0.025	Sep 2019	0.000		-		0.000	0.000	0.149	-
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	15.797	0.000		0.000		0.000		-		0.000	0.000	15.797	-
Subtotal			15.892	0.029		0.025		0.000		-		0.000	0.000	15.946	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	-
Subtotal			0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			135.514	22.979		16.060		11.561		-		11.561	Continuing	Continuing	N/A
Remarks Decrease from FY19 to FY20 reflects programs moving through their acquisition lifecycle.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																								Date: March 2019				
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								
Combined Arms Command & Control Training Upgrade System (CACCTUS)	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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																												
Govt Engineering Support																												
Software Development Reviews																												
Development Contract Awards	◆	◆	◆		◆	◆				◆																		
Annual SW Release	◆				◆				◆				◆				◆				◆				◆			
Test and Validation, All Sites																												
Mid Year Release			◆				◆			◆				◆				◆				◆				◆		
Full Operating Capability (FOC) Combined					■																							
2020DON - 0206623M - 2315																												

2020DON - 0206623M - 2315

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy											Date: March 2019																	
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									
Deployable Virtual Training Environment (DVTE)	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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				—				◆				◆				◆				◆				◆				◆
2020DON - 0206623M - 2315																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

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

Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS)		FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
		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
MTWS IPT/CCB				◆				◆				◆			◆			◆			◆			◆			◆		
Contract Award		◆		◆																									
				◆		◆	◆					◆	◆		◆		◆			◆	◆								
																					◆								
																								◆					
SW Release		◆																											

2020DON - 0206623M - 2315

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy											Date: March 2019																	
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									
Ranges and Training Area Management	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
RISCon Development	◆		◆		◆		◆		◆		◆		◆		◆		◆		◆		◆		◆		◆		◆	
Contract Award	◆				◆				◆				◆				◆				◆					◆		
Systems Integration																												
2020DON - 0206623M - 2315																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																								Date: March 2019				
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								
Supporting Arms Virtual Trainer (SAVT)	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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					◆																							
2020DON - 0206623M - 2315																												

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PE 0206623M: MC Ground Cmbt Spt Arms Sys
Navy

R-1 Line #230

R-1 Program Element (Number/Name)

PE 0206623M / MC Ground Cmbt Spt Arms
Sys

2315 / Training Devices/Simulators

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PE 0206623M: MC Ground Cmbt Spt Arms Sys
Navy

R-1 Line #230

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

Project (Number/Name) 2315 / <i>Training Devices/Simulators</i>	
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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy												Date: March 2019																
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								
Force on Force Training Systems (FoFTS)	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
	Contract Award	◆				◆				◆				◆				◆				◆						
	Contract Award							◆																				
Integration Testing			◆		◆		◆		◆		◆		◆		◆		◆		◆		◆		◆					
2020DON - 0206623M - 2315																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy												Date: March 2019																
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								
TACTICAL DECISION KITS (TDK)	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Initial Tasking		▲																										
Contract Award, Tuva LLC, Herndon, VA		◆																										
Authority to Operate (ATO) ends							▲																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																							Date: March 2019					
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				
Training Simulation Support	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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)												◆																
2020DON - 0206623M - 2315																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy

Date: March 2019

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

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Combined Arms Command & Control Training Upgrade System (CACCTUS)				
Program Contractor Support: Program Contractor Support	2	2018	2	2024
Govt Engineering Support: Govt Engineering Support	3	2018	3	2024
Software Development Reviews: Software Development Reviews	2	2018	2	2024
Development Contract Awards: FY18 Award 3	2	2018	2	2018
Development Contract Awards: FY18 Award 4	4	2018	4	2018
Development Contract Awards: FY18 Award 5	3	2018	3	2018
Development Contract Awards: FY19 Award 4	3	2019	3	2019
Development Contract Awards: FY19 Award 5	2	2019	2	2019
Development Contract Awards: FY20 Award 6	3	2020	3	2020
Annual SW Release: Annual SW Release 2018	2	2018	2	2018
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
Test and Validation, All Sites: Test and Validation 1, All Sites 2018	1	2018	4	2024
Mid Year Release: Mid Year Release 2018	4	2018	4	2018
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

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019	
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	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
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
Full Operating Capability (FOC) Combined: Full Operating Capability (FOC)/Full Development (FD)	2	2019	2	2019
Deployable Virtual Training Environment (DVTE)				
Software Development - Contract Award: Software Development - Contract Award 2018	3	2018	3	2018
Software Development - Contract Award: Software Development - Contract Award 2019	3	2019	3	2019
Software Development - Contract Award: Software Development - Contract Award 2020	3	2020	3	2020
Software Development - Contract Award: Software Development - Contract Award 2021	2	2021	2	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 Version Release - VBS: Software Development Version Release - VBS (2018)	4	2018	4	2018
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

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy

Date: March 2019

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
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
Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS)				
MTWS IPT/CCB: MTWS IPT/CCB 2018	3	2018	3	2018
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
Contract Award: Contract Award New Development	1	2018	1	2018
Contract Award: TO 7 Award	3	2018	3	2018
Contract Award: TO 8 Award	3	2018	3	2018
Contract Award: Contract Award Re-engineering	2	2019	2	2019
Contract Award: TO 1 Award	1	2019	1	2019
Contract Award: Contract Opt 1 Re-engineering	2	2020	2	2020
Contract Award: TO 2 Award	3	2020	3	2020
Contract Award: Contract Opt 2 Re-engineering	1	2021	1	2021
Contract Award: TO 3 Award	4	2021	4	2021
Contract Award: Contract Opt 3 Re-engineering	1	2022	1	2022
Contract Award: TO 4 Award	4	2022	4	2022
Contract Award: Contract Opt 4 Re-engineering	1	2023	1	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019	
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	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Contract Award: TO 5 Award	1	2023	1	2023
Contract Award: Contract Opt 5 Re-engineering	1	2024	1	2024
Contract Award: TO 6 Award	1	2024	1	2024
SW Release: SW Release 2018	1	2018	1	2018
Ranges and Training Area Management				
RISCon Development: RISCon SW Integration Testing 1st Qtr FY18	1	2018	1	2018
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY18	3	2018	3	2018
RISCon Development: RISCon SW Integration Testing 1st Qtr FY19	1	2019	1	2019
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY19	3	2019	3	2019
RISCon Development: RISCon SW Integration Testing 1st Qtr FY20	1	2020	1	2020
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY20	3	2020	3	2020
RISCon Development: RISCon SW Integration Testing 1st Qtr FY21	1	2021	1	2021
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY21	3	2021	3	2021
RISCon Development: RISCon SW Integration Testing 1st Qtr FY22	1	2022	1	2022
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY22	3	2022	3	2022
RISCon Development: RISCon SW Integration Testing 1st Qtr FY23	1	2023	1	2023
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY23	3	2023	3	2023
RISCon Development: RISCon SW Integration Testing 1st Qtr FY17	1	2024	1	2024
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY17	3	2024	3	2024
Contract Award: Contract Award (2018)	1	2018	1	2018
Contract Award: Contract Award (2019)	4	2019	4	2019
Contract Award: Contract Award (2020)	1	2020	1	2020
Contract Award: Contract Award (2021)	1	2021	1	2021
Contract Award: Contract Award (2022)	1	2022	1	2022
Contract Award: Contract Award (2023)	1	2023	1	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019	
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	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Contract Award: Contract Award (2017)	2	2024	2	2024
Systems Integration: Systems Integration	1	2023	4	2023
Supporting Arms Virtual Trainer (SAVT)				
SW Development and Integration: FY18 Task Order Award	2	2019	2	2019
Immersive Training Range Support				
Virtual System Upgrade Deliverables: Virtual System Upgrade Deliverables	1	2018	1	2018
Consolidated Product Line Development Awards: Consolidated Product Line Development (2018)	1	2018	1	2018
Consolidated Product Line Development Awards: Consolidated Product Line Development (2019)	4	2019	4	2019
Consolidated Product Line Development Awards: Consolidated Product Line Development (2020)	1	2020	1	2020
Consolidated Product Line Development Awards: Consolidated Product Line Development (2021)	1	2021	1	2021
Consolidated Product Line Development Awards: Consolidated Product Line Development (2022)	1	2022	1	2022
Consolidated Product Line Development Awards: Consolidated Product Line Development (2023)	1	2023	1	2023
Consolidated Product Line Development Awards: Consolidated Product Line Development (2024)	1	2024	1	2024
Training Support				
LVC-TE AoA: LVC-TE AoA	1	2018	1	2019
Force on Force Training Systems (FoFTS)				
Contract Award: FY18 Award	1	2018	1	2018
Contract Award: FY19 Award	4	2019	4	2019
Contract Award: FY20 Award	1	2020	1	2020
Contract Award: FY21 Award	1	2021	1	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy

Date: March 2019

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Contract Award: FY22 Award	1	2022	1	2022
Contract Award: FY23 Award	1	2023	1	2023
Contract Award: I-TESS III Award	3	2019	3	2019
Integration Testing: Integration Testing 3rd Qtr FY18	3	2018	3	2018
Integration Testing: Integration Testing 1st Qtr FY19	1	2019	1	2019
Integration Testing: Integration Testing 3rd Qtr FY19	3	2019	3	2019
Integration Testing: Integration Testing 1st Qtr FY20	1	2020	1	2020
Integration Testing: Integration Testing 3rd Qtr FY20	3	2020	3	2020
Integration Testing: Integration Testing 1st Qtr FY21	1	2021	1	2021
Integration Testing: Integration Testing 3rd Qtr FY21	3	2021	3	2021
Integration Testing: Integration Testing 1st Qtr FY22	1	2022	1	2022
Integration Testing: Integration Testing 3rd Qtr FY22	3	2022	3	2022
Integration Testing: Integration Testing 1st Qtr FY23	1	2023	1	2023
Integration Testing: Integration Testing 3rd Qtr FY23	3	2023	3	2023
TACTICAL DECISION KITS (TDK)				
Initial Tasking: Initial Tasking	2	2018	2	2018
Contract Award, Tuva LLC, Herndon, VA: Contract Award, Tuva LLC, Herndon, VA	2	2018	2	2018
Authority to Operate (ATO) ends: Authority to Operate (ATO) ends	3	2019	3	2019
Training Simulation Support				
LVC-TE Integration (MTWS): LVC-TE Integration (MTWS)	3	2020	3	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2503 / Initial Issue			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2503: Initial Issue	48.877	4.291	5.412	5.498	-	5.498	5.756	5.845	5.938	6.055	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 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, and Combat Field Feeding Systems; 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. Calibration of tools as simple as torque wrenches to as complex as satellite test equipment is required to ensure their safe

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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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 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 Marine Air Ground Tactical Force (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 2018	FY 2019	Base	OCO	Total
Title: Marine Corps Uniforms (MCU)	0.567	0.964	0.885	0.000	0.885
Articles:	-	-	-	-	-
FY 2019 Plans: - 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. Testing will require larger scale lab and field testing. - Continue testing and evaluation of emerging Marine Corps Uniform Board (MCUB) and Commandant of the Marine Corps (CMC) uniform initiatives (tropical uniforms and boots). - Continue research and development of tropical uniforms, including footwear, and develop affordable alternatives. Testing will require larger scale lab and field testing. - Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development. - Continue research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items. - Continue research and development of enhanced camouflage protection in the shortwave infrared (SWIR) and thermal signature spectrum. Materials, both flame resistant and non-flame resistant, were produced and analyzed.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2503 / Initial Issue		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>- Continue testing to impart flame resistant properties to non-flame resistant uniform (MCCUU) by adding chemistry in the manufacturing process.</div> <div>FY 2020 Base Plans:<div>- 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. Testing will require larger scale lab and field testing.</div><div>- Continue research and development for lighter uniforms, including footwear, and develop affordable alternatives. Testing will require larger scale lab and field testing.</div><div>- Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development.</div><div>- Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices.</div><div>- 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.</div><div>- Continue research and development of enhanced camouflage protection and mitigation of signature in the shortwave infrared (SWIR) and thermal spectrum. Produce and analyze flame resistant and non-flame resistant materials with enhanced signature mitigation.</div><div>- Continue testing to impart flame resistant properties to non-flame resistant uniform (MCCUU) by adding chemistry in the manufacturing process.</div></div> <div>FY 2020 OCO Plans:<div>- N/A</div></div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:<div>Decrease of \$.079M from 2019 to 2020 is in line with requirements and resource realignment of all commodity areas within the budget.</div></div>						
<div>Title: Cold Weather and Mountaineering (CWM)</div> <div>Articles:</div> <div>FY 2019 Plans:<div>- Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine.</div></div>		1.711 -	1.575 -	1.492 -	0.000 -	1.492 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2503 / Initial Issue		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div><div>- Continue to conduct market research for the Cold Weather clothing items to identify product improvements for the Cold Weather Facemask, Cold Weather Balaclava, and the Single Suspender Solution based upon existing requirements and to procure necessary test articles to support a Limited User Evaluation during FY20.</div><div>- Continue validation of ski systems and all components to include boots and clothing in order to procure an effective military ski system to full AAO.</div><div>- Continue the comparative analysis of sister services clothing items to minimize sustainment cost.</div><div>- Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK).</div><div>- Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals.</div><div>- Continue evaluation of Extreme Cold Weather boots and Intense Cold Weather boot.</div><div>- Continue on improvements to existing combat utility uniform and boots to include mitigation of shortwave infrared (SWIR) and thermal signatures, while increasing the Flame Resistance (FR) properties of combat uniforms.</div><div>- Continue developing material solutions for service uniforms, combat utility uniforms, tropical weather clothing, boots, and equipment.</div><div>- Conduct Field User Evaluation (FUE) on Military Ski System (MSS).</div></div> <div><div>FY 2020 Base Plans:</div><div>- Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine.</div><div>- Continue to conduct research for the Cold Weather clothing items to identify product improvements for the Cold Weather Facemask, Cold Weather Balaclava, headwear, and the Single Suspender Solution based upon existing requirements and to procure necessary test articles to support a Limited User Evaluation during FY20.</div><div>- Continue validation of ski systems and all components to include boots and clothing in order to procure an effective military ski system to full AAO.</div><div>- Continue the comparative analysis of sister services clothing items to minimize sustainment cost.</div><div>- Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK).</div><div>- Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals.</div><div>- Continue evaluation of Extreme Cold Weather boots and Intense Cold Weather boot.</div><div>- Continue on improvements to existing materials to include mitigation of shortwave infrared (SWIR) and thermal signatures, while increasing the Flame Resistance (FR) properties of cold weather and combat uniforms.</div></div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2503 / Initial Issue		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>- Continue developing material solutions for service uniforms, combat utility uniforms, cold weather clothing, boots, and equipment.</div> <div>FY 2020 OCO Plans:</div> <div>- N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div> <div>The decrease \$.083M between PB19 and PB20 is in line with requirements and resource realignment of all commodity areas within the budget.</div>						
<div>Title: Load Bearing and Pack Systems (LBPS)</div> <div>Articles:</div> <div>FY 2019 Plans:</div> <div>- 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 finalize Pack Adjustment Modification design, develop improved magazine pouches, and develop Scalable Load Carrier.</div> <div>- Continue evaluations on loadbearing equipment such as prototype versions of magazine pouches and Scalable Load Carrier to implement product improvements to USMC LBPS systems.</div> <div>FY 2020 Base Plans:</div> <div>- 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 update rifleman and grenadier set pouches.</div> <div>- Continue evaluations on loadbearing equipment such as Marine Corps pouch sets to implement product improvements to USMC LBPS systems.</div> <div>FY 2020 OCO Plans:</div> <div>N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div> <div>Increase of \$.059M from 2019 to 2020 funds the development, testing, and evaluation of replacement pouches to support changes to weapon systems, magazines, and ammunition.</div>		0.298 -	0.298 -	0.357 -	0.000 -	0.357 -
<div>Title: Individual Warfighting Equipment (IWE)</div> <div>Articles:</div>		0.186 -	0.112 -	0.134 -	0.000 -	0.134 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2503 / Initial Issue		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: - Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA). - Continue modernization of existing projects by leveraging the technological advances of industry.						
FY 2020 Base Plans: - Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA). - Continue modernization of existing projects, including knee & elbow pads, by leveraging the technological advances of industry.						
FY 2020 OCO Plans: - N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Increase of \$.022M from 2019 to 2010 due to minor modification to high demand low intensity SL3 items.						
Title: *Family of Field Medical Equipment (FFME)		0.900	1.001	1.028	0.000	1.028
Articles:		-	-	-	-	-
FY 2019 Plans: - 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, such as improved oxygen generation efforts, and field sterilization. - 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, such as improved blood product storage and refrigeration. - Continue testing and product development for possible application technology for insertion. - Continue collaborative testing with Army for patient movement research. - Continue collaborative testing efforts with Army for Traumatic Brain Injury (TBI) non-invasive diagnosis and treatment to determine viability in a operational environment in support of reduction of TBI effects.						
FY 2020 Base Plans: - Continue to test COTS/NDI medical equipment items for the ERCS, FRSS and STP to determine future viability in an operational environment.						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2503 / Initial Issue		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>- 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.</div> <div>- 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.</div> <div>- Continue collaborative testing efforts with Army for TBI non-invasive diagnosis and treatment to determine viability in a operational environment in support of reduction of TBI effects.</div> <div>- Complete collaborative testing with Army for patient movement research.</div> <div>FY 2020 OCO Plans: N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement: Increase in funding of \$0.027M from FY19 to FY20 aligns with the COTS/NDI medical equipment test and evaluation plans for AMAL insertion.</div>						
<div>Title: *Family of Shelters and Shelter Equipment (FSSE)</div> <div>Articles:</div> <div>FY 2019 Plans: - Continue development and evaluation of energy efficient Engineering Change Proposals (ECPs) such as alternative construction materials and processes for FSSE.</div> <div>FY 2020 Base Plans: - Continue development and evaluation of energy efficient ECPs such as alternative production techniques and designs for FSSE.</div> <div>FY 2020 OCO Plans: N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement: -PB19 to PB20 decrease (\$177K FY19) reflects early completion of SSH effort. Funding realigned to Combat Field Feeding Systems (CFFS) to support Feeding-On-The-Move effort. -FY19 to FY20 increase \$7K aligns with cost of executing ECPs.</div>		0.384 -	0.185 -	0.192 -	0.000 -	0.192 -
Title: *Family of Combat Field Feeding (CFFS)		0.245	0.227	0.060	0.000	0.060

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2503 / Initial Issue		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Articles:		-	-	-	-	-
FY 2019 Plans: - Continue evaluation testing of technological improvements for use in CFFS that will reduce the overall logistics burden such as alternative appliances and components. - Complete testing for Phase II SBIR Prototype for Alternate Energy Sources for Heating Rations. - Initiate and complete testing of Feeding-On-The-Move on multiple vehicle and trailer configurations.						
FY 2020 Base Plans: - 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.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: - PB19 to PB20 increase \$177K in FY19 reflects funding realigned from Family of Shelters and Shelter Equipment (FSSE) to CFFs in support of Feeding-On-The-Move effort. - FY19 to FY20 decrease (\$167K) aligns with the FY19 completion of the Feeding-On-The-Move testing on multiple vehicle and trailer configurations.						
Title: Calibration and Maintenance Program (CAMP)		0.000	0.250	0.250	0.000	0.250
Articles:		-	-	-	-	-
FY 2019 Plans: - Initiate exploration of emerging technologies to enhance technical capabilities of individual calibration equipment used within expeditionary calibration facilities by deployed Marine Corps units. New calibration equipment is required to replace obsolete items.						
FY 2020 Base Plans: - 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 equipment is required to replace obsolete items.						
FY 2020 OCO Plans: N/A						
Title: Family of Expeditionary Water Systems (FEWS)		0.000	0.400	0.700	0.000	0.700

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Articles:		-	-	-	-	-
FY 2019 Plans: -Initiate market research for Grey Water Recycling research to support improvements to the Combat Batch Laundry (CBL) and Shower systems.						
FY 2020 Base Plans: -Continue 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).						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Increase in FY 2020 supports market research, testing and refinement of shower system upgrades to the legacy program of record.						
Title: Family of Expeditionary Fuel Systems (FEFS)		0.000	0.400	0.400	0.000	0.400
Articles:		-	-	-	-	-
FY 2019 Plans: -Initiate market research of fuel systems utilized by a MAGTF during operations to right size fuel systems for proper distribution, storage and test capabilities.						
FY 2020 Base Plans: -Continue market research of fuel systems utilized by a MAGTF during operations to right size fuel systems for proper distribution, storage and test capabilities.						
FY 2020 OCO Plans: N/A						
Accomplishments/Planned Programs Subtotals		4.291	5.412	5.498	0.000	5.498

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019	
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2503 / Initial Issue			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• PMC/6522: Family of Field Medical Equipment	0.000	33.513	2.898	-	2.898	4.190	10.162	5.118	5.220	Continuing	Continuing
• PMC/4181: Calibration & Maintenance Program (CAMP).	0.576	11.916	11.817	-	11.817	2.829	2.931	0.144	0.147	Continuing	Continuing
• PMC/6670: Family of Expeditionary Water Systems (FEWS)	2.211	4.263	5.079	-	5.079	5.193	3.507	3.566	3.636	Continuing	Continuing
• PMC/6277: Family of Expeditionary Fuel Systems (FEFS)	1.788	0.054	0.052	-	0.052	0.051	0.051	0.050	0.051	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.											
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 RDTE 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.											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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<p>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 Navy's calibration RDT&E efforts.</p> <p>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.</p> <p>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.</p> <p><u>E. Performance Metrics</u> N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2503 / Initial Issue					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.000		0.250	Nov 2018	0.250	Jan 2020	-		0.250	Continuing	Continuing	Continuing
Family of Field Medical	C/FFP	MCSC : Quantico, VA	0.000	0.199	Mar 2018	0.686	Feb 2019	0.000		-		0.000	0.000	0.885	-
Cold Weather & Mountaineering	MIPR	USA NSRDEC : Natick, MA	0.299	0.949	Apr 2018	0.814	Feb 2019	0.737	Feb 2020	-		0.737	Continuing	Continuing	Continuing
Family of Shelters and Shelter Equipment	MIPR	USA NSRDEC : Natick, MA	1.084	0.180	Nov 2017	0.000		0.177	Feb 2020	-		0.177	0.000	1.441	-
Load Bearing and Pack Systems	MIPR	AFRL : Wright Patterson AFB	0.635	0.298	Feb 2018	0.298	Feb 2019	0.357	Feb 2020	-		0.357	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	Natick : Natick, MA	1.232	0.136	Nov 2017	0.000		0.000		-		0.000	0.000	1.368	-
Individual Warfighting Equipment	MIPR	USA NSRDEC : Natick, MA	0.570	0.187	May 2018	0.112	Feb 2019	0.134	Feb 2020	-		0.134	Continuing	Continuing	Continuing
Marine Corps Uniforms	MIPR	USA NSRDEC : Natick, MA	5.631	0.354	Jan 2018	0.482	Feb 2019	0.443	Dec 2019	-		0.443	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	Various : Various	21.760	0.000		0.000		0.000		-		0.000	0.000	21.760	-
Subtotal			31.211	2.303		2.642		2.098		-		2.098	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	-
Subtotal			1.096	0.000		0.000		0.000		-		0.000	0.000	1.096	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2503 / Initial Issue					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Marine Corps Uniform	MIPR	NCTRF : Natick, MA	0.290	0.118	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	U.S. Army Aeromedical Research Lab : Ft. Rucker, AL	0.000	0.101	Jul 2018	0.120	Feb 2019	0.220	Mar 2020	-		0.220	0.000	0.441	-
Family of Field Medical	MIPR	NSWC : Crane, ID	0.000	0.115	May 2018	0.000		0.115	Apr 2020	-		0.115	0.000	0.230	-
Family of Shelters & Shelter Equipment	MIPR	NSWC : Crane, ID	0.000	0.093	May 2018	0.000		0.000		-		0.000	0.000	0.093	-
Family of Shelters and Shelter Equipment	MIPR	Naval Surface AWarfare Center : Crane, ID	0.000	0.111	Dec 2017	0.000		0.000		-		0.000	0.000	0.111	-
Family of Field Medical	MIPR	Naval Surface Warfare Center : CRANE	0.000	0.000	Aug 2018	0.120	Dec 2018	0.000		-		0.000	0.000	0.120	-
Family of Field Medical	C/FFP	MCSC : Qauntico, VA	0.000	0.000		0.000		0.434	Nov 2019	-		0.434	0.000	0.434	-
Family of Expeditionary Water Systems	MIPR	NAVFAC : Port Hueneme, CA	0.000	0.000		0.400	Mar 2019	0.400	Mar 2020	-		0.400	0.000	0.800	-
Family of Combat Field Feeding	MIPR	USA NSRDEC : Natick, MA	0.734	0.073	Oct 2017	0.100	Jan 2019	0.060	Jan 2020	-		0.060	Continuing	Continuing	Continuing
Family of Expeditionary Water Systems	MIPR	ATC : Aberdeen Proving Grd, MD	0.000	0.000		0.000		0.300	Mar 2020	-		0.300	0.000	0.300	-
Family of Expeditionary Fuel Systems	MIPR	ARL : Aberdeen Proving Grd, MD	0.000	0.000		0.400	Mar 2019	0.400	Mar 2020	-		0.400	0.000	0.800	-
Family of Combat Field Feeding	MIPR	ATC : Aberdeen, MD	0.000	0.172	Nov 2017	0.127	Jan 2019	0.000		-		0.000	0.000	0.299	-
Marine Corps Uniforms	MIPR	USA NSRDEC : Natick, MA	0.767	0.094	Jan 2018	0.482	Feb 2019	0.442	Jan 2020	-		0.442	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	USAARL : Ft. Rucker, AL	1.508	0.000		0.000		0.220	Jan 2020	-		0.220	Continuing	Continuing	Continuing
Family of Shelters & Shelter Equipment	MIPR	USA NSRDEC : Natick, MA	0.627	0.000		0.171	Jan 2019	0.000		-		0.000	0.000	0.798	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2503 / Initial Issue					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	1.997	0.762	Dec 2017	0.761	Feb 2019	0.755	Mar 2020	-		0.755	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	NSWC : Dahlgren, VA	10.286	0.309	Aug 2018	0.000		0.000		-		0.000	0.000	10.595	-
Subtotal			16.209	1.948		2.681		3.346		-		3.346	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.361	0.000		0.000		0.000		-		0.000	0.000	0.361	-
Family of Field Medical	Various	MARCORSYSCOM : Quantico, VA	0.000	0.040	Aug 2018	0.035	Aug 2019	0.000		-		0.000	0.000	0.075	-
Family of Shelters and Shelter Equipment	Various	MCSC : Quantico, VA	0.000	0.000		0.014	Oct 2018	0.015	Oct 2019	-		0.015	0.000	0.029	-
Family of Field Medical	Various	MCSC : Quantico, VA	0.000	0.000		0.040	Oct 2018	0.039	Oct 2019	-		0.039	0.000	0.079	-
Subtotal			0.361	0.040		0.089		0.054		-		0.054	0.000	0.544	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			48.877	4.291		5.412		5.498		-		5.498	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

1319 / 7

R-1 Program Element (Number/Name)

PE 0206623M / MC Ground Cmbt Spt Arms
Sys

Project (Number/Name)

2503 / Initial Issue

Infantry Combat Equipment (ICE)	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Marine Corps Uniforms (MCU)																												
Navy Natick Testing Effort Support																												
Lab Testing																												
Shade Lab Testing																												
Uniform Testing																												
Footwear Testing																												
Flame Resistant Testing																												
Individual Warfighting Equipment (IWE)																												
Natick Lab Testing																												
Cold Weather and Mountaineering (CWM)																												
Natick Testing Effort Support																												
Lab Testing																												
Extreme & Intense Cold Weather Boot																												
Marine Assault Climbers Kit (MACK)																												
Ski and Sled System																												
Load Bearing and Pack Systems (LBPS)																												
Lab Testing and Support																												
Calibration And Maintenance Program (CAMP)																												
Develop & test emerging calibration equipment																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2503 / Initial Issue	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Infantry Combat Equipment (ICE)</i>				
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	2018	2	2024
<i>Calibration And Maintenance Program (CAMP)</i>				
Develop & test emerging calibration equipment:	1	2019	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2513 / Body Armor			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2513: Body Armor	51.076	4.205	4.970	4.771	-	4.771	4.696	4.793	4.833	4.930	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); Enhanced Small Arms Protective Inserts (ESAPI); Enhanced Combat Helmet (ECH); Improved Ballistic Eyewear (IBE); 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Ballistic Protection Systems Articles:								4.205	4.970	4.771	0.000	4.771
								-	-	-	-	-
FY 2019 Plans: - 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 a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal. - Continue testing for the next generation of eyewear, specifically the capability to protect against laser threats and to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments. - Complete testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability.												
FY 2020 Base Plans: - 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.												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2513 / Body Armor		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Continue to develop solutions that provide improved fit, modularity, and integration of armor systems. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease of .199M from FY2019 to FY2020 is due to the completion of the Plate Carrier Generation III First Article Test in FY2019.						
Accomplishments/Planned Programs Subtotals		4.205	4.970	4.771	0.000	4.771
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.						
E. Performance Metrics N/A						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2513 / Body Armor					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Ballistic Protection Systems	WR	NSWC : Dahlgren, VA	0.204	0.273	Nov 2017	0.145	Apr 2019	0.280	Nov 2019	-		0.280	0.000	0.902	-
Ballistic Protection Systems	MIPR	PM SPE Army : Ft Belvior	0.000	0.000		0.146	Feb 2019	0.000		-		0.000	0.000	0.146	-
Ballistic Protection Systems	MIPR	USA NSRDEC : Natick MA	9.477	0.000	Dec 2017	0.402	Dec 2018	0.500	Dec 2019	-		0.500	0.000	10.379	-
Ballistic Protection Systems	C/FFP	NRL : Washington DC	16.439	0.422	Mar 2018	0.522	Feb 2019	0.550	May 2020	-		0.550	0.000	17.933	-
Ballistic Protection Systems	MIPR	AFRL : Wright Parrerson, OH	4.559	0.968	Dec 2017	0.226	May 2019	0.200	May 2020	-		0.200	0.000	5.953	-
Ballistic Protection Systems	Various	MCSC : Various	2.244	0.316	Mar 2018	0.696	Dec 2018	0.418	Dec 2019	-		0.418	0.000	3.674	-
Subtotal			32.923	1.979		2.137		1.948		-		1.948	0.000	38.987	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Ballistic Protection Systems	MIPR	NSRDEC : Natick, MA	0.351	0.520	Dec 2017	0.650	Dec 2018	0.650	Dec 2019	-		0.650	0.000	2.171	-
Ballistic Protection Systems	MIPR	MCSC : Quantico, VA	0.000	0.324	Aug 2018	0.319	Aug 2019	0.311	Aug 2020	-		0.311	0.000	0.954	-
Ballistic Protection Systems	MIPR	NCTRF : Natick, MA	0.371	0.170	Feb 2018	0.270	Dec 2018	0.270	Dec 2019	-		0.270	0.000	1.081	-
Cumulative Funding Total	Various	CECOM : MITRE SUPPORT	0.054	0.000		0.000		0.000		-		0.000	0.000	0.054	-
Subtotal			0.776	1.014		1.239		1.231		-		1.231	0.000	4.260	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2513 / Body Armor					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Ballistic Protection Systems	MIPR	USA NSRDEC : Natick, MA	7.687	0.332	Apr 2018	0.100	Mar 2019	0.151	Mar 2020	-		0.151	0.000	8.270	-
Ballistic Protection Systems	MIPR	USA ATC : Aberdeen Prv Grnd, MD	1.298	0.327	May 2018	0.385	May 2019	0.350	May 2020	-		0.350	Continuing	Continuing	Continuing
Ballistic Protection Systems	WR	NRL : Washington, DC	3.415	0.000	Dec 2017	0.000	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Ballistic Protection Systems	MIPR	ARL : Various	0.488	0.230	Dec 2017	0.325	Jan 2019	0.321	Dec 2019	-		0.321	0.000	1.364	-
Ballistic Protection Systems	WR	NAVAL Health research Center : Arlington, VA	0.000	0.323	Dec 2017	0.000	Dec 2018	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 Belvoir	0.000	0.000		0.199	Feb 2019	0.200	Feb 2020	-		0.200	0.000	0.399	-
Ballistic Protection Systems	MIPR	AFRL : Wright Patterson, OH	0.000	0.000		0.125	Dec 2018	0.120	Dec 2019	-		0.120	0.000	0.245	-
Ballistic Protection Systems	Various	MCSC : Quantico, VA	0.000	0.000	May 2018	0.460	Jun 2019	0.450	Mar 2020	-		0.450	0.000	0.910	-
Prior Year Cumulative Funding	Various	Various : Various	4.198	0.000		0.000		0.000		-		0.000	0.000	4.198	-
Subtotal			17.377	1.212		1.594		1.592		-		1.592	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			51.076	4.205		4.970		4.771		-		4.771	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																							Date: March 2019					
Appropriation/Budget Activity 1319 / 7													R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys										Project (Number/Name) 2513 / Body Armor					
Proj 2513	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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 (ECH)																											
	Next Generation Helmet																											
	Hearing Protection																											
	Eye Protection																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2513 / Body Armor	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2513				
Body Armor Improvements: Body Armor Improvements	1	2018	4	2024
Enhanced Combat Helmet (ECH): Enhanced Combat Helmet (ECH)	1	2018	4	2024
Next Generation Helmet: Next Generation Helmet	1	2018	4	2024
Hearing Protection: Hearing Protection	1	2018	4	2024
Eye Protection: Eye Protection	1	2018	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2928 / Exp Indirect Fire Gen Supt Wpn Sys			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2928: Exp Indirect Fire Gen Supt Wpn Sys	13.791	2.981	22.748	0.898	-	0.898	0.490	0.500	0.500	0.500	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 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 and distributed operations. HIMARS is a significant improvement over previously fielded ground fire support systems. Expeditionary Indirect Fires provides the Ground Combat Element (GCE) needed to engage multiple threat systems. Development provides for the modernization and obsolescence mitigation of the HIMARS in order to provide improved operational capabilities

Funding for NMESIS effort moved from BA7 to BA4 in FY20-FY24 from 0206623M to 0603635M (Proj 7400) in support of:

The Navy/Marine Expeditionary Ship Interdiction System (NMESIS) is a major RDT&E effort to develop long term and short term solutions for an Anti-Ship Missile (ASM) capability in support of the Marine Corps Expeditionary Advanced Base Operations (EABO) and the National Defense Strategy approach to build a more lethal Joint Force. The NMESIS project will prototype a USMC system while leveraging other Service-developed missiles to provide a ground based anti-access/area denial, anti-ship capability. In addition, ASM capabilities will be further developed through advanced component improvements and launcher integration into a complex, prototype and unmanned ground vehicle system. Furthermore, the prototyping effort will include the development, design, build, and initial testing of a Remotely Operated Ground Unit Expeditionary (ROGUE) Fires vehicle. ROGUE-Fires is an unmanned ground vehicle based system on a Joint Light Tactical Vehicle (JLTV) chassis, capable of mounting a wide range of missile systems for dynamic force employment and supports the NDS objective to evolve innovative operational concepts. Overall, this effort provides strategic deterrence in the global operational environment through layered missile capability and dynamic force employment.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: HIMARS Expeditionary & Naval Integration Capabilities	2.981	22.748	0.898	0.000	0.898
Articles:	-	-	-	-	-
FY 2019 Plans:					
-Developed Re-supply System (RSS) radio/intercom replacement and integration					
-Provide engineering support for GMLRS Insensitive Munition (IM) rocket motor qualification and certifications					
FY 2020 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019	
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 2928 / Exp Indirect Fire Gen Supt Wpn Sys	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
-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. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY19 to FY20 is due to \$21.85M being realigned from PE 0206623M/Project 2928 to PE 0603635M/Project 7400 in support of the Anti-Ship Missile (ASM) capability developmental and testing efforts.					
Accomplishments/Planned Programs Subtotals	2.981	22.748	0.898	0.000	0.898

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PMC/BLI 221200: High Mobility Artillery Rocket System (HIMARS)	60.103	130.981	100.002	-	100.002	63.685	71.062	63.420	63.702	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
RDT&E efforts for USMC HIMARS support Joint Force 2025 guidance, the National Defense Strategy (NDS) and the Maritime Operation Center (MOC) to employ HIMARS as a Sea Control capability from distributed locations to include naval platforms or surface connectors to support distributed maneuver. Support the continued development of long-range precision fire capabilities from austere and expeditionary bases and to improve the range and capacity to provide fires supporting multiple entry points from the sea. Development will consist of the design integration and support from a combination of Army/Navy labs and multiple DOD contractors.											
E. Performance Metrics											
Milestone Reviews											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2928 / Exp Indirect Fire Gen Supt Wpn Sys					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
HIMARS RSS intercom/ Radio Integration	WR	SPAWAR : Charleston, SC	0.000	0.000		0.000	Dec 2018	0.550	Dec 2019	-		0.550	0.000	0.550	-
NMESIS ASM OTA	C/BOA	MCSC : Quantico, VA	0.000	0.090	Sep 2018	0.000		0.000		-		0.000	0.000	0.090	-
HIMARS ASM Capabilities	Various	Various : Various	0.000	0.677	Jan 2018	19.295	Jan 2019	0.000		-		0.000	0.000	19.972	-
HIMARS expeditionary radio capabilities	MIPR	ARDEC: Redstone : Arsenal, AL	1.454	1.537	Jan 2018	0.000		0.000		-		0.000	0.000	2.991	-
HIMARS Comm Capabilities	Various	Various : Various	0.873	0.677	Jan 2018	0.000		0.000		-		0.000	0.000	1.550	-
HIMARS Safety Engineering Support	WR	NSWC : Indian Head, MD	0.000	0.000		0.000		0.098	Dec 2019	-		0.098	0.000	0.098	-
HIMARS Engineering Support	WR	NSWC : Dahlgren, VA	0.000	0.000		0.000		0.250	Dec 2019	-		0.250	0.000	0.250	-
Subtotal			2.327	2.981		19.295		0.898		-		0.898	0.000	25.501	N/A
Remarks															
Requirements for NMESIS (Long Range Precision Fires, Sea Control) is defined by the product development in support of Anti-Ship Missile (ASM) Capabilities and the unmanned Remotely Operated Ground Unit Expeditionary (ROGUE) Fires. NMESIS is a conjoined development and integration of both efforts.															
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
HIMARS anti-ship capabilities	Various	various : various	0.000	0.000		3.453	Nov 2018	0.000		-		0.000	0.000	3.453	-
Prior year cumulative funding	Various	various : various	5.820	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			5.820	0.000		3.453		0.000		-		0.000	Continuing	Continuing	N/A
Remarks															
Requirements for NMESIS (Long Range Precision Fires, Sea Control) is defined by testing in support of Anti-Ship Missile (ASM) Capabilities and the unmanned Remotely Operated Ground Unit Expeditionary (ROGUE) Fires. NMESIS is the testing and integration of both efforts. FY19 will test the unmanned vehicle prototype and the ASM launcher onto the prototype.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 2928 / Exp Indirect Fire Gen Supt Wpn Sys					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	5.644	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			5.644	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			13.791	2.981		22.748		0.898		-		0.898	Continuing	Continuing	N/A
Remarks															

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PE 0206623M: MC Ground Cmbt Spt Arms Sys
Navy

R-1 Line #230

R-1 Program Element (Number/Name)	Program Element Description	Program Element Type	Program Element Status	Program Element Location	Program Element Contact	Program Element Comments
1	1.1	1.1.1	1.1.1.1	1.1.1.1.1	1.1.1.1.1.1	1.1.1.1.1.1.1
2	2.1	2.1.1	2.1.1.1	2.1.1.1.1	2.1.1.1.1.1	2.1.1.1.1.1.1
3	3.1	3.1.1	3.1.1.1	3.1.1.1.1	3.1.1.1.1.1	3.1.1.1.1.1.1
4	4.1	4.1.1	4.1.1.1	4.1.1.1.1	4.1.1.1.1.1	4.1.1.1.1.1.1
5	5.1	5.1.1	5.1.1.1	5.1.1.1.1	5.1.1.1.1.1	5.1.1.1.1.1.1
6	6.1	6.1.1	6.1.1.1	6.1.1.1.1	6.1.1.1.1.1	6.1.1.1.1.1.1
7	7.1	7.1.1	7.1.1.1	7.1.1.1.1	7.1.1.1.1.1	7.1.1.1.1.1.1
8	8.1	8.1.1	8.1.1.1	8.1.1.1.1	8.1.1.1.1.1	8.1.1.1.1.1.1
9	9.1	9.1.1	9.1.1.1	9.1.1.1.1	9.1.1.1.1.1	9.1.1.1.1.1.1
10	10.1	10.1.1	10.1.1.1	10.1.1.1.1	10.1.1.1.1.1	10.1.1.1.1.1.1
11	11.1	11.1.1	11.1.1.1	11.1.1.1.1	11.1.1.1.1.1	11.1.1.1.1.1.1
12	12.1	12.1.1	12.1.1.1	12.1.1.1.1	12.1.1.1.1.1	12.1.1.1.1.1.1
13	13.1	13.1.1	13.1.1.1	13.1.1.1.1	13.1.1.1.1.1	13.1.1.1.1.1.1
14	14.1	14.1.1	14.1.1.1	14.1.1.1.1	14.1.1.1.1.1	14.1.1.1.1.1.1
15	15.1	15.1.1	15.1.1.1	15.1.1.1.1	15.1.1.1.1.1	15.1.1.1.1.1.1
16	16.1	16.1.1	16.1.1.1	16.1.1.1.1	16.1.1.1.1.1	16.1.1.1.1.1.1
17	17.1	17.1.1	17.1.1.1	17.1.1.1.1	17.1.1.1.1.1	17.1.1.1.1.1.1
18	18.1	18.1.1	18.1.1.1	18.1.1.1.1	18.1.1.1.1.1	18.1.1.1.1.1.1
19	19.1	19.1.1	19.1.1.1	19.1.1.1.1	19.1.1.1.1.1	19.1.1.1.1.1.1
20	20.1	20.1.1	20.1.1.1	20.1.1.1.1	20.1.1.1.1.1	20.1.1.1.1.1.1
21	21.1	21.1.1	21.1.1.1	21.1.1.1.1	21.1.1.1.1.1	21.1.1.1.1.1.1
22	22.1	22.1.1	22.1.1.1	22.1.1.1.1	22.1.1.1.1.1	22.1.1.1.1.1.1
23	23.1	23.1.1	23.1.1.1	23.1.1.1.1	23.1.1.1.1.1	23.1.1.1.1.1.1
24	24.1	24.1.1	24.1.1.1	24.1.1.1.1	24.1.1.1.1.1	24.1.1.1.1.1.1
25	25.1	25.1.1	25.1.1.1	25.1.1.1.1	25.1.1.1.1.1	25.1.1.1.1.1.1
26	26.1	26.1.1	26.1.1.1	26.1.1.1.1	26.1.1.1.1.1	26.1.1.1.1.1.1
27	27.1	27.1.1	27.1.1.1	27.1.1.1.1	27.1.1.1.1.1	27.1.1.1.1.1.1
28	28.1	28.1.1	28.1.1.1	28.1.1.1.1	28.1.1.1.1.1	28.1.1.1.1.1.1
29	29.1	29.1.1	29.1.1.1	29.1.1.1.1	29.1.1.1.1.1	29.1.1.1.1.1.1
30	30.1	30.1.1	30.1.1.1	30.1.1.1.1	30.1.1.1.1.1	30.1.1.1.1.1.1
31	31.1	31.1.1	31.1.1.1	31.1.1.1.1	31.1.1.1.1.1	31.1.1.1.1.1.1
32	32.1	32.1.1	32.1.1.1	32.1.1.1.1	32.1.1.1.1.1	32.1.1.1.1.1.1
33	33.1	33.1.1	33.1.1.1	33.1.1.1.1	33.1.1.1.1.1	33.1.1.1.1.1.1
34	34.1	34.1.1	34.1.1.1	34.1.1.1.1	34.1.1.1.1.1	34.1.1.1.1.1.1
35	35.1	35.1.1	35.1.1.1	35.1.1.1.1	35.1.1.1.1.1	35.1.1.1.1.1.1
36	36.1	36.1.1	36.1.1.1	36.1.1.1.1	36.1.1.1.1.1	36.1.1.1.1.1.1
37	37.1	37.1.1	37.1.1.1	37.1.1.1.1	37.1.1.1.1.1	37.1.1.1.1.1.1
38	38.1	38.1.1	38.1.1.1	38.1.1.1.1	38.1.1.1.1.1	38.1.1.1.1.1.1
39	39.1	39.1.1	39.1.1.1	39.1.1.1.1	39.1.1.1.1.1</	

Project (Number/Name)	Start Date	End Date	Duration (Days)	Progress (%)	Status	Owner	Team Lead	Key Milestones	Notes
101/Alpha	2023-01-15	2023-03-10	55	75	On Track	John Doe	Jane Smith	Requirement Gathering, Design, Development	Minor delays in development phase.
102/Beta	2023-02-01	2023-04-15	74	60	At Risk	Emily White	Michael Brown	Analysis, Design, Development, Testing	Resource allocation issues.
103/Gamma	2023-03-01	2023-05-20	79	40	On Track	David Green	Sarah Black	Requirement Gathering, Design, Development	Steady progress.
104/Delta	2023-03-15	2023-06-01	78	20	On Track	Alice Blue	Chris Red	Analysis, Design, Development	Initial planning phase.
105/Epsilon	2023-04-01	2023-06-15	75	10	On Track	Frank Purple	Grace Yellow	Requirement Gathering, Design	Early stage project.
106/Zeta	2023-04-15	2023-07-01	78	5	On Track	Henry Orange	Ivy Green	Analysis, Design	Very early stage.
107/Eta	2023-05-01	2023-07-15	75	0	On Track	Jack Blue	Karen Red	Requirement Gathering	Just starting.
108/Theta	2023-05-15	2023-07-30	76	0	On Track	Liam Purple	Mia Yellow	Analysis	Planning phase.
109/Iota	2023-06-01	2023-08-15	75	0	On Track	Noah Orange	Olivia Green	Requirement Gathering	Initial setup.
110/Kappa	2023-06-15	2023-08-30	76	0	On Track	Peter Blue	Quinn Red	Analysis	Early planning.

2928 / Exp Indirect Fire Gen Supt Wpn Sys

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 2928 / Exp Indirect Fire Gen Supt Wpn Sys

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2928				
Artillery Weapons: NMESIS (Long Range Precision Fires): Development Efforts: NMESIS Vehicle Platform Testing	1	2019	4	2022
Artillery Weapons: NMESIS (Long Range Precision Fires): Development Efforts: Anti-Ship Integration	1	2019	4	2024
Artillery Weapons: NMESIS (Long Range Precision Fires): Development Efforts: Test & Eval	1	2020	4	2023
Artillery Weapons: HIMARS: Development Efforts: Communication Replacement and Integration	1	2018	1	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
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			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3098: Fire Support System	149.717	5.559	5.999	7.773	-	7.773	6.856	3.100	3.183	3.246	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Fire Support System (FSS) provides the Marine Corps critical operational and logistics capabilities in artillery weapons, fire direction and targeting systems. This includes the following projects:

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. Funding is used to ensure Clinger Cohen Act (CCA) and Information Assurance (IA) requirements are met. 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), the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD), and the Common Laser Range Finder (CLRF). 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.

Family of Artillery Munitions (FAM) funding is used to develop and mature artillery munitions for the Marine Corps triad of fire 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.

The Family of Internally Transportable Vehicles (FITV) are light weight and internally transportable in the V-22, CH-53D & CH53E tilt and rotary wing aircraft consisting of the Utility Task Vehicle (UTV), the future Ultra-Light Tactical Vehicle (ULTV), and the obsolete Internally Transportable Vehicle (ITV). The ITV included two vehicle platforms, the ITV Prime Mover (PM) and the ITV Light Strike Variant (LSV). The FITV provide deployed Marine Air-Ground Task Force (MAGTF) and Marine Expeditionary Unit (Special Operations Capable) (MEU (SOC)) with vehicles that are internally transportable in selected rotary and fixed wing aircraft. The FITV are expeditionary vehicles supporting over-the-horizon amphibious operations, irregular warfare and enhanced company operations. It is fielded to Infantry and Reconnaissance units. Speed, maneuverability, and the use of cover and concealment are the crew's primary means of survival. Efforts have begun to replace the current Family of Internally Transportable Vehicles. This initiative is called the Ultra-Light Tactical Vehicle (ULTV), which will replace the current Utility Task Vehicles

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019				
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				
(UTV). The ULTV will be a government-off-the shelf (GOTS)/Commercial-Off-the-Shelf (COTS)/modified-off-the-shelf (MOTS) solution that will fulfill the FITV mission of an internally transportable vehicle noted above and is planned to have logistics, communications, and weapons mounted variants.								
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)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Fire Support Mods (FSM) Articles: Description: Funding is used for upgrades, engineering change proposals (ECP), and modifications to system hardware and software for the Marine Artillery Survey Set (MASS), Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S), the Improved Position Azimuth Determining System (IPADS), and the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD) as well as technical refresh for target acquisition, and artillery survey and meteorological systems. Funding is also used for upgrades, Engineering Change Proposals (ECPs) and modifications for guided munitions and fire control systems which falls within Fire Support Systems for the Marine Corps. FY 2019 Plans: - Continue development of GCFS replacement components for operational usage and obsolescence management. - Continue product improvements to increase performance capability of legacy targeting and other fire support systems. - Continue development of advanced components for the Improved Position Azimuth Determining System (IPADS) replacement system. - Complete Modeled Meteorological Manager (MMIM)communication testing with a Global Broadcast Service (GBS) Portal Receiver Suite (PRS). FY 2020 Base Plans: - Continue product improvements to increase performance capability of legacy targeting and other fire support systems. - Continue development of advanced components for the Improved Position Azimuth Determining System (IPADS) replacement system.				2.763	2.511	1.982	0.000	1.982
				-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Initiate development of new software configuration changes for Modeled Meteorological Manager (MMIM) to inter-operate with global meteorological models.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Funding decrease from FY 2019 to FY 2020 is due to decrease in FSM efforts.						
Title: Family of Artillery Munitions (FAM)		0.261	0.321	1.080	0.000	1.080
Articles:		-	-	-	-	-
Description: FAM - Efforts include acquisition planning for future munitions, replacement of existing stockpiles, and providing technologically enhanced artillery munitions in order to mitigate/fill capability gaps in range, accuracy, and lethality and reduce undue logistical burden. Additionally, the program office addresses Weapon System Explosives Safety Review Board (WSESRB) requirements for naval transportation issues for all artillery projectiles, propellants, and fuzes.						
The M483A1 and M864 155mm DPICM munitions will no longer be authorized for use after 2018 because they fail to meet the 1 percent Unexploded Ordinance (UXO) criteria established by the Department of Defense Policy memorandum dated 19 June 2008 (DoD Policy on Cluster Munitions and Unintended Harm to Civilians).						
The Marine Corps is interested in solutions that are effective against the same target sets the M483A1 and M864 munitions are designed to engage, this includes: individual area targets dispersed over a defined area, targets whose precise locations are not known, time-sensitive or moving targets, and massed formations of enemy forces. Furthermore, in order to review possible joint development with partner nations the USMC is interested in options compliant with DoD policy and the Convention on Cluster Munitions (CCM) treaty. Solutions which are compliant to DoD Policy on Cluster Munitions but not the CCM treaty are also of interest.						
FY 2019 Plans: -Continue to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for Dual Purpose Improved Conventional Munitions (DPICM) replacement munition and Precision Guidance Kit (PGK) 150mm no function software upgrade, and anti-jam development.						
FY 2020 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<div>-Conduct additional munitions safety efforts, testing and analysis of results required to achieve type qualification and review board approvals for Dual Purpose Improved Conventional Munitions (DPICM) replacement munition and Precision Guidance Kit Modernization(PGK-M).</div> <div>-Review possible joint munitions development efforts with partner Services and other nations that are compliant with DoD policy and the Convention on Cluster Munitions (CCM) treaty.</div> <div>-Research munitions which are compliant to DoD Policy on Cluster Munitions but not the CCM treaty.</div> <div>FY 2020 OCO Plans: N/A</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement: The FAM funding line has received \$759K baseline increase in FY20. This funding will provide engineering, safety, analytical and administrative efforts required to achieve type qualification and safety review board approval, either by the JSWSR or WSESRB for DPICM replacement munitions.</div>						
<div>Title: Common Laser Range Finder (CLRF)</div> <div>Articles:</div> <div>Description: 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.</div> <div>FY 2019 Plans: Initiate development of the NGHTS to replace current fielded laser designators and spot imager into a single foot mobile capability.</div> <div>FY 2020 Base Plans:</div>		0.473 -	3.167 -	4.711 -	0.000 -	4.711 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019				
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				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue development of NGHTS with completion planned for FY21								
FY 2020 OCO Plans: N/A								
FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY 2019 to FY 2020 is due to increased integration requirements to complete prototyping to support LRIP phase of project.								
Title: Family of Internally Transportable Vehicle (FITV)				1.550	0.000	0.000	0.000	0.000
Articles:				-	-	-	-	-
Description: Family of Internally Transportable Vehicle (FITV) program fields expeditionary vehicles to ground units to support various operations. Provides the Marine Air-Ground Task Force (MAGTF) ground combat units with vehicles transportable in the MV-22 and CV-22 tilt-rotor aircraft as well as the CH53.								
FY 2019 Plans: FY19 and out decrease is due to realignment from project 3098, Fire Support Systems, to project 3775 Family of Internally Transportable Vehicles.								
FY 2020 Base Plans: N/A								
FY 2020 OCO Plans: N/A								
Title: Conventional Ground Ammunition				0.512	0.000	0.000	0.000	0.000
Articles:				-	-	-	-	-
Description: All DoD services are required to field munitions that are insensitive munitions (IM) compliant. IM compliancy is measured by the performance of munitions to six tests; Fast Cook-Off, Slow Cook-Off, Bullet Impact, Fragment Impact, Sympathetic Detonation, and Shape Charge Jet. Services are required to submit IM Strategic Plans annually delineating how they intend on executing their Service IM effort to maximize IM improvements to both new development and legacy conventional ground ammunition. These IM Strategic Plans, Supporting Plan of Actions, and Milestones, with funding trial, are submitted to the JROC, demonstrating each Service's commitment to the continuing effort to improve IM characteristics of Conventional Ground Ammunition, for approval. In order to achieve the system's IM performance, the Conventional Ground Ammunition developer/								

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
owner must have new technology identified and available to address IM shortfalls at the onset of the ammunition development or available for insertion during improvement opportunities for legacy ammunition. Under this program, the USMC invests in IM technology which will improve its existing munitions IM reactions or ability to reliably initiate IM technologies and complies with the OSD mandate for maximum feasible IM compliance.						
FY 2019 Plans: Funds transferred to project C3774.						
FY 2020 Base Plans: Funds transferred to project C3774.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: N/A						
Accomplishments/Planned Programs Subtotals		5.559	5.999	7.773	0.000	7.773
C. Other Program Funding Summary (\$ in Millions)						
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete
• PMC/473302: Fire Support Mods	4.064	9.741	4.299	-	4.299	Continuing
• PMC/6545: Family of ITV	1.266	0.606	0.647	-	0.647	0.000
• PMC/473300: Common Laser Range Finder (CLRF)	18.196	15.904	12.955	-	12.955	0.000
						Total Cost
						Continuing
						140.644
						146.414
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: Initiate coordination between the Army's Armament, Research and Development Engineering Center (ARDEC), and MCSC's and NSWC DD science and technology efforts to commence development of the Future Survey System. Continue liaison with the Army's PM TAS in order to leverage future efforts and increase the probability of a joint procurement. Initiate development of a MMIM communications reach back capability to allow for ingestion of meteorological data into artillery firing data for						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / <i>MC Ground Cmbt Spt Arms Sys</i>	Project (Number/Name) 3098 / <i>Fire Support System</i>
<p>units deployed to austere locations with limited or no bandwidth communications. 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.</p> <p>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), Precision Guidance Kit (PGK), M1122 High Explosive (HE) and M1123 Infrared (IR) and M1124 Visible Light (VL) 155mm rounds. Each munitions' status is tracked to ensure Marine Corps requirements are satisfied throughout the systems lifecycle.</p> <p>Common Laser Range Finder (CLRF): The Common Laser Range Finder Integrated Capability (CLRF IC) will develop the NGHTS to replace current fielded laser designators and spot imager into a single foot mobile capability and implement targeted Engineering Change Proposals into the currently fielded target location device to provide Joint Fires Observers and Joint Terminal Attack Controllers a single lightweight mission defined device that meets future operational requirements and extends the equipment service life to 2035. NGHTS will be procured via a full and open competition.</p> <p>Family of Internally Transportable Vehicles (FITV): The FITV program strategy is to explore, research and recommend efforts to address and identify solutions to reliability and safety design issues through government off-the-shelf (GOTS), commercial off-the-shelf (COTS) or modified off-the-shelf (MOTS) components. This includes the efforts to begin to replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV). This effort transfers to 3775.</p> <p>Conventional Ground Ammunition: The Conventional Ground Ammunition strategy is to invest in Insensitive Munitions (IM) technologies to address IM shortfalls of priority programs identified in the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP). Once the IM technologies have been successfully demonstrated and matured, the intent is to insert the new technologies into new conventional ground ammunition development as well as provide opportunities to improve legacy munitions IM characteristics. The IM R&D effort directly addresses the mandated OSD requirement to obtain incremental IM improvement in pursuit of becoming fully IM compliant to the maximum extent practicable.</p> <p>E. Performance Metrics N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	117.783	0.000		0.000		0.000		-		0.000	0.000	117.783	-
FAM Development	WR	NSWC : Dahlgren, VA	0.000	0.000		0.000		0.155	Jan 2020	-		0.155	0.000	0.155	-
CLRF	MIPR	MCSC : MCSC	0.000	0.473	Feb 2018	3.167	Feb 2019	4.711	Feb 2020	-		4.711	Continuing	Continuing	Continuing
Fire Support Mods	WR	NAVSEA : Washington, DC	0.509	0.300	Jul 2018	0.000		0.000		-		0.000	0.000	0.809	-
Conventional Ground Ammunition	MIPR	ARDEC : Picatinny, NJ	1.492	0.000		0.000		0.000		-		0.000	0.000	1.492	-
Fire Support Mods	MIPR	ARDEC : Picatinny, NJ	0.851	1.380	Apr 2018	1.328	Jan 2019	1.011	Nov 2019	-		1.011	0.000	4.570	-
Fire Support Mods	WR	NSWC : Dahlgren, VA	0.729	0.728	Jan 2018	0.390	Jan 2019	0.691	Nov 2019	-		0.691	0.000	2.538	-
Fire Support Mods	WR	MCTSSA : San Diego, CA	0.000	0.000		0.473	Mar 2019	0.000		-		0.000	0.000	0.473	-
Fire Support Mods	MIPR	Army Research Lab : Adelphi, MD	11.346	0.000		0.200	Jan 2019	0.000		-		0.000	0.000	11.546	-
Fires Support Mods (MMIM)	MIPR	Army Research Lab : Adelphi, MD	1.352	0.355	Nov 2017	0.000		0.280	Nov 2019	-		0.280	0.000	1.987	-
Subtotal			134.062	3.236		5.558		6.848		-		6.848	Continuing	Continuing	N/A
Remarks															
CLRF-Increase of 1.544 from FY 2019 to FY 2020 is due to increased integration requirements to complete prototyping to support LRIP phase of project.															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	2.615	0.000		0.000		0.000		-		0.000	0.000	2.615	-
FITV Engineering Support	C/CPFF	NATC : Carson City, NV	0.925	1.418	Aug 2018	0.000		0.000		-		0.000	0.000	2.343	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
FAM Engineering Support	WR	NSWC : Dahlgren, VA	2.752	0.261	Jan 2018	0.321	Jan 2019	0.225	Jan 2020	-		0.225	0.000	3.559	-
Subtotal			6.292	1.679		0.321		0.225		-		0.225	0.000	8.517	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
FAM DPICM Replacement Munition Testing	C/BA	TBD : TBD	0.000	0.000		0.000		0.700	Jan 2020	-		0.700	0.000	0.700	-
Prior Year Cumulative Funding: Fire Support Mods	Various	Various : Various	8.549	0.000		0.000		0.000		-		0.000	0.000	8.549	-
Fire Support Mods	WR	MCTSSA : San Diego, CA	0.000	0.000	Feb 2018	0.120	Dec 2018	0.000		-		0.000	0.000	0.120	-
FITV Snow Mobility Test	C/BOA	NATC : Carson City, NV	0.229	0.132	Nov 2017	0.000		0.000		-		0.000	0.000	0.361	-
Conventional Ground Ammunition	WR	NSWC : Indian Head, MD	0.059	0.512	Jul 2018	0.000		0.000		-		0.000	0.000	0.571	-
Subtotal			8.837	0.644		0.120		0.700		-		0.700	0.000	10.301	N/A
Remarks															
FAM-Increase of 0.759 from FY 2019 to FY 2020 will provide additional engineering, safety, analytical and testing efforts required to achieve type qualification and review board approvals for Dual Purpose Improved Conventional Munitions (DPICM) replacement munition and Precision Guidance Kit Modernization (PGK-M).															
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.526	0.000		0.000		0.000		-		0.000	0.000	0.526	-
Subtotal			0.526	0.000		0.000		0.000		-		0.000	0.000	0.526	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy										Date: March 2019			
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			
	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	149.717	5.559		5.999		7.773		-		7.773	Continuing	Continuing	N/A
Remarks													

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

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

FSML Program Schedule

EVENT	FY18	FY19	FY20	FY21	FY22	FY23	FY24
MILESTONES							
Testing & Reviews							
IPADS-R DT/LUE							
Test Readiness Review (TRR)							
Production and Development							
IPADS Replacement - LRIP							
IPADS Replacement - Fielding							
MMM Hardware Refresh							
GPSS Hardware Refresh							
MMM Comm Reachback Dvlpmnt							
MMM Comm Reachback Prcmnt							
Sustainment							

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PE 0206623M: MC Ground Cmbt Spt Arms Sys
Navy

R-1 Line #230

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

Proj 3098					FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
					1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
CLRF																																
					Prototype Development																											
																	DT				LRIP				Full Rate Production							

2020OSD - 0206623M - 3098

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
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

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3098				
CLRF: Prototype Development	1	2019	4	2021
CLRF: DT	3	2021	4	2021
CLRF: LRIP	2	2022	4	2022
CLRF: Full Rate Production	1	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 3774 / Marine Corps Ammo			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3774: Marine Corps Ammo	0.000	0.000	1.321	1.297	-	1.297	1.306	1.314	1.326	1.353	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 FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.												
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 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. 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)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Ammunition Life Cycle Management Articles:								0.000	0.803	0.776	0.000	0.776
								-	-	-	-	-
Description: Ammunition Life Cycle Management Program supports the PM Ammo 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 designed to extend the												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 3774 / Marine Corps Ammo		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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.						
FY 2019 Plans: - Continue to support the FY18 projects: Emergency Resupply project & two automated site planning projects - Lightweight Ammunition Packaging (LAP) Project: Develop a lightweight ammunition container that "lightens the load" on individual Marines and saves transportation costs across all modes of transportation.						
FY 2020 Base Plans: - Support the following FY20 projects: 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. 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. Ammo Inspection Tools Project: Provides Marines with automated means to count and inspect munitions. Reduces manpower needs and increases inventory accuracy. 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. Lightweight Ammo Packaging Test: Test the lightweight ammunition container developed in FY19 to determine if the new container meets the specifications of the MIL-STD-1904B.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: No significant change from FY 2019 to FY2020.						
Title: Conventional Ground Ammunition		0.000	0.518	0.521	0.000	0.521
Articles:		-	-	-	-	-
FY 2019 Plans: The FY19 increase is due to the realignment of funding from project C3098, Fire Support Systems to project C3774, Marine Corps Ammo.						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019					
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 3774 / Marine Corps Ammo				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>Continue</p> <p>(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)</p> <p>The FY19 effort will include integration of concept design, hardware fabrication and testing.</p> <p>Initiate</p> <p>(1) LAW FFE Particle Impact Mitigation Sleeve (Armament Research and Development Engineering Command, Picatinny NJ)</p> <p>Optimize PIMS design for LAW FFE M72E10 to improve bullet/fragment impact performance. PIMS technology developed under Joint Insensitive Munitions Technology Program, FY19 funding will be used to optimize the PIMS design for the LAW FFE M72E10 anti-structure munition to improve reaction from bullet and fragment impact threats.</p> <p>OCO:</p> <p>N/A.</p> <p>FY 2020 Base Plans:</p> <p>Continue</p> <p>(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)</p> <p>Complete testing of final configuration to improve slow cook off performance.</p> <p>(2) LAW FFE Particle Impact Mitigation Sleeve (Armament Research and Development Engineering Command, Picatinny NJ)</p> <p>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.</p> <p>FY 2020 OCO Plans:</p> <p>N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>								

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys		Project (Number/Name) 3774 / Marine Corps Ammo	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
No significant change from FY 2019 to FY 2020.					
Accomplishments/Planned Programs Subtotals	0.000	1.321	1.297	0.000	1.297
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy Non Developmental Item/Commercial off the Shelf (NDI/COTS).					
E. Performance Metrics N/A					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy													Date: March 2019		
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 3774 / Marine Corps Ammo					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Ammunition Life Cycle Management	MIPR	ARDEC : Picatinny, NJ	0.000	0.000		0.803	Dec 2018	0.776	Oct 2019	-		0.776	Continuing	Continuing	Continuing
Conventional Ground Ammunition	WR	NSWC IHEODTD : Indian Head, MD	0.000	0.000		0.318	Jan 2019	0.321	Mar 2020	-		0.321	Continuing	Continuing	Continuing
Conventional Ground Ammunition	WR	ARDEC : Picatinny NJ	0.000	0.000		0.200	Jan 2019	0.200	Mar 2020	-		0.200	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		1.321		1.297		-		1.297	Continuing	Continuing	N/A
			Prior Years	FY 2018	FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			0.000	0.000	1.321		1.297		-		1.297	Continuing	Continuing	N/A	
Remarks															

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PE 0206623M: MC Ground Cmbt Spt Arms Sys
Navy

R-1 Line #230

Project (Number/Name)
3774 / Marine Corps Ammo

[illegible]

2019DON - 0206623M - 3774

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 3774 / Marine Corps Ammo	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3774				
Ammunition Life Cycle Management - no major milestones	1	2019	4	2023
Conventional Ground Ammunition - no major milestones	1	2019	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 I 7					R-1 Program Element (Number/Name) PE 0206623M I MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 3775 I Family of Internally Transportable Vehicles (FITV)			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3775: Family of Internally Transportable Vehicles (FITV)	0.253	0.000	0.245	2.180	-	2.180	2.183	0.235	0.240	0.245	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, Family of Internally Transportable Vehicles funding has been realigned from project 3098, Fire Support Systems to project 3775 Family of Internally Transportable Vehicles. Realignment of efforts to new projects in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Family of Internally Transportable Vehicles (FITV) are light weight and internally transportable in the V-22, CH-53D & CH53E tilt and rotary wing aircraft consisting of the Utility Task Vehicle (UTV) and the future Ultra-Light Tactical Vehicle (ULTV). The FITV provide deployed Marine Air-Ground Task Force (MAGTF) and Marine Expeditionary Unit (Special Operations Capable) (MEU (SOC)) with vehicles that are internally transportable in selected rotary and fixed wing aircraft. The FITV are expeditionary vehicles supporting over-the-horizon amphibious operations, irregular warfare and enhanced company operations. It is fielded to Infantry and Reconnaissance units. Speed, maneuverability, and the use of cover and concealment are the crew's primary means of survival. Efforts have begun to replace the current Family of Internally Transportable Vehicles. This initiative is called the Ultra-Light Tactical Vehicle (ULTV), which will replace the current Utility Task Vehicles (UTV). The ULTV will be a government-off-the shelf (GOTS) or Commercial-Off-the-Shelf (COTS) or modified-off-the-shelf (MOTS) solution that will fulfill the FITV mission of an internally transportable vehicle noted above and is planned to have logistics, communications, and weapons mounted variants. The FY19 to FY20 increase of \$1.935M is due to vehicle testing on performance and durability along with operational assessments.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Family of Internally Transportable Vehicles	0.000	0.245	2.180	0.000	2.180
Articles:	-	-	-	-	-
FY 2019 Plans:					
FITV funding continues the ULTV technology demonstration effort to evaluate commercial vehicle candidates for possible use by the Marine Corps and to identify performance envelopes of currently available COTS base configuration vehicles that are capable of being internally transported.					
FY 2020 Base Plans:					
FITV funding will test durability and performance requirements for potential ULTV commercial candidates that will be provided from vendors as bid samples, as well as execute an operational assessment to determine					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019	
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)	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>Marine Corps suitability and effectiveness. The information gathered during these events will be used as criteria for the ULTV production contract.</p> <p>FY 2020 OCO Plans: N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY19 to FY20 increase of \$1.935M is due to vehicle testing on performance and durability along with operational assessments.</p>					
Accomplishments/Planned Programs Subtotals	0.000	0.245	2.180	0.000	2.180

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• PMC/6545: Ultra-Light Tactical Vehicle (ULTV)	1.266	0.606	0.647	-	0.647	4.019	5.955	8.827	9.004	0.000	140.644
Remarks											
<p>D. Acquisition Strategy</p> <p>The ULTV program is currently conducting a technology demonstration to evaluate commercial vehicle candidates for possible use by the Marine Corps and to identify performance envelopes of currently available COTS based configuration vehicles that are capable of being internally transported. The final vehicle solution will be determined through full and open competition. Vendors will have the opportunity to respond to a request for proposal (RFP), the government will select three vendors to provide bid samples for testing and operational assessments. The information gathered during these events will be used as criteria for determining the ULTV production contract.</p> <p>The FITV program strategy is to explore, research and recommend efforts to address and identify solutions to reliability and safety design issues through government off-the-shelf (GOTS), commercial off-the-shelf (COTS) or modified off-the-shelf (MOTS) components.</p>											
E. Performance Metrics											
N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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)					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
ULTV Technology Demonstration	C/CPFF	NATC : Carson City, NV	0.000	0.000		0.245	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.245		0.000		-		0.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Testing Events	C/CPFF	NATC : Carson City, NV	0.253	0.000		0.000		1.180	Mar 2020	-		1.180	0.000	1.433	-
Operational Assesment	C/CPFF	NATC : Carson City, NV	0.000	0.000		0.000		1.000	Jun 2020	-		1.000	0.000	1.000	-
Subtotal			0.253	0.000		0.000		2.180		-		2.180	0.000	2.433	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.253	0.000		0.245		2.180		-		2.180	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

1319 / 7

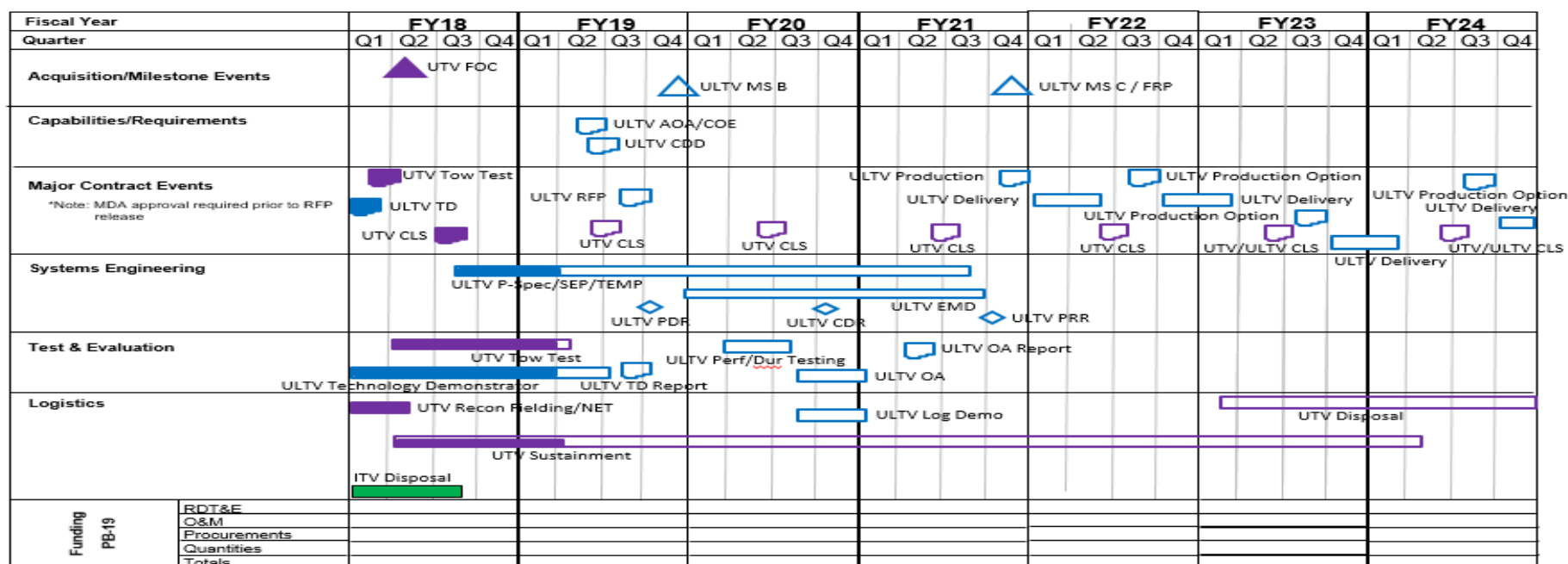
R-1 Program Element (Number/Name)

PE 0206623M / MC Ground Cmbt Spt Arms Sys

Project (Number/Name)

3775 / Family of Internally Transportable Vehicles (FITV)

Family of Internally Transportable Vehicles



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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
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)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3775				
Proj 3775: ULTV TD	1	2018	4	2019
Proj 3775: Milestone B	4	2019	4	2019
Proj 3775: Milestone C	4	2021	4	2021
Proj 3775: Operational Assesment	3	2020	2	2021
Proj 3775: UTV Tow Test	2	2018	2	2019
Proj 3775: PDR	3	2019	4	2019
Proj 3775: UTV CLS	2	2018	3	2024
Proj 3775: UTV Tow Test Contract	1	2018	2	2018
Proj 3775: ULTV Production Contract Award	4	2021	4	2021
Proj 3775: ULTV CLS Contract Award	3	2023	3	2023
Proj 3775: CDR	4	2020	4	2020
Proj 3775: PRR	4	2021	4	2021
Proj 3775: ULTV Performance/Durability Testing	1	2020	3	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
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			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
4002: Family of Raid Reconnaissance	1.077	0.526	7.556	1.613	-	1.613	1.842	18.345	22.671	23.124	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.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Airborne Reconnaissance Equipment (ARE) Articles: FY 2019 Plans: - Complete EMMPS/PS-2 system performance and system safety verification. - 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. FY 2020 Base Plans: - 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. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The decrease of \$.277M from FY2019 to FY2020 is due to finalization of testing for EMMPS/PS-2.								0.421	0.427	0.150	0.000	0.150
								-	-	-	-	-
Title: Amphibious Reconnaissance Capability								0.105	0.116	0.302	0.000	0.302

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Articles:		-	-	-	-	-
FY 2019 Plans: - Continue research and development of amphibious support equipment in support of MAGTF Joint Force and USSOCOM commanders to maneuver, surface or subsurface operations. Specifically, continue research and development efforts for navigation capabilities of the Diver Reconnaissance Vehicle (DRV).						
FY 2020 Base Plans: - 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).						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: The increase of \$.186M from FY2019 to FY2020 is due to the purchase of 1 E-DPD for testing in open water.						
Title: Aerial Delivery and Autonomous Distribution Entry		0.000	7.013	1.161	0.000	1.161
Articles:		-	-	-	-	-
FY 2019 Plans: - Initiate 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 (MAGU), the modularity within aerial delivery systems and various other critical capabilities such as tracking, programming and battery diagnostics. - Initiate 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. Developed capabilities will also add retrograde and unit to unit transit re-distribution not inherent with air drop alone. Release Engineering, Manufacturing and Development (EMD) contract and Low Rate Initial Production (LRIP) contract aligned to Milestone B and C. Certifications include Information Assurance and Net Ready.						
FY 2020 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019		
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	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>- 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 (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/A2D2. Specifically, the integration and development of autonomy aspects for a distribution system of support for resupply and air drops.</p> <p>FY 2020 OCO Plans: N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: The decrease of \$5.852M from FY2019 to FY2020 is due to ULS-A finalization of Joint Capability Technology Demonstration, Phase I development focused on autonomy and refinement of Common Control Module/Human Machine Interface (CCM/HMI) interfaces.</p>					
Accomplishments/Planned Programs Subtotals	0.526	7.556	1.613	0.000	1.613

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PMC/6518: Amphibious Support Equipment	6.230	14.890	7.101	-	7.101	7.181	32.858	52.717	45.640	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.

(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), Diver Propulsion Device (DPD), Combat Rubber Raiding Craft (CRRC) and the Diver Reconnaissance Vehicle (DRV).

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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
<p>(U) Aerial Delivery and Autonomous Distribution 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).</p> <p>E. Performance Metrics Milestone reviews.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
ARE, Various	Various	MCSC : Quantico, VA	0.014	0.000		0.015	Jun 2019	0.000		-		0.000	Continuing	Continuing	Continuing
ARE, Jumper Testing Capability	MIPR	Yuma Proving Ground : Yuma, AZ	0.182	0.000		0.150	Apr 2019	0.000		-		0.000	Continuing	Continuing	Continuing
ARC, MABK and RDOPTS	MIPR	DLA Troop Support : Philadelphia, PA	0.133	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
ARC, A/M Tech Package	WR	NSWC : Carderock	0.000	0.015	Jan 2018	0.000		0.000		-		0.000	0.000	0.015	-
ARC, Battery Chargin Sys	C/FFP	MCSC : Quantico	0.000	0.030	Feb 2018	0.000		0.010	Feb 2020	-		0.010	0.000	0.040	-
ADAD ULS-AIR	Various	NAVAIR : PAX RIVER, MD	0.000	0.000		2.500	May 2019	0.335	May 2020	-		0.335	0.000	2.835	-
ADAD ULS-AIR	MIPR	US Army RDECom : Natick, MA	0.000	0.000		2.271	May 2019	0.000		-		0.000	0.000	2.271	-
ARC, E-DPD	TBD	MCSC : Quantico, VA	0.000	0.000		0.026	Dec 2018	0.192	Dec 2019	-		0.192	0.000	0.218	-
Subtotal			0.329	0.045		4.962		0.537		-		0.537	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
ARE, Sys Eng Support	C/FFP	MCSC : Quantico, VA	0.500	0.000		0.116	Mar 2019	0.000		-		0.000	Continuing	Continuing	Continuing
ADAD, Sys Eng Support	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.200	Mar 2019	0.000		-		0.000	0.000	0.200	-
ADAD Sys Eng Support	Various	NAVAIR : PAX RIVER, MD	0.036	0.000		0.400	Mar 2019	0.150	Mar 2020	-		0.150	0.000	0.586	-
ADAD SYS Eng Support	MIPR	US Army RDECOM : Natick, MA	0.000	0.000		0.469	Apr 2019	0.200	Apr 2020	-		0.200	0.000	0.669	-
Subtotal			0.536	0.000		1.185		0.350		-		0.350	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
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					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
ARE, Various (travel)	Various	Various : Various	0.104	0.041	Jun 2018	0.043	Sep 2019	0.056	Sep 2020	-		0.056	Continuing	Continuing	Continuing
ARC, DeBatts Testing	WR	NSWC : Carderock	0.009	0.000		0.060	Dec 2018	0.060	Dec 2019	-		0.060	0.000	0.129	-
ARE, PS2 FAT Dummy Drops	MIPR	YPG : Yuma	0.000	0.278	Jun 2018	0.000		0.000		-		0.000	0.000	0.278	-
ARE, EMMPS Jumper Testing	C/FFP	MCSC : Quantico	0.046	0.092	Jun 2018	0.093	Jun 2019	0.094	Jun 2020	-		0.094	0.000	0.325	-
ADAD Software Testing	MIPR	NRSDEC : Natick	0.000	0.000		0.583	Feb 2019	0.000		-		0.000	0.000	0.583	-
ARC, Various (travel)	Various	Various : Various	0.053	0.035	Sep 2018	0.030	Sep 2019	0.040	Sep 2020	-		0.040	0.000	0.158	-
ARC, Dive Tablet	MIPR	DLA Troop Support : Philadelphia, PA	0.000	0.035	Jun 2018	0.000		0.000		-		0.000	0.000	0.035	-
ADAD, ULS-AIR	TBD	NAVAIR : PAX RIVER, MD	0.000	0.000		0.300	Aug 2019	0.250	Aug 2020	-		0.250	0.000	0.550	-
ADAD, ULS-AIR	MIPR	US ARMY, RDECOM : Natick, MA	0.000	0.000		0.300	Aug 2019	0.226	Aug 2020	-		0.226	0.000	0.526	-
Subtotal			0.212	0.481		1.409		0.726		-		0.726	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1.077	0.526		7.556		1.613		-		1.613	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

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

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 4002																												
Air Recon: EMMPS/PS2 Jumper Testing																												
Air Recon: EMMPS/PS2 Award																												
Amphibious Reconnaissance: Aerial Delivery and Autonomous Distribution (A2D2) Prototype																												
Amphibious Reconnaissance: A2D2 Phase I TRV Flight Developmental Test and TRV80 Operational Demo																												
Amphibious Reconnaissance: A2D2 Phase II TRV150/400 SkyFalcon Flight Developmental Test and Operational Eval																												
Amphibious Reconnaissance: A2D2 Phase III SkyFalcon and TRV Flight Developmental Test and Final Operational Eval																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
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	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4002				
Air Recon: EMMPS/PS2 Jumper Testing	3	2018	3	2020
Air Recon: EMMPS/PS2 Award	4	2018	4	2018
Amphibious Reconnaissance: Aerial Delivery and Autonomous Distribution (A2D2) Prototype	3	2019	3	2019
Amphibious Reconnaissance: A2D2 Phase I TRV Flight Developmental Test and TRV80 Operational Demo	4	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

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	5.000	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.000
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 2018	FY 2019
Congressional Add: Polymer Cased Small Arms Ammunitions	5.000	0.000
FY 2018 Accomplishments: Activities and Tasks required to successfully develop lightweight small caliber cartridge cases, container and link solutions to production.		
FY 2019 Plans: N/A		
Congressional Add: Advanced Lightweight Polymer Cased 7.62mm Ammunition	0.000	8.000
FY 2018 Accomplishments: N/A		
FY 2019 Plans: 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).		
Congressional Adds Subtotals	5.000	8.000

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.

E. Performance Metrics
 Milestone reviews and OSD execution benchmarks as defined.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy													Date: March 2019		
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Polymer Cased Small Arms Ammunitions	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	4.400	Jun 2019	0.000		0.000		-		0.000	0.000	4.400	-
Lightweight Small Caliber Ammunition (LSCA) Phase IIA	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		0.463	Jun 2019	0.000		-		0.000	0.000	0.463	-
Lightweight Small Caliber Ammunition (LSCA) Phase IIB	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		0.550	Jun 2019	0.000		-		0.000	0.000	0.550	-
Lightweight Links	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		0.600	Jun 2019	0.000		-		0.000	0.000	0.600	-
Accelerated Aging	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		0.872	Jun 2019	0.000		-		0.000	0.000	0.872	-
Propellant Optimization	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		1.000	Jun 2019	0.000		-		0.000	0.000	1.000	-
Metal Injection Molding (MIM) Process Analysis	C/BOA	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		2.000	Jun 2019	0.000		-		0.000	0.000	2.000	-
Subtotal			0.000	4.400		5.485		0.000		-		0.000	0.000	9.885	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Monitoring	MIPR	NSWC Indian Head : Indian Head, MD	0.000	0.600	Feb 2019	0.000		0.000		-		0.000	0.000	0.600	-
Lightweight Small Caliber Ammunition (LSCA) ARDEC Support	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		1.120	Feb 2019	0.000		-		0.000	0.000	1.120	-
Lightweight Small Caliber Ammunition (LSCA) PM MAS Support	MIPR	PM Manuever Ammunition Systems (MAS) : Picatinny Arsenal, NJ	0.000	0.000		0.230	Feb 2019	0.000		-		0.000	0.000	0.230	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys				Project (Number/Name) 9999 / Congressional Adds					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Lightweight Small Caliber Ammunition (LSCA) ARL Support	MIPR	US Army Research Laboratory (ARL) : Adelphi, MD	0.000	0.000		0.090	Feb 2019	0.000		-		0.000	0.000	0.090	-
Lightweight Small Caliber Ammunition (LSCA) BSO Support	MIPR	Ballistic Services Office (BSO) : Independence, MO	0.000	0.000		0.075	Feb 2019	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	0.000		0.600	Feb 2019	0.000		-		0.000	0.000	0.600	-
Lightweight Small Caliber Ammunition (LSCA) USMC Support	MIPR	NSWC Corona : Fallbrook, CA	0.000	0.000		0.400	Feb 2019	0.000		-		0.000	0.000	0.400	-
Subtotal			0.000	0.600		2.515		0.000		-		0.000	0.000	3.115	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	5.000		8.000		0.000		-		0.000	0.000	13.000	N/A
Remarks															

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / MC Ground Cmbt Spt Arms Sys	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
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