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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602705A / <i>Electronics and Electronic Devices</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	98.855	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	98.855
EM4: <i>Electric Component Technologies (CA)</i>	-	38.500	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.500
EM8: <i>High Power And Energy Component Technology</i>	-	12.284	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.284
H11: <i>Tactical And Component Power Technology</i>	-	10.490	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.490
H94: <i>Elec & Electronic Dev</i>	-	37.581	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	37.581

Note

In Fiscal Year (FY) 2020 this Program Element (PE) is realigned, with continuity of effort realigned to the following PEs:

- * PE 0602143A Soldier Lethality Technology
- * PE 0602144A Ground Technology
- * PE 0602145A Next Generation Combat Vehicle Technology
- * PE 0602146A Network C3I Technology
- * PE 0602148A Future Vertical Lift Technology
- * PE 0602150A Air and Missile Defense Technology

A. Mission Description and Budget Item Justification

This PE designs and evaluates power components and power management technologies, frequency control and timing devices, high power microwave devices, display technologies, and electronic components. The applied research on these technologies enable the ability to perform precision deep fires against critical mobile and fixed targets; investigate all-weather, day or night, theater air defense against advanced enemy missiles and aircraft; as well as investigate enhanced communications and target acquisition through support of capabilities such as autonomous missile systems, advanced land combat vehicles, smart anti-tank munitions, electric weapons, secure jam-resistant communications, automatic target recognition, foliage-penetrating radar, and combat identification. Project EM8 designs and evaluates high-power electronic components and technologies. Project H11 designs, investigates and validates advanced power and energy technologies (batteries, alternative energy and hybrids) and power management and distribution techniques (wireless power, intelligent power management). Project H17 designs and evaluates flexible displays in conjunction with the Flexible Display Center. Project H94 researches and evaluates electronic component technologies such as photonics, micro electromechanical systems, imaging laser radar, magnetic materials, ferroelectrics, microwave and millimeter-wave components, and electromechanical systems.

Work in this PE complements and is fully coordinated with efforts in PE 0602120A (Sensors and Electronic Survivability), PE 0602307A (Advanced Weapons Technology), PE 0602709A (Night Vision Technology), PE 0602782A (Command, Control, Communications Technology), PE 0602783A (Computer and Software

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Technology), PE 0603001A (Warfighter Advanced Technology), PE 0603004A (Weapons and Munitions Advanced Technology), and PE 0603772A (Advanced Tactical Computer Science and Sensor Technology).

All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the United States Army Futures Command (AFC).

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	96.760	0.000	0.000	-	0.000
Current President's Budget	98.855	0.000	0.000	-	0.000
Total Adjustments	2.095	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.937	-			
• SBIR/STTR Transfer	-0.842	-			

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

Project: EM4: *Electric Component Technologies (CA)*

Congressional Add: *Flexible Hybrid Electronics Tech*

Congressional Add: *Silicon Carbide Electronics Research*

Congressional Add: *Position Navigation Timing Systems*

Congressional Add: *Tactical Power Generation and Storage Systems*

Congressional Add: *FY 2018 NDAA SEC 825 MDAP Cost Overrun*

Congressional Add Subtotals for Project: EM4

Congressional Add Totals for all Projects

	FY 2019	FY 2020
	5.000	-
	19.982	-
	8.500	-
	5.000	-
	0.018	-
Congressional Add Subtotals for Project: EM4	38.500	-
Congressional Add Totals for all Projects	38.500	-

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Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602705A / <i>Electronics and Electronic Devices</i>				Project (Number/Name) EM4 / <i>Electric Component Technologies (CA)</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
EM4: <i>Electric Component Technologies (CA)</i>	-	38.500	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.500

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Electronics and Electronic Component applied research.

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

	FY 2019	FY 2020
Congressional Add: Flexible Hybrid Electronics Tech	5.000	-
FY 2019 Accomplishments: Flexible Hybrid Electronics Tech		
Congressional Add: Silicon Carbide Electronics Research	19.982	-
FY 2019 Accomplishments: Silicon Carbide Electronics Research		
Congressional Add: Position Navigation Timing Systems	8.500	-
FY 2019 Accomplishments: Position Navigation Timing Systems		
Congressional Add: Tactical Power Generation and Storage Systems	5.000	-
FY 2019 Accomplishments: Tactical Power Generation and Storage Systems		
Congressional Add: FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.018	-
FY 2019 Accomplishments: FY 2018 NDAA SEC 825 MDAP Cost Overrun		
Congressional Adds Subtotals	38.500	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

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

Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602705A / <i>Electronics and Electronic Devices</i>	Project (Number/Name) EM8 / <i>High Power And Energy Component Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
EM8: <i>High Power And Energy Component Technology</i>	-	12.284	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.284

Note

In Fiscal Year (FY) 2020 this Project is being realigned to:
 Program Element (PE) 0602145A Next Generation Combat Vehicle
 * Project BF8 Artificial Intelligence & Machine Learning Tech
 * Project BH7 Enhanced VETRONICS Technology
 PE 0602146A Network C3I Technology
 * Project AO2 Stand-In Advanced RF Effects (STARE)
 * Project AP4 CEMA Camouflage Technology
 * Project AP5 Electronics Warfare Technology
 PE 0602150A Air and Missile Defense Technology
 * Project AD2 High Energy Laser (HEL) Enabling and Support Tech

A. Mission Description and Budget Item Justification

This Project provides for the research, development, and evaluation of high-power electronic components, materials, and related technologies. These technologies have application in compact and efficient power conversion, conditioning, and management sub-systems; energy storage and conversion devices; radio frequency (RF)/microwave and solid-state laser directed energy weapons (DEW); traditional and non-traditional RF and laser electronic attack; and RF photonics. All project elements are coordinated with, and as appropriate leveraged by, DEW and power/energy programs in the Air Force, Navy, High Energy Laser Joint Technology Office, Defense Threat Reduction Agency, national labs, university consortia, and relevant industry and foreign partners. The products of this research are required by developers of Army and Department of Defense (DoD) systems to evolve traditional (mechanical-based) sub-systems such as geared transmissions, plate armor, and kinetic projectiles to electrically-based ones. These products will provide the Soldier enhanced survivability and lethality through increased power management and energy savings as well as new fighting capabilities offered only by electrical power.

This Project sustains Army science and technology efforts supporting the Ground Maneuver, Lethality, Soldier and Command, Control, Communications and Intelligence Portfolios.

The work in this Project is coordinated with the Army Combat Capabilities Development Command, Ground Vehicle Systems Center, Armaments Center, Aviation and Missile Center, and Command, Control, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance Center and the United States Army Space and Missile Defense Command/Army Forces Strategic Command (USASMDC/ARSTRAT).

All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

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Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602705A / <i>Electronics and Electronic Devices</i>	Project (Number/Name) EM8 / <i>High Power And Energy Component Technology</i>

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the United States Army Futures Command (AFC).

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

	FY 2019	FY 2020	FY 2021
<p>Title: Advanced Solid-State Laser Technology and Integrated Photonic Technologies</p> <p>Description: Research novel solid-state laser concepts, architectures, and components with the goal of providing advanced laser technology to Army directed energy weapon and tactical laser developers. Exploit breakthroughs in laser technology, develop and employ innovative laser gain material, and utilize photonics to meet the stringent weight/volume requirements for Army platforms, especially to enhance and improve the generation, transmission, reception, and processing of RF signals. Applied laser research will be conducted in close collaboration with domestic and foreign material vendors, university researchers, and major laser diode manufacturers</p>	2.000	-	-
<p>Title: Electronic Attack Technologies/Spectrum Sensing and Exploitation</p> <p>Description: This effort investigates emerging technologies related to electronic warfare (EW) applications, non-kinetic survivability/lethality, and emerging concepts of operation, such as cognitive radar, in the increasingly contested and congested electromagnetic environment, with the goal of enhancing the survivability/lethality of Army platforms through electronic attack (EA), electronic warfare support (ES), and electronic protection (EP).</p>	1.788	-	-
<p>Title: Electronic Components and Materials Research</p> <p>Description: Investigate compact, high-efficiency, high-temperature, and high-power component technologies (e.g., semiconductor, magnetic, and dielectric devices) for hybrid-electric propulsion, electric power generation and conversion, and smart micro-grid power distribution. Research addresses current and future Army-unique performance and operational requirements.</p>	3.090	-	-
<p>Title: Advanced Distributed Power for Autonomous Platforms</p> <p>Description: The effort investigates power distribution and conversion technologies to provide compact, efficient, and high power capabilities for electrical and electro-mechanical loads supporting both mobile and stationary platforms. High voltage and intelligent control methods will be coupled with the ongoing research in autonomy technologies to provide advanced performance enhancements in mobility and capabilities for these platforms. Research on innovative electric machines covering both electrical generation and motor technologies will focus on providing efficient, power dense, fault tolerant generation and mobility capabilities. Research addresses current and future Army-unique power delivery challenges in compact autonomous air and ground platforms.</p>	1.400	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: RF Electronic Attack/Surveillance (Grey C3) Description: Investigate emerging technologies to enable EW applications in a grey environment. The goal is to develop software and reconfigurable RF hardware in a handheld form factor for distributed electronic attack, distributed EW support, and communications. EW support includes advanced passive and active RF sensing.	2.000	-	-
Title: Vulnerability Analysis Methodology for CEMA threats Description: Research and investigate the optimum configuration of experimental and analysis methodology for separate and combined cyber and electromagnetic threat attack so as to better support and inform Army system designers, analysts, evaluators, and decision makers.	2.000	-	-
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun Description: FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.006	-	-
Accomplishments/Planned Programs Subtotals	12.284	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

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Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602705A / <i>Electronics and Electronic Devices</i>				Project (Number/Name) H11 / <i>Tactical And Component Power Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
H11: <i>Tactical And Component Power Technology</i>	-	10.490	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.490

Note

In Fiscal Year (FY) 2020 this Project is being realigned to:
 Program Element (PE) 0602143A Soldier Lethality Technology
 * Project BD8 Soldier & SM Unit Tactical Energy Tech
 PE 0602148A Future Vertical Lift Technology
 * Project AM4 Opt Energy Stg & Therm Mgmt for FVL Survivability

A. Mission Description and Budget Item Justification

This Project identifies, advances, and enhances emerging power generation, energy storage, and power management components and software. This Project researches advancements in enabling power management, rapid decision making, expeditionary maneuver, and distributed operations across the battlefield. This Project also researches materials and components to develop lightweight, higher capacity, safer and more efficient power technologies that will enable continuous and energy aware operations while on the move and across battlefield environments.

All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the United States Army Futures Command (AFC).

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

	FY 2019	FY 2020	FY 2021
Title: Tactical Power Generation Technology	5.843	-	-
Description: This effort designs, investigates and validates Soldier-borne power generation and energy storage technologies in order to decrease Soldier load and power burden, and increase power capabilities by providing more energy to prolong mission run-time. This effort will investigate energy harvesting devices while on the move which will enable a continuous operations and reduced logistics for the Soldier. This effort will also investigate advanced hybrid battery chemistries for wearable, flexible battery designs.			
Title: Optimized Energy for C4ISR Platforms	4.642	-	-
Description: This effort investigates power and thermal management associated with high power Command, Control, Communications, computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capabilities on ground and air platforms			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
enabling enhanced mobility and mission flexibility. This effort funds research to improve platform efficiency through the use of on-demand hybrid power architectures, while also researching ways to eliminate platform thermal constraints. This effort will also investigate very high density power sources and energy storage for high rate pulsed power, power management and thermal management for dynamic high rate pulsed power.				
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun		0.005	-	-
Description: FY 2018 NDAA SEC 825 MDAP Cost Overrun				
Accomplishments/Planned Programs Subtotals		10.490	-	-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602705A / <i>Electronics and Electronic Devices</i>				Project (Number/Name) H94 / <i>Elec & Electronic Dev</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
H94: <i>Elec & Electronic Dev</i>	-	37.581	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	37.581

Note

In Fiscal Year (FY) 2020 this Project is realigned to:
 Program Element (PE) 0602143A Soldier Lethality Technology
 * Project BD8 Soldier & Sm Unit Tactical Energy Tech
 PE 0602144A Ground Technology
 * Project BL1 Materials and Manufacturing Research Technology
 PE 0602145A Next Generation Combat Vehicle
 * Project BI2 Sensor Protection Technology
 * Project BJ3 Hydrogen Based Combat System Technology
 PE 0602146A Network C3I Technology
 * Project AO4 Energy Efficient Devices Technology
 * Project AV5 Protective Technologies
 * Project AV9 Advanced PNT for GPS Independent Environments Tech
 PE 0602148A Future Vertical Lift Technology
 * Project AK2 Aviation Survivability Technology
 * Project AL8 Holistic Situational Awareness and Dec Making Tech
 PE 0602150A Air and Missile Defense Technology
 * Project AD5 Next Generation Fires Radar Technology

A. Mission Description and Budget Item Justification

This Project designs and characterizes electronics, electronic components, and electronic devices for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) applications and battlefield power and energy applications. Significant areas of component research relevant to C4ISR include: antennas, millimeter wave components and imaging, micro- and nano-technology, eye-safe laser radar (LADAR), vision and sensor protection, infrared (IR) imaging, photonics, and prognostics and diagnostics. Areas of research relevant to power and energy include power and thermal management, micro-power generators and advanced batteries, fuel reformers, fuel cells for hybrid power sources, and photosynthetic routes to fuel and electricity.

This Project supports Army science and technology efforts in the Command, Control, Communications and Intelligence, Soldier, Ground and Air portfolios. Work in this Project is fully coordinated with PE 0602709A (Night Vision Technology), PE 0603001A (Warfighter Advanced Technology), PE 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), and PE 0603313A (Missile and Rocket Advanced Technology).

All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

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Work in this Project is performed by the United States Army Futures Command (AFC).

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>Title: Antennas, Microwave Components, and Millimeter Wave Imaging</p> <p>Description: This effort designs, characterizes, and validates high performance antennas, microwave components, and software for multifunction radar, radio frequency (RF) sensing, and communication systems. Research areas include scanning techniques, broadbanding, beamforming, polarization, platform integration, and affordability. For microwave components, research areas include software defined radios, analog-to-digital conversion rates, bandwidth resolution, bit accuracy, circuit design and affordability.</p>	5.664	-	-
<p>Title: Survivability for Wireless Tactical Networks</p> <p>Description: This effort researches, designs and implements protocols and algorithms for networks of physical devices and autonomous systems operating under severe energy and bandwidth constraints, and which are vulnerable to adversarial infiltration. The objective is to enhance the performance and survivability of these tactical wireless networks through improved monitoring and detection of network problems, resulting from both adversarial activity and the operating environment, and through proactive adaption of the computer and network routers to these dynamics.</p>	0.750	-	-
<p>Title: Sensor Protection</p> <p>Description: This effort develops and characterizes materials for protection of electro-optic (EO) systems from lasers.</p>	4.625	-	-
<p>Title: Applied Photonic and Optoelectronic Devices</p> <p>Description: This effort models and develops materials and devices for the next generation Army sensor systems. Semiconductor materials and devices from Ultraviolet (UV) to Infrared (IR) with active and passive imaging capabilities will be modeled and developed. This will allow the Soldier to maintain situational awareness day and night under cluttered battlefield conditions. Sources and detectors for next generation secure battlefield communication devices will also be developed. For asymmetric threats, chemical sensing devices will also be studied and developed.</p>	2.141	-	-
<p>Title: Power and Thermal Management for Small Systems</p> <p>Description: This effort investigates, designs, and fabricates micro-electromechanical system (MEMS)-based components to improve power generation and micro-cooling technology for both dismounted Soldier and future force applications.</p>	0.903	-	-
<p>Title: Power and Energy</p>	1.671	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>Description: This research focuses on the design and characterization of chemistries, materials, and components for advanced batteries, fuel reformers, and fuel cells. Potential Army applications include hybrid power sources, smart munitions, hybrid electric vehicles, and Soldier power applications. Additionally, investigate the applicability of photosynthesis to provide fuel and electricity for Soldier power applications, and investigate silicon carbide (SiC) power module components that could enable compact, high efficiency, high temperature, and high power density converters for motor drive and pulse power applications.</p>				
<p>Title: Energy Harvesting</p> <p>Description: This research develops technologies to substantially reduce the number of batteries required to accomplish dismounted Soldier/Squad mission objectives, thereby significantly reducing Soldier-borne load and logistics requirements. Research will explore technologies to harvest electrical power by converting and storing energy via engineered structures and electronic bandgaps, MEMS-based micro-scale power conversion, and heterogeneous three dimension (3D) assembly of MEMS with other devices to enable efficient, distributed power conversion. Research explores novel paths to local fuel and energy production, including artificial photosynthesis, to extract hydrogen and electricity directly from water and sunlight.</p>		3.022	-	-
<p>Title: Energy Efficient Electronics & Photonics</p> <p>Description: This effort addresses sustainment operations by unburdening the Soldier and reducing logistics requirements (e.g., fewer batteries) for communications, computing, and sensing. The objective is to improve the underlying energy efficiency of supply and demand for Soldier-portable and unattended sensor electronics to enable the dismounted Soldier to maintain communications, freedom of movement, and increase mission duration. The majority of the electronics power used by the dismounted Soldier and by unattended sensors is attributable to RF communications. In addition, freedom of movement and action during sustained and high tempo operations requires seamless battery recharging. To address these challenges, energy efficient electronics research includes RF circuits, devices, materials and wireless power distribution. Energy efficiency improvements will be developed and investigated in support of five key sensor and electronic areas: RF component devices, passively powered components, low-power, long-lived sources, wireless power transfer, and advanced battery chemistries. Additionally, materials and devices used for photonic applications, such as laser diodes and fiber lasers, will be studied and improved with an emphasis on overall size, weight, and power consumption efficiency gains.</p>		5.513	-	-
<p>Title: Precision Measurement Technology for Contested Environments</p> <p>Description: This research focuses on technologies that will enable precise and assured position, navigation and timing in global positioning system (GPS)-denied environments. The first objective of this research is to improve the size, weight, power, cost, and accuracy of current micro-Inertial Measurement Systems (IMS) through the design, and fabrication of MEMS gyroscopes. The second objective is to develop an opto-electronic device that can be used as an ultra-precise local oscillator with improved stability for precision timing applications. The third objective is to address the ability to transmit jam-resistant precision timing</p>		2.983	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
signals by investigating the transmission of precision, synchronized timing signals over optical fibers and free-space using lasers. The fourth objective is to explore new RF antenna concepts to extend the reach of IMS systems through pseudolites (ground-based substitutes for GPS satellites) and Soldier-borne systems, and to integrate multiple sensor modalities with the IMSs using sensor fusion techniques to reduce drift and increase positional accuracy.				
Title: Anti-Tamper (AT) Technology Development Description: This effort develops tools, devices, and techniques to protect acquisition program systems and Critical Program Information (CPI) from adversarial threats. This work is executed by the Army Anti-Tamper Office located at the Aviation and Missile Research, Development and Engineering Center (AMRDEC) at Redstone Arsenal, AL.		5.900	-	-
Title: Technologies for Alternative Energy Description: Design and develop novel concepts of energy generation, energy capture materials, and component technologies for efficient conversion of ambient energy to electrical energy for use and storage. Design components to include microscale power devices for multimodal harvesting and efficient distributed power conversion.		1.191	-	-
Title: Quantum for Assured PNT in Zero-GPS Environments Acceleration Description: To develop quantum-based GPS-independent ultra-high precision PNT in a contested/gps denied battlespace for mission durations up to 7 days w/o external timing or position re-synchronization. This effort also enables Camouflage, Concealment, and Decoys (CC&D) in an Electronic Warfare (EW) space and synchronization of disaggregated platforms / fires across the battlefield for distributed sensing, processing, and lethal effect.		3.201	-	-
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun Description: FY 2018 NDAA SEC 825 MDAP Cost Overrun		0.017	-	-
Accomplishments/Planned Programs Subtotals		37.581	-	-
C. Other Program Funding Summary (\$ in Millions) N/A Remarks				
D. Acquisition Strategy N/A				