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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	6.546	6.454	11.425	-	11.425	11.573	5.818	5.820	5.876	Continuing	Continuing
EY2: <i>Integrated Soldier Power Data System - Core</i>	-	3.911	4.322	4.576	-	4.576	4.695	4.793	4.795	4.841	Continuing	Continuing
EY4: <i>Universal Battery Charger</i>	-	0.963	0.987	1.022	-	1.022	1.026	1.025	1.025	1.035	Continuing	Continuing
FK4: <i>Soldier Borne Sensor (SBS)</i>	-	1.672	1.145	1.682	-	1.682	1.691	-	-	-	0.000	6.190
S65: <i>Platoon Power Generator</i>	-	-	-	4.145	-	4.145	4.161	-	-	-	0.000	8.306

A. Mission Description and Budget Item Justification

A portion of this funding line is a key enabler of the Army Modernization Priorities in support of the Small Unit Power (SUP) program.

This program element contains four active projects:

Project EY2 - Integrated Soldier Power Data System - Core: Supports development of the Integrated Soldier Power and Data Hub, Conformal Wearable Battery (CWB), Soldier and Squad Power Generation, platform power scavenging on the move, and Squad Power Manager (SPM). These capabilities fill the power and energy requirements for critical Integrated Tactical Network Soldier worn systems to include tactical leader radios, Nett Warrior, and the Integrated Visual Augmentation System (IVAS). These capabilities are critical enablers in closing the power and energy gaps created by the increase in mission essential, Soldier portable power consumers, GPS systems, weapon sensors, radios, night vision systems, and other devices.

Project EY4 - Universal Battery Charger (UBC): Supports development of the UBC and Bulk Charger (BC). These capabilities fill the power and energy requirements for critical Integrated Tactical Network Soldier worn systems to include tactical leader radios, Nett Warrior, and the Integrated Visual Augmentation System (IVAS). These capabilities are critical enablers in closing the power and energy gaps created by the increase in mission essential, Soldier portable power consumers, GPS systems, weapon sensors, radios, night vision systems and other devices by providing multiple charging solutions capable of providing power to handheld communication devices and military issued batteries.

Project FK4 - Soldier Borne Sensor (SBS): The SBS is a small unmanned aerial vehicle. The SBS provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The system is simple to deploy and use to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions. The SBS program will be procured through multiple phases. We will use the funding in this project to develop, integrate, and qualify additional capabilities for each phase. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>
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S65 - Soldier Power: Soldier Power enables dismounted Soldiers to efficiently execute missions for longer durations by reducing the logistical burden associated with fuel and primary (disposable) batteries. Platoon Power Generation (PPG) - PM E2S2: This project supports the demonstration and development of a PPG. The Small Unit Power (SUP) PPG will provide small units with sufficient portable power to sustain Modified Table of Organizational Equipment (MTOE) unit power demand in support of 48 to 72 hour missions using a common logistical fuel (JP-8). It will be used for charging batteries and powering various types of Army communications and electronics devices.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	6.296	6.454	0.000	-	0.000
Current President's Budget	6.546	6.454	11.425	-	11.425
Total Adjustments	0.250	0.000	11.425	-	11.425
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.250	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	11.425	-	11.425

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>			Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>				
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EY2: <i>Integrated Soldier Power Data System - Core</i>	-	3.911	4.322	4.576	-	4.576	4.695	4.793	4.795	4.841	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ISPDS-C includes power and data managing/distribution devices, cutting-edge energy storage solutions, and power scavenging devices. These capabilities fill the power and energy gaps created by the increase in mission essential, Soldier portable power consumers, such as heads up displays, situational awareness displays, GPS systems, weapon sensors, radios, night vision systems, and other devices. This RDT&E line develops power sources and power management solutions for the individual Soldier and squad for use in all operating environments. ISPDS-C systems will enable dismounted Soldiers and squads to execute their missions more efficiently, independently, for longer durations and with fewer battery resupplies while reducing the logistical and physical burden associated with moving fuel and batteries. This project also develops and integrates vehicular on-the-move charging.

Justification: FY23 RDT&E develops and evaluates capabilities to fill the power and energy requirements for critical Integrated Tactical Network Soldier worn systems to include tactical radios, assured position navigation and timing, Next Generation Squad Weapon, Nett Warrior, Enhanced Night Vision Goggles, and the Integrated Visual Augmentation System (IVAS).

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

	FY 2021	FY 2022	FY 2023
Title: Test and Evaluation	0.279	0.533	0.940
Description: Test and validate power and energy solutions from new battery chemistries, fuel cells, and scavenging devices and integrating the solutions using common interfaces with the Power and Data Hub and Squad Power Manager.			
FY 2022 Plans: Continue to develop and integrate power distribution technology, characterize Soldier peripherals, improve current power source chemistries, and improve protective materials and integrate into functional battery packs and pouches.			
FY 2023 Plans: Continue to develop and test new power distribution technology, characterize Soldier peripherals, improve current power source chemistries, and improve protective materials and integrate into functional battery packs and pouches.			
FY 2022 to FY 2023 Increase/Decrease Statement: A slight decrease due to CWB 3.7 FAT utilizing OPA funding.			
Title: System Engineering & Program Management	0.011	0.297	0.548

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: Conduct system engineering and project management for ISDPS-C efforts and power characterization efforts.</p> <p>FY 2022 Plans: Continue to conduct system engineering, project management, and additional R&D center power characterization studies for ISPDS-C efforts.</p> <p>FY 2023 Plans: Continue to conduct system engineering, project management, and additional R&D center power characterization studies for dismounted Soldier equipment and ISPDS-C efforts.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in SEPM costs due to CWB 3.7 SEPM transition to procurement.</p>			
<p>Title: ISPDS-C/CWB Capability Improvements Integration</p> <p>Description: Evaluate higher energy density power and alternative energy solutions.</p> <p>FY 2022 Plans: Integrate emerging alternative power technologies and higher density batteries cells such as SI-Anode.</p> <p>FY 2023 Plans: Continued integration of alternative power technologies and higher energy density batteries and cells for the dismounted Soldier.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Starting new improvement effort with Silicone Anode.</p>	2.161	1.406	1.730
<p>Title: Develop alternative CWB sources.</p> <p>Description: Develop alternative CWB sources.</p> <p>FY 2022 Plans: Continue to test and evaluate incremental improvement in CWB packaging battery technologies to increase overall conformal battery power capacity.</p> <p>FY 2023 Plans: Continue to develop and evaluate incremental improvements in battery technologies to increase overall conformal battery power and energy capacity.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	1.460	1.929	1.358

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Increased funding required to mature cell safety and cell capacity.			
Title: SBIR/STTR Transfer	-	0.157	-
FY 2022 Plans: Funding transferred in accordance with Title 15 USC 2638			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 2638			
Accomplishments/Planned Programs Subtotals	3.911	4.322	4.576

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• R08090: <i>Integrated Soldier Power Data System - Core</i>	20.818	5.947	6.725	-	6.725	6.834	8.018	6.611	6.609	0.000	61.562

Remarks

D. Acquisition Strategy
Pursue a variety of Soldier power products under full and open competition. Initiatives range from Commercial-Off-The-Shelf (COTS) solutions to developmental efforts. The type of solicitation depends on the maturity of the technology. The power initiatives will be evaluated through scheduled lab and/operational test and evaluation events, and if successful, selected for procurement and subsequent fielding and sustainment. The acquisition strategy varies by product. For example, the CWB acquisition strategy consists of two phases: Phase one includes the purchase of test articles using the Defense Logistics Agency (DLA) Special Operational (Spec Ops) Equipment Tailored Logistic Support Program (TLSP) and General Services Administration (GSA) contracts. Phase two establishes an Indefinite Delivery Indefinite Quantity (IDIQ) contract through the Army Contracting Command (ACC) which qualifies a minimum of two vendors to take into production. The Project Manager office will establish IDIQ contracts to support the ISPDS-C requirements over time. Each ISPDS-C system will be procured under purchase orders for production quantities that will be awarded on a Firm Fixed Price (FFP) contract.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604827A / Soldier Systems - Warrior Dem/Val				EY2 / Integrated Soldier Power Data System - Core							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
System Engineering & Program Management Support	MIPR	Various : Various	2.675	0.011		0.297		0.548		-		0.548	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	To Be Determined : To Be Determined	-	-		0.157		-		-		-	0.000	0.157	-
Subtotal			2.675	0.011		0.454		0.548		-		0.548	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
ISPDS-C, CWB Capability Improvements Integration	MIPR	Various : Various	6.096	2.161		1.406		1.730		-		1.730	Continuing	Continuing	-
Squad Power Manager ECP	MIPR	Various : Various	1.986	-		-		-		-		-	Continuing	Continuing	-
Develop alternative CWB sources	MIPR	Various : Various	-	1.460		1.929		1.358		-		1.358	Continuing	Continuing	-
Subtotal			8.082	3.621		3.335		3.088		-		3.088	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 and Evaluation	MIPR	Various : Various	1.716	0.279		0.533		0.940		-		0.940	Continuing	Continuing	-
Subtotal			1.716	0.279		0.533		0.940		-		0.940	Continuing	Continuing	N/A
Project Cost Totals			12.473	3.911		4.322		4.576		-		4.576	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>		Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>	

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Testing of Product Improvements	[Blue bar]																											
Develop, Test and evaluate and upgrade CWB	[Blue bar]																											
Evaluate 3.6.2 CWB packaging modifications	[Blue bar]																											
Evaluate Next Gen CWB Technology	[Blue bar]																											
Alternate power source development	[Blue bar]																											
Enhanced CWB Contract Award 3Q21 - 4Q21	[Blue bar]																											
Next Gen Power and Data Hub award	[Blue bar]																											
Increased Capacity Alternate Power Source	[Blue bar]																											
Cable and connector Interface Product improvements	[Blue bar]																											
Charging on the move development, test integration 3Q21 - 4Q23	[Blue bar]																											
Higher Energy CWB testing 4Q21 - 4Q23	[Blue bar]																											
Market Research/Lab Assessments of Alternate power source & batteries 3Q21-4Q21	[Blue bar]																											
Market Research/Lab Assessments of Alternate power source & batteries 3Q22-4Q22	[Blue bar]																											

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>		Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>	

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Market Research/Lab Assessments of Alternate power source & batteries 3Q23-4Q23																												
Market Research/Lab Assessments of Alternate power source & batteries 3Q24-4Q24																												
Market Research/Lab Assessments of Alternate power source & batteries 3Q25-4Q25																												
Market Research/Lab Assessments of Alternate power source & batteries 3Q26-4Q26																												
Market Research/Lab Assessments of Alternate power source & batteries 3Q27-4Q27																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Testing of Product Improvements	1	2020	4	2026
Develop, Test and evaluate and upgrade CWB	2	2020	4	2022
Evaluate 3.6.2 CWB packaging modifications	1	2021	2	2021
Evaluate Next Gen CWB Technology	1	2021	4	2026
Alternate power source development	2	2021	4	2022
Enhanced CWB Contract Award 3Q21 - 4Q21	3	2021	4	2021
Next Gen Power and Data Hub award	4	2021	1	2022
Increased Capacity Alternate Power Source	4	2022	4	2026
Cable and connector Interface Product improvements	2	2021	4	2023
Charging on the move development, test integration 3Q21 - 4Q23	3	2021	4	2023
Higher Energy CWB testing 4Q21 - 4Q23	4	2021	4	2023
Market Research/Lab Assessments of Alternate power source & batteries 3Q20-4Q20	3	2020	4	2020
Market Research/Lab Assessments of Alternate power source & batteries 3Q21-4Q21	3	2021	4	2021
Market Research/Lab Assessments of Alternate power source & batteries 3Q22-4Q22	3	2022	4	2022
Market Research/Lab Assessments of Alternate power source & batteries 3Q23-4Q23	3	2023	4	2023
Market Research/Lab Assessments of Alternate power source & batteries 3Q24-4Q24	3	2024	4	2024
Market Research/Lab Assessments of Alternate power source & batteries 3Q25-4Q25	3	2025	4	2025
Market Research/Lab Assessments of Alternate power source & batteries 3Q26-4Q26	3	2026	4	2026
Market Research/Lab Assessments of Alternate power source & batteries 3Q27-4Q27	3	2027	4	2028

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EY4: <i>Universal Battery Charger</i>	-	0.963	0.987	1.022	-	1.022	1.026	1.025	1.025	1.035	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Universal Battery Charger: Universal Battery Charger (UBC) fills the power and energy gap created by the increase in mission essential, Soldier portable power consumers, by providing a variety of charging solutions capable of providing power to handheld communication devices and military batteries to support mounted and dismounted formations. The UBC is suited for mounted and dismounted operations at the company level and below in multi-domain and austere operating environments. The system can draw power from wall outlets, vehicle power, generators, and solar power sources. The UBC enables dismounted Soldiers to execute their missions with fewer battery resupplies, thus reducing the logistical burden associated with moving fuel and batteries. The UBC capability allows dismounted Soldiers to operate independently for longer missions. The UBC fills the power and energy gap associated with bulk charging.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Test & Evaluation</p> <p>FY 2022 Plans: Continue to evaluate improvements to charger performance and bulk charging capabilities. Continue to develop and integrate vehicular on-the-move charging systems and reduce SWAP-C of the UBC product line.</p> <p>FY 2023 Plans: Continue to evaluate improved UBC products, including bulk charging, and integrate platform on the move charging systems.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase for additional testing due to new charging capabilities.</p>	0.963	0.782	0.765
<p>Title: System Engineering & Program Management</p> <p>FY 2022 Plans: Update technical drawings and provisioning data to establish NSNs, tech manual changes and safety release documentation for improved Family UBC and bulk charging.</p> <p>FY 2023 Plans: Conduct systems engineering, project management, and logistics management for UBC product line.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Expected decrease in UBC-related engineering management.</p>	-	0.169	0.257
<p>Title: SBIR/STTR Transfer</p>	-	0.036	-

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<i>FY 2022 Plans:</i> Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	0.963	0.987	1.022

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• R09103: <i>Universal Battery Charger</i>	13.479	6.243	9.208	-	9.208	9.445	7.919	7.640	7.637	0.000	61.571

Remarks

D. Acquisition Strategy
 Contracts will be awarded to test, evaluate, and procure the next generation battery chargers to meet the increased power demand on the Soldier. A full and open, five year Indefinite Delivery Indefinite Quantity (IDIQ) production contract was awarded 27 January 2016 to procure the UBC. The PM will initiate efforts to establish a new competitively awarded contract through the Army Contracting Command (ACC) Aberdeen Proving Grounds. The program office may also utilize the Defense Logistics Agency - Tailored Logistics Support competitively awarded contracts to procure UBC systems in FY 2021 and beyond.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Test and evaluate new CWB charging cups																												
UBC-Lite performance improvements																												
Develop and evaluate charging on-the-move capabilities																												
Battery charger performance improvements Phase 2																												
UBC vehicle integration																												
Evaluation of modernized battery chargers Phase 2																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Test and evaluate new CWB charging cups	1	2022	3	2022
UBC-Lite performance improvements	1	2021	3	2023
Develop and evaluate charging on-the-move capabilities	1	2021	4	2026
Battery charger performance improvements Phase 2	1	2022	4	2026
UBC vehicle integration	2	2022	4	2023
Evaluation of modernized battery chargers Phase 2	3	2022	4	2026

Note

Beginning in FY 2018, funding for Universal Battery Charger was realigned from Program Element: 0604827A (Soldier Systems - Warrior Dem/Val)/Project S65/Soldier Power. Prior to this realignment Soldier and Small Unit Power initiated developmental and test power solutions for the UBC technologies.

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>				Project (Number/Name) FK4 / <i>Soldier Borne Sensor (SBS)</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FK4: <i>Soldier Borne Sensor (SBS)</i>	-	1.672	1.145	1.682	-	1.682	1.691	-	-	-	0.000	6.190
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project FK4 - Soldier Borne Sensor (SBS): The SBS is a small unmanned aerial vehicle. The SBS provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The system is simple to deploy and use to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions. The SBS program will be procured through multiple phases. We will use the funding in this project to develop, integrate, and qualify additional capabilities for each phase. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy.

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

	FY 2021	FY 2022	FY 2023
Title: Soldier Borne Sensor (SBS)	1.672	1.103	1.682
Description: The SBS provides the squad a "quick look" capability providing Situational Awareness (SA).			
FY 2022 Plans: This program will continue Phase 2 prototyping and rapidly incorporate new technologies matured during the Phase 2 technology development phase to include improved thermal cameras, improved obstacle avoidance, and integration with the Adaptive Squad Architecture. These prototypes will undergo testing and evaluation from 3QFY21 to 1QFY22. Additionally, the program plans to integrate SBS with systems such as Tactical Assault Kit (TAK)/Nett Warrior, Enhanced Night Vision Goggle (ENVG) and Integrated Visual Augmentation System (IVAS).			
FY 2023 Plans: This program will incorporate advanced obstacle avoidance, autonomous behaviors, edge processing, and novel battery chemistries. The program will integrate S&T portfolio work on efficient target detection. Additionally, the program plans to integrate SBS with systems such as Enhanced Night Vision Goggle (ENVG) and Integrated Visual Augmentation System (IVAS).			
FY 2022 to FY 2023 Increase/Decrease Statement: Increase in funding from FY 2022 to FY 2023 to develop, test and integrate software updates for advanced autonomous behaviors.			
Title: SBIR/STTR Transfer	-	0.042	-
FY 2022 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) FK4 / <i>Soldier Borne Sensor (SBS)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC 638			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i>			
Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals	1.672	1.145	1.682

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• W63798: <i>Soldier Borne Sensor (SBS)</i>	18.907	18.654	20.376	-	20.376	23.005	22.372	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

The SBS program will continue to acquire the current system for FY22. The program will evaluate potential improved phase 2 systems as well as options to fund hardware and software developments that support advanced autonomy and interoperability in FY23 and beyond.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604827A / Soldier Systems - Warrior Dem/Val				FK4 / Soldier Borne Sensor (SBS)								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Management Admin (PMA)	MIPR	ASC : Ft Belvoir	0.058	0.146	Nov 2020	0.062	Nov 2021	0.064	Nov 2022	-		0.064	0.000	0.330	-	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.042		-		-		-	0.000	0.042	-	
Subtotal			0.058	0.146		0.104		0.064		-		0.064	0.000	0.372	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Phase 2 Prototype	C/FFP	Vantage Robotics : San Leandro, CA 95577	0.810	1.138	Feb 2021	0.143	Oct 2021	-		-		-	0.000	2.091	2.534	
Autonomy and Interoperability Development and Integration	TBD	Various : Various	-	-		-		0.860	Feb 2023	-		0.860	0.000	0.860	-	
Subtotal			0.810	1.138		0.143		0.860		-		0.860	0.000	2.951	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Matrix Support	Various	Various : Multiple	0.333	0.085	Nov 2020	0.077	Nov 2021	0.079	Nov 2022	-		0.079	0.000	0.574	-	
Subtotal			0.333	0.085		0.077		0.079		-		0.079	0.000	0.574	N/A	
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Phase 2- Technology Integration and Testing	TBD	Various : Various	-	0.303	Apr 2021	0.821	Dec 2021	0.679	Nov 2022	-		0.679	0.000	1.803	-	

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>		Project (Number/Name) FK4 / <i>Soldier Borne Sensor (SBS)</i>	

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Phase 2 - System Technology Improvements and Integration																												
<i>Phase 2 - Improvements & Integration</i>																												
Phase 2 - Prototype Technology Integration and Testing																												
<i>Phase 2 - Prototype Tech Integr & Testing</i>																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) FK4 / <i>Soldier Borne Sensor (SBS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Phase 1 - First Unit Equiped (FUE)	4	2020	4	2020
Phase 2 - Technology Development	4	2018	4	2020
Phase 2 - System Technology Improvements and Integration	3	2020	4	2024
Phase 2 - Prototype Technology Integration and Testing	4	2020	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>				Project (Number/Name) S65 / <i>Platoon Power Generator</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
S65: <i>Platoon Power Generator</i>	-	-	-	4.145	-	4.145	4.161	-	-	-	0.000	8.306
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY 2023.

This is a New Start in Fiscal Year 2023 (FY23).

A. Mission Description and Budget Item Justification

Mobile Soldier Power enables dismounted Soldiers to efficiently execute missions for longer durations by reducing the logistical burden associated with fuel and primary (disposable) batteries. Power solutions address energy deficits resulting from increased power demands associated with providing the Soldier with increased situational awareness displays, Global Positioning System (GPS) systems, weapon sensors, radios, and other devices. The Soldier and Small Unit Power system develops and tests power sources and solutions suited for the individual Soldier, team, squad, and platoon in the most austere operating environments. Develops and evaluates additional sources of power such as individual Soldier worn systems, renewable energy, and kinetic energy harvesting technologies. This effort is consistent with the Sep 2013 Small Unit Power CDD, the Dec 2011 Operational Energy ICD, and the Mar 2011 Soldier Protection CDD, and the Universal Battery Charger CPD (May 2015).

Platoon Power Generation - PM E2S2: This project supports the demonstration and development of a Platoon Power Generation (PPG). PPG will provide small units with portable power to sustain Modified Table of Organizational Equipment (MTOE) unit power demand in support of 48 to 72 hour missions using a common logistical fuel (JP-8). It will be used for charging batteries and powering various types of Army communications and electronics devices. It will provide sufficient power to recharge and power all Platoon equipment and fulfill residual power gaps at the Squad and Soldier level. The generator will provide Platoon power for charging batteries when away from vehicles in all Brigade Combat Teams (Stryker, Armor and Infantry), Rangers and Special Forces in austere environments.

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

	FY 2021	FY 2022	FY 2023
Title: S65-Platoon Power Generator	-	-	4.145
Description: Utilize OTA contract vehicle to develop and test prototypes.			
FY 2023 Plans: Developing / Testing Reliability Improvements			
FY 2022 to FY 2023 Increase/Decrease Statement: This is a New Start in Fiscal Year 2023 (FY23).			
Accomplishments/Planned Programs Subtotals	-	-	4.145

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Platoon Power Generator</i>

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>			<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• R08090: <i>Integrated Soldier Power Data System - Core</i>	20.818	5.947	6.725	-	6.725	6.834	8.018	6.611	6.609	0.000	61.562
• R09103: <i>Universal Battery Charger</i>	13.479	6.243	9.208	-	9.208	9.445	7.919	7.640	7.637	0.000	61.571
• EY2: <i>Integrated Soldier Power Data System - Core</i>	3.911	4.322	4.576	-	4.576	4.695	4.793	4.795	4.841	Continuing	Continuing
• EY4: <i>Universal Battery Charger</i>	0.963	0.987	1.022	-	1.022	1.026	1.025	1.025	1.035	Continuing	Continuing

Remarks

D. Acquisition Strategy

PEO CS/CSS Effort on the Platoon Power Generation - PM E2S2: Other Transaction Agreement (OTA) contract vehicles will be awarded to at least two contractors to develop and test prototypes. The results of the OTAs and soldier touch points will inform the Milestone C Low Rate Initial Production decision planned for FY25.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604827A / Soldier Systems - Warrior Dem/Val				S65 / Platoon Power Generator								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Platoon Power Generation	Various	PM E2S2 : Fort Belvoir, VA	0.764	-		-		0.750		-		0.750	0.000	1.514	-	
Subtotal			0.764	-		-		0.750		-		0.750	0.000	1.514	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Platoon Power Generation	C/FFP	Picatinny : Contractor Sites	9.358	-		-		3.000		-		3.000	1.500	13.858	-	
Subtotal			9.358	-		-		3.000		-		3.000	1.500	13.858	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Platoon Power Generation	MIPR	APG : APG	3.419	-		-		0.395		-		0.395	0.600	4.414	-	
Subtotal			3.419	-		-		0.395		-		0.395	0.600	4.414	N/A	
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Platoon Power Generation	MIPR	Ft. Benning : Ft. Benning	1.340	-		-		-		-		-	0.220	1.560	-	
Subtotal			1.340	-		-		-		-		-	0.220	1.560	N/A	
Project Cost Totals			14.881	-		-		4.145		-		4.145	2.320	21.346	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022			
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>			Project (Number/Name) S65 / <i>Platoon Power Generator</i>				
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Platoon Power Generator</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Milestone B (PPG)									▲ 1																							
OTA Contracts																																
Developmental Testing																																
Milestone C																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Platoon Power Generator</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone B (PPG)	4	2023	4	2023
OTA Contracts	4	2023	3	2025
Developmental Testing	3	2024	3	2025
Milestone C	4	2025	4	2025