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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Testing</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	110.082	24.510	25.115	25.432	-	25.432	-	-	-	-	-	-
313: <i>Foreign Comparative Testing</i>	110.082	24.510	25.115	25.432	-	25.432	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Foreign Comparative Testing (FCT) Program increases Joint Force readiness and lethality by providing near-term solutions to existing and future Department of Defense (DoD) capability gaps by leveraging the Research & Development (R&D) investments of allied nations and coalition partners. The FCT Program Element (PE) evaluates prototypes derived from allied and partner nation technologies to provide the U.S. Armed Services, U.S. Special Operations Command (USSOCOM), and Defense agencies capabilities to counter emerging threats. FCT's broad reach across our allies and friendly foreign countries enables development of innovative, cost effective, and interoperable solutions to meet needs communicated by the Joint Chiefs of Staff and the Combatant Commanders. Military Services and USSOCOM jointly conduct FCT projects. FCT strengthens alliances by facilitating international collaboration and evaluating technologies that increase interoperability while serving as a catalyst for teaming and other business relationships between international and domestic industries. Partner nations recognize the long-term value of the "two-way street" for Defense procurements for which FCT provides an avenue. Numerous successful projects have resulted in the licensed production of a qualified foreign item in the United States, including the creation of jobs and contributions to local economies. To date, companies from 34 states have benefited from FCT projects. FCT supports DoD best practices by incentivizing the use of prototyping and experimentation in advancing technological solutions to warfighter problems and acts as a hedge against threat developments. FCT enhances affordability by reducing development costs and risk, accelerating acquisition timelines, and increasing competition. Through increasing Joint lethality and readiness, strengthening alliances, and delivering affordable performance on accelerated timelines, FCT supports all three lines of effort outlined in the National Defense Strategy. Authorized by Title 10, U.S. Code, Section 2350a (g), the FCT program is managed by the Office of the Under Secretary of Defense for Research and Engineering (OUSD R&E), Global Capability Programs (GCP) Office.

Measurable Outcomes:

- FCT projects will demonstrate capability objectives within 12-36 months.
- Over its 40-year history, FCT has a transition rate of 60 percent (364 out of 623) for completed projects. Of the 364 projects that tested successful, 284 or 72 percent resulted in follow on procurements of over \$12.000 billion.

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B. Program Change Summary (\$ in Millions)	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>
Previous President's Budget	24.970	25.183	25.784	-	25.784
Current President's Budget	24.510	25.115	25.432	-	25.432
Total Adjustments	-0.460	-0.068	-0.352	-	-0.352
• Congressional General Reductions	-	-0.068			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.456	-			
• Program Adjustments	-0.004	-	-0.352	-	-0.352

Change Summary Explanation

No significant funding changes.

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Testing</i>				Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
313: <i>Foreign Comparative Testing</i>	110.082	24.510	25.115	25.432	-	25.432	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FCT Program Element funding supports projects that test and evaluate innovative technologies already developed by partner nations and in doing so, directly aligns to the National Defense Strategy lines of effort: increasing Joint lethality in contested environments, strengthening partnerships, and fostering reform through delivery of capability at the speed of relevance. Individual projects typically average less than \$1.200 million each and complete within 12-36 months. Projects are proposed by the Military Services and USSOCOM and are selected using a merit-based process that identifies the most promising, innovative, and cost-effective solutions to validated warfighter requirements, with an emphasis on transitioning technologies into current or future programs of record. Projects are selected based on potential to yield cost, schedule, or performance improvements over the status quo.

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

	FY 2020	FY 2021	FY 2022
<p>Title: Hybrid Vertical Take-off and Landing (VTOL)/Fixed Wing Unmanned Aerial Systems (UAS) (Navy)</p> <p>Description: This project comparatively tests off-the-shelf hybrid UAS capable of vertical takeoff and landing as well as fixed wing flight for increased endurance and range over existing UAS in the Navy inventory. Hybrid UAS do not require a runway or launch and recovery equipment and thus may be better suited for shipboard operations. This project enhances DoD capabilities in the Autonomous Systems focus area. Test articles received, bench testing completed, and comparative testing initiated in FY 2019. Comparative testing occurred throughout FY 2020 and is scheduled to complete in 1Q FY 2021. Program Manager (PM) will make a transition decision and a close out report will be completed in 2Q FY 2021 with FY 2020 funds.</p>	0.115	-	-
<p>Title: Pilot Physiology Based Autonomous Life Support System (Air Force)</p> <p>Description: This project will integrate and test a Pilot Physiological Monitoring and Warning System (PPMAWS) with a new digital breathing regulator that incorporates machine learning to autonomously control the flow of oxygen to military aircraft. This project will also evaluate an off-the-shelf Pilot Breath Monitoring System (PBAM) currently in use with the Finnish Air Force, which requires no aircraft modification. These technologies could assist in preventing in-flight hypoxia, hypocapnia, and hyperoxia events currently experienced by pilots, improving flight safety, and aircraft availability. This project supports DoD's Artificial Intelligence/Machine Learning (AI/ML) focus area. If successful, the PBAM will be available for immediate fielding and the PPMAWS will transition to follow-on flight testing which is beyond the scope of this project. Test articles received, integrated into a flight helmet, and bench testing completed in FY 2019. Performance testing occurred in 2Q FY 2020. Integration into pilot breathing system was completed in 3Q FY 2020. Safe-to-fly determination for stand-alone helmet will occur in 1Q FY 2021. A transition decision will occur and a close out report will be completed in 2Q FY 2021 with FY 2020 funds.</p>	0.007	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Title: Future X-Band Radar (Navy)</p> <p>Description: Tests an off-the-shelf open-architecture Active Electronically Scanned Array (AESA) X-band aircraft radar for potential application to the Navy's Air and Missile Defense Radar (AMDR) program for ships. Currently, AMDR lacks a modern AESA X-band component to provide horizon surveillance against current and future threats. Program Manager completed test planning and contracting for acquisition in FY 2019. If successful, this project will inform requirements for the X-band component of the Navy's Air and Missile Defense Radar program. Acceptance evaluation of test article occurred in 3Q FY 2020. A close out report will be completed and a procurement decision will occur in 3Q FY 2021 using FY 2020 funds.</p>		1.000	-	-
<p>Title: Long-Range Tactical Intelligence Surveillance and Reconnaissance (ISR) Targeting, and Strike System (Navy/USMC)</p> <p>Description: This project evaluates the capabilities of a fully autonomous, recoverable, remotely operated, electro-optical, precision-guided loitering munition, which can conduct ISR as well as locate and engage enemy targets. This provides Marine Corps commanders with a responsive strike capability to increase operational flexibility and shorten engagement timelines. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, initial transition would consist of a limited procurement with user evaluation by operational units prior to fielding with Ground Combat Elements. Test planning and test article contract award occurred in FY 2019. Flight testing previously scheduled for 3Q FY 2020 was delayed to 3Q FY 2021 due to COVID-19. Upon completion of flight testing, a close out report will be completed and a procurement decision will occur in 4Q FY 2021 with FY 2020 funds.</p>		0.800	-	-
<p>Title: Low Profile Satellite Communications (SATCOM) on the Move Antenna (Navy/USMC)</p> <p>Description: This project tests a low-profile dual-band (Ku/Ka) antenna with high tracking accuracy for vehicles to enable SATCOM on the move in rough terrain. This reduces the potential of adversaries targeting high value command and control vehicles while increasing operational utility. This project enhances DoD capabilities in the Fully Networked Command, Control, and Communications (FNC3) focus area. If successful, the technology will transition to Marine Corps Networks on the Move program of record. Program Manager received test articles and acceptance testing initiated in FY 2019. Ku-band antenna certification testing completed in 4Q FY 2020. Ka-band antenna certification testing will occur in 1Q FY 2021. The Program Manager will make a transition decision and a close out report will be completed in 3Q FY 2021 with FY 2020 funds.</p>		0.236	-	-
<p>Title: Event-Based Sensing for Space & Directed Energy Applications (Air Force)</p> <p>Description: This project comparatively tests neuromorphic imaging technology and algorithms. This technology enhances daytime ground-based space situational awareness and directed energy test and evaluation. This project enhances DoD capabilities in the Directed Energy and Space focus areas. If successful, this project will transition to the Space and Missile Command's Ground Based Space Situational Awareness Program Office for follow-on demonstration and fielding. Test articles received and initial testing completed in FY 2019. Calibration testing was completed in 1Q FY 2020. Telescope integration</p>		0.456	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
completed in 2Q FY 2020. This project has been delayed since 3Q FY 2020 due a lack of facility access caused by COVID-19 restrictions. Object tracking tests will occur in 1Q FY 2021. Event sensing tests will occur in 3Q FY 2021. A final close out report and transition decision will occur in 4Q FY 2021 with FY 2020 funds.				
Title: Improved Amphibious Track (Navy) Description: Comparatively tests composite rubber track systems for Marine Corps and Army vehicles. This technology reduces weight, improves fuel economy and operational reach, reduces maintenance costs, and increases mobility. If successful, the best product will transition to Program Manager - Advanced Amphibious Assault and may transition to other tracked vehicles. Test planning and test article contract award occurred in 2Q FY 2019. Initial test articles received in 4Q FY 2019. Performance testing occurred throughout FY 2020 on test articles from one vendor. Installation and performance testing on test articles from second vendor were delayed due to COVID-19 and are scheduled to complete in 2Q FY 2021. The Program Manager will make a transition decision and a close out report will be completed in 3Q FY 2021 with FY 2020 funds.		1.628	-	-
Title: Synthetic Aperture Sonar for Mine Countermeasures Unmanned Underwater Vehicles (UUVs) (Navy) Description: This project tests a Synthetic Aperture Sonar payload with on-board automatic target recognition algorithms for Mine Countermeasure UUVs to increase detection range and resolution. This technology reduces the time required for mine countermeasure missions and post mission analysis. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, the technology will transition to Program Manager Naval Explosive Ordnance Disposal for integration on the Mk 18 UUV. Test planning and test article contract award occurred in 1Q-2Q FY 2019. Demonstration of real-time processing on a small UUV occurred in 3Q FY 2019. Test articles received in 4Q FY 2019. Sea trials on the test articles began in 1Q FY 2020. Ongoing sea trials have been delayed to 1Q FY 2021 due to COVID-19. The Program Manager will make a transition decision and a close out report will be completed in 3Q FY 2021 with FY 2020 funds.		0.309	-	-
Title: Active Expendable Decoys (Air Force) Description: This project evaluates expendable Digital Radio Frequency Memory countermeasures for use on 4th Generation Fighter aircraft. This technology provides increased protection against modern air-to-air and surface-to-air radio frequency guided missiles. If successful, the technology will transition to F-15, F-16, and F-18 electronic warfare programs for procurement. Contract preparation occurred in FY 2019. In 2Q FY 2020, aircraft integration was completed. Full avionics testing occurred in 3Q FY 2020. Flight testing will occur 1Q FY 2021. Live demonstrations to occur in 3Q FY 2021. The Program Manager will make a transition decision and a close out report will be completed in 4Q FY 2021 with FY 2020 funds.		2.229	-	-
Title: Cryo-cooler for Electro-Optic Sensors (Air Force)		0.160	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Description: This project tests a new cryo-cooler technology for application to advanced infrared sensor systems for airborne platforms. This technology significantly increases reliability and reduces life cycle costs. If successful, this technology will transition into F-35 Electro-Optic Distributed Aperture System sensor. Laboratory testing occurred 3Q FY 2020. System integration occurred in 4Q FY 2020. Test report and close out report completes in 1Q FY 2021 with FY 2020 funds.</p>				
<p>Title: More Reliable, Longer Endurance, More Power Unmanned Aerial Systems (UAS) (Army)</p> <p>Description: This project comparatively tests the performance of the Danielson Trident 100TD2 engine versus the existing MQ-5B Hunter engine. The Trident 100TD2 is a candidate engine for use in next generation UAS and new production of existing UAS for foreign military sales because of its improved reliability, increased power, and reduced life cycle costs. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, the Army will pursue flight demonstration prior to insertion into the Army's UAS program of record for fielding on MQ-5B Hunter. This project completed legacy baseline testing in FY 2019. Performance testing continued throughout FY 2020 with FY 2019 funds.</p> <p>FY 2021 Plans: Testing at simulated altitudes will be completed in 1Q FY 2021. A transition decision will occur and a close out report will be completed in 2Q FY 2021.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>		0.000	0.095	-
<p>Title: Multi-Mission Weaponized Soldier - Unmanned Aerial System (Army)</p> <p>Description: This project evaluates an Unmanned Aerial System (UAS) in a 40-millimeter grenade form factor with a modular payload. The system is operated by an individual soldier, has a range of up to 12 kilometers, and can fly for up to 12 minutes. This technology provides non-lethal situational awareness and lethal indirect fire support against enemies in defilade or behind walls. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, this technology will transition to the Joint Munitions & Lethality Life Cycle Management Command for follow on operational evaluations. This project initiated test planning and contract preparation in FY 2019. Contract was awarded 4Q FY 2020.</p> <p>FY 2021 Plans: Integration of Government-off-the-shelf payloads will occur in 1Q FY 2021. Phase III performance testing with Government payloads will occur in 2Q FY 2021. Phase IV advanced capabilities assessment and experimentation will occur in 3Q FY 2021. A transition decision and close out report will be completed in 4Q FY 2021.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p>		0.215	0.075	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.				
<p>Title: Anti-Submarine Warfare Sensor Capabilities for Unmanned Surface Vehicles (Navy)</p> <p>Description: This project tests a compact towed variable depth sonar system for Navy Unmanned Surface Vehicles (USVs). This project enhances DoD capabilities in the Autonomous Systems focus area by providing autonomous sensor launch, recovery, and operation suitable for USVs. If successful, this technology will be available for transition to the Navy's Unmanned Maritime Systems Program Office for follow on acquisition and fielding. Test planning and contract preparation occurred in 4Q FY 2019. Test articles were received in 3Q FY 2020. Acceptance testing occurred in 4Q FY 2020.</p> <p>FY 2021 Plans: A demonstration event is scheduled in 2Q FY 2021. A transition decision and close out will be completed in 3Q FY 2021.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>		0.750	0.300	-
<p>Title: Hostile Fire & Pre-Shot Detection for Vehicle Protection Systems (Army)</p> <p>Description: This project comparatively tests technologies to autonomously detect and locate incoming hostile fire as well as potential threats before a shot is fired. These technologies will increase situational awareness and reduce response times leading to increased lethality and survivability for ground forces, especially in urban environments. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, this technology will transition to the Army's Program Manager for Vehicle Protection Systems for initial fielding in 2022. Test articles received and initial testing, bench testing and safety certification occurred throughout FY 2020.</p> <p>FY 2021 Plans: Live demonstrations are planned for 1Q through 3Q FY 2021 with follow on vehicle integration testing in 4Q FY 2021. Final test and close out reports will be completed in 4Q FY 2021.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>		0.615	0.750	-
<p>Title: Dual Protocol Network Interface Card (Air Force)</p> <p>Description: This project evaluates a network interface card that supports both low-speed legacy Military Standard 1553B and high-speed North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 7221 protocols. This provides an affordable upgrade path to high-speed 100 Mbps data throughput for aircraft networks enabling weapons systems to perform at desired warfighting capability levels. This project enhances DoD capabilities in the FNC3 focus area. If successful, this technology will transition to the Air Force Program Executive Office Fighter/Bombers for follow on procurement and fielding</p>		0.674	0.034	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>on military aircraft. Initial test planning and contract preparation occurred in FY 2019. Test article received in 2Q FY 2020. Laboratory testing occurred in 3Q FY 2020.</p> <p>FY 2021 Plans: Flight demonstrations will be conducted from 1Q through 3Q FY 2021. A final ground demonstration will occur in 4Q FY 2021. The Program Manager will make a transition decision and a close out report will be completed in 4Q FY 2021.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>				
<p>Title: Mine Clearance Line Charge Replacement (Navy)</p> <p>Description: This project comparatively tests the performance and reliability of modern mine clearing technologies against the legacy MK-154 Mine Clearing Line Charge (MICLEC). The MICLEC, which is 1950's era technology has a history of reliability, safety, and availability issues. If successful, this technology will transition to the U.S. Marine Corps' Portfolio Manager for Logistics Combat Element Systems to replace/supplement existing MK-154 MICLECs. Contract preparation occurred in 2Q FY 2020. Contract was awarded in 4Q FY 2020.</p> <p>FY 2021 Plans: Three phases of live fire testing will occur throughout FY 2021. This project continues in FY 2022 with FY 2021 funds. Live fire testing concludes and final test and close out reports are to be completed in 1Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>		1.470	0.585	-
<p>Title: Turreted Mortar System (Army)</p> <p>Description: This project will test a turreted mortar system to fill capability gaps within the Brigade Combat Team and across the Multi-Domain Battlefield concept. The system will increase lethality and survivability through extended range, low angle, 360-degree delivery capability, and fire on the move capabilities with overhead protection. If successful, this technology will transition to the Army's Armored Multi-Purpose Vehicle Program Office in FY 2022. Contract preparation and award occurred in FY 2020.</p> <p>FY 2021 Plans: Live fire testing will occur 1Q-3Q FY 2021. This project continues in FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>		0.550	0.250	-
<p>Title: Lightweight Short-Range Guided Missiles (USSOCOM)</p>		0.550	0.550	0.250

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Description: This project comparatively tests man portable, shoulder fired missile systems that utilize seeker technology for engaging moving or static targets at extended ranges compared to existing unguided weapons systems within the USSOCOM inventory. If successful, this technology will transition to USSOCOM's Program Executive Office Special Operations Forces Warrior for follow-on procurement. Test article contract award and test planning occurred in 4Q FY 2020.</p> <p>FY 2021 Plans: Test articles will be received in 1Q FY 2021. Laboratory performance testing continues through 2Q FY 2021. Live fire testing commences in 3Q FY 2021.</p> <p>FY 2022 Plans: This project continues in FY 2022 with completion of live fire testing, warhead characterization and final test and close out reporting.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>				
<p>Title: Advanced Closed Cycle Hull Cleaning (Navy)</p> <p>Description: This project comparatively tests robotic systems that capture and treat marine biofouling collected during undersea hull cleaning operations. This will improve the DoD's global environmental compliance posture and increase operational readiness as existing methods of hull cleaning do not comply with new environmental regulations, particularly on the west coast of the United States due to the creation of biofouling. If successful, the Naval Sea Systems Command's Salvage and Diving office will transition the technology through updating contractor hull cleaning requirements. Contract preparation and test planning took place in 4Q FY 2020.</p> <p>FY 2021 Plans: Test articles will be received in 2Q FY 2021. Field testing will occur in 3Q FY 2021.</p> <p>FY 2022 Plans: Water sampling analysis will take place in 1Q FY 2022. The second round of field testing will occur in 3Q FY 2022. Test report will be completed in 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding increases from FY 2021 to FY 2022 to support major test events.</p>		0.075	0.504	0.509
<p>Title: Software Defined Acoustic Modem Evaluation (Navy)</p>		0.056	0.553	0.482

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Description: This project comparatively tests commercial software-defined radios in underwater acoustic environments. This technology enables interoperable, reliable and secure communication between surface and subsurface platforms and sensors. If successful, this technology will transition to the Naval Undersea Warfare Center Newport Division for inclusion in follow-on large-scale prototype undersea network demonstration programs for further evaluation. Contract preparation and test planning occurred in 4Q FY 2020.</p> <p>FY 2021 Plans: Test articles are to be received and bench tested in 2Q FY 2021. In water testing will begin in 4Q FY 2021.</p> <p>FY 2022 Plans: Controlled in-water testing will be completed in 1Q FY 2022. Final demonstration event will occur in 3Q FY 2022. Project will close out and test report completed by 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>				
<p>Title: Semi-Autonomous Devices for Medical Care (Army)</p> <p>Description: This project evaluates interoperable medical devices such as ventilators and IV pumps that can be remotely controlled. This could result in improving the quality and safety of patient care by enabling immediate adjustment of device settings without delays.</p> <p>FY 2021 Plans: Contract preparation and award will occur in 1Q FY 2021 with test articles received in 2Q FY 2021. Phase one developmental testing will occur in 3Q FY 2021. Go or no-go decision for phase two testing will occur in 4Q FY 2021.</p> <p>FY 2022 Plans: Phase two interoperability testing will finish in 3Q FY 2022. The Program Manager will make a transition decision and a close out report will be completed in 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as final testing is completed and project is closed out.</p>		0.000	0.870	0.630
<p>Title: Top Attack Armor (Army)</p> <p>Description: This project comparatively tests improved vehicle protection technology for defeating overhead threats to Armored Fighting Vehicles. This provides protection against modern anti-tank threats while minimizing negative mobility impact.</p> <p>FY 2021 Plans:</p>		0.000	0.400	1.100

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Contract preparation and award will occur in 3Q FY 2021 with test articles received in 2Q FY 2021. Phase one developmental testing will occur in 4Q FY 2021. Laboratory validation testing will occur in 4Q FY 2021.</p> <p>FY 2022 Plans: Phase two field testing will occur in 2Q FY 2022. Project will close out and test report completed as well as go or no-go procurement decision will be made by 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding increases from FY 2021 to FY 2022 to support major test events.</p>				
<p>Title: Airborne Threat Discrimination Sensors (Navy)</p> <p>Description: This project comparatively tests wide field of view electro-optic and infrared sensors for land and ship platforms as a complement to radar. This enables passive detection and tracking of challenging airborne threats.</p> <p>FY 2021 Plans: Contract preparation and award will occur in 2Q FY 2021 with test articles received in 4Q FY 2021. Phase one laboratory characterization testing will also occur in 4Q FY 2021.</p> <p>FY 2022 Plans: Phase one collection of field data will take place in 1Q FY 2022. Phase two collection will take place in 3Q FY 2022. The Program Manager will make a transition decision and a close out report will be completed in 4Q FY 2021.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as test events are completed.</p>		0.000	1.050	0.250
<p>Title: 1000V DC Power Systems for Directed Energy (Navy)</p> <p>Description: This project evaluates an off-the-shelf large scale energy storage system designed for maritime use. This supports development of next generation directed energy weapons systems for naval platforms. If this comparative test is successful, Program Executive Office (PEO) Electric Ships will then add this to a Program of Record (PoR).</p> <p>FY 2021 Plans: Contract preparation and award will complete in 2Q FY 2021. Test articles will be received in 3Q FY 2021.</p> <p>FY 2022 Plans: Phase one of the comparative test will complete in 2Q FY 2022. Phase two of the comparative test will complete in 3Q FY 2022. Project will close out and test report completed by 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p>		0.000	0.616	0.755

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
Funding increases from FY 2021 to FY 2022 to support major test events.				
<p>Title: Cold Weather All-Terrain Vehicle (Army)</p> <p>Description: This project comparatively tests off-the-shelf cold weather capable tracked vehicles with enhanced off-road mobility. This accelerates the fielding of a replacement for an obsolete system and enables logistics support in austere conditions. If successful, this technology will transition to Cold Region Test Center (CRTC), Alaska for further testing.</p> <p>FY 2021 Plans: Prototype contract preparation and award will complete in 1Q FY 2021. Test articles expected to be received in 2Q 2021. Production contract preparation and award begins in 3Q FY 2021. This project continues in FY 2022 with FY 2022 funds.</p> <p>FY 2022 Plans: Production contract award expected to be completed 3Q FY 2022. First article test and production test to be completed in 3Q FY 2022. Final test report, procurement decision, and project close out to occur in 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding remains constant in FY 2022 to support on-going test events.</p>		0.000	0.500	0.500
<p>Title: Future Aviation Ground Power Unit (Army)</p> <p>Description: This project evaluates a modern, off-the-shelf aviation support system for military rotary wing aircraft. Improves aviation maintenance efficiency and reduces aircraft downtime. If successful, FCT will support the ongoing assessment and down-select of vendors to support the transition to a PoR.</p> <p>FY 2021 Plans: Contract preparation and award will complete in 2Q FY 2021. Test Plan expected to be begin in 3Q 2021. This project continues in FY 2022 with FY 2022 funds.</p> <p>FY 2022 Plans: Testing expected to begin 2Q FY 2022. Final test report, procurement decision, and project close out to be completed in 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding increases in FY 2022 to support major test events.</p>		0.000	0.500	1.260
<p>Title: Precision Strike Missile Submunitions (Army)</p>		0.000	0.754	0.700

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Description: Comparatively tests sensor fuzed submunitions for the Army's next generation, long-range precision strike missile. Provides increased lethality against armored targets while maintaining treaty compliance. If successful, technology will have a signed transition agreement with PEO Missiles & Space (M&S) for insertion into the Precision Strike Missile (PrSM) Program.</p> <p>FY 2021 Plans: Contract preparation will occur in 1Q FY 2021. Test planning will occur in 2-3Q FY 2021. Contract award will occur in 4Q FY 2021. This project will continue in FY 2022 with FY 2022 funds.</p> <p>FY 2022 Plans: Precision Strike Missile Submunitions (Army): Test item manufacture begins 1Q FY 2022. Testing to occur in 2-3Q FY 2022. Final test report, procurement decision, and project close out to be completed in 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases in FY 2022 to support project completion and close out.</p>				
<p>Title: Low Cost Innovative Projects (Projects Less Than One Million Dollars Each):</p> <p>Description: The OSD Global Capability Programs (GCP) Office in execution of the FCT Program selects multiple low-cost projects in the areas of Force Application, Force Protection, Force Support, Logistics, Artificial Intelligence and Machine Learning, Robotics and Autonomous Systems, Interoperability and Countering Unmanned Systems. These projects were selected to deliver prototypes for evaluation, assessment, and Service adoption within 12 to 36 months.</p> <p>Projects:</p> <p>-Civil Affairs Solution-Army Analytics (USSOCOM): This project tests intelligence software that fuses imagery from Unmanned Aerial Systems and satellites with other sensor data and uses Artificial Intelligence and Machine Learning (AI/ML) to rapidly provide actionable analytics. This technology supports Department of Defense Civil Affairs operations by analyzing population migration caused by conflict or natural disasters to enable dynamic planning for large scale operations. This project enhances DoD capabilities in the AI/ML focus area. If successful, this technology will be available for transition to the Army's Distributed Common Ground System Program of Record. Test planning occurred in 4Q FY 2019. Test article contract award completed in 3Q FY 2020.</p> <p>-Insensitive Munitions Fuze for the M67 Fragmentation Hand Grenade (Army): Comparatively tests off-the-shelf hand grenade fuzes to provide increased safety to the operator while maintaining lethality for the widely used M67 fragmentation hand grenade. The M67 has been in use since the 1960's and does not meet current Insensitive Munitions safety standards. If successful, this technology will transition to the Army's Program Executive Office for Ammunition for follow on acquisition. Test articles delivered,</p>		12.615	15.519	6.585

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

	FY 2020	FY 2021	FY 2022
<p>and initial safety testing occurred in 4Q FY 2019 through 3Q FY 2020. This project continues in FY 2021 with FY 2020 funds. Final testing and close out report will be completed by 2Q FY 2021.</p> <p>-Panoramic Infrared Sensor Test (Navy): Comparatively tests foreign naval panoramic infrared sensors with autonomous detection capabilities to enhance shipboard detection and tracking of both surface and air targets to include low, slow, and small Unmanned Aerial Systems. If successful, this technology will transition to the Navy's Program Executive Office for Integrated Warfare Systems for insertion into the future Guided Missile Frigate and Supercarrier I-Stalker programs. Test articles received and acceptance testing occurred in FY 2019. Shipboard testing of the sensor was scheduled for 2Q FY 2020; however, was delayed due to the COVID-19. The Program Manager will make a transition decision and a close out report will be completed in 3Q FY 2021. The project will continue into FY 2021 with FY 2020 funds.</p> <p>-Autonomous Aircraft Material Maintenance (Navy): This project tests a trailer-mounted, autonomous cold spray metallization technology for in-situ repair of corrosion damaged areas on aircraft. If successful, the technology will be available for follow-on procurement and fielding by the Navy's Fleet Readiness Centers. The project completed several demonstration events in FY 2020 for the military aviation community. The Program Manager will make a transition decision and a close out report will be completed in 2Q FY 2021. This project continues in FY 2021 with FY 2020 funds.</p> <p>-Night Vision Device Capable Deck Status Display (Navy): This project evaluates a deck status display currently in use with over ten countries that provides landing status to pilots through night vision compatible symbology instead of colors enabling safer night landing operations. If successful, this project will transition to the Navy's Aircraft Launch and Recovery Equipment Program of Record. Test articles underwent acceptance testing in 4Q FY 2019. Performance evaluation occurred in FY 2020. Final testing to be completed in 2Q FY 2021 with FY 2020 funds. The Program Manager will make a transition decision and a close out report will be completed in 3Q FY 2021.</p> <p>-Reserve Battery for Munitions (Army): This project comparatively tests foreign off-the-shelf reserve battery solutions for use with medium caliber, mortar, and artillery applications to enhance the industrial base. If successful, the Army's Armaments Research Development and Engineering Center will pursue acquisition through either direct purchase from a foreign source or licensed production by a U.S. company. This project completed laboratory testing in 2Q FY 2019, initiated live fire testing in 1Q FY 2020 and completed bench testing in 2Q FY 2020. This project continues in FY 2021 with FY 2020 funds.</p> <p>-Smartshooter Evaluation (Army): This project evaluates an intelligent fire control system for assault rifles that is capable of identifying, selecting, and locking onto stationary or moving targets. This technology significantly improves shooter accuracy and probability of hit while reducing engagement times. If successful, the Army's Program Manager for Soldier Weapons will transition the technology into its Next Generation Fire Control development program. Test articles acquired, tested, and demonstrated in FY</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>2019. Operational assessment conducted in 4Q FY 2020. This project continues in FY 2021 with FY 2020 funds and a close out report will be completed in 2Q FY 2021.</p> <p>-Individual Assault Munition (Army): This project tests a new warhead for existing shoulder fired weapon systems to increase lethality by enabling fire from enclosure and the ability to engage structures and light armored targets. Performance verification testing occurred in FY 2019. Acceptance and firing testing completed in 3Q FY 2020. Airdrop test will occur 2Q FY 2021. This project continues in FY 2021 with FY 2020 funds.</p> <p>-Hydrogen Fuel Cell Technology for Small UAS (Air Force): This project comparatively tests foreign hydrogen fuel cells to increase the performance and range of Small UAS versus using traditional battery technology. If successful, this technology will transition to Air Force Special Operations Command Small UAS programs for follow-on procurement and fielding. Laboratory testing of individual fuel cells occurred in 2Q FY 2019. Safety certification and integration with platforms occurred in 4Q FY 2019. Tuning and endurance flights were completed in 4Q FY 2020. This project will close out and final test report produced by 1Q FY 2021. This project continues in FY 2021 with FY 2020 funds.</p> <p>-Low-Cost Autonomous Target Classification (L-CATC) (Navy): This project conducts at-sea testing of underwater passive acoustic sensors and associated processing software. This technology provides an increased probability of detection and classification for both surface and submerged vessels. Test article engineering change for the underwater acoustic sensor initiated in FY 2019. Final test evaluation of the sensor was scheduled for 4Q FY 2020 but was delayed until 1Q FY 2021 due to COVID-19. A close out report is expected in 1Q FY 2021 using FY 2020 funds.</p> <p>-105 Millimeter Family of Multi-Purpose Munitions (Army): This project tests two variants of a multi-purpose 105 millimeter(MM) munitions including high explosive and anti-personnel/anti-material for increased lethality, safety, and reliability. If successful, the technology will be available for transition to the Army's Mobile Protected Firepower vehicle program. Test article contract awarded in FY 2019. Test articles delivered in 4Q FY 2020. This project continues in FY 2021 with FY 2020 funds.</p> <p>-Uncooled 120 Hertz Longwave Infrared Focal Plane Arrays for Night Vision Sensors (Army): This project comparatively tests foreign developed focal plane array technology for next generation night vision devices. Recent advancements in optical technology offer increased resolution and refresh rates for night vision applications, which enable enhanced situational awareness. If successful, this technology will be available for transition to Army's Project Manager for Soldier Sensors and Lasers for insertion into programs of record. Test article acquisition and integration occurred in FY 2020. This project continues in FY 2021 with FY 2020 funds.</p>			

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

	FY 2020	FY 2021	FY 2022
<p>-Modular Airdrop Platform (Army): This project tests an innovative airdrop platform system with underside airbags that eliminates the need for energy dissipating material. The technology will increase lethality and readiness by enabling a rapid roll-on/off capability and will significantly reduce logistics costs. If successful, this technology will be available for transition to the Product Manager, Force Sustainment Systems - Cargo Air Delivery for insertion into the Advanced Low Velocity Airdrop System Program of Record. Ground testing was completed 3Q FY 2019. Platform and static drop tests were completed in 1Q FY 2020. Air drop testing scheduled for 3Q FY 2020 is on hold due to COVID-19 delays and will resume in FY 2021.</p> <p>-Magnetic Signature Duplicator System (Army): This project evaluates the performance of a foreign magnetic signature duplicator and against known landmine threats. If successful, the technology will be available for transition to the Army's Mounted Detection System Program of Record for follow on acquisition. Test planning and contract award occurred in FY 2019. Test article received in 2Q FY 2020. Range testing that had been scheduled for 3Q FY 2020 remains on hold due to COVID-19 delays. This project continues in FY 2021 with FY 2020 funds.</p> <p>-Personal Dosimeter as an Emergency Response System (Army): This project tests foreign Dosimeter technology along with an automated field analytics system for rapid identification and triage of individuals exposed to radiological or nuclear substances. This technology will be tested alongside the current Joint Personal Dosimeter to determine capabilities in an operational environment. If successful, this technology will transition to the Joint Program Manger Guardian Program of Record. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. Operational testing scheduled for 4Q FY 2020 was delayed due to COVID-19. This project continues in FY 2021 with FY 2020 funds.</p> <p>-Artificial Intelligence (AI) Neuromorphic Chip (Army): This project evaluates a low-cost neuromorphic chip to replace the current paper and pencils method for counting 120-millimeter mortar rounds to more accurately determine weapon system life cycle maintenance. This effort demonstrates a tactical application of AI, will increase readiness, and could save millions of dollars in maintenance cost. If successful, this technology will be available for transition to the Army's Stryker Program Office for follow on acquisition. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. Test article received in 1Q FY 2020. Acceptance tests completed in 2Q FY 2020.</p> <p>-Vector Engine Processor for Use with Legacy Hypersonic Codes (Navy): This project evaluates a high-performance vector processor to significantly reduce time required to evaluate hypersonic designs. If successful, the technology will transition to the High-Performance Computing Modernization Program. Initial test planning and contract preparation occurred in FY 2019. Test articles received in 2Q FY 2020. Evaluation with legacy hypersonic codes began in 3Q FY 2020. This project continues in FY 2021 with FY 2020 funds.</p>			

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

	FY 2020	FY 2021	FY 2022
<p>-High Powered Microwave (HPM) Electro-Optic Electromagnetic Field Sensors (Air Force): This project tests various foreign electro-optic electromagnetic field sensors for use at Department of Defense test ranges to enhance directed energy research, development, test and evaluation efforts. Current radio frequency antennas are too large to embed within HPM targets and thus, are unable to accurately measure HPM effects. If successful, the technology will transition to the Air Force Research Laboratory for follow on procurement as a test asset in support of future HPM test and evaluation efforts. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. Test articles received in FY 2020.</p> <p>-Enhancing DoD Infrastructure Repair (Army): This project evaluates a rapid setting polymer-based mortar for repair of damaged airfield runways and critical infrastructure. This will increase readiness and significantly reduce shipping costs by providing a qualified material source that meets performance requirements in theater. If successful, the Army's Engineering Research & Development Center will include this product as an approved rapid airfield damage repair capping material. Contract preparation and test planning initiated in 4Q FY 2020.</p> <p>-Rapid Response Fentanyl Test Strips (Army): This project evaluates the efficacy of commercially available rapid immunoassay test strips to detect the presence of fentanyl and its analogs. This provides an easy to use, small, low cost detection method that does not require power chemicals. If successful, the Joint Program Executive Office for Chemical Biological Defense will transition this technology into Reactive-Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA) Program of Record. Contract preparation and test planning occurred in 4Q FY 2020.</p> <p>-Extended Reality (XR) Helmet Mounted Display (Navy): This project comparatively tests emerging XR technologies for T-6B operational flight trainers. This will increase training effectiveness while significantly reducing costs and footprint versus legacy flight training systems. If successful, this technology will transition to the Naval Aviation Training Systems and Ranges Program Office for follow on acquisition. Contract preparation and test planning occurred in 4Q FY 2020.</p> <p>-Space Qualification Testing of Event-Based Sensors (Air Force): This project comparatively tests neuromorphic imaging sensor technology under simulated space conditions. This technology offers advantages in performance, size, weight, power, and signal processing that are suitable for space-based applications. If successful, this technology will transition to follow-on high altitude. Contract preparation completed in 4Q FY 2020. Testing continues in FY 2021 with FY 2021 funds.</p> <p>-Precision Vertical Take-off Unmanned Aerial System (VTUAS) (Navy): This project evaluates an ultrasound navigation aid to autonomously guide the landing of VTUAS on moving platforms in all weather conditions. This increases survivability by reducing operator exposure to threats while conducting VTUAS recovery. If successful, this will transition to Navy and Marine Corps Small Tactical Unmanned Aircraft Systems Program Office. Test article contract awarded in 3Q FY 2020. Test articles received in 4Q FY 2020.</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>-Accelerating Human Performance Discovery (Army): This project evaluates an advanced fluorescence microscope with live-cell imaging and analysis against existing capabilities. This technology greatly reduces analysis time from weeks to hours of live-cell imaging and streamlines the development of human performance optimization products. If successful, this technology will transition to the Army's Combat Feeding Directorate and other Service laboratories for continued human performance research & development activity. Contract awarded and test articles received in 4Q FY 2020.</p> <p>-Counter-Unmanned Aircraft Systems (C-UAS) for Vehicle Protection Systems (Army): This project evaluates an autonomous system that combines passive UAS detect, locate, identify and intercept for potential application to ground combat vehicles. This technology eliminates the need to integrate separate C-UAS detect and defeat systems. If successful, this technology will transition to the Army's Product Manager for Vehicle Protection Systems for follow-on acquisition. Contract preparation and test planning occurred in 4Q FY 2020.</p> <p>-High Power Phased Array Radar (HPAR) (Air Force): This project demonstrates an expeditionary S-band active electronically steered array radar with digital beamforming. This technology provides long range surveillance, detection, and tracking of aerial targets in complex electromagnetic and operational environments. This project enhances DoD capabilities in the Air and Missile Defense focus area. If successful, this technology will transition to the Air Force's Three-Dimensional Expeditionary Long Range Radar Program of Record. Contract preparation and test planning occurred in 4Q FY 2020. Comparative demonstration scheduled to occur in 1Q FY 2021 with FY 2020 funds.</p> <p>-Nano-Clay Seals for Long Service Life (Air Force): This project evaluates the service life of emerging nano-clay enhanced compression O-ring seal materials against existing nitrile rubber. This technology significantly reduces aircraft engine life cycle costs. If successful, the Air Force Research Laboratory will modify current military specifications and the technology will be available for purchase through the Defense Logistics Agency. Contract awarded in 3Q FY 2020.</p> <p>-Accurate Tracking & Unmanned Underwater Vehicle Navigation (Navy): This project tests sensors that enable accurate real-time tracking of unmanned underwater systems without the need for a high-cost Inertial Navigation Systems. If successful, this technology will be available for transition to Navy Unmanned Underwater Vehicle (UUV) and Remotely Operated Vehicles programs of record. Operational demonstration that was due to take place in 3Q FY 2020 was delayed due to COVID-19 and will now occur in 2Q FY 2021. PM will make a transition decision and close out report will be completed by 4Q FY 2021.</p> <p>FY 2021 Plans:</p> <p>-Civil Affairs Solution-Army Analytics (USSOCOM): Visual analysis testing will begin in 2Q FY 2021. The project will close out and test report written by 4Q FY 2021.</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>-Precision Vertical Take-off Unmanned Aerial System (VTUAS) (Navy): Field testing will occur in 2Q FY 2021. Operational and vulnerability testing will complete in 4Q FY 2021.</p> <p>-Extended Reality (XR) Helmet Mounted Display (Navy): Contract award is expected by 1Q FY 2021. Test articles should be received by 3Q FY 2021.</p> <p>-105 Millimeter Family of Multi-Purpose Munitions (Army): Ballistic testing of the ammunition at the Yuma Proving Grounds will begin in 2Q FY 2021. The project will close out and test report written by 3Q FY 2021.</p> <p>-Modular Airdrop Platform (Army): Final airdrop test will take place in 2Q FY 2021. The project will close out and test report will be written by 3Q FY 2021.</p> <p>-Counter-Unmanned Aircraft Systems (C-UAS) for Vehicle Protection Systems (Army): Contract award and receipt of test articles expected to occur by 2Q FY 2021. System demonstration is scheduled for 3Q FY 2021. The project will close out with a transition decision in 4Q FY 2021.</p> <p>-Enhancing DoD Infrastructure Repair (Army): Test articles will be received in 1Q FY 2021. Laboratory and field testing is scheduled to occur in 3Q FY 2021. This project will close out and test report completed in 4Q FY 2021.</p> <p>-Artificial Intelligence (AI) Neuromorphic Chip (Army): Bench testing of AI chip will complete in 2Q FY 2021. The project will close out and test report will be written by 3Q FY 2021.</p> <p>-Rapid Response Fentanyl Test Strips (Army): Test articles will be received in 1Q FY 2021. Laboratory testing will occur in 2Q FY 2021. Operational testing and military utility assessments will occur in 3Q FY 2021. This project will close out and test report completed in 4Q FY 2021.</p> <p>-Accelerating Human Performance Discovery (Army): Acceptance testing will occur in 1Q FY 2021. A basic research study on the enhanced microscope will take place from 2Q through 3Q FY 2021, and an applied research study will begin in 4Q FY 2021. This project will continue into FY 2022 with FY 2021 funds.</p> <p>-High Powered Microwave (HPM) Electro-Optic Electromagnetic Field Sensors (Air Force): Laboratory demonstration of sensors is scheduled for 2Q FY 2021. Down select of candidate sensors will take place in 3Q FY 2021. This project will close out with final test report completed by 4Q FY 2021.</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>-Nano-Clay Seals for Long Service Life (Air Force): This project evaluates the service life of emerging nano-clay enhanced compression O-ring seal materials against existing nitrile rubber. This technology significantly reduces aircraft engine life cycle costs. If successful, the Air Force Research Laboratory will modify current military specifications and the technology will be available for purchase through the Defense Logistics Agency. Compression performance testing scheduled to occur in 1Q FY 2021. Field testing will complete in 2Q FY 2021. The project will close out with a transition decision in 4Q FY 2021.</p> <p>-Space Qualification Testing of Event-Based Sensors (Air Force): This project comparatively tests neuromorphic imaging sensor technology under simulated space conditions. This technology offers advantages in performance, size, weight, power, and signal processing that are suitable for space-based applications. If successful, the technology will team with Space & Missile Command or Army Project Insight that are planning demos from high altitude & and space-based layers. Contract expected to be awarded in 1Q FY 2021. Test articles will be received in 3Q FY 2021 with acceptance testing starting in 4Q FY 2021. This project continues in FY 2022 with FY 2022 funds.</p> <p>-Comparative Real-Time Air Quality Sensing (Air Force): This project evaluates an active in-line pilot breathing air- monitoring capability in high performance military aircraft. This will accelerate the delivery of technology that addresses an urgent operational need for the Air Force. If successful, technology will transition to PORs through Air Force Life Cycle Management Center (AFLMC) with support from Air Combat Command (ACC). Contract preparation and award will complete in 2Q FY 2021. Two custom test articles expected to be received in 4Q FY 2021. Phase 1-3 testing to be completed in 4Q FY 2021. Phase 4 testing to begin 4Q FY 2021. This project continues in FY 2022 with FY 2022 funds.</p> <p>-Jet Engine Precooler to Enable High-Speed Flight (Air Force): This project evaluates a full scale heat exchanger technology for precooling jet engine airflow at high speeds. This supports next generation commercial and military high supersonic and hypersonic research and development programs. If successful, this technology will continue to engage with AFRL, DARPA and working with major engine & airframe primes to create new POR to develop a platform scale, high-speed jet engine. Contract preparation and award to be completed in 1Q FY 2021. Test article preparation and integration begins 1Q FY 2021. Pre-cooler testing to be completed 4Q FY 2021. Final Report to be completed in 4Q FY 2021.</p> <p>-Airborne Lean Services Architecture - Phase II (Air Force): Evaluates a network architecture configuration management system with message protocols suitable for systems in forward deployed environments. Enables rapid and flexible interoperability between disparate systems across different radio networks. If successful, technology will transition to the Special Warfare Technology Integration and Support Center for further testing and evaluation. Phase 2 Development, Integration, Labs to be completed in 1Q FY 2021. Phase 2 Test / Demo / Report to be completed in 2Q FY 2021. Phase 3 Operational Testing to complete 3Q FY 2021. Final Analysis and Report to be completed in 3Q FY 2021.</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>-Non-kinetic Defeat of Small Unmanned Aerial Systems (Army): This project evaluates a non-kinetic counter-unmanned aerial system for vehicles and fixed site configurations. This increases the probability of defeat while reducing collateral damage. If successful, this technology will be integrated with Medusa and fielded to the most vulnerable bases through USAF LCMC. Contract award and test article delivery expected in 2Q FY 2021. Initial performance test to begin 3Q FY 2021. This project continues in FY 2022 with FY 2022 funds.</p> <p>-Vehicle Mounted Camouflage (Army): This project comparatively tests vehicle coverings that reduce detection across multiple spectrum bands including infrared, microwave, and radar which could result in increased survivability in contested environments. Contract preparation and award will complete in 3Q FY 2021. Test articles will be received in 3Q FY 2021. Laboratory testing will begin in 4Q FY 2021. This project continues in FY 2022 with FY 2022 funds.</p> <p>-Water Free Chemical Decontaminant System (Army): This project evaluates a decontaminant agent, GD-6, for residual agent contamination testing and contact transfer hazards testing with various materials. This agent/decontaminant would allow for forward deployed personnel and their gear to be decontaminated without water and minimize the need to transfer critical equipment, thus enhancing readiness and resilience of the force. Contract preparation and award will complete in 3Q FY 2021, and test article will be received in 4Q FY 2021.</p> <p>-Water/Land Initiated Sensing Aerial Disconnect (USSOCOM): This project evaluates an airdrop system enhancement that automatically disconnects restraints once it has reached its destination. This system would enable fully autonomous delivery and derigging of unmanned systems and vehicles via airborne transport platforms. Contract preparation and award will complete in 1Q FY 2021. Test article will be received in 2Q FY 2021. Phase one ground testing will be conducted in 3Q FY 2021.</p> <p>-Active Protection Systems for Light Armored Vehicles (Navy/USMC): This project evaluates a vehicle mounted system that autonomously detects, tracks, and engages threats with both Hard and Soft Kill countermeasures. This will increase the combat capabilities of light armored vehicles against rocket propelled grenades and anti-tank missiles. Contract preparation and award will occur in 2Q FY 2021. Test articles will be delivered in 3Q FY 2021. Integrated test stand firing will be completed in 4Q FY 2021.</p> <p>-Organic Precision Fires – Infantry, Light (Navy/USMC): This project comparatively tests Group 1 loitering munitions. This provides an organic asset with precise kinetic effects within a Marine Infantry Company. Contract preparation and award will complete in 3Q FY 2021. Test articles will be received in 4Q FY 2021. This project continues in FY 2022 with FY 2022 funds.</p>			

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

	FY 2020	FY 2021	FY 2022
<p>-Portable High Power Directed Energy Systems for Aviation Support (Navy): This project evaluates a portable high power laser system capable of removing aircraft corrosion and coatings in operational environments. This reduces the health risk to maintenance personnel and increases maintenance efficiency. Contract preparation and award will take place in 2Q FY 2021. Test article will be received in 3Q FY 2021. Phase one validation testing will begin in 4Q FY 2021.</p> <p>FY 2022 Plans:</p> <p>-Extended Reality (XR) Helmet Mounted Display (Navy): Integration of the XR helmet display with the cockpit will occur in 2Q FY 2022. A evaluation report will be produced by 3Q FY 2022. The project will close out with a transition decision in 4Q FY 2022.</p> <p>-Space Qualification Testing of Event-Based Sensors (Air Force): Space Qualification Testing and Orbital mission assessment completed in 1Q FY 2022. Mission assessment and recommendation reports commence in 2Q FY 2022. Final report and project close out to occur in 4Q FY 2022.</p> <p>-Comparative Real-Time Air Quality Sensing (Air Force): Phase 4 testing to be completed in 2Q FY 2022. Phase 5 testing to be completed in 3Q FY 2022. Technology demonstration to occur in 4Q FY 2022. A procurement decision will be made and a close out report will be submitted in 4Q FY 2022.</p> <p>-Jet Engine Precooler to Enable High-Speed Flight (Air Force): Project will close out in 4Q FY 2021.</p> <p>-Non-kinetic Defeat of Small Unmanned Aerial Systems (Army): Cueing sensor integration begins 1Q FY 2022. Final test report, procurement decision, and project close out to be completed in 2Q FY 2022.</p> <p>-Vehicle Mounted Camouflage (Army): Field testing of the camouflage will take place in 1Q FY 2022. Test report and procurement decision will be made in 2Q FY 2022. (\$0.350 million FY 2022).</p> <p>-Water Free Chemical Decontaminant System (Army): Limited efficacy testing and equipment compatibility testing of the decontaminant agent will take place between 1Q FY 2022 and 3Q FY 2022. Test report will be completed by 4Q FY 2022 which will used by the Program of Record owner to support follow on demonstrations and procurement decision. (\$0.080 million FY 2022).</p> <p>-Water/Land Initiated Sensing Aerial Disconnect (USSOCOM): User evaluation will take place in 1Q FY 2022. Project will close out and evaluation report completed in 2Q FY 2022.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Testing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>- Active Protection Systems for Light Armored Vehicles (Navy/USMC): Live fire testing will take place in 1Q FY 2022. Project will close out and procurement decision made by PEO Land Systems in 3Q FY 2022.</p> <p>-Organic Precision Fires – Infantry, Light (Navy/USMC): Phase one flight testing will take place in 1Q FY 2022 with a down select to one vendor. Phase two evaluation testing will take place in 2Q FY 2022. Project will complete and procurement decision made by PM to be included in the Aerial Loitering Munitions program in 2Q FY 2022. (\$0.400 million funding)</p> <p>-Portable High Power Directed Energy Systems for Aviation Support (Navy): Phase one validation testing will complete in 2Q FY 2022. Field trials will take place in 3-4Q FY 2022. Project will complete and, if successful, this item will be added to the Authorized Equipment Lists for Naval and Marine squadrons in 4Q FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreases from FY 2021 to FY 2022 as currently selected projects complete their 12-36 month evaluation and are transitioned.</p>				
<p>Title: Foreign Comparative Testing Prototype Focus Areas</p> <p>Description: Previously funded effort. The FCT program will select new projects to evaluate allied/partner nation technologies that address emerging DoD capability gaps and provide substantial cost, schedule, and/or performance benefit to the warfighter. As projects are selected, they will be reported individually. Prototype evaluation will be aligned to the National Defense Strategy (NDS) and current Office of the Under Secretary of Defense, Research and Engineering focus areas to deliver increased readiness and a more lethal Joint Force while strengthening alliances, attracting new partners, and achieving greater performance and affordability.</p> <p>FY 2021 Plans: For FY 2021, fifty-eight proposals were submitted by the Services and USSOCOM requesting \$48.851 million in FCT funds to support new projects. As a result, seventeen projects were selected for funding. Deliverables will include integrated products that enhance warfighting capabilities across multi-domain battlefield environments. This will be done through test and evaluation of prototypes, demonstrations, and concept experimentation in coordination with the Services and United States Special Operations Command and other DoD Agencies. Remaining funds will be used to support priority out-of-cycle efforts to rapidly address emerging needs.</p> <p>FY 2022 Plans: FCT anticipates supporting ten to fifteen new projects spread across the focus area priorities in FY 2022. Deliverables will include integrated products and software that enhance warfighting capabilities across multi-domain battlefield environments. This will be</p>		0.000	1.210	12.411

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense	Date: May 2021
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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Testing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
done through test and evaluation of prototypes, demonstrations, and concept experimentation in coordination with the Services and United States Special Operations Command and other DoD Agencies.			
<i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> This funding will be allocated for the selection of new projects that will commence in FY 2022. Projects will be selected through a merit-based process and will address current and future OUSD R&E modernization priorities. Funding increases from FY 2021 to FY 2022 due to completion of on-going projects from prior years.			
Accomplishments/Planned Programs Subtotals	24.510	25.115	25.432

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

N/A

Remarks

D. Acquisition Strategy

Successful FCT projects support capability acquisition in several ways: technology upgrade insertion into a current platform or program providing greater capability or prolonging the life of the weapon system, informed/refined requirements for planned systems, or direct transition/procurement. FCT leverages the Services' and Defense Agencies' most efficient and effective acquisition approaches for rapid prototyping. This includes using Other Transaction Authorities and new or existing contract vehicles within middle-tier acquisition strategy.