

committees a written statement certifying that the aircraft to be procured under a contract would include the most recent technological advancements necessary to minimize the impact of physiological episodes on aircraft crewmembers.

TITLE II—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, ARMY

Items of Special Interest

Accelerated integration to counter emerging threats

The Committee supports the accelerated integration capability to counter emerging threats being initiated by the Program Executive Office, Missiles and Space. The Army is developing a government-owned capability to provide cyber-robust networked weapon systems designed to operate within rapidly evolving threat timelines.

The Committee understands this is being accomplished through a unique approach to adapt and respond to real-time threats, dramatically accelerating the timeline to employ resilience in networked weapon systems.

The Committee directs the Secretary of the Army to provide a briefing to the Committee on Armed Services of the House of Representatives by March 1, 2019, on the status of progress being made through this accelerated program.

Assured Position, Navigation and Timing

In response to global peer threats and demands from combatant commanders, the committee last year expressed its concern that the Army was not moving fast enough to field Assured Position Navigation and Timing (APNT) solutions. APNT solutions are required because of the reliance of military vehicles, communications and weapons systems on precise position, navigation and timing. The committee understands that strategic high-end competitors possess the capability to disrupt systems that depend on GPS which could pose an unacceptable level of risk to U.S. operations in GPS-denied environments. The committee notes the Army has stood up a Cross Functional Team (CFT) pilot to rapidly assess material development solutions to address the APNT mission area and perceived capability gaps.

In response to Section 236 of the National Defense Authorization Act of Fiscal Year 2018, the Army submitted a report to the congressional defense committees dated March 30th, 2018 that described its approach to test various systems at White Sands Missile Range in the 3rd Quarter of Fiscal Year 2018. The Army's report further described fielding both the A kits and B kits of a Quick Reaction Capability to specific units starting in the Second Quarter of Fiscal Year 2019. The committee understands that this testing is ongoing.

The committee directs the Secretary of the Army, in coordination with the Director of the Army's APNT CFT pilot, to provide a briefing to the House Committee on Armed Services by September 1, 2018 that outlines potential courses of action to begin immediate

procurement of these systems, subject to successful test and evaluations.

Targeted Soldier Borne Sensor efforts

The committee is encouraged by the Army's efforts to field the new Soldier Borne Sensor (SBS) capability to the warfighter and is encouraged by the Army's recognition of this capability requirement at the squad level. The committee understands the additional visual and situational awareness provided by the sensor to the warfighter will improve the survivability and lethality of the force. The committee also notes that a capability to operate within high-threat and GPS-denied areas, including but not limited to indoors and within tunnels, is currently available with SBS technologies under evaluation. However, the committee understands there are concerns regarding the current generation of thermal sensors associated with ongoing SBS technology evaluations. Specifically, the committee understands that current thermal sensors reportedly do not provide sufficient resolution to meet desired performance objectives. The committee encourages the Secretary of the Army to focus development efforts to accelerate technology development of electro-optic and infrared sensors that could be carried by the SBS.

The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by September 28, 2018, on current development efforts to address and resolve concerns regarding electro-optic and infrared sensor capabilities within the SBS platform. This briefing shall also include a detailed analysis of the electro-optic and infrared sensor technologies under evaluation and a plan for addressing the SBS requirement.

Computational molecular modeling and simulation for material development

The committee is aware the use of modeling and simulation during development of materials and other technologies may result in cost savings and other benefits, such as enhanced lethality and survivability. The committee understands that computational molecular modeling and simulation results subsequently tested using cold spray synthesis and mechanical testing have resulted in new repair techniques for armor, helmets, and other personal protective equipment. The committee, therefore, encourages the Army Research Lab to continue the utilization of computational molecular research for material development.

Future digital munitions and integration

The committee recognizes the importance for the Army to retain lethality overmatch within its aviation portfolio. The committee continues to support the Army's Future Vertical Lift and Joint Multi-Role technology demonstration initiatives. However, the committee is concerned about the Army's ability to mitigate Apache helicopter and Grey Eagle Unmanned Aerial System munitions and launcher obsolescence limitations for the foreseeable future. The committee believes existing and emerging threats are key factors to ensuring lethality overmatch. As digital aviation-launched munitions evolve, the need for the Army to retain flexibility in aircraft to munitions integration is critical to ensuring Army Aviation platforms retain a decisive edge.

Therefore, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services not later than September 15, 2018, on the following:

(1) all requirements, acquisition program plans, and developmental initiatives that address the modernization strategy for all aviation platform munitions and launchers beyond currently fielded systems; and

(2) recommendations on the utility for any development efforts that would modernize aviation launchers and munitions.

Future Vertical Lift

The committee understands that dedicated investment in incremental rotorcraft upgrades has kept America's current vertical lift aviation capabilities viable, and will continue to enable the fleet to bridge capability gaps through the near term. The committee believes that as more dangerous threats emerge at an accelerated pace in the mid-term, unwavering investment in advanced future disruptive technologies like Future Vertical Lift (FVL) will enable rotorcraft aviation to retain overmatch through significant capability improvements in reach, speed, protection, and lethality.

The committee notes that the Army leads the Department of Defense's rotorcraft technology portfolio, which needs additional research and development funding to regain America's world leadership in rotorcraft innovation. Because of America's eroding lead in rotorcraft capability, the committee encourages the Department to explore opportunities to accelerate the FVL program in order to meet national security challenges. The committee expects the Department to maximize full and open competition in doing so.

The committee believes that fiscal years 2019 and 2020 are pivotal years for the FVL modernization efforts, as critical technology demonstrations provide essential evidence during the completion of the FVL analysis of alternatives, and the Army uses this data and analysis to inform its path forward. Therefore, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by December 3, 2018, on the outcome of the analysis of alternatives and on any other analysis utilized in deciding the Army's priority of rotorcraft investment for FVL prior to the release of a request for proposal.

Harnessing Emerging Research Opportunities to Empower Soldiers

The committee is aware of the work being done by the Army's Warfighter Technology directorate in improving the protection, survivability, mobility, and combat effectiveness of the Army. The committee is also aware of Harnessing Emerging Research Opportunities to Empower Soldiers (HEROES), an ongoing joint research and development initiative involving both academia and industry. The committee understands that the HEROES initiative accelerates research and innovation through integration of intellectual assets and research facilities, such as those at Natick Laboratory and others. The committee believes programs like HEROES provide benefit to research in areas of advanced ballistic polymers for body armor, fibers to make uniforms more fire resistant, and lightweight structures for advanced shelters that provide tangible benefits to the warfighter. Therefore, the committee encourages the Army to continue to support such programs.

High energy laser systems integration laboratory

The committee has continuing interest in the Army's research, development, and testing of high energy laser weapons systems. The committee is aware of the Army's efforts to develop a high energy laser system integration laboratory in order to provide an interactive means to conduct warfighter assessments and develop the tactics, techniques, and procedures required to employ this technology. The committee recognizes this integration will be critical in bridging the gap from developmental technology to operational capability, while mitigating risk and ensuring warfighter utility. The committee encourages the Army to continue to mature the high energy laser system integration lab, as well as the benefit these activities provide to the research, development, and testing of directed energy weapons.

Improved Turbine Engine Program

The Improved Turbine Engine Program (ITEP) is a competitive acquisition program designed to develop a more fuel efficient and powerful engine to upgrade and enhance the performance and operational readiness of the current Black Hawk and Apache helicopter fleets. This new engine will increase operational capabilities in high altitudes and hot conditions while reducing operating and support costs. The committee has supported significant Army investments into competitive technology development programs for turbine engines over the past decade. During this time, the Army has made significant progress in maturing technologies that will lower ITEP programmatic risk with the goal of improving warfighting capabilities. In addition, the committee has encouraged the Army to prioritize maintenance and sustainment costs for ITEP to ensure the continued affordability of the program.

The committee also acknowledges the benefits of improved fuel efficiencies through lower specific fuel consumption that the ITEP will bring to the battlefield. This program represents a cost-effective approach to modernizing Army aviation and the committee continues to encourage the Army to pursue opportunities to accelerate the fielding of this capability. The committee recognizes 2019 as a crucial year for the program with Engineering Manufacturing Development (EMD) source selection slated for first quarter fiscal year 2019. Given the positive progress of this critical program, the committee is fully funding ITEP in fiscal year 2019 and encourages the Army to robustly fund ITEP in the EMD phase of the program.

Initial Maneuver-Short Range Air Defense capability

The committee is aware that the Army's critical capability gap for Air and Missile Defense remains protecting maneuvering forces. The committee understands that Army maneuver formations require short range air defense (SHORAD) and counter-UAS (CUAS) capabilities that can cover a wide range of air threats to include: unmanned aircraft systems (UAS), rotary wing (RW), fixed wing (FW), and rockets artillery and mortars (RAM). As such, the committee understands the Army is pursuing cross-domain, multi-dimensional solutions that can address these threats as part of a maneuver short-range air defense and indirect fires protection capability. The committee encourages the Army to consider areas where

commonality exists between current CUAS and SHORAD mission platforms and technologies.

The committee understands the Army has formalized a directed requirement to initiate integration and procurement of an initial Maneuver-Short Range Air Defense (IM-SHORAD) capability on a Stryker combat vehicle. The IM-SHORAD directed requirement requires capability to counter threats posed by UAS, RW, FW, and RAM, as well as address an emerging operational need in support of Operation Atlantic Resolve to provide air and missile defense protection of Stryker and Armored Brigade Combat Teams. The committee understands the acquisition strategy to support this directed requirement is still being developed.

The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by September 14, 2018, on the Army's accelerated acquisition strategy for the IM-SHORAD initiative, as well as identify requirements that are similar to both the SHORAD and CUAS missions. The briefing should also address capabilities currently under development or already fielded that could simultaneously address the CUAS and M-SHORAD mission areas.

Iron Dome experimentation and assessment for short-range air defense

The budget request included \$38.0 million in PE 64020A for cross functional team (CFT) advanced development and prototyping.

The committee understands the Army established six CFT pilots to examine how the Army could leverage existing resources and accelerate getting needed capability to the warfighter. The Army's critical capability gap for Air and Missile Defense (AMD) remains protecting the maneuvering force and is aware the AMD CFT pilot is focused on accelerating delivery of a maneuver short-range air defense (SHORAD) capability. The committee commends the AMD CFT for getting an approved directed requirement for an interim-maneuver SHORAD capability that accelerated the original schedule by 5 years. The committee notes the AMD CFT is also reviewing other AMD capability gaps for the protection of fixed and semi-fixed sites. The committee expects the AMD CFT to immediately address capability gaps in the areas of indirect fire protection capability and AMD.

Since 2011, Congress has provided over \$1.5 billion for the procurement of Iron Dome batteries for the State of Israel, a system with demonstrated capability against a wide-range of threats. There is value in experimenting with the Iron Dome system through demonstrations to assess operational suitability for the fixed and semi-fixed site AMD mission, and M-SHORAD missions. Such demonstrations will evaluate challenges associated with integration of the Iron Dome command and control system with the existing AMD C2 system and sensors.

The committee recommends \$68.0 million, an increase of \$30.0 million, in PE 64020A to support the acquisition of Iron Dome hardware and associated integration activities, for the operational demonstration of the Iron Dome system against a range of threats to evaluate issues associated with the following:

(1) integrating the Iron Dome launcher into a U.S. Army AMD architecture for complimentary support of fixed, semi-fixed, and M-SHORAD operations;

(2) re-designing the Iron Dome launcher to be compatible with the Indirect Fire Protection Capability Multi-Mission Launcher; and

(3) potential options for accelerating development of the Skyhunter missile.

Further, the committee directs the Director of the AMD CFT to provide a briefing to the House Committee on Armed Services by April 2, 2019, on the Army's plans for this experiment and demonstration. If warranted by the demonstration results, the committee directs the Director of the AMD CFT to provide a follow-on briefing on the advisability and feasibility of rapidly transitioning Iron Dome hardware for immediate use, with budgetary recommendations and schedules for accelerated procurement of additional systems.

Lightweight metal matrix composite technology for combat and tactical vehicles

In the committee report (H. Rept. 115–200) accompanying the National Defense Authorization Act for Fiscal Year 2018, the committee recognized the versatility and broad application that Metal Matrix Composite (MMC) Technology provides for the Armed Forces by reducing the weight of parts by 50 percent and increasing their service life by three to four times that of traditional steel parts. The committee understands the U.S. Army Tank and Automotive Research, Development, and Engineering Command (TARDEC) is currently evaluating technologies that can reduce vehicle weight, reduce fuel consumption, increase payload capacity, and extend service life of combat and tactical vehicles, and that MMC technology is part of this ongoing evaluation. The committee supports these efforts and recommends the U.S. Army TARDEC continue to test MMC technology, develop and field components that can reduce vehicle weight, reduce fuel consumption, increase payload capacity, and extend service life.

M119 105mm self-propelled artillery system technology

The committee understands the Army is examining the operational benefits of procuring a self-propelled 105mm howitzer in order to address existing capability gaps for infantry brigade combat teams (IBCTs) indirect fires capabilities. The committee understands that recent demonstrations as part of the Army's Maneuver and Fires Integration Experiment at Fort Sill produced positive results. The committee supports continued demonstrations of this capability and is aware of a potential future demonstration under consideration by the 18th Airborne Corps. The committee understands the demonstrated system incorporated artillery soft recoil technology with existing 105mm artillery systems and then integrated these technologies onto an existing light tactical vehicle. The committee expects the outcomes from these demonstrations to inform future operational requirements and procurement strategies.

The committee believes this capability could enable the Army to achieve significant improvements in combat capability and lethality through only a modest reinvestment of funding for current or fu-

ture planned M119 105mm howitzer modifications. Further, the committee also believes a light, self-propelled 105mm artillery system could substantially improve the deterrence posture of the U.S. Army and allied armies in Europe that may face sophisticated, quick-fire counter-battery systems.

The committee directs the Secretary of the Army, in coordination with the Directors of the Long-Range Precision Fires and Soldier Lethality cross-functional teams, to provide a briefing to the House Committee on Armed Services by December 14, 2018, on the advisability and feasibility of rapidly accelerating the testing, evaluation, and procurement of a self-propelled 105mm howitzer to address the indirect fire capability gaps in IBCTs. The briefing shall include feedback and results from recent demonstrations of self-propelled 105mm howitzer technology, specifically the demonstration that occurred as part of the Army's Maneuver and Fires Integration Experiment at Fort Sill.

Mobile camouflage system

The committee notes the longstanding success of our allied partner nations who employ mobile camouflage systems on their combat vehicles, especially within the North Atlantic Treaty Organization and the European theater. These relatively inexpensive camouflage net systems provide enhanced signature management protection, reduce heat and temperature inside and around combat vehicles, and yield fuel savings without interfering with the operation of the vehicles. Army commanders have expressed an immediate operational need for mobile camouflage systems, in particular woodland, desert, and Arctic variants. The committee is aware of the Army's ongoing operational testing of mobile camouflage systems at the National Training Center, and encourages further acceleration of those efforts.

The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by September 28, 2018, that outlines the mobile camouflage system test results and the Army's plan and timeline to fund the accelerated development and fielding of these systems to the warfighter.

Personal Protective Equipment advance technology development

The budget request contained \$18.0 million in PE 63827A for soldier systems-advanced development.

The committee recognizes advancements the military services have made in researching and developing materials for Personal Protective Equipment (PPE). The committee notes that this work has steadily reduced the weight of and increased ballistic protection for items like helmets, body armor, and protective undergarments designed for the men and women of the Armed Forces. The committee understands, based on the views of senior defense laboratory scientists, that further research on current materials, such as ceramics and Kevlar, are experiencing diminishing returns. The committee supports further research on advanced materials like high molecular weight polyethylene film and new and harder ceramics like boron suboxide.

Therefore, the committee recommends \$28.0 million, an increase of \$10.0 million, in PE 63827A for PPE advanced materials research.

Shoot-on-the-Move experimentation for short range air defense systems

The budget request contained \$61.1 million in PE 63313A for Missile and Rocket Advanced Technology, to include investment in missile components enabling detection and full kinematic capabilities to develop shoot-on-the-move capability for future short range air defense (SHORAD).

The committee is aware the Army is currently pursuing a near-term maneuver short range air defense (M-SHORAD) capability; however, the near-term solution will not include a shoot-on-the-move capability. The committee understands the capability to shoot-on-the-move would potentially be considered as a future capability requirement as part of follow-on M-SHORAD increments. The committee believes that the development and demonstration of a shoot-on-the-move capability could enable future combat formations to be protected from modern and advanced air and missile delivered fires while maneuvering, and enable continuous force protection during offensive operations.

The committee recommends \$71.1 million, an increase of \$10.0 million, in PE 63313A to accelerate the development and potential demonstration of shoot-on-the-move capability for M-SHORAD platforms and associated systems.

Soldier power and composite armor development

The budget request contained \$28.6 million in PE 62105A for Materials Technology research.

The committee understands that soldier power and composite armor technology development is critical to meeting the increased power demands of soldiers' equipment, while reducing weight. The committee recognizes that conformal wearable battery technology provides a lightweight, flexible power solution that offers greater mobility and flexibility than current capabilities, while streamlining the various battery types and sizes carried by the soldiers. The committee notes these capabilities provide soldiers with expeditionary power, as well as multiple power management alternatives that are all designed for combat operations in austere environments and can be tailored to any mission. The committee supports these programs and believes that they will help to reduce the soldiers' combat carrying load, while meeting the future demands of an increased power burden as well as maximizing survivability and protection. The committee encourages the Army to continue to work with the industrial base to improve and upgrade components in the soldier power and composite armor portfolio to potentially reduce weight and cost, as well as to improve overall performance.

The committee recommends \$29.6 million, an increase of \$1.0 million, in PE 62105A for Materials Technology research.

Squad multipurpose equipment transport

The committee understands the Army is conducting a 12-month technology demonstration leading to a capabilities production document and eventual procurement of a squad multipurpose equipment transport system (SMET). The SMET is an unmanned ground vehicle that will transport equipment for specific missions, resupply, and extended operations, thereby reducing soldier load and increasing squad mobility. The committee supports the Army's use of

other transaction authority to achieve a rapid start to this effort, and encourages the Army to seek additional ways to expedite acquisition of this critical capability.

The committee directs the Army's Program Executive Officer for Combat Support and Combat Service Support to provide a briefing to the House Committee on Armed Services by November 30, 2018, that includes:

- (1) options to accelerate this acquisition strategy;
- (2) courses of action to ensure the delivered system meets all key performance parameters;
- (3) findings and analysis from the user evaluations conducted by two brigade combat teams; and
- (4) an assessment of each variant's reliance on generators versus batteries, power generation capabilities, noise signatures, abilities to adapt to additional systems such as flail and mine rollers, dual stretchers, backhoe and loader kits, as well as any other capabilities considered to be essential by the program executive officer.

Supercavitating ammunition technology

In the committee report accompanying the National Defense Authorization Act for Fiscal Year 2018 (H. Rept. 115–200), the committee noted that supercavitating ammunition can be used in various operational environments, including air-to-air, water-to-water, air-to-water, and water-to-air, and that this technology could potentially address critical mission capability gaps for the warfighter. The committee also directed the U.S. Army Program Executive Officer (PEO) for Ammunition, who acts as the single manager of all conventional ammunition, to provide a briefing to the House Committee on Armed Services on the current status of supercavitating ammunition technology across the Department ammunition enterprise. The briefing acknowledged that the entire ammunition enterprise of the Department of Defense recognizes the value of supercavitating ammunition, and indicated that several efforts are underway to evaluate its performance. The committee notes that this technology is currently in use by the Department of the Navy and that other organizations in the Department of Defense are evaluating supercavitating small caliber ammunition. The committee is pleased that the Department of Defense is continuing to evaluate the performance of this technology and remains supportive of these efforts.

Therefore, the committee directs the PEO for Ammunition, in coordination with all relevant Department of Defense agencies, to provide a briefing to the House Committee on Armed Services by September 14, 2018, on all current test and evaluation activity currently ongoing and planned for supercavitating ammunition technology.

Third Generation Forward-Looking Infrared development

The committee is aware of a growing parity in U.S. Army sights and sensors against current and emerging threats, particularly when it comes to combat vehicle platforms. The committee is concerned that the Third Generation Forward-Looking Infrared (FLIR) development program is proceeding at too slow of a pace to ensure it will enter production as an integrated system in the next Abrams tank and Bradley Fighting Vehicle upgrades.

Therefore, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by March 15, 2019, on the Army's plans to synchronize the Third Generation FLIR program with the M1A2 SEP V4 Abrams Upgrade and M2A5 Bradley Fighting Vehicle upgrade. The briefing should also include potential courses of action for, and costs associated with, the acceleration of Third Generation FLIR development.

Transport telemedicine system

The committee is aware that the Department of Defense is developing capabilities that would provide telemedicine and remote physiological monitoring for casualty care of deployed forces. The committee recognizes that such telemedicine capabilities can provide useful reachback support for complex injuries, especially for sensitive organs where combat medics and surgeons may not have in-depth specialty training. The committee encourages the Department to continue to experiment with and examine ways to use emerging telemedicine capabilities to allow for consultation with specialty subject matter experts to provide soldiers on the battlefield with access to high-quality care for complex and difficult injuries. Additionally, the committee supports the idea of partnering with subject matter experts in order to provide direct, real-time consultation between geographically dispersed military and civilian medical personnel; this would support complex diagnostic and surgical problems, as well as allow conferencing for complicated, but less urgent, patient management decisions and virtualized training and continuing medical education.

Urban warfare training

The committee has continuing interest in the Department of Defense's ability to prepare for and operate in complex, densely populated urban terrain. Recent trends reflect that the future of global violence is urban, and that the next war will likely be fought in densely populated cities. The committee is supportive of the Department's ongoing efforts, but remains concerned with the lack of Army prioritization and resourcing to address these challenges. The committee is particularly concerned with the Army's lack of realistic training sites that reflect the scale and density of real-world urban operating environments. The committee believes the Army should more aggressively prepare for urban warfare and explore the construction of an urban warfare training center that focuses on basic and advanced skills to fight, survive, and win in urban operating environments. This training should address the challenges associated with vertical, subterranean, and dense urban terrain, and the inclusion and integration of joint and interagency enablers.

Therefore, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services not later than February 1, 2019, on the Army's plan for urban warfare training. The report should include:

- (1) a description of urban warfare training requirements;
- (2) an overview of a plan and timeline to integrate urban warfare training within the Army;
- (3) an identification of costs associated with an urban warfare training program;

- (4) a feasibility study on the construction of an urban warfare training center;
- (5) feasibility of utilizing existing private facilities and contracting training iterations until a final DOD facility can be constructed;
- (6) any critical technology, maneuver, or mobility shortfalls associated with operating in a dense urban environment; and
- (7) force design impacts or considerations within the Army.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, NAVY

Items of Special Interest

Academic partnerships for undersea unmanned warfare research

The budget request contained \$58.0 million in PE 62747N for undersea warfare applied research.

The committee supports the Navy's efforts to develop the next generation of nuclear submarines and other undersea systems and capabilities. Specifically, the committee supports research, development, testing, and demonstration of maritime robotic systems that may be used for security and surveillance, inspection and survey, munitions retrieval, and environmental monitoring.

The committee understands that there are additional opportunities to enhance development of the next generation submarines and maritime robotics technology in the areas of autonomy, adaptive decision making, docking, 3-D imaging, energy technologies such as marine and hydrokinetic convertors, and data transfer. The committee believes that university-based research and innovation centered on the development of maritime robotic technology and other capabilities required for advanced undersea warfare will be essential in maintaining the Navy's competitive advantage.

Therefore, the committee recommends \$78.0 million, an increase of \$20.0 million, in PE 62747N. Elsewhere in this title, the committee notes the importance of partnerships with academia to advance unmanned platforms and systems in order to maintain a competitive war fighting advantage.

Artificial intelligence and computer vision technologies in Navy unmanned systems

The committee has continuing interest in the Navy's ability to leverage artificial intelligence, machine learning, and computer vision in exploitation and analysis. The committee also recognizes the increasing amounts of imagery and other sensor data that Navy unmanned undersea and unmanned surface vessels generate, and the demand this creates for additional processing, exploitation, management, and dissemination of information. The committee recommends the Navy synchronize their efforts with the Under Secretary of Defense for Intelligence, and ensure that unmanned undersea and unmanned surface vessel computer vision and artificial intelligence requirements are incorporated into Project Maven and other Department of Defense research and development programs. The committee supports the Department's initiatives to leverage commercial technology and innovative solutions to rapidly address current Department challenges, and believes the Navy can benefit from similar capabilities.

Briefing for the Senate Committee on Armed Services and the House Committee on Armed Services on US Navy's efforts to expand carrier air wing long-range strike capability

The committee notes that the aircraft carrier air wing has been optimized for striking power and sortie generation and believes that it may not be configured to support the long-range strike required by current and future threat systems. While the introduction of the F-35C will significantly expand stealth capabilities, the F-35C could require increased range to address necessary targets. The committee believes that several options could be used to address this issue to include developing a stealth tanker capability, improved engine technology or to develop and procure a strike capability that is purposely built to strike at increased range. The committee further notes that the Navy previously desired to significantly increase the carrier air wing with the development of the A-12 aircraft. The committee understands that the A-12 would have included a 5,000-pound internal carriage payload, stealth, and a range of 800 nautical miles. While the committee believes that requirements to support this capability remain relevant and the technology available, the development of the A-12 aircraft was mired in acquisition challenges that eventually resulted in the cancellation of the program. While the committee further believes that the Department of Defense has successfully developed a suite of long-range intelligence, surveillance and reconnaissance capabilities, the committee also believes that it is vital that the Navy develop a carrier-based long-range strike capability.

Therefore, the committee directs the Secretary of the Navy to provide a briefing to the Senate Committee on Armed Services and the House Committee on Armed Services by January 25, 2019, on options to expand the strike range of a carrier air wing in a contested environment, including manned and unmanned capabilities, and, Department of the Navy capabilities it plans to pursue in the Next Generation Air Dominance capability.

Briefing on Navy support for research into autonomous systems

The committee is aware of the Robotarium, a laboratory hosted at the Georgia Institute of Technology, sponsored by the Office of Naval Research (ONR), where researchers conduct experiments with interconnected, heterogeneous unmanned ground and aerial systems. The committee is supportive of competitively awarded grant programs that enhance academia's ability to conduct complex experiments with autonomous systems. As the role of autonomous systems in operations is expected to grow, the Committee believes it will be increasingly important for ONR to continue to fund initiatives that prepare future engineers to conduct cutting edge research in this discipline, especially with different classes of autonomous systems including unmanned underwater vehicles, unmanned surface vehicles, and unmanned aerial vehicles operating simultaneously across multiple domains. Therefore, the committee directs the Director of ONR to brief the House Committee on Armed Services by November 1, 2018, on initiatives that enhance the ability of academia to conduct complex experiments with autonomous systems.

Briefing on ongoing engine noise reduction efforts

The Committee continues to support ongoing efforts to reduce engine noise from the F-414 engine on the F/A-18 E/F Super Hornet and E/A-18 G Growler.

Attachments, known as chevrons, could reduce the noise associated with operations of these aircraft. A reduction in engine noise would benefit sailors working in close proximity to the aircraft, particularly on the carrier deck, and communities near installations home to these squadrons.

Having received the briefing required by the House Report to the Fiscal Year 2018 National Defense Authorization Act, the committee is aware that the Navy may be requesting authority to reprogram Fiscal Year 2018 funding in order to engineer, manufacture, proof and test redesigned chevrons. The Committee supports such a request, provided the funding source is a program with unexecutable funds.

The Committee is aware that these funds would be used to develop an improved chevron design which could achieve significant noise reduction at full military power. The committee directs the Secretary of the Navy to brief the House Committee on Armed Services no later than September 30, 2018 on engineering plans for Fiscal Year 2018 and 2019 and potential applications of chevron designs to additional aircraft.

Consolidated Afloat Networks and Enterprise Services

The committee acknowledges the Navy's efforts to modernize the functions of its existing command, control, communications, computers, and intelligence network systems through Consolidated Afloat Networks and Enterprise Services (CANES) installation. The committee recognizes that, through CANES, the Navy seeks to build a more responsive and adaptable information technology platform by creating a common computing environment that will increase capabilities, address cybersecurity vulnerabilities, and lower sustainment costs across the fleet. Therefore, the committee continues to support full deployment of CANES, as scheduled, to ensure the Navy's networking environment remains adequately equipped for information warfare.

Defense University Research Instrumentation Program

The budget request contained \$119.4 million in PE 61103N for University Research Initiatives.

The Defense University Research Instrumentation Program (DURIP), administered by the Office of Naval Research, provides academic institutions conducting research for the Department of Defense the ability to acquire the necessary infrastructure to support high-quality research. Additionally, the instrumentation developed and acquired through the DURIP process ensures that the next generation of scientists and engineers are trained with cutting-edge capabilities for the defense science and technology workforce. The committee understands there is additional opportunity for the Navy to facilitate research in an area of interest to the Navy through the DURIP program.

Therefore, the committee recommends \$129.4 million, an increase of \$10.0 million, in PE 61103N, to support the acquisition

of infrastructure required by universities to conduct cutting-edge Navy research.

Directed energy and non-lethal weapons technology policy and guidance

The budget request contained \$27.6 million in PE 63851M for Joint Non-Lethal Weapons testing.

The committee continues to support the Department of Defense's efforts to develop non-lethal technologies as a materiel solution to provide military commanders with a non-lethal capability to protect military bases, security perimeters, and other secured spaces. The committee acknowledges the importance of these technologies as a force multiplier that gives service members more options, and minimizes civilian casualties and collateral damage. Recent development efforts of High Power Radio Frequency directed energy technologies have advanced these weapons to a maturity that can be used globally by the military services and combatant commands to stop vehicles, vessels, and other systems. The committee is concerned that the lack of policy, strategy, and guidance for employment of these non-lethal weapons has limited the potential benefits of deploying these technologies for use more broadly across the combatant commands.

Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services by November 1, 2018, on the future strategy for non-lethal weapons, including development of appropriate policy and guidance for employment. The briefing should also describe the current organizational structure of the non-lethal weapons program and consider the assignment of a joint proponent for non-lethal weapons who would be responsible for coordinating command requirements, facilitating policy development, and setting conditions for further integration of these capabilities.

The committee recommends \$32.6 million, an increase of \$5.0 million, in PE 63851M for the Non-Lethal Weapons program.

E2-D Advanced Hawkeye Identification Friend or Foe

The budget request contained \$223.6 million for the E-2D Advanced Hawkeye program.

The committee notes that the E-2D Identification Friend or Foe (IFF) Interrogation System has certain limitations at long range. These limitations affect the ability of the crewmembers to identify threats at range, reducing critical time to react. The committee also notes that applying meta-materials to the E-2D IFF system may improve the E-2D IFF range detection and overall ability of the fleet to react against distant threats.

The committee recommends \$225.6 million, an increase of \$2.0 million, for the E-2D Advanced Hawkeye program.

Joint Air-to-Ground Missile for fixed wing aircraft (JAGM-F) integration

The committee notes the Department of the Navy, with the eventual retirement of the Maverick missile has similar requirements as the Air Force for Joint Air-to-Ground Fixed (JAGM-F) missile on its AV-8B Harrier, F/A-18C/D/E/F Hornet, and F-35B/C aircraft. JAGM-F is an improvement to the Army's JAGM which will

allow the missile to be eject-launched from fixed-wing aircraft to eliminate time sensitive moving targets and high value covered/sheltered and armored targets. The committee understands JAGM-F will be able to combat adverse weather, low visibility and austere communication environments on land and at sea while engaging multiple targets near simultaneously in multiple engagement modes.

Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services by February 8, 2019 that provides potential options for accelerating Navy and Marine Corps efforts with respect to integrating JAGM on fixed-wing aircraft.

Marine Corps Group 5-class unmanned aircraft development

The budget request contained \$25.3 million in PE 34240M for development of advanced tactical unmanned aircraft system capabilities.

The committee understands that the Marine Corps plans to develop a medium- to large-sized, long-range, medium-altitude, multi-mission, unmanned aircraft system that can persist and survive in an anti-access, area-denial contingency environment. The committee is also aware of multiple capabilities and platforms across joint-service portfolios that could likely mitigate, if not eliminate, the capability gaps and shortfalls identified in the Marine Corps' Initial Capabilities Document, from August 10, 2016, "Marine Air Ground Task Force Unmanned Aircraft System Expeditionary Capabilities." The committee believes the Marine Corps underestimates the required communications, data link, launch, mission execution, and recovery infrastructure, or the human capital resources required to train, operate, maintain, and sustain such a system. The Marine Corps also underestimates the necessary human capital resources required to meet current deployment-to-dwell policy and guidance issued by the Secretary of Defense.

Therefore, the committee recommends \$10.3 million, a decrease of \$15.0 million, in PE 34240M for development of advanced tactical unmanned aircraft system capabilities. The committee also directs the Chairman of the Joint Requirements Oversight Council to provide a briefing to the House Committee on Armed Services, not later than February 5, 2019, that assesses all existing or future joint-service capabilities that are similar in nature to the Marine Corps' planned system, and includes a detailed explanation for why each of those joint-service capabilities could not mitigate or fulfill the gaps or shortfalls identified by the Marine Corps. The committee also directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services, not later than February 5, 2019, that explains the acquisition and funding strategy of the Marine Corps to affordably develop and field an unmanned capability of this nature, and the personnel, funding, infrastructure, and mission-execution resources that would be needed to viably sustain and support this capability.

Maritime intelligence, surveillance, and reconnaissance capabilities demonstration

The budget request contained no funding for the MS-177A maritime enhanced sensor demonstration program.

The committee notes that the Navy has the opportunity to leverage a \$300.0 million Air Force investment in the MS-177A sensor, which is meant to improve maritime target detection and long-range imaging. This investment could significantly reduce procurement costs and expedite fielding. The committee is aware that U.S. Pacific Command (PACOM) identified the MS-177A in its fiscal year 2018 integrated priority list for consideration. The committee believes that having an organic Navy MS-177A demonstration in the PACOM area of responsibility could help the Navy to assess the full range of anti-surface unit warfare and anti-submarine warfare capabilities. In addition, the MS-177A would help gather needed intelligence against threats in the PACOM strategic environment. The MS-177A would improve the Navy organic capability to conduct standoff anti-surface unit warfare intelligence, surveillance, reconnaissance, and long-range positive identification of targets.

The committee recommends \$23.5 million for the MS-177A maritime enhanced sensor demonstration program.

Naval underwater test ranges

The committee has continuing interest in the Department of Defense's plan to redevelop and modernize the Barking Sands Tactical Underwater Range (BARSTUR). The committee report (H. Rept. 114-577) accompanying the Department of Defense Appropriations Act, 2017, directed the Navy to submit a report to the congressional defense committees on the plan to redevelop and modernize BARSTUR. The report was submitted on October 13, 2017. The report provided by the Navy noted that BARSTUR is an invaluable asset to numerous Hawaii-based and transiting subsurface, surface, and aviation platforms. The committee notes the underwater range is used extensively to conduct submarine sonar, fire control, and weapons technical and operational evaluations, and serves a critical role in hosting the world's largest international maritime warfare exercise, Rim of the Pacific. This exercise serves as a means of promoting stability in the region and represents a unique training opportunity to foster and sustain cooperative relationships that are necessary for ensuring the safety of sea lines of communication and security in the Pacific Ocean. The committee remains concerned about the readiness and operational status of the Barking Sands Tactical Underwater Range and its ability to support critical training and exercises. The committee encourages the Navy to aggressively sustain the modernization timeline, begin the program requirement and acquisition process, and support a competitive source selection and contract award to achieve operational capability in fiscal year 2026.

MQ-25 Unmanned Carrier Aviation program

The budget request contained \$718.9 million for the MQ-25 Unmanned Carrier Aviation program.

The committee supports the Navy's efforts to develop and field a carrier-based unmanned aerial system to provide refueling as well as intelligence, surveillance, and reconnaissance support to the fleet. The committee notes that the Chief of Naval Operations intends to accelerate this program by 2 years in order to provide this capability by 2026. To date, the Navy has provided insufficient air

vehicle justification. Budget documents state that \$598.78 million will go to Air Segment Primary Hardware Development with very little further justification or cost estimates.

The committee recommends a decrease of \$116.9 million, for a total of \$602.0 million, to procure one test article for the MQ-25 Unmanned Carrier Aviation program.

Navy Explosive Ordnance Disposal recovery operations

Navy Explosive Ordnance Disposal (EOD) forces require a safe, effective, and supportable means to conduct Raise, Tow, and Beach (RTB) operations. These operations entail attaching suitable lifting mechanisms to the item of interest on the sea bed (e.g., threat items, Unexploded Ordnance (UXO), salvage items), actuating the lifting mechanism to raise the item to the sea surface, and securing and/or transporting the item of interest to a safe environment for subsequent action. The committee notes that Navy desired to employ the MK V Ordnance Recovery Air Bag (ORCA), a commercial-off-the-shelf (COTS) lift bag with similar lift capacity to legacy requirements. However, the ORCA system was never transitioned to a program of record that could replace the Mod 1 because the system experienced numerous material and design shortcomings making its continued use unacceptable without significant design modifications. Last year, Navy reassessed this issue and determined that the EOD Lift Balloon capability should be provided by the MK 2 MOD 2 Flotation Bladder Assembly. The committee notes that comparable capabilities exist to support this requirement including a developmental lift balloon and an automated tow coupling actuation system currently in limited use by EOD. Therefore, the committee directs the Secretary of the Navy to provide a brief to the House Armed Services Committee by October 1, 2018 that provides a comparison of the current program of record with other developmental efforts.

Navy Next Generation Enterprise Network

The committee acknowledges the Defense Information System Agency's current role in providing network management and security to the Navy's networks. The committee is also aware that the Navy has sought commercial sector input for modernizing its information technology services through the Navy Next Generation Enterprise Network. The committee recognizes that employing advanced commercial network capabilities for end-to-end network connectivity can promote rapid innovation, lead to cost efficiencies, and enhance security capabilities. Therefore, the committee encourages the Department of Defense, where practicable, to take advantage of commercial-off-the-shelf capabilities for supporting, securing, and modernizing its networks.

Navy Theater Anti-Submarine Warfare prototyping

The committee understands that the Navy plans to begin a Deployables Program of Record (PoR) in fiscal year 2020 which intends to address operational gaps in wide area undersea surveillance. The committee commends the Navy for conducting a robust prototyping program as a part of Theater Anti-Submarine Warfare (TASW) efforts since fiscal year 2015, which will inform future requirements and will produce valuable technical and operational in-

formation regarding the fielding and employment of deployables capabilities. However, the committee is also aware that under the current fiscal year 2020 start timeline, tested production units from the Deployable System of Systems Project effort will not be operationally available until late 2022. Therefore, the committee directs the Secretary of the Navy to brief the House Committee on Armed Services by August 30, 2018 as to a plan to maximize the capabilities that have been achieved from current prototyping efforts as well as how the Secretary intends to mitigate the operational gaps that could result because of the Deployables PoR fielding schedule.

Ocular Interruption System

The Committee is aware the Marine Corps' new Ocular Interruption System, which will replace the current decades-old system, represents a materiel solution providing personnel a single, non-lethal hail and warning capability applicable across the range of military operations where the objective is to minimize civilian casualties and limit collateral damage. The Committee is concerned with the budget request's proposed reduction of the Marine Corps Approved Acquisition Objective (AAO) requirement of 1,758 units from the previously stated goal of 1,848 units, and the delay of Full Operational Capability (FOC) until the fourth quarter of fiscal year 2020. The Committee is further concerned that the AAO requirement and the FOC timeline may have been altered without an associated change in requirements. Therefore, the Committee directs the Commandant of the Marine Corps to provide a briefing, not later than September 1, 2018, to the House Armed Services Committee on a plan to potentially fulfill its original AAO requirement of 1,848 units. This briefing shall include to planned delivery order schedule, pricing per unit, and fielding schedule.

Passive rocket propelled grenade armor protection technology

The committee notes there have been significant improvements in passive rocket propelled grenade (RPG) armor protection over legacy RPG armor systems, which are heavy and cumbersome, and present form, fit, and function constraints, particularly for Marine Corps ground combat tactical vehicle fleets operating in expeditionary environments. The committee encourages the Secretary of the Navy to consider lightweight RPG armor solutions that provide protection against RPG attacks while maintaining the ability to fold flat against the vehicle to allow for rapid deployment and transport from amphibious ships and aircraft.

Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services by February 1, 2019, on the testing, evaluation, and integration of lightweight, textile, and flexible RPG armor solutions that provide protection against RPG attacks, while maintaining the ability to fold flat against the vehicle to allow for rapid deployment and transport from amphibious ships and aircraft.

Small Business Innovation Research—Automated Test and Retest Program

The committee recognizes the Small Business Innovation Research (SBIR) program is a valuable tool to engage small business and provide a pathway for innovators to conduct business with the

Department of Defense. The National Defense Authorization Act of 2012 (Public Law 112–81), Section 5001, also known as the SBIR/STTR Reauthorization Act of 2011, mandates that agencies, to the greatest extent practicable, shall issue Phase III awards to the SBIR award recipients that developed the technology. The committee is aware that the technology developed for the Automated Test and Retest Program has demonstrated success that has led to an enterprise-wide approach, and offers cost savings over current efforts. The committee encourages the Navy to continue to support SBIR award recipients to the greatest extent practicable for any Phase III awards associated with the Automated Test and Retest Program.

Therefore, the committee directs the Secretary of the Navy, no later than 31 January 2019, to provide to the Committee on Armed Services of the House of Representatives, a briefing on the Automated Test and Retest Program. The briefing should include an overview of SBIR award recipients associated with this program, the Navy’s methodology and process for considering SBIR Phase III awards, and a plan detailing how the Navy’s Automated Test and Retest program will comply with the SBIR/STTR Reauthorization Act of 2011 for future contract awards.

TH-57 follow-on training system

The budget request contained no funds in PE 63208N for the TH-57 follow-on training system program.

The committee notes that the Department of the Navy procured the TH-57B and TH-57C helicopters used to train Navy, Marine Corps, Coast Guard, and foreign military partners between November 1981 and December 1985. The committee further notes that budget justification materials submitted with the budget request for fiscal year 2019 describe the TH-57 training system as experiencing obsolescence, diminishing manufacturing sources and material shortages, and increasingly expensive operating costs relating to aging aircraft issues. The committee understands that this situation results in potential pilot training shortfalls that will have a negative impact on readiness.

Accordingly, the committee believes the Department of the Navy should accelerate the program to procure a follow-on system to replace the TH-57B and TH-57C helicopters. The committee recommends \$1.0 million in PE 63208N for this purpose.

U.S. Navy MH-60R helicopter antisubmarine warfare and aircraft health monitoring

The committee understands the U.S. Navy operates a fleet of Antisubmarine Warfare (ASW) equipped MH-60R helicopters. The committee notes the MH-60R is fitted with advanced mission systems and sensors that are capable of detecting and engaging modern submarines in littoral and open ocean scenarios. However, the committee understands that the current ASW sonobuoy receiver is heavy and limited to its specific mission of receiving and transmitting data to and from U.S. Navy sonobuoy fields for analysis through acoustic processors.

The committee is aware that new Size Weight and Power (SWaP) receiver technology currently being used on the DDG-51 that could provide the Navy with enhanced capability while also reducing

weight on the MH-60R by over forty pounds. Additionally, the committee understands that the new receiver has the capability to integrate a Next Generation Health Monitoring System (NGHMS), which has the potential to replace the current HUMS system on the aircraft, saving an additional fifty pounds of critical weight. The committee is also aware the U.S. Army is currently conducting demonstrations of NGHMS on the UH-72 Lakota light utility helicopter.

The committee directs the Secretary of the Navy, or his designee, to provide a briefing to the House Committee on Armed Services by September 28, 2018 that provides operational details of the DDG-51 SWaP receiver to include capabilities, any challenges associated with integration with NGHMS and subsequently onto the MH-60R platform. The briefing should also include a notional plan for testing this technology as well as a notional acquisition strategy.

Warfighter safety and performance

The budget request contained \$56.2 million in PE 62236N for Warfighter Sustainment Applied Research.

The committee notes that this program has been instrumental in technology efforts to improve warfighter safety, prevent occupational injury in hazardous, deployed areas, and minimize the effects of extreme environments. The committee believes additional research focused on the safety, performance, and resilience of Navy divers can further reduce risk during dangerous missions in adverse conditions. Research areas that warrant additional focus include studies on decompression sickness, oxygen toxicity, optimization of diver performance, and assessment of the impact of thermal stress. This research can also illuminate human performance characteristics and technologies that have implications across a much larger set of mission-relevant performance calculations.

The committee recommends \$56.2 million, the amount requested, in PE 62236N for Warfighter Sustainment Applied Research.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, AIR FORCE

Items of Special Interest

Academic and industrial partnerships for aerospace materials

The budget request contained \$42.0 million in PE 63680F for the manufacturing technology program.

The Air Force has been studying materials for advanced aerospace needs to enhance lethality and survivability in accordance with the 2018 National Defense Strategy. The committee understands developing and manufacturing advanced materials can be challenging, and that opportunity may exist for the Air Force Research Laboratory to leverage existing relationships, and form new partnerships, with higher education and industrial partners in the Manufacturing Technology Program to better understand these challenges. Specifically, the committee believes greater leveraging of software and simulation tools to assess new machining, composite manufacturing, casting, and additive manufacturing technologies being developed by original equipment manufacturers, will

ultimately improve advanced material development and manufacturing.

Therefore, the committee recommends \$47.0 million, an increase of \$5.0 million, in PE 63680F to develop advanced materials and increase advanced materials manufacturing through academic and industrial partnerships to better support aerospace needs.

Academic partnerships for modeling, design, and analysis of unmanned air platforms

The budget request contained \$190.9 million in PE 62203F for aerospace propulsion research and development.

The committee is aware that the Air Force performs a wide range of advanced research and engineering in multi-disciplinary design for unmanned air platforms. Further, the committee recognizes that advanced modeling and design, as well as quicker comparative analyses, are beneficial to this effort. The committee believes that academia is well-suited to partner with the Air Force on modeling, design, and comparative analysis through the use of Educational Partnership Agreements, which are mutually beneficial agreements that may also enhance the Air Force's effort to recruit a diverse and educated workforce.

Therefore, the committee recommends \$195.9 million, an increase of \$5.0 million, in PE 62203F for Educational Partnership Agreements for unmanned platforms.

Elsewhere in this title, the committee notes the importance of partnerships with academia to advance unmanned platforms and systems in order to maintain a competitive war fighting advantage.

Advanced engine development program

The budget request contained \$1.2 billion in PE 64858F for technology transition programs, of which \$790.4 million was included for the advanced engine development project.

The advanced engine development project enables demonstration of advanced turbine engine prototypes. The committee notes that the main effort in this project is the adaptive engine transition program, which is maturing fuel-efficient adaptive engine component technologies and reducing associated risk in preparation for next-generation propulsion system development for multiple combat aircraft applications. The committee understands that adaptive engine technology enables next generation combat aircraft capabilities by combining the efficiency of high-bypass turbofans used by commercial airlines with the performance demanded of military fighter engines. This technology has undergone initial development through the adaptive engine technology and adaptive engine technology demonstrator programs, which the committee has supported in past years. The committee believes that both legacy aircraft and future aircraft can benefit from this capability and technology. Therefore, the committee encourages the Department of the Air Force to continue to make the necessary investments in these critical technology demonstrations and engine developments to ensure operational capability is achieved at the earliest opportunity.

The committee recommends \$790.4 million, the full amount requested, in PE 64858F in order to continue the advanced engine development project, and further encourages the Department of Defense to consider early initiation of development programs aimed at

transitioning advanced engines into the field for both legacy and future combat weapon systems.

Advanced pilot training program

The budget request contained \$265.5 million in PE 65223F for the advanced pilot training (APT) program. The APT program will replace the Air Education Training Command's aging T-38C fleet with new aircraft, a ground-based training system, a maintenance training system, and support infrastructure currently used in the fighter/bomber advanced Specialized Undergraduate Pilot Training track, as well as in the Introduction to Fighter Fundamentals program.

The committee continues to view the APT program as a critical program to replace the aging T-38C aircraft in order to train student pilots in an advanced training aircraft so they can make a more effective transition to fifth-generation combat aircraft upon graduation from undergraduate pilot training. The committee notes that for fiscal year 2018, contract award had been planned for late 2017, and has now been delayed until the summer of 2018. If the delay in contract award extends beyond the summer of 2018, the committee expects the Secretary of the Air Force to provide a briefing to the House Committee on Armed Services within 30 days of the delay announcement, detailing the reasons for further delay, impact on aircraft delivery, and efforts to mitigate the delay so that initial and full operational capability remains on schedule.

The committee recommends \$265.5 million, the full amount requested, in PE 64233F to continue the APT program. The committee also expects the Secretary of the Air Force to provide the briefing to the House Committee on Armed Services directed in the committee report (H. Rept. 115-200) accompanying the National Defense Authorization Act for Fiscal Year 2018, on potential options to accelerate the APT program, subsequent to contract award.

Advanced radar threat system emitters

The budget request contained \$35.9 million in PE 64735F for Department of the Air Force combat training range development, of which \$34.8 million was included for development of a family of advanced radar threat system (ARTS) emitters. The ARTS programs develop, design, build, and test threat system simulators based on advanced foreign-fielded surface-to-air missile (SAM) radar threat systems. ARTS will be used at Department of Defense training ranges for fourth- and fifth-generation aircrew training and tactics development to increase combat effectiveness and aircrew survivability by training aircrews to engage or defend against an advanced SAM threat before encountering it in actual combat to stress their tactics, techniques, and procedures.

The committee understands that ARTS radars would add modern, high-fidelity threat training devices to the ranges that are capable of interacting with fifth-generation sensor-fusion technologies. During a visit to Hill Air Force Base, Utah, in April 2018, F-35A pilots briefed committee members that current training ranges are not equipped with the threat radars necessary to provide the most effective training for F-35 pilots, and the committee believes that the ARTS emitter programs should be accelerated.

Accordingly, the committee recommends \$62.9 million in PE 64735F for Air Force combat training range development, an increase of \$27.0 million, to accelerate the ARTS emitter programs, and understands that this amount is executable in fiscal year 2019.

Advanced Turbine Engine Gas Generators

The Advanced Turbine Engine Gas Generator project develops and demonstrates core engine technologies to address the growing need for affordable small turbofans utilized in current and future missile and remotely piloted aircraft propulsion systems. The project develops and demonstrates technology to reduce cost of ownership by half while improving mission flexibility and fuel consumption to increase range. It will also pave the way for providing much needed competition where there currently is none. The committee directs the Secretary of the Air Force to provide a briefing to the House Committee on Armed Services, not later than February 15, 2019, on Department of the Air Force plans to fund technologies which lead to low cost, high performance turbofan engines of up to 1,200 pounds of thrust.

Aerospace composite structures manufacturing

The budget request contained \$42.0 million in PE 63680F for the Air Force manufacturing technology program. Of this amount, \$30.1 million was requested for advanced manufacturing technology, including agile manufacturing capabilities.

The committee believes that manufacturing technology related to cost reduction for aerospace composite structures is a particularly important part of this overall effort. Specifically, the committee encourages work on production cost reduction methods, low-cost tooling, and agile manufacturing technologies to enable future Air Force unmanned systems requirements to be achieved at an affordable cost.

The committee recommends \$42.0 million, the full amount requested, in PE 63680F for the Air Force manufacturing technology program.

Air Force test and evaluation support

The budget request contained \$692.8 million in PE 65807F for Department of the Air Force test and evaluation support. The committee notes that this amount is \$14.5 million, or about 2 percent, higher than the budget request for fiscal year 2018. The committee also notes that test facilities, capabilities, and resources operated through this program include wind tunnels, rocket and jet engine test cells, armament test ranges, civilian payroll, and contractor services.

In the committee report (H. Rept. 115–200) accompanying the National Defense Authorization Act for Fiscal Year 2018, the committee reported on a briefing it received on a comprehensive assessment of Major Range and Test Facility Base needs and investments to meet the testing required for fifth- and sixth-generation aircraft and air armament, including hypersonic strike weapons. The committee noted that among its findings were that fifth- and sixth-generation aircraft and weapons introduce test and evaluation gaps, and that significant research and development and operations and support investments are required to fill those gaps.

For fiscal year 2018, Department of the Air Force officials informed the committee that funding for test and evaluation support is about \$30.0 million below its historical norms, and that this funding erosion has diminished the ability of the Air Force Test and Evaluation (T&E) enterprise to support T&E of next-generation capabilities in the near term. Since the budget request for fiscal year 2019 would only provide an inflation increase over the previous year, the committee believes that the budget request for fiscal year 2019 is also about \$30.0 million below historical norms.

Consequently, the committee recommends \$724.7 million in PE 65807F for Air Force test and evaluation support, an increase of \$31.9 million, to provide improved open-air range test capabilities on a timeline that supports the Air Force's roles in the development of next-generation platforms and air armament, and addresses the growing range challenges.

Air Operations Center software modernization utilizing agile development software processes

The budget request contained \$106.1 million in PE 27410F for the Air and Space Operations Center (AOC), of which, \$97.6 million is for development of applications and software for the AOC utilizing agile software development and operations (Ag DevOps) techniques.

The committee is disappointed in the past attempt to modernize and upgrade AOC capability through the AOC 10.2 program and the waste of fiscal resources that occurred as a result of AOC 10.2 program termination. The committee is concerned by the Air Force's lack of knowledge regarding contractual insights and cost data, the inability to explain cost-estimation tools and planning considerations necessary to formulate budgets, and how the Air Force values the goods and services received for the resources expended.

Therefore, the committee recommends \$79.6 million in PE 27410F, a decrease of \$26.5 million, for development of applications and software for the AOC utilizing Ag DevOps techniques. The committee also includes a provision elsewhere in this title that would provide the Secretary of the Air Force 25 percent of authorized funding recommended until the Secretary provides a report to the congressional defense committees on software development cost-estimation tools needed to develop "should-cost" models, information regarding costs incurred to date for software development, and a sufficiency review of the report by the Department of Defense Director, Defense Pricing and Acquisition Policy office prior to submitting the report to Congress.

Autonomous life support system

The budget request contained \$36.5 million in PE 63456F for human effectiveness advanced technology development, but included no funds for an autonomous life support system (ALSS). An ALSS is a system in development that would monitor the physiologic state, respiratory profile, and environmental conditions of a pilot in a fighter or training aircraft. It automatically adjusts to the pilot's physiologic demands, thereby diminishing the prospect that a pilot would be subjected to a physiological episode resulting from an inadequate supply of oxygen.

A National Aeronautics and Space Administration (NASA) report conducted by the NASA Engineering and Safety Center, dated September 14, 2017, on F/A-18 and EA-18 fleet physiological episodes, recommended the development of systems that would monitor a pilot's physiologic state. The committee understands that the Air Force's 711th Human Performance Wing is pursuing a cooperative research and development agreement with a contractor to develop an ALSS that includes capabilities for monitoring inhaled and exhaled gas. The committee further understands that the scope of funded work should also include the monitoring of pilot physiology for heart rate, pulse or tissue oxygenation, and estimated core temperature, and that an increase in funds for this purpose would accelerate the development of an ALSS.

Consequently, the committee recommends \$46.5 million, an increase of \$10.0 million, in PE 63456F.

Education and outreach for anti-tampering and cybersecurity research

The committee recognizes the role that anti-tampering technology plays in safeguarding U.S. military weapon systems from theft, reverse engineering, and exploitation. The committee acknowledges and supports the Air Force's highly focused efforts to grow technological advances in this area. Therefore, the committee encourages the Department of Defense to fully fund programs that support anti-tampering research and development. Furthermore, the committee encourages the Department to leverage talent from Historically Black Colleges and Universities (HBCUs) that have a proven track record of excellence in this particular field. The committee recognizes the vital contributions that HBCUs have made in supporting defense readiness and national security priorities through successful research initiatives.

F-15 ALQ-128 electronic warfare warning set

The budget request contained \$192.9 million in PE 27134F for development of F-15 systems, but included no funds for development of the ALQ-128 electronic warfare warning set (EWWS). The ALQ-128 EWWS is a countermeasures receiver used on the F-15C, D, and E aircraft. The ALQ-128, used in concert with other systems, provides active jamming against enemy radar threats.

The committee notes that with the fielding of upgraded active electronically scanned array radars on the F-15 fleet, the aircraft's automatic electronic warfare warning countermeasures and active jamming capability was lost because the legacy ALQ-128 EWWS is not compatible with the new antennas and cannot be upgraded. The committee understands that an ALQ-128 development program to re-design the ALQ-128 would regain the lost warfighter capability to provide active jamming against enemy radar threats, and is necessary to provide an expandable and upgradeable system to meet mission requirements.

Therefore, the committee recommends \$242.9 million, an increase of \$50.0 million, in PE 27134F for development of the ALQ-128 EWWS.

F-35 follow-on development

The committee notes that the F-35 program has accomplished the final developmental test flight of the system development and demonstration (SDD) phase of the program on April 11, 2018. While the SDD required flight test is now complete, the committee further notes that flight testing continues in support of phased capability improvements and modernization of the F-35 air system in an effort formerly known as block four and now known as continuous capability development and delivery (C2D2). The C2D2 program will provide timely, affordable incremental warfighting capability improvements to maintain joint air dominance against evolving threats to the United States and its allies.

Section 224(b) of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114-328) directed the Secretary of Defense to submit a report to the congressional defense committees that contains the basic elements of an acquisition baseline for the F-35 block four program. However, the report delivered in January 2018 provided only an initial insight into the basic elements of the F-35 C2D2 program. The committee understands that a complete report is planned to be submitted in March 2019, and believes that the basic elements of an acquisition baseline are vital to the ability of the committee to conduct its oversight responsibilities of a significant F-35 modernization budget.

Therefore, elsewhere in this Act, the committee recommends a provision that would limit the obligation of funds for the F-35 C2D2 program until the Secretary of Defense submits the complete report required by section 224(b) of Public Law 114-328.

The committee also notes that in its annual report on the F-35 program, the Director of Operational Test and Evaluation assessed that the F-35 C2D2 schedule was not executable due to insufficient test resources, including an inadequate number of test aircraft configured to conduct C2D2 test flight activity. Accordingly, the committee believes the Department should procure an additional six new test aircraft, two in each of the F-35A, F-35B, and F-35C configuration, to support the C2D2 program so that capability improvements and modernization can be more rapidly developed and procured to meet evolving threats.

Metals Affordability Initiative

The budget requested contained \$37.9 million in PE 63112F for Advanced Materials for Weapons System.

The committee recognizes the importance of this program in providing affordable materials and manufacturing technologies across the entire life-cycle of aerospace materials. Specifically, the Air Force Research Lab-managed Metals Affordability Initiative has reduced metallic aircraft component costs and accelerated the implementation and transfer of technologies across a wide range of aircraft platforms. The committee notes the value of this public-private partnership and the risk sharing model that has directly led to a nearly \$2.4 billion return on the U.S. Government's investment. The committee recommends the Secretary of the Air Force create a dedicated funding line for the Metals Affordability Initiative to show the Air Force's clear commitment to this program.

The committee recommends \$47.9 million, an increase of \$10.0 million, in PE 63112F for Advanced Materials for Weapons System.

Passive ground-based imaging of space objects

The committee is aware of the progress with ground-based space imaging experiments being made by the Air Force Research Laboratory's (AFRL) Joint United States-United Kingdom Research Team. The committee recognizes the potential for high resolution imaging of geosynchronous satellites that also supports the AFRL Science, Technology, Engineering, and Mathematics education goals. The committee is also aware of positive initial test results and additional ground based experiments using full scale baseline separations of over 100 meters between the tracking telescopes. The committee recommends the AFRL continue ground-based space imaging experimentation with passive/unobtrusive optical amplitude interferometry imaging in combination with other surveillance systems for Department of Defense applications.

Precision metrology tools

The budget request contained \$125.3 million in PE 62102F for materials research and development.

The committee recognizes that metrology, or the development of precise measurement tools, is an important aspect of materials research. As the ability to manipulate materials at the subatomic scale, and to generate new and novel materials from computational design, continues to advance, it will also require further development of precision measuring tools. The committee encourages the Air Force to explore new and innovative methods to develop and provision for these tools, including through public-private partnerships to field and maintain cutting-edge metrology systems.

Therefore, the committee recommends \$128.3 million, an increase of \$3.0 million, in PE 62102F to support the development of advanced, precision metrology tools.

Recapitalization of Battle-Management, Command and Control, and associated intelligence capabilities in support of ground forces

The budget request contained no funds in PE 37581F for the Joint Surveillance Target and Attack Radar System (JSTARS) Recapitalization (Recap) program, and \$14.9 million for research and development, and \$9.9 million for procurement activities related to the legacy E-8C JSTARS program.

The committee is concerned and disagrees with the Air Force's decision to terminate the JSTARS Recap program. While the committee understands the Air Force's desire to transition to a new "family of systems" concept for providing intelligence to the Joint Force, it believes that the proposed plan involves significant risk in terms of technology development, integration, cost, and schedule, and therefore the termination of the JSTARS Recap program is unwarranted and will create a significant gap in overall ISR capability and capacity. While the Air Force claims to have accounted for such risks in its decision, the committee does not believe it is appropriate to accept these risks given the importance of this mission area to the Joint Force. In addition, the committee notes that the Air Force's decision on the JSTARS Recap program directly contradicts numerous Department of Defense analyses, and senior-officials' testimony provided to Congress regarding requirements, capabilities, war-gaming, and affordability that justified the exist-

ence and execution of the JSTARS Recap program, as recently as part of the fiscal year 2018 budget request.

Further, the committee is also concerned that the Air Force's decision could impose an unacceptable level of risk to joint ground forces that will rely heavily upon JSTARS Recap to provide reliable, consistent, accurate, and highly integrated Battle-Management, Command and Control, and Ground Moving Target Indicator intelligence capabilities. Finally, the committee believes that the Air Force's decision did not take into account the significantly improved capabilities and increased capacity that the JSTARS Recap aircraft, utilizing a modern aircraft design with fifth-generation radar technology and integrated software processing, is currently designed to bring to the battlefield as compared to the current fleet of legacy E-8C aircraft.

Therefore, the committee recommends \$623.0 million, an increase of \$623.0 million, in PE 37581F to fund the JSTARS Recap program's continued development. The committee also includes a provision elsewhere in this title that addresses this program.

Reusable hypersonic vehicle structure development

The budget request contained \$130.5 million in PE 62201F, and \$125.4 million in PE 62102F for aerospace vehicle technologies and materials. The committee supports the Department of Defense's efforts to accelerate the testing and development of hypersonic vehicles. The committee believes further investment in the development of economically efficient reusable hypersonic systems will extend national defense capabilities beyond the limits of expendable systems. Additional reusable hypersonic vehicle structure development and thermal protection system development is necessary to enable rapid global response to threats, and extend the survivability of platforms in highly contested environments. Further research focused on ceramic matrix components, fabrication, assembly, and full-scale component testing is necessary in order to meet the Air Force's fiscal year 2019 test bed vehicle operations goals. The committee recommends \$140.5 million, an increase of \$10.0 million, in PE 62201F and \$135.34 million, an increase of \$10.0 million, in PE 62102F for aerospace vehicle technologies and materials, to accelerate the development of reusable and air-launched hypersonic vehicle structures.

Robust aircraft electrical power and thermal management systems

The budget request contained \$115.5 million in PE 63216F and \$190.9 million in PE 62203F for the development and demonstration of electrical power, thermal management, and distribution for aerospace applications.

The committee recognizes the Air Force is highly focused on developing directed energy and laser weapons systems, both for self-protection and to provide offensive capability for future aircraft. In order to meet those goals, the Air Force will not just need a lasing system and optics with the size and weight to be incorporated into aircraft-sized systems, but it will also need an end-to-end power generation system that can meet all of these new power demands in addition to all of the other electrical and avionics subsystems on these aircraft. The committee encourages the Air Force to focus developmental work on the aerospace electrical power for lightweight

and efficient power technologies needed for those future aircraft concepts.

Therefore, the committee recommends \$125.5 million, an increase of \$10.0 million, in PE 63216F, and \$195.9 million, an increase of \$5.0 million, in PE 62203F, to accelerate design, fabrication, and testing to support a light-weight, robust electrical power and thermal management system for future aircraft needs.

Secure-live-virtual-constructive advanced training environment

The budget request included \$112.5 million in PE 62202F for Human Effectiveness Applied Research, a program element that includes learning and operational readiness.

The committee notes that this project supports research on the application of cognitive science for performance improvement by enhancing training in mission-relevant environments. This includes advanced technology demonstrations for a secure live-virtual-constructive advanced training environment and live-virtual-constructive cockpit technologies. The committee recognizes the important advances that have resulted from this particular technology demonstration since its inception in 2015, and looks forward to a joint services proof of concept demonstration, as well as accelerated encryption and waveform development. As the U.S. Air Force continues to seek ways to leverage cutting-edge technologies in realistic training and improve mission readiness, the committee is interested in ensuring the joint interoperability of this technology in fifth generation aircraft.

The committee recommends \$112.5 million, the full amount requested, in PE 62202F for Human Effectiveness Applied Research.

Small diameter bomb II cost reduction initiative

The committee understands the small diameter bomb increment II (SDB II) is a joint program between the Air Force and Navy. The SDB II can be used on every tactical fixed-wing aircraft platform and provides the warfighter the capability to attack mobile targets from stand-off ranges, through inclement weather and adverse conditions. The committee notes that since the award of the initial production contract the cost of an all up round (AUR) has increased largely as a result of lower-than-expected quantities of the tri-mode seeker that is currently used on SDB II for other precision guided munition programs. The committee is concerned that this could negatively impact potential planned procurement of SDB IIs in the out-years, and as a result could delay SDB II fielding when the program is scheduled to increase production.

The committee encourages the Secretary of the Air Force to examine implementing potential cost reduction efforts to address rising AUR costs related to the tri-mode seeker at this early stage of SDB II production in order to maximize return on investment for the Department of Defense and the taxpayer.

Technology Transition Program

The budget request contained \$1.2 billion in PE 64858F for the Technology Transition Program.

The committee commends the program's efforts to accelerate and transition technologies and prototypes into acquisition programs of record and operational use. The committee notes a majority of the

funds are allocated towards advanced engine development and prototyping, and is concerned that only \$87.2 million is allocated for experimentation with other technologies. The investment in non-engine technologies is insufficient to address the critical technology and development required to transition systems-of-systems research, mixing low-tech and high-tech assets in a combat-effective framework, and scalable and additive manufacturing solutions.

The committee recommends an increase of \$15.0 million in PE 64858F for non-engine technology experimentation and competitively awarded transition programs within the Technology Transition Program.

Wide-area motion imagery intelligence capability

The budget request contained \$175.3 million in PE 35206F for development of airborne reconnaissance systems, but contained no funding for continued development and modernization of wide-area motion imagery (WAMI) beyond line-of sight (BLOS) capabilities.

The committee notes that persistent, near real-time day and night WAMI capability is considered by operational commanders to be a critical BLOS intelligence, surveillance, and reconnaissance capability for numerous combat units. WAMI capability has been deployed in support of combat operations in the Islamic Republic of Afghanistan since 2010 and in the Republic of Iraq since 2015; however, despite the invaluable capability that WAMI provides, the Air Force has only been able to provide four steady-state unmanned aircraft system lines of WAMI capability. The committee understands that 2 years ago, the Department of Defense validated a U.S. Central Command Joint Urgent Operational Need Statement that requires the further development and procurement of WAMI BLOS capabilities for forward-deployed operations. The committee notes that previous funding has resulted in preliminary multi-intelligence fusion capabilities, near-vertical-direction finding, and enhanced BLOS capabilities. However, a lack of fiscal year 2019 funding will impede final delivery of these capabilities, and will prevent necessary sensor system upgrades to satisfy validated warfighter requirements.

Accordingly, the committee recommends \$186.1 million in PE 35206F, an increase of \$10.8 million, for development of WAMI BLOS sensor improvements, and to continue processing and exploiting improvements that would enable automated multi-intelligence sensor fusion.

Wind energy development radar mitigation efforts

The budget request contained \$6.3 million in PE 35114F for the Air Traffic Control, Approach, and Landing System.

The committee understands the growing importance of renewable energy as a national security imperative, in particular the rapid expansion of wind energy as an alternative energy source. The committee also recognizes the potential impact of wind energy development on the operational readiness, training activities, safety, and force protection of Department of Defense service members, aircraft, and installations. Given the expected increase in the U.S. wind energy development, mitigation approaches must be further developed and accelerated.

The committee recommends that the U.S. Government and industry continue to evaluate the impacts of existing and planned wind energy developments in coordination with the Federal Inter-agency Wind Turbine Radar Impact Mitigation Working Group, and develop best practices for radar mitigation strategies. The committee is aware of an existing pilot program by the U.S. Transportation Command and Air Mobility Command to integrate gap-filler radar systems into their air traffic control operations to mitigate the impact of wind energy developments. This mitigation pilot program has reduced false target alerts and improved the situational awareness of air traffic control operators and the safety of aircrew. The committee recommends additional analysis to assess the feasibility and development requirements associated with the integration, operation, and performance of gap-fill radars integrated into existing air traffic command and control systems.

Therefore, the committee directs the Secretary of the Air Force to provide a briefing to the House Committee on Armed Services not later than October 31, 2018, on the status of the pilot mitigation project and strategy for developing gap-filler radar thresholds and requirements.

Additionally, the committee recommends \$8.8 million, an increase of \$2.5 million, in PE 35114F for the Air Traffic Control, Approach, and Landing System.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, DEFENSE-WIDE

Items of Special Interest

Advanced ceramic capabilities

The committee is interested in advancements in dual-use ceramic capabilities and production technologies. The committee is aware that recent advancements in smelting have significant overlap with ceramic production methods and could lower ceramic production costs. Advanced ceramic capabilities have demonstrated versatility in critical military applications, including composite armor for soldier and vehicle protection, and for use in advanced hypersonic vehicle development.

Therefore, the committee directs the Under Secretary of Defense for Research and Engineering, no later November 1, 2018, to provide to the Committee on Armed Services of the House of Representatives a briefing on dual-use ceramic capabilities. The briefing should include an overview of advances in ceramic production processes and technologies, the benefits ceramic capabilities provides, and any forecasted adoption of ceramic capabilities into current weapon systems.

Antitoxin to combat botulinum toxin

Botulinum neurotoxin type A (BoNT/A) is a highly potent toxin, as well as a medical therapy with numerous uses in neurophysiology. The Department of Defense is managing efforts to develop a vaccine against BoNT/A; however, the potential impact of BoNT/A vaccination on future benefits of the medical uses of BoNT/A is unknown. These benefits include treatment of post-traumatic stress disorder-associated migraines and amputation pain.

The committee understands that the Department is also pursuing a small molecule antitoxin drug to combat BoNT/A, which could be used by military personnel without impacting future use of medical therapies derived from BoNT/A. Therefore, the committee encourages the Secretary of Defense to continue its work to develop a monoclonal antibody-based BoNT/A antitoxin drug through the Joint Program Executive Office for Chemical and Biological Defense.

Autonomous capabilities

Not later than April 1, 2019, the Secretary of Defense shall submit to the committee on Armed Services an assessment on the consequences of the international proliferation of autonomous weapons, including those utilizing artificial intelligence and machine learning, and a strategy for U.S. engagement in international discussions. In conducting such an assessment, the Secretary of Defense shall consider each of the following:

(1) An evaluation of the consequences of an arms race in autonomous weapons, cyber weapons, artificial intelligence and machine learning, both from the domestic and competitor point of views.

(2) An explanation of the of the concept of “appropriate human judgement” and how it differs from “meaningful human control”.

(3) An explanation of the U.S. strategy towards influencing how other nations approach autonomous weapons, including human judgement, national safety review processes, and stability concerns.

Further, the study should include an assessment of the current policy guidelines with respect to the role of autonomy in offensive and defensive cyberspace operations, and a discussion of how artificial intelligence and machine learning could impact current policy and doctrine. In conducting such an assessment, the Secretary of Defense shall evaluate the sufficiency of Department of Defense policies governing autonomy in cyberspace.

Central Test and Evaluation Investment Program

The budget request contained \$258.7 million in PE 64940D8Z for the Central Test and Evaluation Investment Program (CTEIP). The committee notes that CTEIP has been used to fund the development of critically needed, high-priority test and evaluation capabilities for the Department of Defense. CTEIP has used a corporate approach to combine service and Department requirements to maximize opportunities for joint efforts and avoid unwarranted duplication of test capabilities. The committee recommends additional focus on developing a geospatial architecture to assist in the testing, analysis, and visualization of cyber and electronic warfare threat systems, and their impact in a radio frequency compromised environment.

The committee encourages the Department to explore efforts to automate data collection and analysis capabilities, thereby reducing manual data entry and expediting the preparation of products and reports. The committee recommends \$258.7 million, the amount requested, in PE 64940D8Z for the Central Test and Evaluation Investment Program.

Chemical, biological, radiological, nuclear, and explosive standoff detection

The committee is aware of the enduring challenge of detecting chemical, biological, radiological, nuclear, and explosive (CBRNE) threats from a safe distance. The committee is also aware of a new technology that may be capable of dynamic wavelength modulation of laser light with potential applications in multiple mission areas, including standoff detection of CBRNE threats. Given the use of chemical weapons in the Syrian Arab Republic and the threat of CBRNE use in the Democratic People's Republic of Korea, sensors capable of standoff detection would provide early warning, thereby increasing timelines to prepare and respond to threats. Therefore, the committee encourages the Department of Defense to continue its efforts to develop standoff CBRNE detection.

Common data environment for modeling and simulation

The committee recognizes that common data environments can yield benefits, such as increased interoperability and strong modeling and simulation (M&S) capabilities. The committee supports continued funding for projects that provide critical Department of Defense-wide data services, such as the Army's Enterprise Data Services Common Data Production Environment. The committee is aware that in the committee report (S. Rept. 115-125) accompanying the National Defense Authorization Act for Fiscal Year 2018, the Senate Committee on Armed Services directed the Secretary of Defense to take actions to identify and address data collection, analysis, and sharing issues that limit robust M&S. Therefore, the committee directs the Secretary of Defense to provide a briefing to the House Committee on Armed Services by November 1, 2018, on the Department's findings from the directive in S. Rept. 115-125.

Contraband cellular devices

The committee is aware that the illegal use of cellular devices in Federal prisons is on the rise. The committee is also aware that new technologies, such as managed access systems, are being developed, tested, and deployed to detect the use of contraband cellular devices among Federal prison populations. The committee acknowledges that military correctional facilities are often plagued with the same ills that infiltrate Federal correctional facilities. Therefore, the committee encourages the Department of Defense to study the effectiveness of new technologies that detect contraband cellular devices to identify and prevent instances of such use in military correctional facilities.

Counter small tactical unmanned air systems

The committee notes that Class I and II unmanned air systems (UAS), which in most cases are readily available commercial-off-the-shelf small and lightweight UAS, can be employed by state and non-state actors for use against U.S. military and civilian personnel. The committee understands that current maneuver short range air defense initiatives, as well as counter-UAS initiatives would address fixed-wing, rotorcraft, and medium-to-large UAS platforms. The committee is concerned by the rapid proliferation of small UAS and believes the military services should examine all

potential combined kinetic and non-kinetic options to immediately address this perceived capability gap in organic air defense for Army Maneuver Brigades.

The committee directs the Secretary of the Defense to provide a briefing to the House Committee on Armed Services by December 15, 2018 that provides an update on current Department of Defense programs to counter class I and II UAS. The briefing shall include:

- (a) The command responsible for developing and promulgating counter-UAS performance requirements;
- (b) A resource plan for developing and assessing potential material solutions for near-term and mid-term timeframes;
- (c) How the Department of Defense intends to ensure that units at the battalion and below echelons will be capable of defeating single and swarming Class 1 and II UAVs; and
- (d) The procedures whereby technical assessments will be shared and coordinated with the other military services.

Counter-unmanned aerial system threat detection

The committee is interested in advancements in counter-unmanned aerial system (C-UAS) technology and the threat these systems pose to the Armed Forces. The committee supports ongoing efforts by the U.S. Army and U.S. Special Operations Command to develop and employ unmanned aerial system (UAS) threat detection technology, and commends the services for recognizing the seriousness of the threat. In light of recent UAS attacks in the U.S. Central Command area of responsibility, the committee is concerned about the increased threat from unmanned aerial systems to forward operating bases and special operations forces personnel. The committee believes additional advancements in scalable C-UAS technologies are necessary to effectively detect, track, neutralize, and ensure the force protection and operational security of deployed service members.

Therefore, the committee directs the Secretary of Defense to provide a briefing to the House Committee on Armed Services by October 31, 2018, on the employment of C-UAS systems. The briefing should include an assessment of the UAS threat to the Armed Forces, a roadmap for C-UAS threat detection technology and capabilities, and the results of operational fielding of C-UAS systems.

Enhanced Maritime Biological Detection

The budget request contained \$145.7 million in PE 64384BP for Contamination Avoidance (CA) Engineering Manufacturing Development (EMD) within the Department of Defense Chemical and Biological Defense Program (CBDP).

The Enhanced Maritime Biological Detection (EMBD) program, an ongoing effort that began in fiscal year 2017, is included in CA EMD and will transition technology from the Joint United States Forces Korea Portal and Integration Threat Recognition Advanced Technology Demonstration to a program of record for the U.S. Navy. EMBD will complete development, testing, integration, and production of a lower cost biological point detection system that will detect, collect, and identify biological warfare agent aerosols, and provide automated warning at a lower sustained cost.

The committee recommends \$145.7 million, the amount requested in PE 64384BP, for CA EMD within the CBDP.

Fielding of radiation detection devices

The committee is encouraged by the Army's efforts to field additional radiation detection devices, and endorses the Army's efforts in fiscal year 2019 to develop and field the next-generation Joint Personal Dosimeter Individual (JPD-I), an individual dosimeter that includes immediate visual alert, measurement of radiation dose, and inclusion of a comprehensive record of radiation exposure over a soldier's career. The committee encourages the Army to conduct a rigorous, fair, and open competition for this new system to ensure the best dosimeter is developed and selected.

Future uses of synthetic biology

The committee is aware of recent advancements in synthetic biology, genomics, biotechnology, and related novel technologies that may enhance human performance and improve traditional approaches to healthcare. This includes enhancing human ability to perform through stressful and resource-limited environments, improving decision making, minimizing the time between disease identification and treatment, and augmenting human immune systems to defeat a variety of diseases, rather than depending on specific vaccines and therapeutics. The development of advanced biosensors to understand hypoxia is a current example of the type of human performance challenges that can be addressed through these advancements.

Therefore, the committee directs the Secretary of Defense to provide a briefing to the House Committee on Armed Services by December 1, 2018, on how the Department of Defense may leverage these advancements, when appropriate, and in accordance with ethical standards, U.S. law, our nation's values, and Department of Defense policy, to enhance service members' performance, increase lethality and survivability, and improve battlefield healthcare. The briefing should also identify opportunities, when appropriate and feasible, to facilitate the maturation of capabilities based on recent advancements.

Historically black colleges and universities, and minority serving institutions

The budget request contained \$30.4 million in PE 61228D8Z for research work with historically black colleges and universities, and minority serving institutions (HBCU/MI).

The committee recognizes the important role this program plays in bolstering the research capabilities and capacities at HBCU/MIs. Not only is such work important in meeting the defense research needs of the Department of Defense, but the committee also believes it provides an added benefit by diversifying the supply of scientists, engineers, and researchers working on the Department of Defense's most challenging problems.

Therefore, the committee recommends \$40.4 million, an increase of \$10.0 million, in PE 61228D8Z for additional research between historically black colleges and universities, and minority serving institutions, as well as increased teaming opportunities between

these institutions and other research universities with experience supporting the Department's unique requirements.

Innovative installation capabilities

The budget request contained \$29.4 million in PE 63342D8W for the Defense Innovation Unit Experimental (DIUx).

DIUx supports the identification, development, and demonstration of game-changing technologies to satisfy joint force priorities at a faster pace than the traditional Department of Defense planning, programming, budgeting, and execution process. As DIUx leverages partnerships with academic institutions, science and technology communities, and private industries, the committee recognizes the advantages that DIUx may provide to accelerate fielding of decisive technical capabilities and interoperability while mitigating operational risk to the warfighter and promoting affordability.

The committee supports the objective of DIUx to maintain U.S. technological superiority across the range of military operations. The committee believes DIUx should also increase efforts to support technological superiority at Department installations by addressing critical technological needs. This may also include mitigation of cybersecurity vulnerabilities identified during the ongoing review of critical infrastructure being conducted by the Department as directed in section 1650 of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114-328).

Therefore, the committee recommends prioritizing critical technological needs at Department installations, and directs the Director of DIUx to provide a briefing to the House Committee on Armed Services by October 1, 2018, on a plan to invest in the rapid insertion of innovative installation capabilities.

Joint Regional Security Stacks

The committee supports the Department of Defense's efforts to secure and simplify the Department's network environment through modernization. Specifically, the committee supports continued use of the Joint Regional Security Stacks (JRSS) and the modernization, streamlining, and optimization of JRSS architecture to improve performance, reduce the Department's attack surface, and eliminate outdated technical redundancy. The committee believes incorporation of next-generation technology may further increase the Department's cybersecurity posture and resiliency. Therefore, the committee encourages the Defense Information Systems Agency to make full use of next-generation packet brokers which reduce costs by employing active-failover features, reducing redundancy of cybersecurity tools, and implementing new technology that eliminates duplicate network traffic.

Joint threat warning system

The committee recognizes that the Joint Threat Warning System (JTWS) provides credible threat warning and intelligence information to special operations forces (SOF). The committee notes that this program has been critical to enhancing the situational awareness of SOF elements by alerting them to threats to the force and illuminating targeting opportunities. The committee is concerned that the program does not include an air-variant precision high fre-

quency band capability. This gap in coverage exposes SOF operators to unknown threats and decreases their situational awareness. The committee recommends U.S. Special Operations Command further explore collection capabilities that address this critical air-variant high frequency gap in coverage.

Military Free Fall School

The committee is aware of the increased demand being placed on the U.S. Army's Military Free Fall School (MFFS). The committee understands the increased student throughput is largely a result of the expanded population of U.S. Army Special Operations Command personnel who are required to attend MFFS. Consequently, the increased student throughput has resulted in shortfalls in resourcing, an over-reliance on contract personnel, and an increased risk to students and cadre. Therefore, the committee directs the Commander, U.S. Special Operations Command to provide a briefing to the House Committee on Armed Services not later than October 15, 2018, on Special Operations Force Military Free Fall requirements, the funds expended, the expected cost of operating the MFFS across the Future Years Defense Program, and any change in the rate of MFFS safety incidents or injuries from fiscal years 2012 through 2018.

Minerva Research Initiative

The committee recognizes the valuable contributions the Minerva Research Initiative has had on social science research relevant to national security. This initiative has supported innovations in social science and translated important scientific discoveries in the field of counter-terrorism and counter-violent extremism. The committee believes similar research examining our peer and near-peer adversaries' growing influence and competitive advantage against the United States is necessary. According to the National Security Strategy of 2017, the People's Republic of China is reasserting its influence in order to deny the United States access in times of crisis and contest the Department of Defense's ability to operate freely in decisive locations. The committee believes additional national security-related social science research dedicated towards the Russian Federation, China, the Islamic Republic of Iran, and the Democratic People's Republic of Korea, and their export of military and security technology, will help understand these nations' true intentions and develop and implement strategy aimed at countering their influence.

Therefore, the committee directs the Secretary of Defense to provide a briefing to the House Committee on Armed Services not later than November 16, 2018, on the feasibility of expanding the Minerva Research Initiative to state actors, including Russia, China, Iran, and North Korea. The briefing should include the program's ability to provide substantive research addressing peer and near-peer adversary statecraft, to include, but not limited to, foreign influence, foreign investment, emerging technologies, and military exports.

National Hypersonics Initiative

The committee is aware of a National Hypersonics Initiative under development by the Under Secretary of Defense for Research

and Engineering, in conjunction with the military services, defense labs, and the Defense Advanced Research Projects Agency. The committee recognizes the growing amount of resources and emphasis placed by the Department of Defense on the research and development of hypersonic vehicle technology. The committee supports the development of a National Hypersonics Initiative, and believes it is prudent and consistent with the roles and responsibilities granted to the Department's Joint Hypersonics Transition Office as authorized in the National Defense Authorization Act of 2018 (Public Law 115–91). The committee is interested in any impact that the Treaty Between the United States of America and The Union of the Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles, signed in 1987 and commonly referred to as the INF Treaty, is having on the research and development of hypersonic vehicle technology. The committee understands there is concern that the INF treaty obligations may limit the Department of Defense's ability to flight-test and operationally employ hypersonic vehicles.

Therefore, the committee directs the Under Secretary of Defense for Research and Engineering to provide a briefing to the House Committee on Armed Services not later than September 15, 2018, on the status of the National Hypersonics Initiative and any impacts of the INF Treaty obligations on the research, development, prototyping, testing, or employment of hypersonic vehicle technology.

National lab integration in defense innovation hubs

The committee has continuing interest in the Department of Defense laboratories and engineering centers, their responsiveness to Department of Defense requirements, and maximizing their expertise and reach. The Department's laboratories are integral to the Department's ability to retain capability in areas where the private sector has no commercial interest, and ensuring that commercial solutions are adapted for warfighter needs in a timely manner so that the United States remains dominant in the land, air, sea, space, and cyber domains.

The committee recommends that the Department better enable laboratories and centers to embrace an open and innovative posture, while simultaneously becoming more active in the Department's requirements process. The committee is aware of the Army Research Lab's Open Campus project as an example of open innovation that encourages groundbreaking advances in basic and applied research areas through increased collaboration with the broader research enterprise. The committee believes that this serves as a model for laboratories to become more ingrained in the scientific and research communities, both locally and globally, and become a greater sensor for disruptive technologies that present opportunities or highlight vulnerabilities for the Department. Additionally, the committee recommends that the laboratories increase their presence in innovation hubs across the United States, like those established by the Defense Innovation Unit Experimental, and enhance existing relationships with the Strategic Capabilities Office and the Defense Advanced Research Projects Agency.

Therefore, the committee directs the Under Secretary of Defense for Research and Engineering to provide a briefing to the House

Committee on Armed Services not later than October 1, 2018, on the respective plan for further integrating the laboratories across defense and commercial innovation hubs, and maximizing their expertise and reach. The briefing should include a robust plan and timeline for increasing the Department's laboratory joint presence in innovation hubs across the United States.

Non-lethal directed energy technologies

The committee continues to support the need to minimize collateral damage, pursue all available avenues to reduce civilian casualties, and prevent damage to infrastructure in engagements abroad. The use of non-lethal directed energy technologies provides many opportunities to do so. Some of these technologies have matured and are already employed by military service and combatant commands in the operational environment across the globe. These technologies have the capacity to stop ground vehicles, small vessels, and unmanned aerial vehicles from infringing upon protected spaces, or to deny access to secured facilities. The committee continues to encourage the Department of Defense to make greater efforts to use these technologies where appropriate. Elsewhere in this report, the need for concurrent policy development, sustained integrated non-lethal directed energy technologies, and continued development of next-generation directed energy non-lethal technologies, like the Marine Corps' Ocular Interruption System, is addressed.

Protect DIB critical technologies

The committee recognizes the importance of safeguarding defense industrial base (DIB) critical technologies from cyber and economic actions conducted by our adversaries. The challenge in doing so is particularly acute as supply chains become increasingly globalized, as noted in the report published by the RAND Corporation entitled "U.S. Authorities and DoD Options for Protecting the Defense Industrial Base from Cyber Intrusions and Economic Enticement, Influence, and Control." The report calls attention to the difficulties in protecting DIB members with supply chains in foreign countries and the resulting risks to the integrity of various critical technologies and materials.

Therefore, the committee directs the Undersecretary of Defense for Research and Engineering (R&E) to provide a briefing to the House Armed Services Committee no later than 1 March 2019 on activities and investments the Department is making with respect to foreign suppliers of critical technologies to national defense to ensure their integrity, including microelectronics.

Rapidly deployable radar system

The committee is aware of U.S. Special Operations Command's efforts to accelerate development of an ultra-low power, rapidly deployable radar system. This modular technology can enhance radar situational awareness for special operations forces elements in austere environments. The committee notes the value of this technology and its relevance in current conflicts, particularly due to the persistent threat of adversary controlled, small unmanned aerial systems. The committee looks forward to the results of additional testing and encourages the integration of this ultra-low

power, rapidly deployable radar with other counter-unmanned aerial system efforts across the Department of Defense.

Report on DoD target and threat systems

The Committee recognizes that military capabilities of adversary nations continue to improve over time thus challenging the ability of the United States military to project power and protect its national interests throughout the world. In order to ensure thorough and realistic testing and evaluation of defense weapons systems and effective operational unit training, it is imperative that DoD continues to develop and maintain a sufficient inventory of realistic targets and threat systems that accurately represent the capability of adversary nations. In support of that imperative, the Committee believes that the status and adequacy of target and threat systems programs need to be assessed.

The Secretary of Defense shall conduct a review of the Department's targets and threat systems in support of test and evaluation and training and shall identify recommended actions to address shortcomings in those systems in a final report.

The review, recommendations, and final report shall address, but not be limited to, the following:

(A) All airborne, seaborne, ground, and undersea targets and target control systems used to support open air test and evaluation and warfighter training exercises;

(B) All real and simulated threat systems used to support open air test and evaluation and warfighter training exercises;

(C) The degree to which all of the above systems replicate both current and future threats;

(D) The adequacy of target and threat systems inventories to meet current and future test and evaluation and training requirements;

(E) The ability of the above systems to support effective testing and evaluation of future U.S. combat and weapon systems;

(F) The ability of the above systems to support effective warfighter training against future threats.

Not later than one year after the date of enactment, the Secretary shall submit to the congressional defense committees a final report on the review and recommended actions to address all shortcomings in the abilities of DoD targets and threat systems to effectively support open air test and evaluation events and training exercises.

Research to enhance the understanding of adversarial influence operations

Manipulation of the global information environment by adversaries using both human and machine means poses a challenge to the viability of democratic institutions and social stability. The committee is aware of research conducted by the Defense Advanced Research Projects Agency (DARPA) to develop technologies for high-fidelity simulation of online social behavior, while testing and measuring simulation accuracy and other research projects to better understand influence. For example, the Social-Cognitive Information Security research program uses modeling and simulation to examine how behavior is manipulated in a way that compromises cyber or social infrastructures.

The committee is aware that the Secretary of Defense recently designated the Commander, U.S. Special Operations Command, to be the Joint Proponent for Military Information Support Operations (MISO), and to establish a global messaging/counter-messaging capability. The committee believes research conducted to enhance the understanding of the impact of adversarial manipulation of the global information environment may complement and inform information operation activities of the Department of Defense. Therefore, the committee encourages the Director of DARPA and the Commander, U.S. Special Operations Command, to collaborate and provide for transition of appropriate research projects that enhance and complement MISO.

Use of authority for transactions other than contracts and grants by the Department of Defense

The committee recognizes the need for agility and innovation in the procurement process. The committee believes that, when used appropriately, other transaction authority (OTA) of section 2371 of title 10, United States Code, can provide the necessary flexibility to give the Department of Defense a competitive edge in the commercial marketplace.

The National Defense Authorization Act for Fiscal Year 2016 (Public Law 114–92) modified and made permanent the Department’s ability to carry out certain prototype projects using OTA. Further recognizing the benefits of OTA, section 867 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91) required the Secretary of Defense to establish a preference for using other transactions (OTs) “in circumstances determined appropriate by the Secretary.”

The committee supports the Department’s continued use of OTA to rapidly explore cutting-edge technologies and reduce barriers to attract non-traditional defense contractors. The committee also acknowledges the Department’s guidance that OTs should be used appropriately by individuals possessing the requisite level of business acumen and judgment to operate in a “relatively unstructured environment.”

However, the committee is increasingly concerned by a perceived lack of transparency surrounding the use of OTA within the Department. The committee is particularly concerned by the limited details provided on the Defense Innovation Unit Experimental’s use of OTA to award a large-scale follow-on production contract for cloud services. While the Department significantly reduced the original award from \$950.0 million to \$65.0 million, and greatly limited the scope of the production agreement, the committee remains concerned about the Department’s failure to provide a comprehensive explanation for how such a large-scale award was made unbeknownst to senior Department officials, and why the award was later reduced.

Therefore, the committee urges the Department to exercise greater prudence and transparency when employing OTA to prevent misuse and abuse. The committee also urges the Department to reiterate through established guidelines that OTA is not a means for circumventing appropriate use of the Federal Acquisition Regulation, and that full and open competition should be used to the max-

imum extent practicable to maintain a sense of integrity, fairness, and credibility in the Federal procurement process.

LEGISLATIVE PROVISIONS

SUBTITLE A—AUTHORIZATION OF APPROPRIATIONS

Section 201—Authorization of Appropriations

This section would authorize appropriations for research, development, test, and evaluation at the levels identified in section 4201 of division D of this Act.

SUBTITLE B—PROGRAM REQUIREMENTS, RESTRICTIONS, AND LIMITATIONS

Section 211—Modification of Authority to Carry Out Certain Prototype Projects

This section would make modifications to section 2371b of title 10, United States Code, regarding use of transactions other than contracts and grants for follow-on production.

Section 212—Extension of Directed Energy Prototype Authority

This section would extend the directed energy prototype authority provided for in section 219(c)(4) of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328) through fiscal year 2019.

Section 213—Prohibition on Availability of Funds for the Weather Common Component Program

This section would restrict funding for further development of meteorological situational awareness sensor programs for unmanned aircraft systems, and require the Secretary of the Air Force to submit a report to the congressional defense committees that describes requirements, existing technologies, current program efforts, testing and evaluation, and a fielding plan for capabilities associated with providing meteorological situational awareness to unmanned aircraft aircrews.

The committee notes that the Air Force office for Unmanned Aircraft Systems (UAS) Innovations and Integration under the Deputy Chief of Staff of the Air Force for Intelligence, Surveillance, and Reconnaissance (HAF/A2) began an initiative in 2010 to develop an UAS sensor that could provide real-time meteorological situational awareness for UAS aircrews to increase mission effectiveness and mitigate reliance upon weather forecasting capabilities in geographic regions with limited or no weather services provided for flight operations. The effort culminated in 2015 and cost the Air Force \$10.6 million. On October 30, 2015, the then-12th Air Force Commander, and now current Deputy Chief of Staff of the Air Force for Operations (HAF/A3), validated key global weather requirements for UAS operations, to include: increasing UAS situational awareness of current and predicted state of environmental phenomena to maximize mission effectiveness, efficiency, safety, resource protection, and risk management; relaying all onboard-UAS weather data and information, such as air temperature, humidity,

wind speed and direction, turbulence, ice accretion, and weather radar in real-time; and increasing real-time, on-board weather collection capability to provide pilot situational awareness and support Air Force forecast processes. However, the HAF/A2 sensor remains non-deployed, despite the Air National Guard Air Force Reserve Command Test Center finding the sensor and its associated software to be potentially operationally effective and suitable in a formal report published in January 2018. More concerning to the committee is that a separate development effort is being undertaken by HAF/A3 weather officials that appears to duplicate the technology. Thus, this section would restrict further funding for additional systems until the Air Force provides a report that will allow the committee to evaluate the need for additional capability.

Section 214—Limitation Pending Certification on the Joint Surveillance Target Attack Radar System Recapitalization Program

This section would restrict obligation of funding for the Advanced Battle-Management System (ABMS) of Systems initiative of the Department of the Air Force, as well as a portion of the proposed divestment of legacy E-8C aircraft contained in the fiscal year 2019 budget request. The restriction would remain in effect until the Secretary of the Air Force certifies to the congressional defense committees that the Joint Surveillance Target Attack Radar System (JSTARS) Recapitalization (Recap) program, as submitted and described in the fiscal year 2018 budget request, is proceeding unhindered with originally planned activities associated with engineering, manufacturing, and development; low-rate initial production; production; and initial contractor support. This section also would require the Comptroller General of the United States to provide a report to the congressional defense committees that assesses the acquisition strategy associated with ABMS, and would require the Secretary of the Air Force to submit a report to the congressional defense committees that includes a strategy for accelerating the JSTARS Recap program, while also managing appropriately the legacy fleet of E-8C aircraft. This section would also authorize use of JSTARS Recap program funding to maintain the program office's functionality.

Section 215—Limitation on Availability of Funds for F-35 Continuous Capability Development and Delivery

This section would limit the obligation or expenditure of 25 percent of the funds for the F-35 continuous capability development and delivery program until 15 days after the Secretary of Defense provides the congressional defense committees a detailed cost estimate and baseline schedule for the program. This section does not apply to any funds authorized to be appropriated by this Act for the development of F-35 dual capable aircraft capability.

Section 216—Limitation on Availability of Funds Pending Report on Agile Software Development and Software Operations

This section would temporarily restrict funding for software development efforts that use agile development and operations methodology until the Secretary of the Air Force provides a report to the congressional defense committees that describes the cost-estimation

tools, the types of contracts, and the mitigation efforts to avoid duplicative development related to the strategy for modernizing and upgrading existing software at worldwide Air Force Air Operations Centers.

Section 217—Limitation on Availability of Funds for Certain High Energy Laser Advanced Technology

This section would limit the availability of 50 percent of the funds authorized to be appropriated by this Act, or otherwise made available for fiscal year 2019, until the Secretary of Defense provides the High Energy Laser logical roadmap and assessment to the congressional defense committees.

Section 218—Plan for Elimination or Transfer of the Strategic Capabilities Office of the Department of Defense

This section would direct the Secretary of Defense to submit a plan to the congressional defense committees by March 1, 2019, for the elimination or transfer of the functions of the Strategic Capabilities Office to another organization or element of the Department of Defense.

Section 219—National Security Science and Technology Strategy

This section would direct the Secretary of Defense to develop a National Security Science and Technology Strategy to prioritize Department of Defense science and technology efforts and investments. The Secretary of Defense would be required to submit the most recent version of the strategy to the congressional defense committees not later than February 4, 2019, and annually thereafter through December 31, 2021.

Section 220—Modification of CVN-73 to Support Fielding of MQ-25 Unmanned Aerial Vehicle

This section would require the Navy to fund the modification of CVN-73 during its refueling and overhaul period in support of future MQ-25 unmanned carrier aircraft operations.

SUBTITLE C—REPORTS AND OTHER MATTERS

Section 221—Report on Survivability of Air Defense Artillery

This section would require the Secretary of the Army to submit a report to the Committees on Armed Services of the Senate and the House of Representatives by March 1, 2019, on efforts to improve Army Air Defense Artillery (ADA) survivability and require the Army to assess measures that could better enhance ADA defenses, both active and passive.

The committee is concerned that U.S. Army Air Defense Artillery units may lack required active and passive non-kinetic capabilities and training to maximize their level of survivability against sophisticated threats. The committee recognizes that ADA is a critical and increasingly important component of Joint Integrated Air and Missile Defense. The committee also supports continued modernization and expansion of ADA capability.

Section 222—Report on T-45 Aircraft Physiological Episode Mitigation Actions

This section would require the Secretary of the Navy to submit a report to the congressional defense committees by March 1, 2019, on modifications made to T-45 aircraft and associated ground equipment to mitigate the risk of physiological episodes among T-45 aircraft crewmembers, and would require the Secretary include certain elements in such report.

Section 223—Report on Efforts of the Air Force to Mitigate Physiological Episodes Affecting Aircraft Crewmembers

This section would require the Secretary of the Air Force to submit a report to the congressional defense committees by March 1, 2019, on all efforts of the Air Force to reduce the occurrence of, and mitigate the risk posed by, physiological episodes affecting crewmembers of covered aircraft and would require the inclusion of certain elements in such report. In this section, the term “covered aircraft” would mean F-35A aircraft of the Air Force, T-6A aircraft of the Air Force, and any other aircraft of the Air Force as determined by the Secretary of the Air Force.

Section 224—Briefing on Use of Quantum Sciences for Military Applications and Other Purposes

This section would require the Secretary of Defense to provide to the congressional defense committees a briefing and plan for using quantum sciences for military applications and other purposes.

Section 225—Report on Defense Innovation Unit Experimental

This section would require the Under Secretary of Defense for Research and Engineering to submit a report to the congressional defense committees by May 1, 2019, on the integration of Defense Innovation Unit Experimental into the broader Department of Defense research and engineering community, the unit’s measures of effectiveness, the number and type of transitions, and the impacts of the unit’s initiatives and investments on the Department.

TITLE III—OPERATION AND MAINTENANCE

ITEMS OF SPECIAL INTEREST

LOGISTICS AND SUSTAINMENT ISSUES

Briefing on Rapidly Deployable Structures

The committee is aware that the military services, including but not limited to the Air Force Civil Engineer Center at Tyndall Air Force Base, are testing and evaluating options that improve the deployability, safety, and energy efficiency of structures used by the Armed Forces in a variety of operational environments. Of particular interest is the use of such structures in remote areas, where access to reliable energy sources can be difficult and environmental conditions can be severe. As such efforts continue, the committee encourages the Department of Defense to allocate appropriate resources for the research, development, test, evaluation, and pro-

TITLE XLII—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION.

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION (In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY					
BASIC RESEARCH					
001	0601101A	IN-HOUSE LABORATORY INDEPENDENT RESEARCH	11,585		11,585
002	0601102A	DEFENSE RESEARCH SCIENCES	276,912		276,912
003	0601103A	UNIVERSITY RESEARCH INITIATIVES	65,283		65,283
004	0601104A	UNIVERSITY AND INDUSTRY RESEARCH CENTERS	92,115		92,115
		SUBTOTAL BASIC RESEARCH	445,895		445,895
APPLIED RESEARCH					
005	0602105A	MATERIALS TECHNOLOGY	28,600	1,000	29,600
		Conformal batteries and composite armor		[1,000]	
006	0602120A	SENSORS AND ELECTRONIC SURVIVABILITY	32,366	4,000	36,366
		Expand Army Research lab Open Campus project		[4,000]	
007	0602122A	TRACTOR HIP	8,674		8,674
008	0602126A	TRACTOR JACK	400		400
009	0602211A	AVIATION TECHNOLOGY	64,847		64,847
010	0602270A	ELECTRONIC WARFARE TECHNOLOGY	25,571		25,571
011	0602303A	MISSILE TECHNOLOGY	50,183		50,183
012	0602307A	ADVANCED WEAPONS TECHNOLOGY	29,502		29,502

013	0602308A	ADVANCED CONCEPTS AND SIMULATION	28,500	28,500
014	0602601A	COMBAT VEHICLE AND AUTOMOTIVE TECHNOLOGY	70,450	70,450
015	0602618A	BALLISTICS TECHNOLOGY	75,541	75,541
016	0602622A	CHEMICAL, SMOKE AND EQUIPMENT DEFEATING TECHNOLOGY	5,032	5,032
017	0602623A	JOINT SERVICE SMALL ARMS PROGRAM	12,394	12,394
018	0602624A	WEAPONS AND MUNITIONS TECHNOLOGY	40,444	50,444
		Accelerate Army railgun development and prototyping	10,000	
			[10,000]	
019	0602705A	ELECTRONICS AND ELECTRONIC DEVICES	58,283	58,283
020	0602709A	NIGHT VISION TECHNOLOGY	29,582	29,582
021	0602712A	COUNTERMINE SYSTEMS	21,244	21,244
022	0602716A	HUMAN FACTORS ENGINEERING TECHNOLOGY	24,131	24,131
023	0602720A	ENVIRONMENTAL QUALITY TECHNOLOGY	13,242	13,242
024	0602782A	COMMAND, CONTROL, COMMUNICATIONS TECHNOLOGY	55,003	55,003
025	0602783A	COMPUTER AND SOFTWARE TECHNOLOGY	14,958	14,958
026	0602784A	MILITARY ENGINEERING TECHNOLOGY	78,159	78,159
027	0602785A	MANPOWER/PERSONNEL/TRAINING TECHNOLOGY	21,862	21,862
028	0602786A	WARFIGHTER TECHNOLOGY	40,566	45,566
		Program increase	5,000	
		MEDICAL TECHNOLOGY	[5,000]	
029	0602787A	SUBTOTAL APPLIED RESEARCH	919,609	939,609
030	0603001A	ADVANCED TECHNOLOGY DEVELOPMENT	39,338	39,338
031	0603002A	WARFIGHTER ADVANCED TECHNOLOGY	62,496	62,496
032	0603003A	MEDICAL ADVANCED TECHNOLOGY	124,958	124,958
033	0603004A	AVIATION ADVANCED TECHNOLOGY	102,686	102,686
034	0603005A	WEAPONS AND MUNITIONS ADVANCED TECHNOLOGY	119,739	119,739
035	0603006A	COMBAT VEHICLE AND AUTOMOTIVE ADVANCED TECHNOLOGY	13,000	13,000
036	0603007A	SPACE APPLICATION ADVANCED TECHNOLOGY	8,044	8,044
037	0603009A	MANPOWER, PERSONNEL AND TRAINING ADVANCED TECHNOLOGY	22,631	22,631
038	0603015A	TRACTOR HIKE	25,682	25,682
040	0603125A	NEXT GENERATION TRAINING & SIMULATION SYSTEMS	3,762	3,762
		COMBATING TERRORISM—TECHNOLOGY DEVELOPMENT		

38
39
51

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
041	0603130A	TRACTOR NAIL	4,896		4,896
042	0603131A	TRACTOR EGGS	6,041		6,041
043	0603270A	ELECTRONIC WARFARE TECHNOLOGY	31,491		31,491
044	0603313A	MISSILE AND ROCKET ADVANCED TECHNOLOGY	61,132	10,000	71,132
		Shoot-on-the-Move Technology Development for SHORAD platforms		[10,000]	
045	0603322A	TRACTOR CAGE	16,845		16,845
046	0603461A	HIGH PERFORMANCE COMPUTING MODERNIZATION PROGRAM	183,322	5,000	188,322
		Enhance and accelerate Army artificial intelligence and machine learning		[5,000]	
047	0603606A	LANDMINE WARFARE AND BARRIER ADVANCED TECHNOLOGY	11,104		11,104
048	0603607A	JOINT SERVICE SMALL ARMS PROGRAM	5,885		5,885
049	0603710A	NIGHT VISION ADVANCED TECHNOLOGY	61,376	-2,500	58,876
		Program decrease		[-2,500]	
050	0603728A	ENVIRONMENTAL QUALITY TECHNOLOGY DEMONSTRATIONS	9,136		9,136
051	0603734A	MILITARY ENGINEERING ADVANCED TECHNOLOGY	25,864		25,864
052	0603772A	ADVANCED TACTICAL COMPUTER SCIENCE AND SENSOR TECHNOLOGY	34,883	5,000	39,883
		Program increase		[5,000]	
053	0603794A	C3 ADVANCED TECHNOLOGY	52,387	-2,500	49,887
		Program decrease		[-2,500]	
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	1,026,698	15,000	1,041,698
ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES					
054	0603305A	ARMY MISSILE DEFENSE SYSTEMS INTEGRATION	10,777		10,777
056	0603327A	AIR AND MISSILE DEFENSE SYSTEMS ENGINEERING	42,802	1,000	43,802
		Realignment of EDI APS Unit Set from OCO to Base		[1,000]	
057	0603619A	LANDMINE WARFARE AND BARRIER—ADV DEV	45,254		45,254
058	0603627A	SMOKE, OBSCURANT AND TARGET DEFEATING SYS-ADV DEV	22,700		22,700
059	0603639A	TANK AND MEDIUM CALIBER AMMUNITION	41,974	14,000	55,974

060	0603645A	ARMORED SYSTEM MODERNIZATION—ADV DEV	119,395	119,395
061	0603747A	SOLDIER SUPPORT AND SURVIVABILITY	8,746	8,746
062	0603766A	TACTICAL ELECTRONIC SURVEILLANCE SYSTEM—ADV DEV	35,667	35,667
063	0603774A	NIGHT VISION SYSTEMS ADVANCED DEVELOPMENT	7,350	7,350
064	0603779A	ENVIRONMENTAL QUALITY TECHNOLOGY—DEM/VAL	14,749	14,749
065	0603790A	NATO RESEARCH AND DEVELOPMENT	3,687	3,687
066	0603801A	AVIATION—ADV DEV	10,793	10,793
067	0603804A	LOGISTICS AND ENGINEER EQUIPMENT—ADV DEV	14,248	14,248
068	0603807A	MEDICAL SYSTEMS—ADV DEV	34,284	34,284
069	0603827A	SOLDIER SYSTEMS—ADVANCED DEVELOPMENT	18,044	18,044
		Advanced materials research for personal protective equipment (PPE)		10,000
		ROBOTICS DEVELOPMENT		[10,000]
070	0604017A	CROSS FUNCTIONAL TEAM (CFT) ADVANCED DEVELOPMENT & PROTOTYPING	95,660	95,660
071	0604020A	Iron Dome short range air defense experimentation	38,000	38,000
		ANALYSIS OF ALTERNATIVES	9,765	9,765
072	0604100A	FUTURE TACTICAL UNMANNED AIRCRAFT SYSTEM (FTUAS)	12,393	12,393
073	0604113A	LOWER TIER AIR MISSILE DEFENSE (LTAMD) SENSOR	120,374	120,374
074	0604114A	TECHNOLOGY MATURATION INITIATIVES	95,347	95,347
075	0604115A	MANEUVER—SHORT RANGE AIR DEFENSE (M-SHORAD)	95,085	95,085
076	0604117A	Realignment of EDI APS Unit Set from OCO to Base		23,000
		TRACTOR BEAM	52,894	[23,000]
077	0604118A	SYNTHETIC TRAINING ENVIRONMENT REFINEMENT & PROTOTYPING	77,939	77,939
079	0604121A	INDIRECT FIRE PROTECTION CAPABILITY INCREMENT 2—INTERCEPT (IFPC2)	51,030	51,030
080	0604319A	CYBERSPACE OPERATIONS FORCES AND FORCE SUPPORT	65,817	65,817
081	0305251A	ASSURED POSITIONING, NAVIGATION AND TIMING (PNT)	146,300	146,300
082	1206120A	ARMY SPACE SYSTEMS INTEGRATION	38,319	38,319
083	1206308A	SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	1,329,393	78,000
		SYSTEM DEVELOPMENT & DEMONSTRATION		
084	0604201A	AIRCRAFT AVIONICS	32,293	32,293

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
085	0604270A	ELECTRONIC WARFARE DEVELOPMENT	78,699		78,699
088	0604328A	TRACTOR CAGE	17,050		17,050
089	0604601A	INFANTRY SUPPORT WEAPONS	83,155		83,155
090	0604604A	MEDIUM TACTICAL VEHICLES	3,704		3,704
091	0604611A	JAVELIN	10,623		10,623
092	0604622A	FAMILY OF HEAVY TACTICAL VEHICLES	11,950		11,950
093	0604633A	AIR TRAFFIC CONTROL	12,347		12,347
095	0604642A	LIGHT TACTICAL WHEELED VEHICLES	8,212		8,212
096	0604645A	ARMORED SYSTEMS MODERNIZATION (ASM)—ENG DEV	393,613		393,613
097	0604710A	NIGHT VISION SYSTEMS—ENG DEV	139,614		139,614
098	0604713A	COMBAT FEEDING, CLOTHING, AND EQUIPMENT	4,507		4,507
099	0604715A	NON-SYSTEM TRAINING DEVICES—ENG DEV	49,436		49,436
100	0604741A	AIR DEFENSE COMMAND, CONTROL AND INTELLIGENCE—ENG DEV	95,172		95,172
101	0604742A	CONSTRUCTIVE SIMULATION SYSTEMS DEVELOPMENT	22,628		22,628
102	0604746A	AUTOMATIC TEST EQUIPMENT DEVELOPMENT	13,297		13,297
103	0604760A	DISTRIBUTIVE INTERACTIVE SIMULATIONS (DIS)—ENG DEV	9,145		9,145
104	0604768A	BRILLIANT ANTI-ARMOR SUBMUNITION (BAT)	9,894		9,894
105	0604780A	COMBINED ARMS TACTICAL TRAINER (CATT) CORE	21,964		21,964
106	0604798A	BRIGADE ANALYSIS, INTEGRATION AND EVALUATION	49,288		49,288
107	0604802A	WEAPONS AND MUNITIONS—ENG DEV	183,100		183,100
108	0604804A	LOGISTICS AND ENGINEER EQUIPMENT—ENG DEV	79,706	-3,800	75,906
		Late MSV-L contract award and concurrency		[-3,800]	
109	0604805A	COMMAND, CONTROL, COMMUNICATIONS SYSTEMS—ENG DEV	15,970		15,970
110	0604807A	MEDICAL MATERIEL/MEDICAL BIOLOGICAL DEFENSE EQUIPMENT—ENG DEV	44,542		44,542
111	0604808A	LANDMINE WARFARE/BARRIER—ENG DEV	50,817		50,817
112	0604818A	ARMY TACTICAL COMMAND & CONTROL HARDWARE & SOFTWARE	178,693		178,693
113	0604820A	RADAR DEVELOPMENT	39,338		39,338

114	0604822A	GENERAL FUND ENTERPRISE BUSINESS SYSTEM (GFEB)	37,851	37,851
115	0604823A	FIREFINDER	45,473	45,473
116	0604827A	SOLDIER SYSTEMS—WARRIOR DEMAL	10,395	10,395
117	0604852A	SUITE OF SURVIVABILITY ENHANCEMENT SYSTEMS—EMD	69,204	55,804
		Program reduction		-13,400
				[-13,400]
118	0604854A	ARTILLERY SYSTEMS—EMD	1,781	1,781
119	0605013A	INFORMATION TECHNOLOGY DEVELOPMENT	113,758	113,758
120	0605018A	INTEGRATED PERSONNEL AND PAY SYSTEM-ARMY (IPPS-A)	166,603	166,603
121	0605028A	ARMORED MULTI-PURPOSE VEHICLE (AMPV)	118,239	118,239
122	0605029A	INTEGRATED GROUND SECURITY SURVEILLANCE RESPONSE CAPABILITY (GSSR-C)	3,211	3,211
123	0605030A	JOINT TACTICAL NETWORK CENTER (JTNC)	15,889	15,889
124	0605031A	JOINT TACTICAL NETWORK (JTN)	41,972	41,972
125	0605032A	TRACTOR TIRE	41,166	41,166
126	0605033A	GROUND-BASED OPERATIONAL SURVEILLANCE SYSTEM—EXPEDITIONARY (GBOSS-E)	5,175	5,175
127	0605034A	TACTICAL SECURITY SYSTEM (TSS)	4,496	4,496
128	0605035A	COMMON INFRARED COUNTERMEASURES (CIRCM)	51,178	51,178
129	0605036A	COMBATING WEAPONS OF MASS DESTRUCTION (CWMD)	11,311	11,311
131	0605038A	NUCLEAR BIOLOGICAL CHEMICAL RECONNAISSANCE VEHICLE (NBCRV) SENSOR SUITE	17,154	17,154
132	0605041A	DEFENSIVE CYBER TOOL DEVELOPMENT	36,626	36,626
133	0605042A	TACTICAL NETWORK RADIO SYSTEMS (LOW-TIER)	3,829	3,829
134	0605047A	CONTRACT WRITING SYSTEM	41,928	41,928
135	0605049A	MISSILE WARNING SYSTEM MODERNIZATION (MWSM)	28,276	28,276
136	0605051A	AIRCRAFT SURVIVABILITY DEVELOPMENT	21,965	21,965
137	0605052A	INDIRECT FIRE PROTECTION CAPABILITY INC 2—BLOCK 1	157,710	157,710
138	0605053A	GROUND ROBOTICS	86,167	86,167
139	0605054A	EMERGING TECHNOLOGY INITIATIVES	42,866	68,266
		Army UFR: program increase		25,400
				[25,400]
140	0605380A	AMF JOINT TACTICAL RADIO SYSTEM (JTRS)	15,984	15,984
141	0605450A	JOINT AIR-TO-GROUND MISSILE (JAGM)	11,773	11,773
142	0605457A	ARMY INTEGRATED AIR AND MISSILE DEFENSE (AIAMD)	277,607	277,607
143	0605766A	NATIONAL CAPABILITIES INTEGRATION (MIP)	12,340	12,340
144	0605812A	JOINT LIGHT TACTICAL VEHICLE (LTV) ENGINEERING AND MANUFACTURING DEVELOPMENT PH	2,686	2,686

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
145	0605830A	AVIATION GROUND SUPPORT EQUIPMENT	2,706		2,706
147	0303032A	TROJAN—RH12	4,521		4,521
150	0304270A	ELECTRONIC WARFARE DEVELOPMENT	8,922		8,922
151	1205117A	TRACTOR BEARS	23,170		23,170
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	3,192,689	8,200	3,200,889
		RD&E MANAGEMENT SUPPORT			
152	0604256A	THREAT SIMULATOR DEVELOPMENT	12,835		12,835
153	0604258A	TARGET SYSTEMS DEVELOPMENT	12,135		12,135
154	0604759A	MAJOR T&E INVESTMENT	82,996		82,996
155	0605103A	RAND ARROYO CENTER	19,821		19,821
156	0605301A	ARMY KWAJALEIN ATOLL	246,574		246,574
157	0605326A	CONCEPTS EXPERIMENTATION PROGRAM	30,430		30,430
159	0605601A	ARMY TEST RANGES AND FACILITIES	305,759		305,759
160	0605602A	ARMY TECHNICAL TEST INSTRUMENTATION AND TARGETS	62,379		62,379
161	0605604A	SURVIVABILITY/LETHALITY ANALYSIS	40,496		40,496
162	0605606A	AIRCRAFT CERTIFICATION	3,941		3,941
163	0605702A	METEOROLOGICAL SUPPORT TO RD&E ACTIVITIES	9,767		9,767
164	0605706A	MATERIEL SYSTEMS ANALYSIS	21,226		21,226
165	0605709A	EXPLOITATION OF FOREIGN ITEMS	13,026		13,026
166	0605712A	SUPPORT OF OPERATIONAL TESTING	52,718		52,718
167	0605716A	ARMY EVALUATION CENTER	57,049		57,049
168	0605718A	ARMY MODELING & SIM X-CMD COLLABORATION & INTEG	2,801		2,801
169	0605801A	PROGRAMWIDE ACTIVITIES	60,942		60,942
170	0605803A	TECHNICAL INFORMATION ACTIVITIES	29,050		29,050
171	0605805A	MUNITIONS STANDARDIZATION, EFFECTIVENESS AND SAFETY	42,332		42,332
172	0605857A	ENVIRONMENTAL QUALITY TECHNOLOGY MGMT SUPPORT	3,216		3,216

173	0605898A	ARMY DIRECT REPORT HEADQUARTERS—R&D - MHA	54,145	54,145
174	0606001A	MILITARY GROUND-BASED CREW TECHNOLOGY	4,896	4,896
175	0606002A	RONALD REAGAN BALLISTIC MISSILE DEFENSE TEST SITE	63,011	63,011
176	0606003A	COUNTERINTEL AND HUMAN INTEL MODERNIZATION	2,636	2,636
177	0606942A	ASSESSMENTS AND EVALUATIONS CYBER VULNERABILITIES	88,300	88,300
		SUBTOTAL ROT&E MANAGEMENT SUPPORT	1,322,481	1,322,481
OPERATIONAL SYSTEMS DEVELOPMENT				
181	0603778A	MLRS PRODUCT IMPROVEMENT PROGRAM	8,886	8,886
182	0603813A	TRACTOR PULL	4,067	4,067
183	0605024A	ANTI-TAMPER TECHNOLOGY SUPPORT	4,254	4,254
184	0607131A	WEAPONS AND MUNITIONS PRODUCT IMPROVEMENT PROGRAMS	16,022	16,022
185	0607133A	TRACTOR SMOKE	4,577	4,577
186	0607134A	LONG RANGE PRECISION FIRES (LRPF)	186,475	186,475
187	0607135A	APACHE PRODUCT IMPROVEMENT PROGRAM	31,049	31,049
188	0607136A	BLACKHAWK PRODUCT IMPROVEMENT PROGRAM	35,240	35,240
189	0607137A	CHINOOK PRODUCT IMPROVEMENT PROGRAM	157,822	157,822
190	0607138A	FIXED WING PRODUCT IMPROVEMENT PROGRAM	4,189	4,189
191	0607139A	IMPROVED TURBINE ENGINE PROGRAM	192,637	192,637
194	0607142A	AVIATION ROCKET SYSTEM PRODUCT IMPROVEMENT AND DEVELOPMENT	60,860	60,860
195	0607143A	UNMANNED AIRCRAFT SYSTEM UNIVERSAL PRODUCTS	52,019	52,019
196	0607665A	FAMILY OF BIOMETRICS	2,400	2,400
197	0607865A	PATRIOT PRODUCT IMPROVEMENT	65,369	65,369
		Increase PATRIOT improvement efforts		25,000
				[25,000]
198	0202429A	AEROSTAT JOINT PROJECT—COCOM EXERCISE	1	1
199	0203728A	JOINT AUTOMATED DEEP OPERATION COORDINATION SYSTEM (JADOCs)	30,954	30,954
200	0203735A	COMBAT VEHICLE IMPROVEMENT PROGRAMS	411,927	411,927
202	0203743A	155MM SELF-PROPELLED HOWITZER IMPROVEMENTS	40,676	40,676
203	0203744A	AIRCRAFT MODIFICATIONS/PRODUCT IMPROVEMENT PROGRAMS	17,706	17,706
204	0203752A	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	146	146
205	0203758A	DIGITIZATION	6,316	6,316
206	0203801A	MISSILE/AIR DEFENSE PRODUCT IMPROVEMENT PROGRAM	1,643	1,643
				2,000

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
		Realignment of EDI APS Unit Set from OCO to Base		[2,000]	
207	0203802A	OTHER MISSILE PRODUCT IMPROVEMENT PROGRAMS	4,947		4,947
208	0203808A	TRACTOR CARD	34,050		34,050
210	0205410A	MATERIALS HANDLING EQUIPMENT	1,464		1,464
211	0205412A	ENVIRONMENTAL QUALITY TECHNOLOGY—OPERATIONAL SYSTEM DEV	249		249
212	0205456A	LOWER TIER AIR AND MISSILE DEFENSE (AMD) SYSTEM	79,283		79,283
213	0205778A	GUIDED MULTIPLE-LAUNCH ROCKET SYSTEM (GMLRS)	154,102		154,102
216	0303028A	SECURITY AND INTELLIGENCE ACTIVITIES	12,280		12,280
217	0303140A	INFORMATION SYSTEMS SECURITY PROGRAM	68,533		68,533
218	0303141A	GLOBAL COMBAT SUPPORT SYSTEM	68,619		68,619
220	0303150A	WMCGS/GLOBAL COMMAND AND CONTROL SYSTEM	2,034		2,034
223	0305172A	COMBINED ADVANCED APPLICATIONS	1,500		1,500
224	0305179A	INTEGRATED BROADCAST SERVICE (IBS)	450		450
225	0305204A	TACTICAL UNMANNED AERIAL VEHICLES	6,000		6,000
226	0305206A	AIRBORNE RECONNAISSANCE SYSTEMS	12,416	14,000	26,416
		Realignment of EDI APS Unit Set from OCO to Base		[14,000]	
227	0305208A	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	38,667		38,667
229	0305232A	RQ-11 UAV	6,180		6,180
230	0305233A	RQ-7 UAV	12,863		12,863
231	0307665A	BIOMETRICS ENABLED INTELLIGENCE	4,310		4,310
233	0708045A	END ITEM INDUSTRIAL PREPAREDNESS ACTIVITIES	53,958		53,958
234	1203142A	SATCOM GROUND ENVIRONMENT (SPACE)	12,119		12,119
235	1208053A	JOINT TACTICAL GROUND SYSTEM	7,400		7,400
235A	9999999999	CLASSIFIED PROGRAMS	5,955		5,955
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	1,922,614	41,000	1,963,614
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY	10,159,379	162,200	10,321,579

RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY			
BASIC RESEARCH			
001	0601103N	UNIVERSITY RESEARCH INITIATIVES	119,433
		Defense University Research Instrumentation Program	10,000
		IN-HOUSE LABORATORY INDEPENDENT RESEARCH	[10,000]
002	0601152N	DEFENSE RESEARCH SCIENCES	19,237
003	0601153N	.....	458,708
		SUBTOTAL BASIC RESEARCH	10,000
			607,378
APPLIED RESEARCH			
004	0602114N	POWER PROTECTION APPLIED RESEARCH	14,643
005	0602123N	FORCE PROTECTION APPLIED RESEARCH	124,049
006	0602131M	MARINE CORPS LANDING FORCE TECHNOLOGY	59,607
007	0602235N	COMMON PICTURE APPLIED RESEARCH	41,348
		Enhance and accelerate Navy artificial intelligence research	5,000
		.....	[5,000]
008	060236N	WARFIGHTER SUSTAINMENT APPLIED RESEARCH	56,197
009	0602271N	ELECTROMAGNETIC SYSTEMS APPLIED RESEARCH	83,800
010	0602435N	OCEAN WARFIGHTING ENVIRONMENT APPLIED RESEARCH	42,998
011	0602651M	JOINT NON-LETHAL WEAPONS APPLIED RESEARCH	6,349
012	0602747N	UNDERSEA WARFARE APPLIED RESEARCH	78,049
		Academic partnerships for undersea unmanned warfare research and energy technology	20,000
		.....	[20,000]
013	0602750N	FUTURE NAVAL CAPABILITIES APPLIED RESEARCH	147,771
014	0602782N	MINE AND EXPEDITIONARY WARFARE APPLIED RESEARCH	37,545
		Program increase-one sensor plus integration	23,500
		.....	[23,500]
015	0602792N	INNOVATIVE NAVAL PROTOTYPES (INP) APPLIED RESEARCH	159,697
		Accelerate Navy railgun development and prototyping	10,000
		.....	[10,000]
016	0602861N	SCIENCE AND TECHNOLOGY MANAGEMENT—ONR FIELD ACTIVITIES	64,418
		SUBTOTAL APPLIED RESEARCH	891,471
ADVANCED TECHNOLOGY DEVELOPMENT			
019	0603123N	FORCE PROTECTION ADVANCED TECHNOLOGY	2,423
021	0603640M	USMC ADVANCED TECHNOLOGY DEMONSTRATION (ATD)	150,245

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
022	0603651M	JOINT NON-LETHAL WEAPONS TECHNOLOGY DEVELOPMENT	13,313		13,313
023	0603671N	NAVY ADVANCED TECHNOLOGY DEVELOPMENT (ATD)	131,502		131,502
024	0603673N	FUTURE NAVAL CAPABILITIES ADVANCED TECHNOLOGY DEVELOPMENT	232,996		232,996
025	0603680N	MANUFACTURING TECHNOLOGY PROGRAM	58,657		58,657
030	0603801N	INNOVATIVE NAVAL PROTOTYPES (INF) ADVANCED TECHNOLOGY DEVELOPMENT	161,859	20,000	181,859
		Accelerate Navy railgun development and prototyping		[20,000]	
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	750,995	20,000	770,995
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES			
031	0603207N	AIR/OCEAN TACTICAL APPLICATIONS	29,747		29,747
032	0603216N	AVIATION SURVIVABILITY	7,050		7,050
033	0603251N	AIRCRAFT SYSTEMS	793		793
034	0603254N	ASW SYSTEMS DEVELOPMENT	7,058	5,000	12,058
		Prototyping fiber deployment sonobuoy systems		[5,000]	
035	0603261N	TACTICAL AIRBORNE RECONNAISSANCE	3,540		3,540
036	0603382N	ADVANCED COMBAT SYSTEMS TECHNOLOGY	59,741		59,741
037	0603502N	SURFACE AND SHALLOW WATER MINE COUNTERMEASURES	62,727		62,727
038	0603506N	SURFACE SHIP TORPEDO DEFENSE	8,570	10,000	18,570
		Program increase		[10,000]	
039	0603512N	CARRIER SYSTEMS DEVELOPMENT	5,440		5,440
040	0603525N	PILOT FISH	162,222		162,222
041	0603527N	RETRACT LARCH	11,745		11,745
042	0603536N	RETRACT JUNIPER	114,265		114,265
043	0603542N	RADIOLOGICAL CONTROL	740		740
044	0603553N	SURFACE ASW	1,122		1,122
045	0603561N	ADVANCED SUBMARINE SYSTEM DEVELOPMENT	109,086	-20,000	89,086
		Excessive cost growth		[-7,000]	

046	0603562N	Prior year inefficiencies impact			
047	0603563N	SUBMARINE TACTICAL WARFARE SYSTEMS	9,374		9,374
048	0603564N	SHIP CONCEPT ADVANCED DESIGN	89,419		89,419
049	0603570N	SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES	13,348		13,348
050	0603573N	ADVANCED NUCLEAR POWER SYSTEMS	256,137		256,137
051	0603576N	ADVANCED SURFACE MACHINERY SYSTEMS	22,109		22,109
052	0603581N	CHALK EAGLE	29,744		29,744
053	0603582N	LITTORAL COMBAT SHIP (LCS)	27,997		27,997
054	0603595N	COMBAT SYSTEM INTEGRATION	16,351		16,351
		OHIO REPLACEMENT	514,846	12,000	526,846
		Advanced Submarines Control and Precision Propulsion Module Integration		[12,000]	
055	0603596N	LCS MISSION MODULES	103,633		103,633
056	0603597N	AUTOMATED TEST AND ANALYSIS	7,931		7,931
057	0603599N	FRIGATE DEVELOPMENT	134,772		134,772
058	0603609N	CONVENTIONAL MUNITIONS	9,307		9,307
060	0603635M	MARINE CORPS GROUND COMBAT/SUPPORT SYSTEM	1,828		1,828
061	0603654N	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	43,148		43,148
062	0603713N	OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT	5,915		5,915
063	0603721N	ENVIRONMENTAL PROTECTION	19,811	5,000	24,811
		High-Pressure Waterjet Explosive Ordnance Disposal Technology development		[5,000]	
064	0603724N	NAVY ENERGY PROGRAM	25,656		25,656
065	0603725N	FACILITIES IMPROVEMENT	5,301		5,301
066	0603734N	CHALK CORAL	267,985		267,985
067	0603739N	NAVY LOGISTIC PRODUCTIVITY	4,059		4,059
068	0603746N	RETRACT MAPLE	377,878		377,878
069	0603748N	LINK PLUMERIA	381,770		381,770
070	0603751N	RETRACT ELM	60,535		60,535
073	0603790N	NAVY RESEARCH AND DEVELOPMENT	9,652		9,652
074	0603795N	LAND ATTACK TECHNOLOGY	15,529		15,529
075	0603851M	JOINT NON-LETHAL WEAPONS TESTING	27,581	5,000	32,581
		Joint service adoption of non-lethal weapon technologies		[5,000]	
076	0603860N	JOINT PRECISION APPROACH AND LANDING SYSTEMS—DE/MVAL	101,566		101,566

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
077	0603925N	DIRECTED ENERGY AND ELECTRIC WEAPON SYSTEMS	223,344	-52,000	171,344
		Program decrease		[-52,000]	
078	0604014N	F/A -18 INFRARED SEARCH AND TRACK (IRST)	108,700		108,700
079	0604027N	DIGITAL WARFARE OFFICE	26,691		26,691
080	0604028N	SMALL AND MEDIUM UNMANNED UNDERSEA VEHICLES	16,717		16,717
081	0604029N	UNMANNED UNDERSEA VEHICLE CORE TECHNOLOGIES	30,187		30,187
082	0604030N	RAPID PROTOTYPING, EXPERIMENTATION AND DEMONSTRATION.	48,796		48,796
083	0604031N	LARGE UNMANNED UNDERSEA VEHICLES	92,613	-21,200	71,413
		Excessive Snakehead LDUUV growth		[-21,200]	
084	0604112N	GERALD R. FORD CLASS NUCLEAR AIRCRAFT CARRIER (CVN 78-80)	58,121	15,000	73,121
		EMALS software support activity		[15,000]	
086	0604126N	LITTORAL AIRBORNE MCM	17,622		17,622
087	0604127N	SURFACE MINE COUNTERMEASURES	18,154		18,154
088	0604272N	TACTICAL AIR DIRECTIONAL INFRARED COUNTERMEASURES (TADIRCM)	47,278		47,278
090	0604289M	NEXT GENERATION LOGISTICS	11,081		11,081
092	0604320M	RAPID TECHNOLOGY CAPABILITY PROTOTYPE	7,107		7,107
093	0604454N	LX (R)	5,549		5,549
094	0604536N	ADVANCED UNDERSEA PROTOTYPING	87,669		87,669
095	0604659N	PRECISION STRIKE WEAPONS DEVELOPMENT PROGRAM	132,818		132,818
096	0604707N	SPACE AND ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT	7,230		7,230
097	0604786N	OFFENSIVE ANTI-SURFACE WARFARE WEAPON DEVELOPMENT	143,062		143,062
099	0303354N	ASW SYSTEMS DEVELOPMENT—MIP	8,889		8,889
100	0304240M	ADVANCED TACTICAL UNMANNED AIRCRAFT SYSTEM	25,291	-14,950	10,341
		Unjustified cost growth		[-14,950]	
101	0304240N	ADVANCED TACTICAL UNMANNED AIRCRAFT SYSTEM	9,300		9,300
102	0304270N	ELECTRONIC WARFARE DEVELOPMENT—MIP	466		466
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	4,293,713	-56,150	4,237,563

103	0603208N	SYSTEM DEVELOPMENT & DEMONSTRATION			
		TRAINING SYSTEM AIRCRAFT	12,798	1,000	13,798
		TH-57 follow-on training system development		[1,000]	
104	0604212N	OTHER HELO DEVELOPMENT	32,128		32,128
105	0604214M	AV-8B AIRCRAFT—ENG DEV	46,363		46,363
107	0604215N	STANDARDS DEVELOPMENT	3,771		3,771
108	0604216N	MULTI-MISSION HELICOPTER UPGRADE DEVELOPMENT	16,611		16,611
109	0604218N	AIR/OCEAN EQUIPMENT ENGINEERING	17,368		17,368
110	0604221N	P-3 MODERNIZATION PROGRAM	2,134		2,134
111	0604230N	WARFARE SUPPORT SYSTEM	9,729		9,729
112	0604231N	TACTICAL COMMAND SYSTEM	57,688		57,688
113	0604234N	ADVANCED HAWKEYE	223,565		215,565
		Forward financed in the FY18 Omnibus		-8,000	
		Program increase—IFF range improvement		[-10,000]	
		Program increase—IFF range improvement		[2,000]	
114	0604245M	H-1 UPGRADES	58,097		58,097
116	0604261N	ACOUSTIC SEARCH SENSORS	42,485		42,485
117	0604262N	V-22A	143,079		143,079
118	0604264N	AIR CREW SYSTEMS DEVELOPMENT	20,980		20,980
119	0604269N	EA-18	147,419		147,419
120	0604270N	ELECTRONIC WARFARE DEVELOPMENT	89,824	31,600	121,424
		Navy UFR: EA-18G offensive airborne electronic attack special mission pods		[31,600]	
121	0604273M	EXECUTIVE HELO DEVELOPMENT	245,064		245,064
123	0604274N	NEXT GENERATION JAMMER (NGJ)	459,529		459,529
124	0604280N	JOINT TACTICAL RADIO SYSTEM—NAVY (JTRS-NAVY)	3,272		3,272
125	0604282N	NEXT GENERATION JAMMER (NGJ) INCREMENT II	115,253		115,253
126	0604307N	SURFACE COMBATANT COMBAT SYSTEM ENGINEERING	397,403	-20,000	377,403
		ACB 20 unexecutable growth		[-20,000]	
127	0604311N	LPD-17 CLASS SYSTEMS INTEGRATION	939		939
128	0604329N	SMALL DIAMETER BOMB (SDB)	104,448		104,448
129	0604366N	STANDARD MISSILE IMPROVEMENTS	165,881	15,000	180,881
		XFU electronics unit integration		[15,000]	

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
130	0604373N	AIRBORNE MCM	10,831		10,831
131	0604378N	NAVAL INTEGRATED FIRE CONTROL—COUNTER AIR SYSTEMS ENGINEERING	33,429	-6,900	26,529
		Excess overhead		[-6,900]	
132	0604501N	ADVANCED ABOVE WATER SENSORS	35,635		35,635
133	0604503N	SSN-688 AND TRIDENT MODERNIZATION	126,932		126,932
134	0604504N	AIR CONTROL	62,448		62,448
135	0604512N	SHIPBOARD AVIATION SYSTEMS	9,710		9,710
136	0604518N	COMBAT INFORMATION CENTER CONVERSION	19,303		19,303
137	0604522N	AIR AND MISSILE DEFENSE RADAR (AMDR) SYSTEM	27,059		27,059
138	0604530N	ADVANCED ARRESTING GEAR (AAG)	184,106		184,106
139	0604558N	NEW DESIGN SSN	148,233	-21,400	126,833
		Excess cost growth		[-21,400]	
140	0604562N	SUBMARINE TACTICAL WARFARE SYSTEM	60,824		60,824
141	0604567N	SHIP CONTRACT DESIGN LIVE FIRE T&E	60,062		60,062
142	0604574N	NAVY TACTICAL COMPUTER RESOURCES	4,642		4,642
144	0604601N	MINE DEVELOPMENT	25,756		25,756
145	0604610N	LIGHTWEIGHT TORPEDO DEVELOPMENT	95,147		95,147
146	0604654N	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	7,107		7,107
147	0604703N	PERSONNEL, TRAINING, SIMULATION, AND HUMAN FACTORS	6,539		6,539
148	0604727N	JOINT STANDOFF WEAPON SYSTEMS	441		441
149	0604755N	SHIP SELF DEFENSE (DETECT & CONTROL)	180,391		180,391
150	0604756N	SHIP SELF DEFENSE (ENGAGE: HARD KILL)	178,538		178,538
151	0604757N	SHIP SELF DEFENSE (ENGAGE: SOFT KILL/EW)	120,507		120,507
152	0604761N	INTELLIGENCE ENGINEERING	29,715		29,715
153	0604771N	MEDICAL DEVELOPMENT	8,095		8,095
154	0604777N	NAVIGATION/ID SYSTEM	121,026		121,026
155	0604800M	JOINT STRIKE FIGHTER (JSF)—EMD	66,566		66,566

156	0604800N	JOINT STRIKE FIGHTER (JSF)—EMD	65,494	65,494
159	0605013M	INFORMATION TECHNOLOGY DEVELOPMENT	14,005	14,005
160	0605013N	INFORMATION TECHNOLOGY DEVELOPMENT	268,567	268,567
161	0605024N	ANTI-TAMPER TECHNOLOGY SUPPORT	5,618	5,618
162	0605212M	CH-53K RDTE	326,945	326,945
164	0605215N	MISSION PLANNING	32,714	32,714
165	0605217N	COMMON AVIONICS	51,486	51,486
166	0605220N	SHIP TO SHORE CONNECTOR (SSC)	1,444	1,444
167	0605327N	T-AO 205 CLASS	1,298	1,298
168	0605414N	UNMANNED CARRIER AVIATION (UCA)	718,942	718,942
		Insufficient Air Vehicle budget justification	-116,900	-116,900
169	0605450M	JOINT AIR-TO-GROUND MISSILE (JAGM)	5,000	[-116,900]
		JAGM-F for USN and USMC	6,759	5,000
171	0605500N	MULTI-MISSION MARITIME AIRCRAFT (MMA)	37,296	37,296
172	0605504N	MULTI-MISSION MARITIME (MMA) INCREMENT III	160,389	160,389
173	0605611M	MARINE CORPS ASSAULT VEHICLES SYSTEM DEVELOPMENT & DEMONSTRATION	98,223	98,223
174	0605813M	JOINT LIGHT TACTICAL VEHICLE (LTV) SYSTEM DEVELOPMENT & DEMONSTRATION	2,260	2,260
175	0204202N	DDG-1000	161,264	161,264
180	0304785N	TACTICAL CRYPTOLOGIC SYSTEMS	44,098	44,098
182	0306250M	CYBER OPERATIONS TECHNOLOGY DEVELOPMENT	6,808	6,808
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	6,042,480	-120,600
				[5,000]
183	0604256N	MANAGEMENT SUPPORT	94,576	94,576
184	0604258N	THREAT SIMULATOR DEVELOPMENT	10,981	10,981
185	0604759N	TARGET SYSTEMS DEVELOPMENT	77,014	77,014
		MAJOR T&E INVESTMENT		6,000
		Program increase		[6,000]
186	0605126N	JOINT THEATER AIR AND MISSILE DEFENSE ORGANIZATION	48	48
187	0605152N	STUDIES AND ANALYSIS SUPPORT—NAVY	3,942	3,942
188	0605154N	CENTER FOR NAVAL ANALYSES	48,797	48,797
189	0605285N	NEXT GENERATION FIGHTER	5,000	5,000
191	0605804N	TECHNICAL INFORMATION SERVICES	1,029	1,029

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
192	0605853N	MANAGEMENT, TECHNICAL & INTERNATIONAL SUPPORT	87,565		87,565
193	0605856N	STRATEGIC TECHNICAL SUPPORT	4,231		4,231
194	0605861N	RDT&E SCIENCE AND TECHNOLOGY MANAGEMENT	1,072		1,072
195	0605863N	RDT&E SHIP AND AIRCRAFT SUPPORT	97,471		97,471
196	0605864N	TEST AND EVALUATION SUPPORT	373,834		373,834
197	0605865N	OPERATIONAL TEST AND EVALUATION CAPABILITY	21,554		21,554
198	0605866N	NAVY SPACE AND ELECTRONIC WARFARE (SEW) SUPPORT	16,227		16,227
200	0605873M	MARINE CORPS PROGRAM WIDE SUPPORT	24,303		24,303
201	0605898N	MANAGEMENT HQ—R&D	43,262		43,262
202	0606355N	WARFARE INNOVATION MANAGEMENT	41,918		41,918
203	0606942M	ASSESSMENTS AND EVALUATIONS CYBER VULNERABILITIES	7,000		7,000
204	0606942N	ASSESSMENTS AND EVALUATIONS CYBER VULNERABILITIES	48,800		48,800
205	0305327N	INSIDER THREAT	1,682		1,682
206	0902498N	MANAGEMENT HEADQUARTERS (DEPARTMENTAL SUPPORT ACTIVITIES)	1,579		1,579
208	1206867N	SEW SURVEILLANCE/RECONNAISSANCE SUPPORT	8,684		8,684
		SUBTOTAL MANAGEMENT SUPPORT	1,020,569	6,000	1,026,569
OPERATIONAL SYSTEMS DEVELOPMENT					
210	0604227N	HARPOON MODIFICATIONS	5,426		5,426
211	0604840M	F-35 C2D2	259,122		259,122
212	0604840N	F-35 C2D2	252,360		252,360
213	0607658N	COOPERATIVE ENGAGEMENT CAPABILITY (CEC)	130,515	-11,200	119,315
		Excess cost growth		[-11,200]	
214	0607700N	DEPLOYABLE JOINT COMMAND AND CONTROL	3,127		3,127
215	0101221N	STRATEGIC SUB & WEAPONS SYSTEM SUPPORT	157,679	9,000	166,679
		Project 2228, technical applications, systems engineering modeling and simulation capability and tool development.		[9,000]	

216	0101224N	SSBN SECURITY TECHNOLOGY PROGRAM	43,198	-4,000	39,198
		Excess program growth		[-4,000]	
217	0101226N	SUBMARINE ACOUSTIC WARFARE DEVELOPMENT	11,311		11,311
218	0101402N	NAVY STRATEGIC COMMUNICATIONS	39,313		39,313
219	0204136N	F/A-18 SQUADRONS	193,086	7,500	200,586
		Engine noise reduction engineering		[2,500]	
		JAGM-F for USN and USMC		[5,000]	
220	0204163N	FLEET TELECOMMUNICATIONS (TACTICAL)	25,014		25,014
221	0204228N	SURFACE SUPPORT	11,661		11,661
222	0204229N	TOMAHAWK AND TOMAHAWK MISSION PLANNING CENTER (TMPC)	282,395		282,395
223	0204311N	INTEGRATED SURVEILLANCE SYSTEM	36,959		36,959
224	0204313N	SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS	15,454		15,454
225	0204413N	AMPHIBIOUS TACTICAL SUPPORT UNITS (DISPLACEMENT CRAFT)	6,073		6,073
226	0204460M	GROUND/AIR TASK ORIENTED RADAR (G/ATOR)	45,029		45,029
227	0204571N	CONSOLIDATED TRAINING SYSTEMS DEVELOPMENT	104,903		104,903
228	0204574N	CRYPTOLOGIC DIRECT SUPPORT	4,544		4,544
229	0204575N	ELECTRONIC WARFARE (EW) READINESS SUPPORT	66,889		66,889
230	0205601N	HARM IMPROVEMENT	120,762		120,762
231	0205604N	TACTICAL DATA LINKS	104,696		104,696
232	0205620N	SURFACE ASW COMBAT SYSTEM INTEGRATION	28,421		28,421
233	0205632N	MK-48 ADCAP	94,155	-25,600	68,555
		Excessive TI-I cost growth		[-25,600]	
234	0205633N	AVIATION IMPROVEMENTS	121,805	15,000	136,805
		Navy UFR: F/A-18E/F Super Hornet engine enhancements		[15,000]	
235	0205675N	OPERATIONAL NUCLEAR POWER SYSTEMS	117,028		117,028
236	0206313M	MARINE CORPS COMMUNICATIONS SYSTEMS	174,779		174,779
237	0206335M	COMMON AVIATION COMMAND AND CONTROL SYSTEM (CAC2S)	4,826		4,826
238	0206623M	MARINE CORPS GROUND COMBAT/SUPPORTING ARMS SYSTEMS	97,152		97,152
239	0206624M	MARINE CORPS COMBAT SERVICES SUPPORT	30,156		30,156
240	0206625M	USMC INTELLIGENCE/ELECTRONIC WARFARE SYSTEMS (MIP)	39,976		39,976
241	0206629M	AMPHIBIOUS ASSAULT VEHICLE	22,637		22,637
242	0207161N	TACTICAL AIM MISSILES	40,121		40,121

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
243	0207163N	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM)	32,473		32,473
249	0303138N	CONSOLIDATED AFLOAT NETWORK ENTERPRISE SERVICES (CANES)	23,697		23,697
250	0303140N	INFORMATION SYSTEMS SECURITY PROGRAM	44,228		44,228
252	0305192N	MILITARY INTELLIGENCE PROGRAM (MIP) ACTIVITIES	6,081		6,081
253	0305204N	TACTICAL UNMANNED AERIAL VEHICLES	8,529		8,529
254	0305205N	UAS INTEGRATION AND INTEROPERABILITY	41,212		41,212
255	0305208M	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	7,687		7,687
256	0305208N	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	42,846		42,846
257	0305220N	MQ-4C TRITON	14,395		14,395
258	0305231N	MQ-8 UAV	9,843		9,843
259	0305232M	RQ-11 UAV	524		524
260	0305234N	SMALL (LEVEL 0) TACTICAL UAS (STUASLO)	5,360		5,360
261	0305239M	RQ-21A	10,914		10,914
262	0305241N	MULTI-INTELLIGENCE SENSOR DEVELOPMENT	81,231		81,231
263	0305242M	UNMANNED AERIAL SYSTEMS (UAS) PAYLOADS (MIP)	5,956		5,956
264	0305421N	RQ-4 MODERNIZATION	219,894	-3,000	216,894
		Program decrease		[-3,000]	
265	0308601N	MODELING AND SIMULATION SUPPORT	7,097		7,097
266	0702207N	DEPOT MAINTENANCE (NON-IF)	36,560		36,560
267	0708730N	MARITIME TECHNOLOGY (MARITECH)	7,284		7,284
268	1203109N	SATELLITE COMMUNICATIONS (SPACE)	39,174		39,174
268A	9999999999	CLASSIFIED PROGRAMS	1,549,503		1,549,503
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	4,885,060	-12,300	4,872,760
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY	18,481,666	-94,550	18,387,116

RESEARCH, DEVELOPMENT, TEST & EVAL, AF

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
018	0603203F	ADVANCED AEROSPACE SENSORS	39,968		39,968
019	0603211F	AEROSPACE TECHNOLOGY DEV/DEMO	121,002		121,002
020	0603216F	AEROSPACE PROPULSION AND POWER TECHNOLOGY	115,462	10,000	125,462
		Laser power system enhancement		[10,000]	
021	0603270F	ELECTRONIC COMBAT TECHNOLOGY	55,319		55,319
022	0603401F	ADVANCED SPACECRAFT TECHNOLOGY	54,895		54,895
023	0603444F	MAUI SPACE SURVEILLANCE SYSTEM (MSSS)	10,674		10,674
024	0603456F	HUMAN EFFECTIVENESS ADVANCED TECHNOLOGY DEVELOPMENT	36,463	10,000	46,463
		Autonomous life support system development		[10,000]	
025	0603601F	CONVENTIONAL WEAPONS TECHNOLOGY	194,981		194,981
026	0603605F	ADVANCED WEAPONS TECHNOLOGY	43,368		43,368
027	0603680F	MANUFACTURING TECHNOLOGY PROGRAM	42,025	5,000	47,025
		Academic and industrial partnerships for aerospace materials		[5,000]	
028	0603788F	BATTLESACE KNOWLEDGE DEVELOPMENT AND DEMONSTRATION	51,064	13,300	64,364
		Additional facility engineering research and development		[8,300]	
		Enhance and accelerate Air Force artificial intelligence research		[5,000]	
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	814,797	53,300	868,097
ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES					
030	0603260F	INTELLIGENCE ADVANCED DEVELOPMENT	5,568		5,568
032	0603742F	COMBAT IDENTIFICATION TECHNOLOGY	18,194		18,194
033	0603790F	NATO RESEARCH AND DEVELOPMENT	2,305		2,305
035	0603851F	INTERCONTINENTAL BALLISTIC MISSILE—DEN/VAL	41,856		41,856
037	0604015F	LONG RANGE STRIKE—BOMBER	2,314,196		2,314,196
038	0604201F	INTEGRATED AVIONICS PLANNING AND DEVELOPMENT	14,894		14,894
039	0604257F	ADVANCED TECHNOLOGY AND SENSORS	34,585		34,585
040	0604288F	NATIONAL AIRBORNE OPS CENTER (NAOC) RECAP	9,740		9,740

041	0604317F	TECHNOLOGY TRANSFER	12,960	12,960
042	0604327F	HARD AND DEEPLY BURIED TARGET DEFEAT SYSTEM (HDBTDS) PROGRAM	71,501	71,501
043	0604414F	CYBER RESILIENCY OF WEAPON SYSTEMS-ACS	62,618	62,618
046	0604776F	DEPLOYMENT & DISTRIBUTION ENTERPRISE R&D	28,350	28,350
048	0604858F	TECH TRANSITION PROGRAM	1,201,075	1,201,075
		Competitively Awarded Transition Programs	15,000	15,000
		Non-engine development technology	[5,000]	[5,000]
049	0605230F	GROUND BASED STRATEGIC DETERRENT	69,400	69,400
		Accelerated execution of program	[69,400]	[69,400]
050	0207110F	NEXT GENERATION AIR DOMINANCE	413,997	413,997
		Ahead of need	[-90,000]	[-90,000]
051	0207455F	THREE DIMENSIONAL LONG-RANGE RADAR (3DELRR)	40,326	40,326
052	0208099F	UNIFIED PLATFORM (UP)	29,800	29,800
054	0305236F	COMMON DATA LINK EXECUTIVE AGENT (CDL EA)	41,880	41,880
055	0305601F	MISSION PARTNER ENVIRONMENTS	10,074	10,074
056	0306250F	CYBER OPERATIONS TECHNOLOGY DEVELOPMENT	253,825	253,825
057	0306415F	ENABLED CYBER ACTIVITIES	16,325	16,325
059	0901410F	CONTRACTING INFORMATION TECHNOLOGY SYSTEM	17,577	17,577
060	1203164F	NAVSTAR GLOBAL POSITIONING SYSTEM (USER EQUIPMENT) (SPACE)	286,629	286,629
061	1203710F	EO/IR WEATHER SYSTEMS	7,940	7,940
062	1206422F	WEATHER SYSTEM FOLLOW-ON	138,052	148,052
		Commercial weather data pilot	10,000	10,000
063	1206425F	SPACE SITUATION AWARENESS SYSTEMS	39,338	39,338
064	1206434F	MIDTERM POLAR MILSATCOM SYSTEM	383,113	383,113
065	1206438F	SPACE CONTROL TECHNOLOGY	91,018	106,018
		NTS-3 Payload	15,000	15,000
066	1206730F	SPACE SECURITY AND DEFENSE PROGRAM	45,542	49,542
		Allied launch services	4,000	4,000
067	1206760F	PROTECTED TACTICAL ENTERPRISE SERVICE (PTES)	51,419	51,419
068	1206761F	PROTECTED TACTICAL SERVICE (PTS)	29,776	29,776
069	1206855F	PROTECTED SATCOM SERVICES (PSCS)—AGGREGATED	29,379	29,379
070	1206857F	OPERATIONALLY RESPONSIVE SPACE	366,050	247,050
			[-119,000]	

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
		Space RCO Advanced Solar Power—early to need		[-119,000]	
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	6,529,943	-95,600	6,434,343
		SYSTEM DEVELOPMENT & DEMONSTRATION			
071	0604200F	FUTURE ADVANCED WEAPON ANALYSIS & PROGRAMS	39,602		39,602
072	0604201F	INTEGRATED AVIONICS PLANNING AND DEVELOPMENT	58,531		58,531
073	0604222F	NUCLEAR WEAPONS SUPPORT	4,468		4,468
074	0604270F	ELECTRONIC WARFARE DEVELOPMENT	1,909		1,909
075	0604281F	TACTICAL DATA NETWORKS ENTERPRISE	207,746		207,746
076	0604287F	PHYSICAL SECURITY EQUIPMENT	14,421		14,421
077	0604329F	SMALL DIAMETER BOMB (SDB)—EMD	73,158	20,000	93,158
		SDB II cost reduction initiatives		[20,000]	
081	0604429F	AIRBORNE ELECTRONIC ATTACK	7,153		7,153
083	0604602F	ARMAMENT/ORDNANCE DEVELOPMENT	58,590		58,590
084	0604604F	SUBMUNITIONS	2,990		2,990
085	0604617F	AGILE COMBAT SUPPORT	20,028		20,028
086	0604618F	JOINT DIRECT ATTACK MUNITION	15,787		15,787
087	0604706F	LIFE SUPPORT SYSTEMS	8,919		8,919
088	0604735F	COMBAT TRAINING RANGES	35,895	27,000	62,895
		Advanced threat radar system		[27,000]	
089	0604800F	F-35—EMD	69,001		69,001
091	0604932F	LONG RANGE STANDOFF WEAPON	614,920	85,000	699,920
		Accelerated execution of program		[85,000]	
092	0604933F	ICBM FUZE MODERNIZATION	172,902		172,902
097	0605221F	KC-46	88,170		88,170
098	0605223F	ADVANCED PILOT TRAINING	265,465		265,465
099	0605229F	COMBAT RESCUE HELICOPTER	457,652		457,652

105	0605830F	ACQ WORKFORCE- GLOBAL BATTLE MGMT	3,617	623,000	3,617
106	0605931F	B-2 DEFENSIVE MANAGEMENT SYSTEM	261,758	[623,000]	261,758
107	0101125F	NUCLEAR WEAPONS MODERNIZATION	91,907		91,907
108	0207171F	F-15 EPAWSS	137,095		137,095
109	0207328F	STAND IN ATTACK WEAPON	43,175		43,175
110	0207423F	ADVANCED COMMUNICATIONS SYSTEMS	14,888		14,888
111	0207701F	FULL COMBAT MISSION TRAINING	1,015		1,015
115	0307581F	JSTARS RECAP		623,000	623,000
		JSTARS recap EMD execution			
116	0401310F	C-32 EXECUTIVE TRANSPORT RECAPITALIZATION	7,943		7,943
117	0401319F	PRESIDENTIAL AIRCRAFT RECAPITALIZATION (PAR)	673,032		673,032
118	0701212F	AUTOMATED TEST SYSTEMS	13,653		13,653
119	1203176F	COMBAT SURVIVOR EVADER LOCATOR	939		939
120	1203269F	GPS IIIC	451,889		451,889
121	1203940F	SPACE SITUATION AWARENESS OPERATIONS	46,668		46,668
122	1206421F	COUNTERSPACE SYSTEMS	20,676		20,676
123	1206425F	SPACE SITUATION AWARENESS SYSTEMS	134,463		134,463
124	1206426F	SPACE FENCE	20,215		20,215
125	1206431F	ADVANCED EHF MILSATCOM (SPACE)	151,506		151,506
126	1206432F	POLAR MILSATCOM (SPACE)	27,337		27,337
127	1206433F	WIDEBAND GLOBAL SATCOM (SPACE)	3,970		3,970
128	1206441F	SPACE BASED INFRARED SYSTEM (SBIRS) HIGH EMD	60,565		60,565
129	1206442F	EVOLVED SBIRS	643,126		643,126
130	1206853F	EVOLVED EXPENDABLE LAUNCH VEHICLE PROGRAM (SPACE)—EMD	245,447		245,447
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	5,272,191	755,000	6,027,191
MANAGEMENT SUPPORT					
131	0604256F	THREAT SIMULATOR DEVELOPMENT	34,256		34,256
132	0604759F	MAJOR T&E INVESTMENT	91,844		91,844
133	0605101F	RAND PROJECT AIR FORCE	34,614		34,614
135	0605712F	INITIAL OPERATIONAL TEST & EVALUATION	18,043		18,043
136	0605807F	TEST AND EVALUATION SUPPORT	692,784	31,900	724,684

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
		Test range modernization		[31,900]	
137	0605826F	ACQ WORKFORCE- GLOBAL POWER	233,924		233,924
138	0605827F	ACQ WORKFORCE- GLOBAL VIG & COMBAT SYS	263,488		263,488
139	0605828F	ACQ WORKFORCE- GLOBAL REACH	153,591		153,591
140	0605829F	ACQ WORKFORCE- CYBER, NETWORK, & BUS SYS	232,315		232,315
141	0605830F	ACQ WORKFORCE- GLOBAL BATTLE MGMT	169,868		169,868
142	0605831F	ACQ WORKFORCE- CAPABILITY INTEGRATION	226,219		226,219
143	0605832F	ACQ WORKFORCE- ADVANCED PRGM TECHNOLOGY	38,400		38,400
144	0605833F	ACQ WORKFORCE- NUCLEAR SYSTEMS	125,761		125,761
147	0605898F	MANAGEMENT HQ—R&D	10,642		10,642
148	0605976F	FACILITIES RESTORATION AND MODERNIZATION—TEST AND EVALUATION SUPPORT	162,216		162,216
149	0605978F	FACILITIES SUSTAINMENT—TEST AND EVALUATION SUPPORT	28,888		28,888
150	0606017F	REQUIREMENTS ANALYSIS AND MATURATION	35,285		35,285
153	0308602F	ENTERPRISE INFORMATION SERVICES (EIS)	20,545		20,545
154	0702806F	ACQUISITION AND MANAGEMENT SUPPORT	12,367		12,367
155	0804731F	GENERAL SKILL TRAINING	1,448		1,448
157	1001004F	INTERNATIONAL ACTIVITIES	3,998		3,998
158	1206116F	SPACE TEST AND TRAINING RANGE DEVELOPMENT	23,254		23,254
159	1206392F	SPACE AND MISSILE CENTER (SMC) CIVILIAN WORKFORCE	169,912		169,912
160	1206398F	SPACE & MISSILE SYSTEMS CENTER—MHA	10,508		10,508
161	1206860F	ROCKET SYSTEMS LAUNCH PROGRAM (SPACE)	19,721		29,721
		Rocket systems launch program		10,000	
162	1206864F	SPACE TEST PROGRAM (STP)	25,620	[10,000]	75,620
		Blackjack project		50,000	
		SUBTOTAL MANAGEMENT SUPPORT	2,899,511	91,900	2,931,411

OPERATIONAL SYSTEMS DEVELOPMENT

165	0604233F	SPECIALIZED UNDERGRADUATE FLIGHT TRAINING	11,344	11,344
167	0605018F	AF INTEGRATED PERSONNEL AND PAY SYSTEM (AF-IPPS)	47,287	47,287
168	0605024F	ANTI-TAMPER TECHNOLOGY EXECUTIVE AGENCY	32,770	32,770
169	0605117F	FOREIGN MATERIEL ACQUISITION AND EXPLOITATION	68,368	68,368
170	0605278F	HC/MC-130 RECAP RDT&E	32,574	32,574
171	0606018F	NC3 INTEGRATION	26,112	26,112
172	0606942F	ASSESSMENTS AND EVALUATIONS CYBER VULNERABILITIES	99,100	99,100
173	0101113F	B-52 SQUADRONS	14,700	295,114
		Technical adjustment	[14,700]	
174	0101122F	AIR-LAUNCHED CRUISE MISSILE (ALCM)	5,955	5,955
175	0101126F	B-1B SQUADRONS	76,030	76,030
176	0101127F	B-2 SQUADRONS	105,561	105,561
177	0101213F	MINUTEMAN SQUADRONS	156,047	156,047
179	0101316F	WORLDWIDE JOINT STRATEGIC COMMUNICATIONS	10,442	10,442
180	0101324F	INTEGRATED STRATEGIC PLANNING & ANALYSIS NETWORK	22,833	22,833
181	0101328F	ICBM REENTRY VEHICLES	18,412	18,412
183	0102110F	UH-1H REPLACEMENT PROGRAM	288,022	288,022
184	0102326F	REGION/SECTOR OPERATION CONTROL CENTER MODERNIZATION PROGRAM	9,252	9,252
186	0205219F	MQ-9 UAV	115,345	115,345
188	0207131F	A-10 SQUADRONS	26,738	26,738
189	0207133F	F-16 SQUADRONS	191,564	191,564
190	0207134F	F-15E SQUADRONS	192,883	242,883
		ALQ-128 EW suite for ANG units	50,000	50,000
		MANNED DESTRUCTIVE SUPPRESSION	[50,000]	
191	0207136F	F-22A SQUADRONS	15,238	15,238
192	0207138F	Program reduction	603,553	583,853
		F-35 SQUADRONS	549,501	549,501
		TACTICAL AIM MISSILES	37,230	37,230
194	0207161F	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM)	61,393	61,393
196	0207227F	COMBAT RESCUE—PARARESCUE	647	647
198	0207249F	PRECISION ATTACK SYSTEMS PROCUREMENT	14,891	14,891
199	0207253F	COMPASS CALL	13,901	13,901

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
200	0207268F	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	121,203		121,203
202	0207325F	JOINT AIR-TO-SURFACE STANDOFF MISSILE (JASSM)	60,062		60,062
203	0207410F	AIR & SPACE OPERATIONS CENTER (AOC)	106,102	-26,500	79,602
		Unjustified request		[-26,500]	
204	0207412F	CONTROL AND REPORTING CENTER (CRC)	6,413		6,413
205	0207417F	AIRBORNE WARNING AND CONTROL SYSTEM (AWACS)	120,664	-41,800	78,864
		Program reduction		[-41,800]	
		Radar controller program delay		[-36,000]	
206	0207418F	TACTICAL AIRBORNE CONTROL SYSTEMS	2,659		2,659
208	0207431F	COMBAT AIR INTELLIGENCE SYSTEM ACTIVITIES	10,316		10,316
209	0207444F	TACTICAL AIR CONTROL PARTY-MOD	6,149		6,149
210	0207448F	C2ISR TACTICAL DATA LINK	1,738		1,738
211	0207452F	DCAPES	13,297		13,297
212	0207573F	NATIONAL TECHNICAL NUCLEAR FORENSICS	1,788		1,788
213	0207581F	JOINT SURVEILLANCE/TARGET ATTACK RADAR SYSTEM (JSTARS)	14,888		14,888
214	0207590F	SEEK EAGLE	24,699		24,699
215	0207601F	USAF MODELING AND SIMULATION	17,078		17,078
216	0207605F	WARGAMING AND SIMULATION CENTERS	6,141		6,141
218	0207697F	DISTRIBUTED TRAINING AND EXERCISES	4,225		4,225
219	0208006F	MISSION PLANNING SYSTEMS	63,653		63,653
220	0208007F	TACTICAL DECEPTION	6,949		6,949
221	0208087F	AF OFFENSIVE CYBERSPACE OPERATIONS	40,526		40,526
222	0208088F	AF DEFENSIVE CYBERSPACE OPERATIONS	24,166		24,166
223	0208097F	JOINT CYBER COMMAND AND CONTROL (UCC2)	13,000		13,000
224	0208099F	UNIFIED PLATFORM (UP)	28,759		28,759
229	0301017F	GLOBAL SENSOR INTEGRATED ON NETWORK (GSIN)	3,579		3,579
230	0301112F	NUCLEAR PLANNING AND EXECUTION SYSTEM (NPES)	29,620		29,620

237	0301401F	AIR FORCE SPACE AND CYBER NON-TRADITIONAL ISR FOR BATTLESPACE AWARENESS	6,633		6,633
238	0302015F	E-4B NATIONAL AIRBORNE OPERATIONS CENTER (NAOC)	57,758		57,758
240	0303131F	MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN)	99,088		99,088
241	0303133F	HIGH FREQUENCY RADIO SYSTEMS	51,612		51,612
242	0303140F	INFORMATION SYSTEMS SECURITY PROGRAM	34,612		34,612
244	0303142F	GLOBAL FORCE MANAGEMENT—DATA INITIATIVE	2,170		2,170
246	0304260F	AIRBORNE SIGINT ENTERPRISE	106,873	3,000	109,873
		SIGINT single-pod development		[3,000]	
247	0304310F	COMMERCIAL ECONOMIC ANALYSIS	3,472		3,472
250	0305015F	C2 AIR OPERATIONS SUITE—C2 INFO SERVICES	8,608		8,608
251	0305020F	CCMD INTELLIGENCE INFORMATION TECHNOLOGY	1,586		1,586
252	0305099F	GLOBAL AIR TRAFFIC MANAGEMENT (GATM)	4,492		4,492
254	0305111F	WEATHER SERVICE	26,942		26,942
255	0305114F	AIR TRAFFIC CONTROL, APPROACH, AND LANDING SYSTEM (ATCAL)	6,271	2,500	8,771
		Augmentation of air surveillance and early warning radar systems		[2,500]	
256	0305116F	AERIAL TARGETS	8,383		8,383
259	0305128F	SECURITY AND INVESTIGATIVE ACTIVITIES	418		418
261	0305146F	DEFENSE JOINT COUNTERINTELLIGENCE ACTIVITIES	3,845		3,845
268	0305202F	DRAGON U-2	48,518	17,000	65,518
		EO/IR sensor upgrades		[17,000]	
270	0305206F	AIRBORNE RECONNAISSANCE SYSTEMS	175,334		175,334
		Gorgon Stare		[10,800]	
		Program reduction		[−10,800]	
271	0305207F	MANNED RECONNAISSANCE SYSTEMS	14,223		14,223
272	0305208F	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	24,554		24,554
273	0305220F	RQ-4 UAV	221,690	−9,800	211,890
		RQ-4 infrastructure unjustified request		[−9,800]	
274	0305221F	NETWORK-CENTRIC COLLABORATIVE TARGETING	14,288		14,288
275	0305238F	NATO AGS	51,527		51,527
276	0305240F	SUPPORT TO DCGS ENTERPRISE	26,579		26,579
278	0305600F	INTERNATIONAL INTELLIGENCE TECHNOLOGY AND ARCHITECTURES	8,464		8,464
280	0305881F	RAPID CYBER ACQUISITION	4,303		4,303

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
284	030584F	PERSONNEL RECOVERY COMMAND & CTRL (PRC2)	2,466		2,466
285	030757F	INTELLIGENCE MISSION DATA (IMD)	4,117		4,117
287	040115F	C-130 AIRLIFT SQUADRON	105,988		105,988
288	040119F	C-5 AIRLIFT SQUADRONS (IF)	25,071		25,071
289	0401130F	C-17 AIRCRAFT (IF)	48,299		48,299
290	0401132F	C-130J PROGRAM	15,409		15,409
291	0401134F	LARGE AIRCRAFT IR COUNTERMEASURES (LAIRCIM)	4,334		4,334
292	0401218F	KC-135S	3,493		3,493
293	0401219F	KC-10S	6,569		6,569
294	0401314F	OPERATIONAL SUPPORT AIRLIFT	3,172		3,172
295	0401318F	CV-22	18,502		18,502
296	0401840F	AMC COMMAND AND CONTROL SYSTEM	1,688		1,688
297	0408011F	SPECIAL TACTICS / COMBAT CONTROL	2,541		2,541
298	0702207F	DEPOT MAINTENANCE (NON-IF)	1,897		1,897
299	0708055F	MAINTENANCE, REPAIR & OVERHAUL SYSTEM	50,933		50,933
300	0708610F	LOGISTICS INFORMATION TECHNOLOGY (LOGIT)	13,787		13,787
301	0708611F	SUPPORT SYSTEMS DEVELOPMENT	4,497		4,497
302	0804743F	OTHER FLIGHT TRAINING	2,022		2,022
303	0808716F	OTHER PERSONNEL ACTIVITIES	108		108
304	0901202F	JOINT PERSONNEL RECOVERY AGENCY	2,023		2,023
305	0901218F	CIVILIAN COMPENSATION PROGRAM	3,772		3,772
306	0901220F	PERSONNEL ADMINISTRATION	6,358		6,358
307	0901226F	AIR FORCE STUDIES AND ANALYSIS AGENCY	1,418		1,418
308	0901538F	FINANCIAL MANAGEMENT INFORMATION SYSTEMS DEVELOPMENT	99,734		99,734
309	1201921F	SERVICE SUPPORT TO STRATCOM—SPACE ACTIVITIES	14,161		14,161
310	1202247F	AF TENCAP	26,986		26,986
311	1203001F	FAMILY OF ADVANCED BLOS TERMINALS (FAB-T)	80,168		80,168

312	1203110F	SATELLITE CONTROL NETWORK (SPACE)	17,808	17,808	
314	1203165F	NAVSTAR GLOBAL POSITIONING SYSTEM (SPACE AND CONTROL SEGMENTS)	8,937	8,937	
315	1203173F	SPACE AND MISSILE TEST AND EVALUATION CENTER	59,935	59,935	
316	1203174F	SPACE INNOVATION, INTEGRATION AND RAPID TECHNOLOGY DEVELOPMENT	21,019	21,019	
317	1203179F	INTEGRATED BROADCAST SERVICE (IBS)	8,568	8,568	
318	1203182F	SPACELIFT RANGE SYSTEM (SPACE)	10,641	10,641	
319	1203265F	GPS III SPACE SEGMENT	144,543	144,543	
320	1203400F	SPACE SUPERIORITY INTELLIGENCE	16,278	16,278	
321	1203614F	JSPOC MISSION SYSTEM	72,256	72,256	
322	1203620F	NATIONAL SPACE DEFENSE CENTER	42,209	42,209	
325	1203913F	NUDET DETECTION SYSTEM (SPACE)	19,778	19,778	
326	1203940F	SPACE SITUATION AWARENESS OPERATIONS	19,572	19,572	
327	1206423F	GLOBAL POSITIONING SYSTEM III—OPERATIONAL CONTROL SEGMENT	513,235	513,235	
327A	9999999999	CLASSIFIED PROGRAMS	16,534,124	16,390,224	-143,900
		Classified adjustment			[-40,000]
		Forward financed in the FY18 Omnibus			[-89,900]
		PDSA staff reduction			[-14,000]
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	22,891,740	22,737,240	-154,500
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, AF	40,178,343	40,872,443	694,100
		RESEARCH, DEVELOPMENT, TEST & EVAL, DW			
		BASIC RESEARCH			
001	0601000BR	DTRA BASIC RESEARCH	37,023	37,023	
002	0601101E	DEFENSE RESEARCH SCIENCES	422,130	416,130	-6,000
		Program decrease			[-6,000]
003	0601110D8Z	BASIC RESEARCH INITIATIVES	42,702	42,702	
004	0601117E	BASIC OPERATIONAL MEDICAL RESEARCH SCIENCE	47,825	47,825	
005	0601120D8Z	NATIONAL DEFENSE EDUCATION PROGRAM	85,919	85,919	
006	0601228D8Z	HISTORICALLY BLACK COLLEGES AND UNIVERSITIES/MINORITY INSTITUTIONS	30,412	40,412	10,000
		Program increase			[10,000]
007	0601384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	42,103	42,103	

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
		SUBTOTAL BASIC RESEARCH	708,114	4,000	712,114
		APPLIED RESEARCH			
008	0602000D8Z	JOINT MUNITIONS TECHNOLOGY	19,170		19,170
009	0602115E	BIOMEDICAL TECHNOLOGY	101,300		101,300
011	060234D8Z	LINCOLN LABORATORY RESEARCH PROGRAM	51,596		51,596
012	060251D8Z	APPLIED RESEARCH FOR THE ADVANCEMENT OF S&T PRIORITIES	60,688		60,688
013	0602303E	INFORMATION & COMMUNICATIONS TECHNOLOGY	395,317		395,317
014	0602383E	BIOLOGICAL WARFARE DEFENSE	38,640		38,640
015	0602384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	192,674		192,674
016	0602668D8Z	CYBER SECURITY RESEARCH	14,969		14,969
017	0602702E	TACTICAL TECHNOLOGY	335,466		335,466
018	0602715E	MATERIALS AND BIOLOGICAL TECHNOLOGY	226,898		226,898
019	0602716E	ELECTRONICS TECHNOLOGY	333,847		333,847
020	0602718BR	COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH	161,151		161,151
021	0602751D8Z	SOFTWARE ENGINEERING INSTITUTE (SEI) APPLIED RESEARCH	9,300		9,300
022	11604018B	SOF TECHNOLOGY DEVELOPMENT	35,921		35,921
		SUBTOTAL APPLIED RESEARCH	1,976,937		1,976,937
		ADVANCED TECHNOLOGY DEVELOPMENT			
023	0603000D8Z	JOINT MUNITIONS ADVANCED TECHNOLOGY	25,598		25,598
024	0603122D8Z	COMBATING TERRORISM TECHNOLOGY SUPPORT	125,271		125,271
025	0603133D8Z	FOREIGN COMPARATIVE TESTING	24,532		24,532
027	0603160BR	COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT	299,858		299,858
028	0603176C	ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT	13,017		13,017
029	0603178C	WEAPONS TECHNOLOGY		10,000	10,000
		Accelerate hypersonic defense capability		[10,000]	

031	0603180C	ADVANCED RESEARCH	20,365	20,000	40,365
		Accelerate hypersonic defense capability		[20,000]	
032	0603225D8Z	JOINT DOD-DOE MUNITIONS TECHNOLOGY DEVELOPMENT	18,644		18,644
034	0603286E	ADVANCED AEROSPACE SYSTEMS	277,603		277,603
035	0603287E	SPACE PROGRAMS AND TECHNOLOGY	254,671		254,671
036	0603288D8Z	ANALYTIC ASSESSMENTS	19,472		19,472
037	0603289D8Z	ADVANCED INNOVATIVE ANALYSIS AND CONCEPTS	37,263		37,263
038	0603291D8Z	ADVANCED INNOVATIVE ANALYSIS AND CONCEPTS—MHA	13,621		13,621
039	0603294C	COMMON KILL VEHICLE TECHNOLOGY	189,753	-89,000	100,753
		Early to need		[-89,000]	
040	0603342D8W	DEFENSE INNOVATION UNIT EXPERIMENTAL (DIUX)	29,364		29,364
041	0603375D8Z	TECHNOLOGY INNOVATION	83,143		83,143
042	0603384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—ADVANCED DEVELOPMENT	142,826		142,826
043	0603527D8Z	RETRACT LARCH	161,128		161,128
044	0603618D8Z	JOINT ELECTRONIC ADVANCED TECHNOLOGY	12,918		12,918
045	0603648D8Z	JOINT CAPABILITY TECHNOLOGY DEMONSTRATIONS	106,049		106,049
046	0603662D8Z	NETWORKED COMMUNICATIONS CAPABILITIES	12,696		12,696
047	0603680D8Z	DEFENSE-WIDE MANUFACTURING SCIENCE AND TECHNOLOGY PROGRAM	114,637		114,637
048	0603680S	MANUFACTURING TECHNOLOGY PROGRAM	49,667		49,667
049	0603699D8Z	EMERGING CAPABILITIES TECHNOLOGY DEVELOPMENT	48,338		48,338
050	0603712S	GENERIC LOGISTICS R&D TECHNOLOGY DEMONSTRATIONS	11,778		11,778
052	0603716D8Z	STRATEGIC ENVIRONMENTAL RESEARCH PROGRAM	76,514		76,514
053	0603720S	MICROELECTRONICS TECHNOLOGY DEVELOPMENT AND SUPPORT	168,931		168,931
054	0603727D8Z	JOINT WARFIGHTING PROGRAM	5,992		5,992
055	0603739E	ADVANCED ELECTRONICS TECHNOLOGIES	111,099		111,099
056	0603760E	COMMAND, CONTROL AND COMMUNICATIONS SYSTEMS	185,984		185,984
057	0603766E	NETWORK-CENTRIC WARFARE TECHNOLOGY	438,569		438,569
058	0603767E	SENSOR TECHNOLOGY	190,128		190,128
059	0603769D8Z	DISTRIBUTED LEARNING ADVANCED TECHNOLOGY DEVELOPMENT	13,564		13,564
060	0603781D8Z	SOFTWARE ENGINEERING INSTITUTE	15,050		15,050
061	0603826D8Z	QUICK REACTION SPECIAL PROJECTS	69,626		69,626
062	0603833D8Z	ENGINEERING SCIENCE & TECHNOLOGY	19,415		19,415

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
063	0603924D8Z	HIGH ENERGY LASER ADVANCED TECHNOLOGY PROGRAM	69,533		69,533
064	0603941D8Z	TEST & EVALUATION SCIENCE & TECHNOLOGY	96,389		96,389
065	0604055D8Z	OPERATIONAL ENERGY CAPABILITY IMPROVEMENT	40,582		40,582
066	0303310D8Z	CWMD SYSTEMS	26,644		26,644
067	1160402BB	SOF ADVANCED TECHNOLOGY DEVELOPMENT	79,380		79,380
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	3,699,612	-59,000	3,640,612
ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES					
068	0603161D8Z	NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT RDT&E ADC&P	28,140		28,140
069	0603600D8Z	WALKOFF	92,222		92,222
070	0603821D8Z	ACQUISITION ENTERPRISE DATA & INFORMATION SERVICES	2,506		2,506
071	0603851D8Z	ENVIRONMENTAL SECURITY TECHNICAL CERTIFICATION PROGRAM	40,016		40,016
072	0603881C	BALLISTIC MISSILE DEFENSE TERMINAL DEFENSE SEGMENT	214,173	145,000	359,173
		Accelerate USFK JEON delivery		[100,000]	
		Address cyber threats		[45,000]	
073	0603882C	BALLISTIC MISSILE DEFENSE MIDCOURSE DEFENSE SEGMENT	926,359	-200,000	726,359
		Address cyber threats		[8,000]	
		Forward financed in the FY18 Omnibus		[-208,000]	
074	0603884BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—DEMI/VAL	129,886		129,886
075	0603884C	BALLISTIC MISSILE DEFENSE SENSORS	220,876	25,000	245,876
		Accelerate USFK JEON delivery		[20,000]	
		Address cyber threats		[5,000]	
076	0603890C	BMD ENABLING PROGRAMS	540,926		540,926
077	0603891C	SPECIAL PROGRAMS—MDA	422,348		422,348
078	0603892C	AEGIS BMD	767,539		767,539
081	0603896C	BALLISTIC MISSILE DEFENSE COMMAND AND CONTROL, BATTLE MANAGEMENT AND COMMUNICATI	475,168	8,000	483,168
		Address cyber threats		[8,000]	

082	0603898C	BALLISTIC MISSILE DEFENSE JOINT WARRIGHTER SUPPORT	48,767	48,767	
083	0603904C	MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	54,925	54,925	
084	0603906C	REGARDING TRENCH	16,916	16,916	
085	0603907C	SEA BASED X-BAND RADAR (SBX)	149,715	149,715	-33,000
		Forward financed in the FY18 Omnibus			[-33,000]
086	0603913C	ISRAELI COOPERATIVE PROGRAMS	300,000	300,000	
087	0603914C	BALLISTIC MISSILE DEFENSE TEST	365,681	365,681	65,000
		Accelerate USFK JEON delivery			[50,000]
		Address cyber threats			[15,000]
088	0603915C	BALLISTIC MISSILE DEFENSE TARGETS	517,852	517,852	-26,500
		Accelerate USFK JEON delivery			[4,500]
		Address cyber threats			[5,000]
		Forward financed in the FY18 Omnibus			[-36,000]
089	0603920D8Z	HUMANITARIAN DEMINING	11,347	11,347	
090	0603923D8Z	COALITION WARFARE	8,528	8,528	
091	0604016D8Z	DEPARTMENT OF DEFENSE CORROSION PROGRAM	3,477	3,477	
092	0604115C	TECHNOLOGY MATURATION INITIATIVES	148,822	148,822	55,000
		Address cyber threats			[5,000]
		Continue directed energy and boost phase intercept efforts			[50,000]
093	0604132D8Z	MISSILE DEFEAT PROJECT	58,607	58,607	
094	0604134BR	COUNTER IMPROVISED-THREAT DEMONSTRATION, PROTOTYPE DEVELOPMENT, AND TESTING	12,993	12,993	
095	0604181C	HYPERSONIC DEFENSE	120,444	120,444	10,000
		Accelerate hypersonic defense capability			[10,000]
096	0604250D8Z	ADVANCED INNOVATIVE TECHNOLOGIES	1,431,702	1,381,702	-50,000
		Program reduction			[-50,000]
097	0604294D8Z	TRUSTED & ASSURED MICROELECTRONICS	233,142	233,142	
098	0604331D8Z	RAPID PROTOTYPING PROGRAM	99,333	99,333	
098A	0604342D8Z	DEFENSE TECHNOLOGY OFFSET			100,000
		Directed energy			[100,000]
099	0604400D8Z	DEPARTMENT OF DEFENSE (DOD) UNMANNED SYSTEM COMMON DEVELOPMENT	3,781	3,781	
100	0604673C	PACIFIC DISCRIMINATING RADAR	95,765	95,765	
101	0604682D8Z	WARGAMING AND SUPPORT FOR STRATEGIC ANALYSIS (SSA)	3,768	3,768	

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
103	0604826J	JOINT C5 CAPABILITY DEVELOPMENT, INTEGRATION AND INTEROPERABILITY ASSESSMENTS	22,435		22,435
104	0604873C	LONG RANGE DISCRIMINATION RADAR (LRDR)	164,562		164,562
105	0604874C	IMPROVED HOMELAND DEFENSE INTERCEPTORS	561,220	-139,400	421,820
		Forward financed in the FY18 Omnibus		[-139,400]	
106	0604876C	BALLISTIC MISSILE DEFENSE TERMINAL DEFENSE SEGMENT TEST	61,017		61,017
107	0604878C	AEGIS BMD TEST	95,756		95,756
108	0604879C	BALLISTIC MISSILE DEFENSE SENSOR TEST	81,001		81,001
109	0604880C	LAND-BASED SM-3 (LBSM3)	27,692	150	27,842
		Retain Poland CHUs		[150]	
111	0604887C	BALLISTIC MISSILE DEFENSE MIDCOURSE SEGMENT TEST	81,934	-9,300	72,634
		Forward financed in the FY18 Omnibus		[-9,300]	
112	0604894C	MULTI-OBJECT KILL VEHICLE	8,256		8,256
113	0300206R	ENTERPRISE INFORMATION TECHNOLOGY SYSTEMS	2,600		2,600
114	0303191D8Z	JOINT ELECTROMAGNETIC TECHNOLOGY (JET) PROGRAM	3,104		3,104
115	0305103C	CYBER SECURITY INITIATIVE	985		985
116	1206893C	SPACE TRACKING & SURVEILLANCE SYSTEM	36,955		36,955
117	1206895C	BALLISTIC MISSILE DEFENSE SYSTEM SPACE PROGRAMS	16,484	58,000	74,484
		Address cyber threats		[8,000]	
		Develop space sensor architecture		[50,000]	
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES	8,709,725	7,950	8,717,675
SYSTEM DEVELOPMENT AND DEMONSTRATION					
118	0604161D8Z	NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT RDT&E SDD	8,333		8,333
119	0604165D8Z	PROMPT GLOBAL STRIKE CAPABILITY DEVELOPMENT	263,414	150,000	413,414
		Accelerate program		[150,000]	
120	0604384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—EMD	388,701		388,701
121	0604771D8Z	JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS)	19,503		19,503

122	0605000BR	COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT	6,163	6,163
123	0605013BL	INFORMATION TECHNOLOGY DEVELOPMENT	11,988	11,988
124	0605021SE	HOMELAND PERSONNEL SECURITY INITIATIVE	296	296
125	0605022D8Z	DEFENSE EXPORTABILITY PROGRAM	1,489	1,489
126	0605027D8Z	OSD(C) IT DEVELOPMENT INITIATIVES	9,590	9,590
127	0605070S	DOD ENTERPRISE SYSTEMS DEVELOPMENT AND DEMONSTRATION	3,173	3,173
128	0605075D8Z	DCMO POLICY AND INTEGRATION	2,105	2,105
129	0605080S	DEFENSE AGENCY INITIATIVES (DAI)—FINANCIAL SYSTEM	21,156	21,156
130	0605090S	DEFENSE RETIRED AND ANNUITANT PAY SYSTEM (DRAS)	10,731	10,731
132	0605210D8Z	DEFENSE-WIDE ELECTRONIC PROCUREMENT CAPABILITIES	6,374	6,374
133	0605294D8Z	TRUSTED & ASSURED MICROELECTRONICS	56,178	56,178
134	0303141K	GLOBAL COMBAT SUPPORT SYSTEM	2,512	2,512
135	0305304D8Z	DOD ENTERPRISE ENERGY INFORMATION MANAGEMENT (EIM)	2,435	2,435
136	0305310D8Z	CWMD SYSTEMS: SYSTEM DEVELOPMENT AND DEMONSTRATION	17,048	17,048
		SUBTOTAL SYSTEM DEVELOPMENT AND DEMONSTRATION	831,189	150,000
MANAGEMENT SUPPORT				
137	0604774D8Z	DEFENSE READINESS REPORTING SYSTEM (DRRS)	6,661	6,661
138	0604875D8Z	JOINT SYSTEMS ARCHITECTURE DEVELOPMENT	4,088	4,088
139	0604940D8Z	CENTRAL TEST AND EVALUATION INVESTMENT DEVELOPMENT (CTEIP)	258,796	258,796
140	0604942D8Z	ASSESSMENTS AND EVALUATIONS	31,356	31,356
141	0605001E	MISSION SUPPORT	65,646	65,646
142	0605100D8Z	JOINT MISSION ENVIRONMENT TEST CAPABILITY (JMETC)	84,184	84,184
143	0605104D8Z	TECHNICAL STUDIES, SUPPORT AND ANALYSIS	22,576	22,576
144	0605126J	JOINT INTEGRATED AIR AND MISSILE DEFENSE ORGANIZATION (JIAMDO)	52,565	42,565
		Unjustified program growth		-10,000
				[-10,000]
146	0605142D8Z	SYSTEMS ENGINEERING	38,872	38,872
147	0605151D8Z	STUDIES AND ANALYSIS SUPPORT—OSD	3,534	3,534
148	0605161D8Z	NUCLEAR MATTERS-PHYSICAL SECURITY	5,050	5,050
149	0605170D8Z	SUPPORT TO NETWORKS AND INFORMATION INTEGRATION	11,450	11,450
150	0605200D8Z	GENERAL SUPPORT TO USD (INTELLIGENCE)	1,693	1,693
151	0605384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	102,883	102,883

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
159	0605790D8Z	SMALL BUSINESS INNOVATION RESEARCH (SBIR)/ SMALL BUSINESS TECHNOLOGY TRANSFER	2,545		2,545
160	0605798D8Z	DEFENSE TECHNOLOGY ANALYSIS	24,487		24,487
161	0605801KA	DEFENSE TECHNICAL INFORMATION CENTER (DTIC)	56,853		56,853
162	0605803SE	R&D IN SUPPORT OF DOD ENLISTMENT, TESTING AND EVALUATION	24,914		24,914
163	0605804D8Z	DEVELOPMENT TEST AND EVALUATION	20,179		20,179
164	0605898E	MANAGEMENT HQ—R&D	13,643		13,643
165	060598KA	MANAGEMENT HQ—DEFENSE TECHNICAL INFORMATION CENTER (DTIC)	4,124		4,124
166	0606100D8Z	BUDGET AND PROGRAM ASSESSMENTS	5,768		5,768
167	0606225D8Z	ODNA TECHNOLOGY AND RESOURCE ANALYSIS	1,030		1,030
168	0606589D8W	DEFENSE DIGITAL SERVICE (DDS) DEVELOPMENT SUPPORT	1,000		1,000
169	0606942C	ASSESSMENTS AND EVALUATIONS CYBER VULNERABILITIES	3,400		3,400
170	0606942S	ASSESSMENTS AND EVALUATIONS CYBER VULNERABILITIES	4,000		4,000
171	0203345D8Z	DEFENSE OPERATIONS SECURITY INITIATIVE (DOSI)	3,008		3,008
172	0204571J	JOINT STAFF ANALYTICAL SUPPORT	6,658		6,658
175	0303166J	SUPPORT TO INFORMATION OPERATIONS (IO) CAPABILITIES	652		652
176	0303260D8Z	DEFENSE MILITARY DECEPTION PROGRAM OFFICE (DMDPO)	1,005		1,005
177	0305172K	COMBINED ADVANCED APPLICATIONS	21,363		21,363
180	0305245D8Z	INTELLIGENCE CAPABILITIES AND INNOVATION INVESTMENTS	109,529		109,529
181	0306310D8Z	CWMD SYSTEMS: RDT&E MANAGEMENT SUPPORT	1,244		1,244
184	0804768J	COCOM EXERCISE ENGAGEMENT AND TRAINING TRANSFORMATION (CE2T2)—NON-MHA	42,940		42,940
185	0901598C	MANAGEMENT HQ—MDA	28,626		28,626
187	0903235K	JOINT SERVICE PROVIDER (JSP)	5,104		5,104
188A	9999999999	CLASSIFIED PROGRAMS	45,604		45,604
		SUBTOTAL MANAGEMENT SUPPORT	1,117,030	-10,000	1,107,030
189	0604130V	OPERATIONAL SYSTEM DEVELOPMENT ENTERPRISE SECURITY SYSTEM (ESS)	9,750		9,750

190	0605127T	REGIONAL INTERNATIONAL OUTREACH (RIO) AND PARTNERSHIP FOR PEACE INFORMATION MANA	1,855	1,855
191	0605147T	OVERSEAS HUMANITARIAN ASSISTANCE SHARED INFORMATION SYSTEM (OHASIS)	304	304
192	0607210D8Z	INDUSTRIAL BASE ANALYSIS AND SUSTAINMENT SUPPORT	10,376	10,376
193	0607310D8Z	CWMD SYSTEMS: OPERATIONAL SYSTEMS DEVELOPMENT	5,915	5,915
194	0607327T	GLOBAL THEATER SECURITY COOPERATION MANAGEMENT INFORMATION SYSTEMS (G-TSCMIS)	5,869	5,869
195	0607384BP	CHEMICAL AND BIOLOGICAL DEFENSE (OPERATIONAL SYSTEMS DEVELOPMENT)	48,741	48,741
196	0208043J	PLANNING AND DECISION AID SYSTEM (PDAS)	3,037	3,037
197	0208045K	C4I INTEROPERABILITY	62,814	62,814
203	0302019K	DEFENSE INFO INFRASTRUCTURE ENGINEERING AND INTEGRATION	16,561	16,561
204	0303126K	LONG-HAUL COMMUNICATIONS—DCS	14,769	14,769
205	0303131K	MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN)	17,579	17,579
207	0303136G	KEY MANAGEMENT INFRASTRUCTURE (KMI)	31,737	31,737
208	0303140D8Z	INFORMATION SYSTEMS SECURITY PROGRAM	7,940	7,940
		Expand cyber scholarship program		10,000
				[10,000]
209	0303140G	INFORMATION SYSTEMS SECURITY PROGRAM	229,252	229,252
210	0303140K	INFORMATION SYSTEMS SECURITY PROGRAM	19,611	19,611
211	0303150K	GLOBAL COMMAND AND CONTROL SYSTEM	46,900	46,900
212	0303153K	DEFENSE SPECTRUM ORGANIZATION	7,570	7,570
213	0303228K	JOINT INFORMATION ENVIRONMENT (JIE)	7,947	7,947
215	0303430K	FEDERAL INVESTIGATIVE SERVICES INFORMATION TECHNOLOGY	39,400	39,400
224	0305186D8Z	POLICY R&D PROGRAMS	6,262	6,262
225	0305199D8Z	NET CENTRICITY	16,780	16,780
227	0305208BB	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	6,286	6,286
230	0305208K	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	2,970	2,970
233	0305327V	INSIDER THREAT	5,954	5,954
234	0305387D8Z	HOMELAND DEFENSE TECHNOLOGY TRANSFER PROGRAM	2,198	2,198
240	0307577D8Z	INTELLIGENCE MISSION DATA (IMD)	6,889	6,889
242	0708012K	LOGISTICS SUPPORT ACTIVITIES	1,317	1,317
243	0708012S	PACIFIC DISASTER CENTERS	1,770	1,770
244	0708047S	DEFENSE PROPERTY ACCOUNTABILITY SYSTEM	1,805	1,805
246	1105219BB	MQ-9 UAV	18,403	18,403
248	1160403BB	AVIATION SYSTEMS	184,993	179,993
				-5,000

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
		Realignment of funds		[-5,000]	
249	1160405BB	INTELLIGENCE SYSTEMS DEVELOPMENT	10,625		10,625
250	1160408BB	OPERATIONAL ENHANCEMENTS	102,307		102,307
251	1160431BB	WARRIOR SYSTEMS	46,942		46,942
252	1160432BB	SPECIAL PROGRAMS	2,479		2,479
253	1160434BB	UNMANNED ISR	27,270		27,270
254	1160480BB	SOF TACTICAL VEHICLES	1,121		1,121
255	1160483BB	MARITIME SYSTEMS	42,471		42,471
256	1160489BB	GLOBAL VIDEO SURVEILLANCE ACTIVITIES	4,780		4,780
257	1160490BB	OPERATIONAL ENHANCEMENTS INTELLIGENCE	12,176		12,176
258	1203610K	TELEPORT PROGRAM	2,323		2,323
258A	99999999999	CLASSIFIED PROGRAMS	3,877,898		3,877,898
		SUBTOTAL OPERATIONAL SYSTEM DEVELOPMENT	4,973,946	5,000	4,978,946
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, DW	22,016,553	97,950	22,114,503
		OPERATIONAL TEST & EVAL, DEFENSE			
		MANAGEMENT SUPPORT			
001	06051180TE	OPERATIONAL TEST AND EVALUATION	85,685		85,685
002	06051310TE	LIVE FIRE TEST AND EVALUATION	64,332		64,332
003	06058140TE	OPERATIONAL TEST ACTIVITIES AND ANALYSES	70,992		70,992
		SUBTOTAL MANAGEMENT SUPPORT	221,009		221,009
		TOTAL OPERATIONAL TEST & EVAL, DEFENSE	221,009		221,009
		TOTAL RDT&E	91,056,950	859,700	91,916,650

SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS.

SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES					
056	0603327A	AIR AND MISSILE DEFENSE SYSTEMS ENGINEERING	1,000	-1,000	
		Realignment of EDI APS Unit Set from OCO to Base		[-1,000]	
058	0603627A	SMOKE, OBSCURANT AND TARGET DEFEATING SYS-ADV DEV	1,500		1,500
061	0603747A	SOLDIER SUPPORT AND SURVIVABILITY	3,000		3,000
076	0604117A	MANEUVER—SHORT RANGE AIR DEFENSE (M-SHORAD)	23,000	-23,000	
		Realignment of EDI APS Unit Set from OCO to Base		[-23,000]	
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	28,500	-24,000	4,500
SYSTEM DEVELOPMENT & DEMONSTRATION					
088	0604328A	TRACTOR CAGE	12,000		12,000
100	0604741A	AIR DEFENSE COMMAND, CONTROL AND INTELLIGENCE—ENG DEV	119,300		119,300
125	0605032A	TRACTOR TIRE	66,760		66,760
128	0605035A	COMMON INFRARED COUNTERMEASURES (CIRCUM)	2,670		2,670
136	0605051A	AIRCRAFT SURVIVABILITY DEVELOPMENT	34,933		34,933
147	0303032A	TROJAN—RH12	1,200		1,200
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	236,863		236,863
OPERATIONAL SYSTEMS DEVELOPMENT					
184	0607131A	WEAPONS AND MUNITIONS PRODUCT IMPROVEMENT PROGRAMS	2,548		2,548
185	0607133A	TRACTOR SMOKE	7,780		7,780
206	0203801A	MISSILE/AIR DEFENSE PRODUCT IMPROVEMENT PROGRAM	2,000	-2,000	
		Realignment of EDI APS Unit Set from OCO to Base		[-2,000]	
209	0205402A	INTEGRATED BASE DEFENSE—OPERATIONAL SYSTEM DEV	8,000		8,000

SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
216	0303028A	SECURITY AND INTELLIGENCE ACTIVITIES	23,199		23,199
226	0305206A	AIRBORNE RECONNAISSANCE SYSTEMS	14,000	-14,000	
		Realignment of EDI APS Unit Set from OCO to Base		[-14,000]	
231	0307665A	BIOMETRICS ENABLED INTELLIGENCE	2,214		2,214
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	59,741	-16,000	43,741
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY	325,104	-40,000	285,104
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES			
041	0603527N	RETRACT LARCH	18,000		18,000
061	0603654N	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	13,900		13,900
074	0603795N	LAND ATTACK TECHNOLOGY	1,400		1,400
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	33,300		33,300
		SYSTEM DEVELOPMENT & DEMONSTRATION			
149	0604755N	SHIP SELF DEFENSE (DETECT & CONTROL)	1,100		1,100
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	1,100		1,100
		OPERATIONAL SYSTEMS DEVELOPMENT			
236	0206313M	MARINE CORPS COMMUNICATIONS SYSTEMS	16,130		16,130
268A	9999999999	CLASSIFIED PROGRAMS	117,282		117,282
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	133,412		133,412
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY	167,812		167,812
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES			
065	1206438F	SPACE CONTROL TECHNOLOGY	1,100		1,100

070	1206857F	OPERATIONALLY RESPONSIVE SPACE	12,395	12,395
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	13,495	13,495
		OPERATIONAL SYSTEMS DEVELOPMENT		
186	0205219F	MQ-9 UAV	4,500	4,500
187	0205671F	JOINT COUNTER ROICED ELECTRONIC WARFARE	4,000	4,000
188	0207131F	A-10 SQUADRONS	1,000	1,000
217	0207610F	BATTLEFIELD ABN COMM NODE (BACN)	42,349	42,349
228	0208288F	INTEL DATA APPLICATIONS	1,200	1,200
254	0305111F	WEATHER SERVICE	3,000	3,000
268	0305202F	DRAGON U-2	22,100	22,100
272	0305208F	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	29,500	29,500
310	1202247F	AF TENCAP	5,000	5,000
327A	9999999999	CLASSIFIED PROGRAMS	188,127	188,127
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	300,776	300,776
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, AF	314,271	314,271
		ADVANCED TECHNOLOGY DEVELOPMENT		
024	0603122D8Z	COMBATING TERRORISM TECHNOLOGY SUPPORT	25,000	25,000
026	0603134BR	COUNTER IMPROVISED-THREAT SIMULATION	13,648	13,648
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	38,648	38,648
		ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES		
094	0604134BR	COUNTER IMPROVISED-THREAT DEMONSTRATION, PROTOTYPE DEVELOPMENT, AND TESTING	242,668	242,668
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES	242,668	242,668
		OPERATIONAL SYSTEM DEVELOPMENT		
250	1160408BB	OPERATIONAL ENHANCEMENTS	3,632	3,632
251	1160431BB	WARRIOR SYSTEMS	11,040	11,040
253	1160434BB	UNMANNED ISR	11,700	11,700
254	1160480BB	SOF TACTICAL VEHICLES	725	725

SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Program Element	Item	FY 2019 Request	House Change	House Authorized
258A	9999999999	CLASSIFIED PROGRAMS	192,131		192,131
		SUBTOTAL OPERATIONAL SYSTEM DEVELOPMENT	219,228		219,228
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, DW	500,544		500,544
		TOTAL RDT&E	1,307,731	-40,000	1,267,731

TITLE XLIII—OPERATION AND MAINTENANCE

SEC. 4301. OPERATION AND MAINTENANCE.

SEC. 4301. OPERATION AND MAINTENANCE (In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
OPERATION & MAINTENANCE, ARMY				
OPERATING FORCES				
010	MANEUVER UNITS	2,076,360	-445,300	1,631,060
	Readiness restoration		[9,400]	
	Realign OCO requirements from Base to OCO		[-454,700]	
020	MODULAR SUPPORT BRIGADES	107,946	1,800	109,746
	Readiness restoration		[1,800]	
030	ECHELONS ABOVE BRIGADE	732,485	-143,970	588,515
	Readiness restoration		[7,600]	
	Realign OCO requirements from Base to OCO		[-151,570]	
040	THEATER LEVEL ASSETS	1,169,508	-224,200	945,308
	Readiness restoration		[18,300]	
	Realign OCO requirements from Base to OCO		[-242,500]	
050	LAND FORCES OPERATIONS SUPPORT	1,180,460	17,500	1,197,960
	Readiness restoration		[17,500]	
060	AVIATION ASSETS	1,467,500	17,800	1,485,300
	Readiness restoration		[17,800]	
070	FORCE READINESS OPERATIONS SUPPORT	4,285,211	-604,260	3,680,951
	Female personal protective equipment		[2,000]	
	Realign OCO requirements from Base to OCO		[-606,260]	
080	LAND FORCES SYSTEMS READINESS	482,201		482,201

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
090	LAND FORCES DEPOT MAINTENANCE	1,536,851	-161,620	1,375,231
	Readiness restoration		[111,200]	
	Realign OCO requirements from Base to OCO		[-272,820]	
100	BASE OPERATIONS SUPPORT	8,274,299	-606,260	7,668,039
	Realign OCO requirements from Base to OCO		[-606,260]	
110	FACILITIES SUSTAINMENT	3,516,859	-1,018,881	2,497,978
	85% Sustainment		[175,469]	
	Capability Output Level 3 Funding		[25,000]	
	Realignment of FSRM funds to new RM and Demo lines		[-1,219,350]	
111	FACILITIES RESTORATION & MODERNIZATION	1,054,140	1,054,140	1,054,140
	Realignment of FSRM funds to new RM and Demo lines		[1,054,140]	
112	FACILITIES DEMOLITION	215,210	215,210	215,210
	Program increase		[50,000]	
	Realignment of FSRM funds to new RM and Demo lines		[165,210]	
120	MANAGEMENT AND OPERATIONAL HEADQUARTERS	438,733		438,733
180	US AFRICA COMMAND	231,518		231,518
190	US EUROPEAN COMMAND	150,268		150,268
200	US SOUTHERN COMMAND	195,964		195,964
210	US FORCES KOREA	59,625		59,625
	SUBTOTAL OPERATING FORCES	25,905,788	-1,898,041	24,007,747
MOBILIZATION				
220	STRATEGIC MOBILITY	370,941		370,941
230	ARMY PREPOSITIONED STOCKS	573,560	158,753	732,313
	Realignment of EDI APS Unit Set from OCO to Base		[158,753]	
240	INDUSTRIAL PREPAREDNESS	7,678		7,678
	SUBTOTAL MOBILIZATION	952,179	158,753	1,110,932

	TRAINING AND RECRUITING		
250	OFFICER ACQUISITION	135,832	135,832
260	RECRUIT TRAINING	54,819	54,819
270	ONE STATION UNIT TRAINING	69,599	69,599
280	SENIOR RESERVE OFFICERS TRAINING CORPS	518,998	518,998
290	SPECIALIZED SKILL TRAINING	1,020,073	1,020,073
300	FLIGHT TRAINING	1,082,190	1,082,190
310	PROFESSIONAL DEVELOPMENT EDUCATION	220,399	220,399
320	TRAINING SUPPORT	611,482	611,482
330	RECRUITING AND ADVERTISING	698,962	698,962
340	EXAMINING	162,049	162,049
350	OFF-DUTY AND VOLUNTARY EDUCATION	215,622	215,622
360	CIVILIAN EDUCATION AND TRAINING	176,914	176,914
370	JUNIOR RESERVE OFFICER TRAINING CORPS	174,430	174,430
	SUBTOTAL TRAINING AND RECRUITING	5,141,369	5,141,369
	ADMIN & SRWIDE ACTIVITIES		
390	SERVICEWIDE TRANSPORTATION	588,047	588,047
	Realign OCO requirements from Base to OCO	-151,600	-151,600
	[-151,600]		
400	CENTRAL SUPPLY ACTIVITIES	931,462	931,462
410	LOGISTIC SUPPORT ACTIVITIES	696,114	696,114
420	AMMUNITION MANAGEMENT	461,637	461,637
430	ADMINISTRATION	447,564	447,564
440	SERVICEWIDE COMMUNICATIONS	2,069,127	2,069,127
450	MANPOWER MANAGEMENT	261,021	261,021
460	OTHER PERSONNEL SUPPORT	379,541	379,541
470	OTHER SERVICE SUPPORT	1,699,767	1,699,767
480	ARMY CLAIMS ACTIVITIES	192,686	192,686
490	REAL ESTATE MANAGEMENT	240,917	240,917
500	FINANCIAL MANAGEMENT AND AUDIT READINESS	291,569	291,569
510	INTERNATIONAL MILITARY HEADQUARTERS	442,656	442,656

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
520	MISC. SUPPORT OF OTHER NATIONS	48,251	10,000	58,251
	NATO Cooperative Cyber Defense Center of Excellence		[5,000]	
	NATO Strategic Communications Center of Excellence		[5,000]	
565	CLASSIFIED PROGRAMS	1,259,622		1,259,622
	SUBTOTAL ADMIN & SRYWIDE ACTIVITIES	10,009,981	-141,600	9,868,381
	UNDISTRIBUTED			
570	UNDISTRIBUTED		-894,500	-894,500
	Foreign Currency adjustments		[-210,300]	
	Historical unobligated balances		[-694,200]	
	Simulators and other technologies to reduce the use of live animal tissue for medical training		[10,000]	
	SUBTOTAL UNDISTRIBUTED		-894,500	-894,500
	TOTAL OPERATION & MAINTENANCE, ARMY	42,009,317	-2,775,388	39,233,929
	OPERATION & MAINTENANCE, ARMY RES			
	OPERATING FORCES			
010	MODULAR SUPPORT BRIGADES	13,867		13,867
020	ECHELONS ABOVE BRIGADE	536,438		536,438
030	THEATER LEVEL ASSETS	113,225		113,225
040	LAND FORCES OPERATIONS SUPPORT	551,141		551,141
050	AVIATION ASSETS	89,073		89,073
060	FORCE READINESS OPERATIONS SUPPORT	409,531		409,531
070	LAND FORCES SYSTEMS READINESS	101,411		101,411
080	LAND FORCES DEPOT MAINTENANCE	60,114		60,114
090	BASE OPERATIONS SUPPORT	595,728		595,728
100	FACILITIES SUSTAINMENT	304,658	-41,593	263,065

	Realignment of FSRM funds to new RM and Demo lines				
	Sustainment recovery				[-71,593]
					[30,000]
	FACILITIES RESTORATION & MODERNIZATION				49,176
	Realignment of FSRM funds to new RM and Demo lines				[49,176]
101	FACILITIES DEMOLITION				22,417
102	Realignment of FSRM funds to new RM and Demo lines				[22,417]
110	MANAGEMENT AND OPERATIONAL HEADQUARTERS	22,175			22,175
	SUBTOTAL OPERATING FORCES	2,797,361			2,827,361
	ADMIN & SRVWD ACTIVITIES				
120	SERVICEWIDE TRANSPORTATION	11,832			11,832
130	ADMINISTRATION	18,218			18,218
140	SERVICEWIDE COMMUNICATIONS	25,069			25,069
150	MANPOWER MANAGEMENT	6,248			6,248
160	RECRUITING AND ADVERTISING	58,181			58,181
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	119,548			119,548
	TOTAL OPERATION & MAINTENANCE, ARMY RES	2,916,909			2,946,909
	OPERATION & MAINTENANCE, ARNG				
	OPERATING FORCES				
010	MANEUVER UNITS	810,269			810,269
020	MODULAR SUPPORT BRIGADES	193,402			193,402
030	ECHELONS ABOVE BRIGADE	753,815			753,815
040	THEATER LEVEL ASSETS	84,124			84,124
050	LAND FORCES OPERATIONS SUPPORT	31,881			31,881
060	AVIATION ASSETS	973,874			973,874
070	FORCE READINESS OPERATIONS SUPPORT	784,086			784,086
080	LAND FORCES SYSTEMS READINESS	51,353			51,353
090	LAND FORCES DEPOT MAINTENANCE	221,633			221,633
100	BASE OPERATIONS SUPPORT	1,129,942			1,129,942
110	FACILITIES SUSTAINMENT	919,947			888,760
					-31,187

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
	Realignment of FSRM funds to new RM and Demo lines		[-101,187]	
	Sustainment recovery		[70,000]	
111	FACILITIES RESTORATION & MODERNIZATION		85,859	85,859
	Realignment of FSRM funds to new RM and Demo lines		[85,859]	
112	FACILITIES DEMOLITION		15,328	15,328
	Realignment of FSRM funds to new RM and Demo lines		[-15,328]	
120	MANAGEMENT AND OPERATIONAL HEADQUARTERS	1,010,524		1,010,524
	SUBTOTAL OPERATING FORCES	6,964,850	70,000	7,034,850
	ADMIN & SRVWD ACTIVITIES			
130	SERVICEWIDE TRANSPORTATION	10,017		10,017
140	ADMINISTRATION	72,746		72,746
150	SERVICEWIDE COMMUNICATIONS	83,105		83,105
160	MANPOWER MANAGEMENT	10,678		10,678
170	OTHER PERSONNEL SUPPORT	254,753		254,753
180	REAL ESTATE MANAGEMENT	3,146		3,146
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	434,445		434,445
	TOTAL OPERATION & MAINTENANCE, ARNG	7,399,295	70,000	7,469,295
	OPERATION & MAINTENANCE, NAVY			
	OPERATING FORCES			
010	MISSION AND OTHER FLIGHT OPERATIONS	5,372,399		5,372,399
020	FLEET AIR TRAINING	2,023,351	-8,758	2,014,593
	Advanced skills management		[-8,758]	
030	AVIATION TECHNICAL DATA & ENGINEERING SERVICES	56,225		56,225
040	AIR OPERATIONS AND SAFETY SUPPORT	156,081		156,081

050	AIR SYSTEMS SUPPORT	682,379		682,379
060	AIRCRAFT DEPOT MAINTENANCE	1,291,156	37,400	1,291,156
	Readiness restoration		[37,400]	
070	AIRCRAFT DEPOT OPERATIONS SUPPORT	66,649		66,649
080	AVIATION LOGISTICS	939,368	6,400	945,768
	Readiness restoration		[6,400]	
090	MISSION AND OTHER SHIP OPERATIONS	4,439,566		4,439,566
100	SHIP OPERATIONS SUPPORT & TRAINING	997,663		997,663
110	SHIP DEPOT MAINTENANCE	8,751,526	148,600	8,900,126
	Readiness restoration		[116,600]	
	Western Pacific Dry Dock capability		[32,000]	
120	SHIP DEPOT OPERATIONS SUPPORT	2,168,876		2,168,876
130	COMBAT COMMUNICATIONS AND ELECTRONIC WARFARE	1,349,593		1,349,593
150	SPACE SYSTEMS AND SURVEILLANCE	215,255		215,255
160	WARFARE TACTICS	632,446		632,446
170	OPERATIONAL METEOROLOGY AND OCEANOGRAPHY	373,046		373,046
180	EQUIPMENT MAINTENANCE AND DEPOT OPERATIONS SUPPORT	1,452,075		1,452,075
190	COMBATANT COMMANDERS CORE OPERATIONS	153,719		153,719
210	COMBATANT COMMANDERS DIRECT MISSION SUPPORT	63,039		63,039
220	MILITARY INFORMATION SUPPORT OPERATIONS	89,339		89,339
230	FLEET BALLISTIC MISSILE	8,475		8,475
240	WEAPONS MAINTENANCE	424,088		424,088
260	Insufficient budget justification for submarine acoustic systems	1,361,947		1,361,947
280	Other weapon systems support	823,952	-4,500	819,452
	Enterprise information		[-4,500]	
290	Facilities sustainment	494,101		494,101
300	Capability Output Level 3 Funding	921,936		921,936
310	Project oversight (Unjustified Growth)	2,040,389		2,040,389
	Realignment of FSRM funds to new RM and Demo lines			
	85% Sustainment		-328,167	
	Capacity Output Level 3 Funding		[101,000]	
	Project oversight (Unjustified Growth)		[20,000]	
	Realignment of FSRM funds to new RM and Demo lines		[-85,420]	
	85% Sustainment		[-363,747]	

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
311	FACILITIES RESTORATION & MODERNIZATION		243,745	243,745
	Realignment of FSRM funds to new RM and Demo lines		[243,745]	
312	FACILITIES DEMOLITION		160,002	160,002
	Program increase		[40,000]	
	Realignment of FSRM funds to new RM and Demo lines		[120,002]	
320	BASE OPERATING SUPPORT	4,414,753		4,414,753
	SUBTOTAL OPERATING FORCES	41,725,992	254,722	41,980,714
	MOBILIZATION			
330	SHIP PREPOSITIONING AND SURGE	549,142	-148,597	400,545
	Realign DoD Mobilization Alternation to NDSF		[-20,858]	
	Realign LG Med Spd RO/RO Maintenance to NDSF		[-127,739]	
340	READY RESERVE FORCE	310,805	-310,805	
	Realign Ready Reserve Forces to NDSF		[-310,805]	
360	SHIP ACTIVATIONS/INACTIVATIONS	161,150		161,150
370	EXPEDITIONARY HEALTH SERVICES SYSTEMS	120,338	-72,350	47,988
	Realign T-AH Maintenance to NDSF		[-72,350]	
390	COAST GUARD SUPPORT	24,097		24,097
	SUBTOTAL MOBILIZATION	1,165,532	-531,752	633,780
	TRAINING AND RECRUITING			
400	OFFICER ACQUISITION	145,481		145,481
410	RECRUIT TRAINING	9,637		9,637
420	RESERVE OFFICERS TRAINING CORPS	149,687		149,687
430	SPECIALIZED SKILL TRAINING	879,557		879,557
450	PROFESSIONAL DEVELOPMENT EDUCATION	184,436	1,700	186,136
	Naval Sea Cadets		[1,700]	

460	TRAINING SUPPORT	223,159	223,159
470	RECRUITING AND ADVERTISING	181,086	181,086
480	OFF-DUTY AND VOLUNTARY EDUCATION	96,006	96,006
490	CIVILIAN EDUCATION AND TRAINING	72,083	72,083
500	JUNIOR ROTC	54,156	54,156
	SUBTOTAL TRAINING AND RECRUITING	1,995,288	1,995,288
	ADMIN & SRVWD ACTIVITIES		
510	ADMINISTRATION	1,089,964	1,089,964
530	CIVILIAN MANPOWER AND PERSONNEL MANAGEMENT	164,074	164,074
540	MILITARY MANPOWER AND PERSONNEL MANAGEMENT	418,350	418,350
580	SERVICEWIDE TRANSPORTATION	167,106	167,106
600	PLANNING, ENGINEERING, AND PROGRAM SUPPORT	333,556	333,556
610	ACQUISITION, LOGISTICS, AND OVERSIGHT	663,690	663,690
650	INVESTIGATIVE AND SECURITY SERVICES	705,087	705,087
765	CLASSIFIED PROGRAMS	574,994	574,994
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	4,116,821	4,116,821
	UNDISTRIBUTED		
770	UNDISTRIBUTED	-398,100	-398,100
	Foreign Currency adjustments	[-55,100]	
	Historical unobligated balances	[-343,000]	
	SUBTOTAL UNDISTRIBUTED	-398,100	-398,100
	TOTAL OPERATION & MAINTENANCE, NAVY	-673,430	48,330,203
	OPERATION & MAINTENANCE, MARINE CORPS		
	OPERATING FORCES		
010	OPERATIONAL FORCES	873,320	885,720
	Additional parts & spares to support intermediate & organizational maintenance	[8,200]	
	Additional training requirements	[4,200]	
020	FIELD LOGISTICS	1,094,187	1,094,187

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
030	DEPOT MAINTENANCE	314,182	26,900	341,082
	Readiness restoration		[26,900]	
040	MARITIME PREPOSITIONING	98,136		98,136
050	CYBERSPACE ACTIVITIES	183,546		183,546
060	FACILITIES SUSTAINMENT	832,636	-86,282	746,354
	85% Sustainment		[42,400]	
	Capability Output Level 3 Funding		[10,000]	
	Realignment of FSRM funds to new RM and Demo lines		[-138,682]	
061	FACILITIES RESTORATION & MODERNIZATION		61,469	61,469
	Realignment of FSRM funds to new RM and Demo lines		[61,469]	
062	FACILITIES DEMOLITION		107,213	107,213
	Program increase		[30,000]	
	Realignment of FSRM funds to new RM and Demo lines		[77,213]	
070	BASE OPERATING SUPPORT	2,151,390		2,151,390
	SUBTOTAL OPERATING FORCES	5,547,397	121,700	5,669,097
	TRAINING AND RECRUITING			
080	RECRUIT TRAINING	16,453		16,453
090	OFFICER ACQUISITION	1,144		1,144
100	SPECIALIZED SKILL TRAINING	106,360		106,360
110	PROFESSIONAL DEVELOPMENT EDUCATION	46,096		46,096
120	TRAINING SUPPORT	389,751		389,751
130	RECRUITING AND ADVERTISING	201,662		201,662
140	OFF-DUTY AND VOLUNTARY EDUCATION	32,461		32,461
150	JUNIOR ROTC	24,217		24,217
	SUBTOTAL TRAINING AND RECRUITING	818,144		818,144

160	ADMIN & SRVWD ACTIVITIES			
170	SERVICEWIDE TRANSPORTATION	29,735	29,735	29,735
225	ADMINISTRATION	386,375	386,375	386,375
	CLASSIFIED PROGRAMS	50,859	50,859	50,859
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	466,969	466,969	466,969
230	UNDISTRIBUTED			
	UNDISTRIBUTED		-43,600	-43,600
	Foreign Currency adjustments		[-13,600]	
	Historical unobligated balances		[-30,000]	
	SUBTOTAL UNDISTRIBUTED		-43,600	-43,600
	TOTAL OPERATION & MAINTENANCE, MARINE CORPS	6,832,510	78,100	6,910,610

	OPERATION & MAINTENANCE, NAVY RES			
	OPERATING FORCES			
010	MISSION AND OTHER FLIGHT OPERATIONS	569,584	569,584	569,584
020	INTERMEDIATE MAINTENANCE	6,902	6,902	6,902
030	AIRCRAFT DEPOT MAINTENANCE	109,776	109,776	109,776
040	AIRCRAFT DEPOT OPERATIONS SUPPORT	538	538	538
050	AVIATION LOGISTICS	18,888	18,888	18,888
060	SHIP OPERATIONS SUPPORT & TRAINING	574	574	574
070	COMBAT COMMUNICATIONS	17,561	17,561	17,561
080	COMBAT SUPPORT FORCES	121,070	121,070	121,070
090	CYBERSPACE ACTIVITIES	337	337	337
100	ENTERPRISE INFORMATION	23,964	23,964	23,964
110	FACILITIES SUSTAINMENT	36,356	36,356	41,151
	Realignment of FSRM funds to new RM and Demo lines		4,795	4,795
	Sustainment recovery		[-5,205]	[-5,205]
	Facilities Restoration & Modernization		[10,000]	[10,000]
111	FACILITIES RESTORATION & MODERNIZATION		3,205	3,205
	Realignment of FSRM funds to new RM and Demo lines		[3,205]	[3,205]
112	FACILITIES DEMOLITION		2,000	2,000

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
120	Realignment of FSRM funds to new RM and Demo lines		[2,000]	
	BASE OPERATING SUPPORT	103,562		103,562
	SUBTOTAL OPERATING FORCES	1,009,112	10,000	1,019,112
	ADMIN & SRWD ACTIVITIES			
130	ADMINISTRATION	1,868		1,868
140	MILITARY MANPOWER AND PERSONNEL MANAGEMENT	12,849		12,849
160	ACQUISITION AND PROGRAM MANAGEMENT	3,177		3,177
	SUBTOTAL ADMIN & SRWD ACTIVITIES	17,894		17,894
	TOTAL OPERATION & MAINTENANCE, NAVY RES	1,027,006	10,000	1,037,006
	OPERATION & MAINTENANCE, MC RESERVE			
	OPERATING FORCES			
010	OPERATING FORCES	99,173	8,700	107,873
	Additional training requirements		[8,700]	
020	DEPOT MAINTENANCE	19,430		19,430
030	FACILITIES SUSTAINMENT	39,962	-14,296	25,666
	Realignment of FSRM funds to new RM and Demo lines		[-22,296]	
	Sustainment recovery		[8,000]	
031	FACILITIES RESTORATION & MODERNIZATION		22,296	22,296
	Realignment of FSRM funds to new RM and Demo lines		[22,296]	
040	BASE OPERATING SUPPORT	101,829		101,829
	SUBTOTAL OPERATING FORCES	260,394	16,700	277,094
	ADMIN & SRWD ACTIVITIES			
050	ADMINISTRATION	11,176		11,176

	SUBTOTAL ADMIN & SRVWD ACTIVITIES	11,176	11,176
	TOTAL OPERATION & MAINTENANCE, MC RESERVE	271,570	288,270
	OPERATION & MAINTENANCE, AIR FORCE		
	OPERATING FORCES		
010	PRIMARY COMBAT FORCES	758,178	758,178
020	COMBAT ENHANCEMENT FORCES	1,509,027	1,509,027
030	AIR OPERATIONS TRAINING (OJT, MAINTAIN SKILLS)	1,323,330	1,323,330
040	DEPOT PURCHASE EQUIPMENT MAINTENANCE	3,511,830	3,596,330
	Readiness restoration		84,500
	Restoration of U-2 Tail #80-1099		[46,500]
	FACILITIES SUSTAINMENT	2,892,705	2,621,824
	85% Sustainment		[38,000]
	Capability Output Level 3 Funding		[-270,881]
	Realignment of FSRM funds to new RM and Demo lines		[152,000]
	Realignment of FSRM funds to new RM and Demo lines		[23,000]
	Realignment of FSRM funds to new RM and Demo lines		[-445,881]
051	FACILITIES RESTORATION & MODERNIZATION		420,861
	Realignment of FSRM funds to new RM and Demo lines		[420,861]
052	FACILITIES DEMOLITION		67,020
	Program increase		[42,000]
	Realignment of FSRM funds to new RM and Demo lines		[25,020]
060	CONTRACTOR LOGISTICS SUPPORT AND SYSTEM SUPPORT	7,613,084	7,687,884
	Readiness restoration		[74,800]
070	FLYING HOUR PROGRAM	4,345,208	4,345,208
080	BASE SUPPORT	5,989,215	5,989,215
090	GLOBAL C3I AND EARLY WARNING	928,023	928,023
100	OTHER COMBAT OPS SPT PROGRAMS	1,080,956	1,080,956
110	CYBERSPACE ACTIVITIES	879,032	879,032
130	LAUNCH FACILITIES	183,777	183,777
140	SPACE CONTROL SYSTEMS	404,072	404,072
170	US NORTHCOM/NORAD	187,375	187,375
180	US STRATCOM	529,902	529,902

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
190	US CYBERCOM	329,474		329,474
200	US CENTCOM	166,024		166,024
210	US SOCOM	723		723
220	US TRANSCOM	535		535
225	CLASSIFIED PROGRAMS	1,164,810		1,164,810
	SUBTOTAL OPERATING FORCES	33,797,280	376,300	34,173,580
	MOBILIZATION			
230	AIRLIFT OPERATIONS	1,307,695		1,307,695
240	MOBILIZATION PREPAREDNESS	144,417		144,417
	SUBTOTAL MOBILIZATION	1,452,112		1,452,112
	TRAINING AND RECRUITING			
280	OFFICER ACQUISITION	133,187		133,187
290	RECRUIT TRAINING	25,041		25,041
300	RESERVE OFFICERS TRAINING CORPS (ROTC)	117,338		117,338
330	SPECIALIZED SKILL TRAINING	401,996		401,996
340	FLIGHT TRAINING	477,064		477,064
350	PROFESSIONAL DEVELOPMENT EDUCATION	276,423		276,423
360	TRAINING SUPPORT	95,948		95,948
380	RECRUITING AND ADVERTISING	154,530		154,530
390	EXAMINING	4,132		4,132
400	OFF-DUTY AND VOLUNTARY EDUCATION	223,150		223,150
410	CIVILIAN EDUCATION AND TRAINING	209,497		209,497
420	JUNIOR ROTC	59,908		59,908
	SUBTOTAL TRAINING AND RECRUITING	2,178,214		2,178,214

430	ADMIN & SRVWD ACTIVITIES		
	LOGISTICS OPERATIONS	681,788	681,788
440	TECHNICAL SUPPORT ACTIVITIES	117,812	117,812
480	ADMINISTRATION	953,102	953,102
490	SERVICEWIDE COMMUNICATIONS	358,389	358,389
500	OTHER SERVICEWIDE ACTIVITIES	1,194,862	1,194,862
510	CIVIL AIR PATROL	29,594	29,594
540	INTERNATIONAL SUPPORT	74,959	74,959
545	CLASSIFIED PROGRAMS	1,222,456	1,222,456
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	4,632,962	4,632,962

550	UNDISTRIBUTED		
	UNDISTRIBUTED	-455,200	-455,200
	Foreign Currency adjustments	[-104,500]	
	Historical unobligated balances	[-350,700]	
	SUBTOTAL UNDISTRIBUTED	-455,200	-455,200

TOTAL OPERATION & MAINTENANCE, AIR FORCE **42,060,568**

	OPERATION & MAINTENANCE, AF RESERVE		
	OPERATING FORCES		
010	PRIMARY COMBAT FORCES	1,853,437	1,853,437
020	MISSION SUPPORT OPERATIONS	205,369	205,369
030	DEPOT PURCHASE EQUIPMENT MAINTENANCE	345,576	347,476
	Readiness restoration	1,900	
	FACILITIES SUSTAINMENT	[1,900]	
040	Realignment of FSRM funds to new RM and Demo lines	2,367	123,103
	Sustainment recovery	[-27,633]	
	FACILITIES RESTORATION & MODERNIZATION	[30,000]	
041	Realignment of FSRM funds to new RM and Demo lines	27,633	27,633
050	CONTRACTOR LOGISTICS SUPPORT AND SYSTEM SUPPORT	[27,633]	
	Readiness restoration	18,700	259,939
		[18,700]	

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
060	BASE SUPPORT	385,922		385,922
	SUBTOTAL OPERATING FORCES	3,152,279	50,600	3,202,879
	ADMINISTRATION AND SERVICEWIDE ACTIVITIES			
070	ADMINISTRATION	71,188		71,188
080	RECRUITING AND ADVERTISING	19,429		19,429
090	MILITARY MANPOWER AND PERS MGMT (ARPC)	9,386		9,386
100	OTHER PERS SUPPORT (DISABILITY COMP)	7,512		7,512
110	AUDIOVISUAL	440		440
	SUBTOTAL ADMINISTRATION AND SERVICEWIDE ACTIVITIES	107,955		107,955
	TOTAL OPERATION & MAINTENANCE, AF RESERVE	3,260,234	50,600	3,310,834
	OPERATION & MAINTENANCE, ANG			
	OPERATING FORCES			
010	AIRCRAFT OPERATIONS	2,619,940		2,619,940
020	MISSION SUPPORT OPERATIONS	623,265		623,265
030	DEPOT PURCHASE EQUIPMENT MAINTENANCE	748,287		748,287
040	FACILITIES SUSTAINMENT	303,792		289,700
	Realignment of FSRM funds to new RM and Demo lines		-14,092	
	Sustainment recovery		[-34,092]	
	Facilities Restoration & Modernization		[20,000]	
041	FACILITIES RESTORATION & MODERNIZATION	31,696		31,696
	Realignment of FSRM funds to new RM and Demo lines		[31,696]	
042	FACILITIES DEMOLITION	2,396		2,396
	Realignment of FSRM funds to new RM and Demo lines		[2,396]	
050	CONTRACTOR LOGISTICS SUPPORT AND SYSTEM SUPPORT	1,061,759		1,064,759
	Readiness restoration		3,000	
	Readiness restoration		[3,000]	

060	BASE SUPPORT	988,333	900	989,233
	Readiness restoration		[900]	
	SUBTOTAL OPERATING FORCES	6,345,376	23,900	6,369,276
	ADMINISTRATION AND SERVICE-WIDE ACTIVITIES			
070	ADMINISTRATION	45,711		45,711
080	RECRUITING AND ADVERTISING	36,535		36,535
	SUBTOTAL ADMINISTRATION AND SERVICE-WIDE ACTIVITIES	82,246		82,246
	TOTAL OPERATION & MAINTENANCE, ANG	6,427,622	23,900	6,451,522
	OPERATION AND MAINTENANCE, DEFENSE-WIDE			
	OPERATING FORCES			
010	JOINT CHIEFS OF STAFF	430,215		430,215
020	JOINT CHIEFS OF STAFF—CE2TZ	602,186		602,186
040	SPECIAL OPERATIONS COMMAND/OPERATING FORCES	5,389,250		5,215,250
	Civilian pay ahead of need		-174,000	
	Communications		[-10,000]	
	DCGS-SOF		[-20,000]	
	MC-12 ahead of need		[-10,000]	
	Program decrease		[-33,300]	
	SUBTOTAL OPERATING FORCES	6,421,651	-174,000	6,247,651
	TRAINING AND RECRUITING			
050	DEFENSE ACQUISITION UNIVERSITY	181,601		172,501
	Efficiencies within the 4th estate		-9,100	
060	JOINT CHIEFS OF STAFF	96,565		96,565
070	SPECIAL OPERATIONS COMMAND/TRAINING AND RECRUITING	370,583		370,583
	SUBTOTAL TRAINING AND RECRUITING	648,749	-9,100	639,649
	ADMIN & SRWIDE ACTIVITIES			
080	CIVIL MILITARY PROGRAMS	166,131	20,000	186,131

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
100	STARBASE		[20,000]	
	DEFENSE CONTRACT AUDIT AGENCY	625,633	-31,300	594,333
	Efficiencies within the 4th estate		[-31,300]	
110	DEFENSE CONTRACT MANAGEMENT AGENCY	1,465,354	-73,300	1,392,054
	Efficiencies within the 4th estate		[-73,300]	
120	DEFENSE HUMAN RESOURCES ACTIVITY	859,923	-43,000	816,923
	Efficiencies within the 4th estate		[-43,000]	
130	DEFENSE INFORMATION SYSTEMS AGENCY	2,106,930	-105,300	2,001,630
	Efficiencies within the 4th estate		[-105,300]	
150	DEFENSE LEGAL SERVICES AGENCY	27,403	-1,400	26,003
	Efficiencies within the 4th estate		[-1,400]	
160	DEFENSE LOGISTICS AGENCY	379,275	6,475	385,750
	Efficiencies within the 4th estate		[-19,000]	
	Program increase for the Procurement Technical Assistance Program (PTAP)		[25,475]	
170	DEFENSE MEDIA ACTIVITY	207,537	-10,400	197,137
	Efficiencies within the 4th estate		[-10,400]	
180	DEFENSE PERSONNEL ACCOUNTING AGENCY	130,696		130,696
190	DEFENSE SECURITY COOPERATION AGENCY	754,711		754,711
200	DEFENSE SECURITY SERVICE	789,175		789,175
220	DEFENSE TECHNOLOGY SECURITY ADMINISTRATION	34,951	-1,700	33,251
	Efficiencies within the 4th estate		[-1,700]	
230	DEFENSE THREAT REDUCTION AGENCY	553,329		553,329
250	DEPARTMENT OF DEFENSE EDUCATION ACTIVITY	2,892,284	50,000	2,942,284
	Impact Aid		[40,000]	
	Impact Aid for Children with Severe Disabilities		[10,000]	
260	MISSILE DEFENSE AGENCY	499,817		499,817
280	OFFICE OF ECONOMIC ADJUSTMENT	70,035	96,500	166,535

290	Defense Community Infrastructure Program		[100,000]	
	Efficiencies within the 4th estate		[-3,500]	
	OFFICE OF THE SECRETARY OF DEFENSE	1,519,655	11,000	1,530,655
	CDC PPOS/PFOA Health Study Increment		[7,000]	
	Contract support for ACCM oversight as directed by Sec. 1062 of FY17 NDAA		[5,000]	
	Efficiencies within the 4th estate		[-76,000]	
	Establish Artificial Intelligence commission		[10,000]	
	Funds to support the Global Engagement Center		[60,000]	
	Initial capital for Department of Defense World War II Commemoration Fund		[2,000]	
	Training of qualified personnel to join the staff of the Boards of Corrections for Military and Naval Records		[3,000]	
300	SPECIAL OPERATIONS COMMAND/ADMIN & SVC-WIDE ACTIVITIES	97,787		97,787
310	WASHINGTON HEADQUARTERS SERVICES	456,407	-68,500	387,907
	Efficiencies within the 4th estate		[-68,500]	
315	CLASSIFIED PROGRAMS	15,645,192		15,645,192
	SUBTOTAL ADMIN & SRVWIDE ACTIVITIES	29,282,225	-150,925	29,131,300
320	UNDISTRIBUTED			
	Foreign Currency adjustments		-411,800	-411,800
	Historical unobligated balances		[-26,400]	
	SUBTOTAL UNDISTRIBUTED		-411,800	-411,800
	TOTAL OPERATION AND MAINTENANCE, DEFENSE-WIDE	36,352,625	-745,825	35,606,800
010	US COURT OF APPEALS FOR ARMED FORCES, DEF			
	ADMINISTRATION AND ASSOCIATED ACTIVITIES			
	US COURT OF APPEALS FOR THE ARMED FORCES, DEFENSE	14,662		14,662
	SUBTOTAL ADMINISTRATION AND ASSOCIATED ACTIVITIES	14,662		14,662
	TOTAL US COURT OF APPEALS FOR ARMED FORCES, DEF	14,662		14,662
	DOD ACQUISITION WORKFORCE DEVELOPMENT FUND			

SEC. 4301. OPERATION AND MAINTENANCE
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
	ACQUISITION WORKFORCE DEVELOPMENT			
010	ACQ WORKFORCE DEV FD	400,000		400,000
	SUBTOTAL ACQUISITION WORKFORCE DEVELOPMENT	400,000		400,000
	TOTAL DOD ACQUISITION WORKFORCE DEVELOPMENT FUND	400,000		400,000
	OVERSEAS HUMANITARIAN, DISASTER, AND CIVIC AID			
	HUMANITARIAN ASSISTANCE			
010	OVERSEAS HUMANITARIAN, DISASTER AND CIVIC AID	107,663		107,663
	SUBTOTAL HUMANITARIAN ASSISTANCE	107,663		107,663
	TOTAL OVERSEAS HUMANITARIAN, DISASTER, AND CIVIC AID	107,663		107,663
	COOPERATIVE THREAT REDUCTION ACCOUNT			
	FSU THREAT REDUCTION			
010	FORMER SOVIET UNION (FSU) THREAT REDUCTION	335,240		335,240
	SUBTOTAL FSU THREAT REDUCTION	335,240		335,240
	TOTAL COOPERATIVE THREAT REDUCTION ACCOUNT	335,240		335,240
	ENVIRONMENTAL RESTORATION, ARMY			
	DEPARTMENT OF THE ARMY			
060	ENVIRONMENTAL RESTORATION, ARMY	203,449	10,000	213,449
	PFOA/PFOA remediation increase		[10,000]	
	SUBTOTAL DEPARTMENT OF THE ARMY	203,449	10,000	213,449
	TOTAL ENVIRONMENTAL RESTORATION, ARMY	203,449	10,000	213,449

080	ENVIRONMENTAL RESTORATION, NAVY DEPARTMENT OF THE NAVY						
	ENVIRONMENTAL RESTORATION, NAVY	329,253	10,000	339,253			
	PFOS/PFOA remediation increase		[10,000]				
	SUBTOTAL DEPARTMENT OF THE NAVY	329,253	10,000	339,253			
	TOTAL ENVIRONMENTAL RESTORATION, NAVY	329,253	10,000	339,253			
100	ENVIRONMENTAL RESTORATION, AIR FORCE DEPARTMENT OF THE AIR FORCE						
	ENVIRONMENTAL RESTORATION, AIR FORCE	296,808	50,000	346,808			
	PFOS/PFOA remediation increase		[50,000]				
	SUBTOTAL DEPARTMENT OF THE AIR FORCE	296,808	50,000	346,808			
	TOTAL ENVIRONMENTAL RESTORATION, AIR FORCE	296,808	50,000	346,808			
120	ENVIRONMENTAL RESTORATION, DEFENSE DEFENSE-WIDE						
	ENVIRONMENTAL RESTORATION, DEFENSE	8,926		8,926			
	SUBTOTAL DEFENSE-WIDE	8,926		8,926			
	TOTAL ENVIRONMENTAL RESTORATION, DEFENSE	8,926		8,926			
140	ENVIRONMENTAL RESTORATION FORMERLY USED SITES DEFENSE-WIDE						
	ENVIRONMENTAL RESTORATION FORMERLY USED SITES	212,346		212,346			
	SUBTOTAL DEFENSE-WIDE	212,346		212,346			
	TOTAL ENVIRONMENTAL RESTORATION FORMERLY USED SITES	212,346		212,346			
	TOTAL OPERATION & MAINTENANCE	199,469,636	-3,924,243	195,545,393			

SEC. 4302. OPERATION AND MAINTENANCE FOR OVERSEAS CONTINGENCY OPERATIONS.

SEC. 4302. OPERATION AND MAINTENANCE FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
	OPERATION & MAINTENANCE, ARMY			
	OPERATING FORCES			
010	MANEUVER UNITS	1,179,339	454,700	1,634,039
	Realign OCO requirements from Base to OCO		[454,700]	
030	ECHELONS ABOVE BRIGADE	25,983	151,570	177,553
	Realign OCO requirements from Base to OCO		[151,570]	
040	THEATER LEVEL ASSETS	2,189,916	242,500	2,432,416
	Realign OCO requirements from Base to OCO		[242,500]	
050	LAND FORCES OPERATIONS SUPPORT	188,609		188,609
060	AVIATION ASSETS	120,787		120,787
070	FORCE READINESS OPERATIONS SUPPORT	3,867,286	606,260	4,473,546
	Realign OCO requirements from Base to OCO		[606,260]	
080	LAND FORCES SYSTEMS READINESS	550,068		550,068
090	LAND FORCES DEPOT MAINTENANCE	195,873	272,820	468,693
	Realign OCO requirements from Base to OCO		[272,820]	
100	BASE OPERATIONS SUPPORT	109,560	606,260	715,820
	Realign OCO requirements from Base to OCO		[606,260]	
110	FACILITIES SUSTAINMENT	60,807		60,807
140	ADDITIONAL ACTIVITIES	5,992,222		5,992,222
150	COMMANDERS EMERGENCY RESPONSE PROGRAM	10,000		10,000
160	RESET	1,036,454		1,036,454
180	US AFRICA COMMAND	248,796	15,000	263,796
	Contract personnel recovery/casualty evacuation in AFRICOM		[15,000]	
190	US EUROPEAN COMMAND	98,127		98,127

200	US SOUTHERN COMMAND	2,550		2,550
	SUBTOTAL OPERATING FORCES	15,876,377	2,349,110	18,225,487
230	MOBILIZATION			
	ARMY PREPOSITIONED STOCKS	158,753	-158,753	0
	Realignment of EDI AFS Unit Set from OCO to Base		[-158,753]	
	SUBTOTAL MOBILIZATION	158,753	-158,753	0
390	ADMIN & SRWIDE ACTIVITIES			
	SERVICEWIDE TRANSPORTATION	712,230	151,600	863,830
	Realign OCO requirements from Base to OCO		[151,600]	
400	CENTRAL SUPPLY ACTIVITIES	44,168		44,168
410	LOGISTIC SUPPORT ACTIVITIES	5,300		5,300
420	AMMUNITION MANAGEMENT	38,597		38,597
460	OTHER PERSONNEL SUPPORT	109,019		109,019
490	REAL ESTATE MANAGEMENT	191,786		191,786
565	CLASSIFIED PROGRAMS	1,074,270		1,074,270
	SUBTOTAL ADMIN & SRWIDE ACTIVITIES	2,175,370	151,600	2,326,970
570	UNDISTRIBUTED			
	UNDISTRIBUTED		-27,900	-27,900
	Historical unobligated balances		[-27,900]	
	SUBTOTAL UNDISTRIBUTED		-27,900	-27,900
	TOTAL OPERATION & MAINTENANCE, ARMY	18,210,500	2,314,057	20,524,557
020	OPERATION & MAINTENANCE, ARMY RES			
	OPERATING FORCES			
	ECHELONS ABOVE BRIGADE	20,700		20,700
060	FORCE READINESS OPERATIONS SUPPORT	700		700
090	BASE OPERATIONS SUPPORT	20,487		20,487
	SUBTOTAL OPERATING FORCES	41,887		41,887

SEC. 4302. OPERATION AND MAINTENANCE FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
	TOTAL OPERATION & MAINTENANCE, ARMY RES	41,887		41,887
	OPERATION & MAINTENANCE, ARNG			
	OPERATING FORCES			
010	MANEUVER UNITS	42,519		42,519
020	MODULAR SUPPORT BRIGADES	778		778
030	ECHELONS ABOVE BRIGADE	12,093		12,093
040	THEATER LEVEL ASSETS	708		708
060	AVIATION ASSETS	28,135		28,135
070	FORCE READINESS OPERATIONS SUPPORT	5,908		5,908
100	BASE OPERATIONS SUPPORT	18,877		18,877
120	MANAGEMENT AND OPERATIONAL HEADQUARTERS	956		956
	SUBTOTAL OPERATING FORCES	109,974		109,974
	ADMIN & SRVWD ACTIVITIES			
150	SERVICEWIDE COMMUNICATIONS	755		755
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	755		755
	TOTAL OPERATION & MAINTENANCE, ARNG	110,729		110,729
	AFGHAN NATIONAL ARMY			
090	SUSTAINMENT	1,522,777		1,522,777
100	INFRASTRUCTURE	137,732		137,732
110	EQUIPMENT AND TRANSPORTATION	71,922		71,922
120	TRAINING AND OPERATIONS	175,846		175,846
	SUBTOTAL AFGHAN NATIONAL ARMY	1,908,277		1,908,277

130	AFGHAN NATIONAL POLICE		
	SUSTAINMENT	527,554	527,554
140	INFRASTRUCTURE	42,984	42,984
150	EQUIPMENT AND TRANSPORTATION	14,554	14,554
160	TRAINING AND OPERATIONS	181,922	181,922
	SUBTOTAL AFGHAN NATIONAL POLICE	767,014	767,014
	AFGHAN AIR FORCE		
170	SUSTAINMENT	942,279	942,279
180	INFRASTRUCTURE	30,350	30,350
190	EQUIPMENT AND TRANSPORTATION	572,310	572,310
200	TRAINING AND OPERATIONS	277,191	277,191
	SUBTOTAL AFGHAN AIR FORCE	1,822,130	1,822,130
	AFGHAN SPECIAL SECURITY FORCES		
210	SUSTAINMENT	353,734	353,734
220	INFRASTRUCTURE	43,132	43,132
230	EQUIPMENT AND TRANSPORTATION	151,790	151,790
240	TRAINING AND OPERATIONS	153,373	153,373
	SUBTOTAL AFGHAN SPECIAL SECURITY FORCES	702,029	702,029
	TOTAL AFGHANISTAN SECURITY FORCES FUND	5,199,450	5,199,450
	COUNTER-ISIS TRAIN AND EQUIP FUND		
	COUNTER-ISIS TRAIN AND EQUIP FUND (CTEF)		
010	IRAQ	850,000	850,000
020	SYRIA	300,000	300,000
030	OTHER	250,000	250,000
	SUBTOTAL COUNTER-ISIS TRAIN AND EQUIP FUND (CTEF)	1,400,000	1,400,000
	TOTAL COUNTER-ISIS TRAIN AND EQUIP FUND	1,400,000	1,400,000

SEC. 4302. OPERATION AND MAINTENANCE FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
OPERATION & MAINTENANCE, NAVY				
OPERATING FORCES				
010	MISSION AND OTHER FLIGHT OPERATIONS	435,507		435,507
030	AVIATION TECHNICAL DATA & ENGINEERING SERVICES	800		800
040	AIR OPERATIONS AND SAFETY SUPPORT	9,394		9,394
050	AIR SYSTEMS SUPPORT	193,384		193,384
060	AIRCRAFT DEPOT MAINTENANCE	173,053		173,053
070	AIRCRAFT DEPOT OPERATIONS SUPPORT	3,524		3,524
080	AVIATION LOGISTICS	60,219		60,219
090	MISSION AND OTHER SHIP OPERATIONS	942,960		942,960
100	SHIP OPERATIONS SUPPORT & TRAINING	20,236		20,236
110	SHIP DEPOT MAINTENANCE	1,022,647		1,022,647
130	COMBAT COMMUNICATIONS AND ELECTRONIC WARFARE	59,553		59,553
160	WARFARE TACTICS	16,651		16,651
170	OPERATIONAL METEOROLOGY AND OCEANOGRAPHY	31,118		31,118
180	COMBAT SUPPORT FORCES	635,560		635,560
190	EQUIPMENT MAINTENANCE AND DEPOT OPERATIONS SUPPORT	4,334		4,334
220	COMBATANT COMMANDERS DIRECT MISSION SUPPORT	24,800		24,800
240	CYBERSPACE ACTIVITIES	355		355
280	WEAPONS MAINTENANCE	493,033		493,033
290	OTHER WEAPON SYSTEMS SUPPORT	12,780		12,780
310	FACILITIES SUSTAINMENT	67,321		67,321
320	BASE OPERATING SUPPORT	211,394		211,394
	SUBTOTAL OPERATING FORCES	4,418,623		4,418,623
MOBILIZATION				

370	EXPEDITIONARY HEALTH SERVICES SYSTEMS	12,902	12,902
390	COAST GUARD SUPPORT	165,000	165,000
	SUBTOTAL MOBILIZATION	177,902	177,902
	TRAINING AND RECRUITING		
430	SPECIALIZED SKILL TRAINING	51,138	51,138
	SUBTOTAL TRAINING AND RECRUITING	51,138	51,138
	ADMIN & SRVWD ACTIVITIES		
510	ADMINISTRATION	4,145	4,145
540	MILITARY MANPOWER AND PERSONNEL MANAGEMENT	7,503	7,503
580	SERVICEWIDE TRANSPORTATION	69,297	69,297
610	ACQUISITION, LOGISTICS, AND OVERSIGHT	10,912	10,912
650	INVESTIGATIVE AND SECURITY SERVICES	1,559	1,559
765	CLASSIFIED PROGRAMS	16,076	16,076
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	109,492	109,492
	TOTAL OPERATION & MAINTENANCE, NAVY	4,757,155	4,757,155
	OPERATION & MAINTENANCE, MARINE CORPS		
	OPERATING FORCES		
010	OPERATIONAL FORCES	734,505	734,505
020	FIELD LOGISTICS	212,691	212,691
030	DEPOT MAINTENANCE	53,040	53,040
070	BASE OPERATING SUPPORT	23,047	23,047
	SUBTOTAL OPERATING FORCES	1,023,283	1,023,283
	TRAINING AND RECRUITING		
120	TRAINING SUPPORT	30,459	30,459
	SUBTOTAL TRAINING AND RECRUITING	30,459	30,459
	ADMIN & SRVWD ACTIVITIES		

SEC. 4302. OPERATION AND MAINTENANCE FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
160	SERVICEWIDE TRANSPORTATION	61,400		61,400
170	ADMINISTRATION	2,108		2,108
225	CLASSIFIED PROGRAMS	4,650		4,650
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	68,158		68,158
	TOTAL OPERATION & MAINTENANCE, MARINE CORPS	1,121,900		1,121,900
	OPERATION & MAINTENANCE, NAVY RES			
	OPERATING FORCES			
020	INTERMEDIATE MAINTENANCE	500		500
030	AIRCRAFT DEPOT MAINTENANCE	11,400		11,400
080	COMBAT SUPPORT FORCES	13,737		13,737
	SUBTOTAL OPERATING FORCES	25,637		25,637
	TOTAL OPERATION & MAINTENANCE, NAVY RES	25,637		25,637
	OPERATION & MAINTENANCE, MC RESERVE			
	OPERATING FORCES			
010	OPERATING FORCES	2,550		2,550
040	BASE OPERATING SUPPORT	795		795
	SUBTOTAL OPERATING FORCES	3,345		3,345
	TOTAL OPERATION & MAINTENANCE, MC RESERVE	3,345		3,345
	OPERATION & MAINTENANCE, AIR FORCE			
	OPERATING FORCES			
010	PRIMARY COMBAT FORCES	166,274		166,274

020	COMBAT ENHANCEMENT FORCES	1,492,580	1,492,580
030	AIR OPERATIONS TRAINING (OUT, MAINTAIN SKILLS)	110,237	110,237
040	DEPOT PURCHASE EQUIPMENT MAINTENANCE	209,996	209,996
050	FACILITIES SUSTAINMENT	92,412	92,412
060	CONTRACTOR LOGISTICS SUPPORT AND SYSTEM SUPPORT	1,289,693	1,289,693
070	FLYING HOUR PROGRAM	2,355,264	2,355,264
080	BASE SUPPORT	1,141,718	1,141,718
090	GLOBAL C3I AND EARLY WARNING	13,537	13,537
100	OTHER COMBAT OPS SPT PROGRAMS	224,713	224,713
110	CYBERSPACE ACTIVITIES	17,353	17,353
120	TACTICAL INTEL AND OTHER SPECIAL ACTIVITIES	36,098	36,098
130	LAUNCH FACILITIES	385	385
140	SPACE CONTROL SYSTEMS	38,966	38,966
170	US NORTHCOM/NORAD	725	725
180	US STRATCOM	2,056	2,056
190	US CYBERCOM	35,189	35,189
200	US CENTCOM	162,691	162,691
210	US SOCOM	19,000	19,000
	SUBTOTAL OPERATING FORCES	7,408,887	7,408,887
MOBILIZATION			
230	AIRLIFT OPERATIONS	1,287,659	1,287,659
240	MOBILIZATION PREPAREDNESS	107,064	107,064
	SUBTOTAL MOBILIZATION	1,394,723	1,394,723
TRAINING AND RECRUITING			
280	OFFICER ACQUISITION	300	300
290	RECRUIT TRAINING	340	340
330	SPECIALIZED SKILL TRAINING	25,327	25,327
340	FLIGHT TRAINING	844	844
350	PROFESSIONAL DEVELOPMENT EDUCATION	1,199	1,199
360	TRAINING SUPPORT	1,320	1,320

SEC. 4302. OPERATION AND MAINTENANCE FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Item	FY 2019 Request	House Change	House Authorized
	SUBTOTAL TRAINING AND RECRUITING	29,330		29,330
	ADMIN & SRVWD ACTIVITIES			
430	LOGISTICS OPERATIONS	154,485		154,485
440	TECHNICAL SUPPORT ACTIVITIES	13,608		13,608
480	ADMINISTRATION	4,814		4,814
490	SERVICEWIDE COMMUNICATIONS	131,123		131,123
500	OTHER SERVICEWIDE ACTIVITIES	97,471		97,471
540	INTERNATIONAL SUPPORT	240		240
545	CLASSIFIED PROGRAMS	51,108		51,108
	SUBTOTAL ADMIN & SRVWD ACTIVITIES	452,849		452,849
	TOTAL OPERATION & MAINTENANCE, AIR FORCE	9,285,789		9,285,789
	OPERATION & MAINTENANCE, AF RESERVE			
	OPERATING FORCES			
030	DEPOT PURCHASE EQUIPMENT MAINTENANCE	51,000		51,000
060	BASE SUPPORT	9,500		9,500
	SUBTOTAL OPERATING FORCES	60,500		60,500
	TOTAL OPERATION & MAINTENANCE, AF RESERVE	60,500		60,500
	OPERATION & MAINTENANCE, ANG			
	OPERATING FORCES			
020	MISSION SUPPORT OPERATIONS	3,560		3,560
060	BASE SUPPORT	12,310		12,310
	SUBTOTAL OPERATING FORCES	15,870		15,870

	TOTAL OPERATION & MAINTENANCE, ANG	15,870	15,870
	OPERATION AND MAINTENANCE, DEFENSE-WIDE		
	OPERATING FORCES		
010	JOINT CHIEFS OF STAFF	28,671	28,671
040	SPECIAL OPERATIONS COMMAND/OPERATING FORCES	3,733,161	3,733,161
	SUBTOTAL OPERATING FORCES	3,761,832	3,761,832
	ADMIN & SRWIDE ACTIVITIES		
100	DEFENSE CONTRACT AUDIT AGENCY	1,781	1,781
110	DEFENSE CONTRACT MANAGEMENT AGENCY	21,723	21,723
130	DEFENSE INFORMATION SYSTEMS AGENCY	111,702	111,702
150	DEFENSE LEGAL SERVICES AGENCY	127,023	127,023
170	DEFENSE MEDIA ACTIVITY	14,377	14,377
190	DEFENSE SECURITY COOPERATION AGENCY	2,208,442	2,008,442
	Transfer of funds to Ukraine Security Assistance fund		-200,000
			[-200,000]
230	DEFENSE THREAT REDUCTION AGENCY	302,250	302,250
250	DEPARTMENT OF DEFENSE EDUCATION ACTIVITY	31,620	31,620
290	OFFICE OF THE SECRETARY OF DEFENSE	16,579	16,579
310	WASHINGTON HEADQUARTERS SERVICES	7,766	7,766
315	CLASSIFIED PROGRAMS	1,944,813	1,944,813
	SUBTOTAL ADMIN & SRWIDE ACTIVITIES	4,788,076	4,588,076
	TOTAL OPERATION AND MAINTENANCE, DEFENSE-WIDE	8,549,908	8,349,908
	UKRAINE SECURITY ASSISTANCE		
010	UKRAINE SECURITY ASSISTANCE	250,000	250,000
	Program increase for defensive lethal assistance	[50,000]	[50,000]
	Transfer of funds from the Defense Security Cooperation Agency	[200,000]	[200,000]
	SUBTOTAL UKRAINE SECURITY ASSISTANCE	250,000	250,000

SEC. 4302. OPERATION AND MAINTENANCE FOR OVERSEAS CONTINGENCY OPERATIONS (In Thousands of Dollars)					
Line	Item	FY 2019 Request	House Change	House Authorized	
	TOTAL UKRAINE SECURITY ASSISTANCE		250,000	250,000	
	TOTAL OPERATION & MAINTENANCE	48,782,670	2,364,057	51,146,727	