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SENATE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON AIRLAND FORCES
UNITED STATES SENATE

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE
SENATE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON AIRLAND FORCES
UNITED STATES SENATE

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SUBJECT: Air Force, Force Structure and Modernization Programs

STATEMENT OF:

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INTORDUCTION

Chairman Cotton, Ranking Member King and distinguished members of the subcommittee, thank you for having us here today to continue our discussion on Air Force modernization. Additionally, thank you for your leadership and bringing fiscal stability back to our government, departments, and agencies. Stable, predictable and timely funding levels are critical to arrest the readiness decline across the Air Force as we look forward to our future national security interests.

Today's demand for Air Force capabilities continues to grow with global trends and intensifying pressure from major challengers. The United States faces a more competitive and dangerous international security environment not seen in generations. Our relative advantage in air and space has atrophied in a number of critical areas and the projected mismatch between demand and available resources has widened. We require the right size and mix of agile capabilities to compete, deter, and win in this environment.

To ensure we maintain the advantage, the Air Force is increasing our fighter and tanker procurement with the intent to modernize the force. Additionally, we are moving towards the production of the B-21 to modernize our long- range strike fleet. We are also in the early stages of replacing a portion of our training aircraft, which will enable shorter training timelines and better trained aircrew. Efforts to modernize and extend the durability of some of our older aircraft and to provide increased capability to kill and survive in combat are currently underway. Finally, we are accelerating our efforts to deter, defend, and prevail against anyone who seeks to deny our ability to freely operate in space. Our FY19 Budget proposal prioritizes long-term competition with China and Russia and moves the Air Force in the direction of multi-domain battle. It is focused on Readiness (people, munitions, FHP, WSS); Nuclear Deterrence (Bomber,

ICBM, NC3); Cost-Effective Modernization (F-35, KC-46, B-21, T-X, UH-1 replacement); Air / Space Superiority (Air Superiority 2030, defendable Space, Electronic Warfare); Multi-Domain Command and Control (modernize E-3 AWACS, begin transition to Advanced Battle Management System); Light Attack (continue experiment, rapid prototyping); and Science and Technology (complete S&T strategy, long-term innovation).

For more than 70 years, your United States Air Force has secured peace by providing decisive warfighting advantage in, through, and from air, space, and cyberspace. Today's 670,000 active duty, guard, reserve, and civilian Airmen meet these challenges by **defeating our adversaries, deterring threats** and **assuring our allies** 24/7/365.

DEFEATING OUR ADVERSARIES

Last year, your Air Force accelerated the campaign to defeat ISIS' physical caliphate by conducting more than 172,000 sorties and 98,000 precision air strikes—over 70% of the total in the campaign—to support Iraqi and partner forces in Operation INHERENT RESOLVE. These strikes were enabled with Intelligence, Surveillance and Reconnaissance (ISR) missions. In 2017, the Air Force provided nearly 25,000 ISR missions and produced 2.55 million intelligence products that close intelligence gaps and support target analysis and development; almost 5 products every minute.

The Air Force's command and control missions ensures that the right info gets to the right person at the right time. Our E-8C Joint Surveillance Target Attack Radar System flew over 5,000 hours, enabling a range of support for Combatant Commanders from command and control in the ISIS campaign to the interdiction of over 12,500 kilograms of illicit drugs before they entered our Nation's borders.

Airmen transported nearly 1 million joint warfighters across the globe personnel and delivered over 738 million pounds of equipment and humanitarian supplies. Our tanker force extended joint power projection at intercontinental distances by passing more than 1 billion pounds of fuel in-flight, while aeromedical evacuation Airmen airlifted more than 5,000 patients to safety. Closer to home, Airmen helped combat multiple wild fires in the western United States and delivered 13,600 short tons of relief supplies following the string of record-setting hurricanes in the North American hemisphere.

DETERRING THREATS

Last year, Airmen conducted 16,425 intercontinental ballistic missile alert tours and 248 missile convoys across five states. Our bombers flew 580 missions (over 2,500 flight hours) in the Indo-Pacific, strengthening security and stability in the region and reassuring our partners. Reinforcing NATO's eastern flank, American bombers flew 70 assurance and deterrence missions (67 deployment missions and 3 global missions). In space, the Air Force operates six constellations and 12 satellite systems vital to national security that provide communications, command and control, missile warning, nuclear detonation detection, weather, and GPS for the world.

ASSURING OUR ALLIES

In the NATO-led mission in Afghanistan, the Air Force executed a sustained air interdiction campaign of over 4,000 sorties to support Afghan partners, decimating Taliban so-called safe zones, command and control nodes, illicit revenue-generating ventures, and logistical networks. In 2017, the Air Force engaged in more than 85 exercises with international partners, including five focused on high-end combat. We furthered the international role of the F-35,

training with partners in both Europe and South Korea, and began delivery of F-35s to Israel, Norway, and Italy. Increasingly, we are conducting these missions with allies and partners.

READINESS

This steadfast watch, however, comes at a price. Continuous, worldwide combat operations since 1991 have taken a toll on our Airmen, equipment, and infrastructure and the overall readiness of our Air Force. The relentless pace of non-stop global counter-violent extremist organization (VEO) operations for nearly thirty years affected high-end readiness for the active duty, National Guard, and Reserve forces. At the same time, our strategic competitors have closed gaps in capability and capacity. The new National Defense Strategy is clear: inter-state strategic great power competition, not terrorism, is now the primary concern in U.S. national security. Today's world requires an Air Force ready for great power competition. It is our top priority to restore readiness to win any fight at any time.

Readiness is first and foremost about having enough trained people. We continue to address the aircrew shortage through a multi-pronged approach. This budget boosts pipeline training capacity, expands pilot training and addresses experience shortfalls, continues incentive pay and bonuses, improves administrative support at the squadron level, and funds flying hours to executable levels. It also addresses gaps in space, nuclear, cyber, and intelligence career fields, and supports Battlefield Airmen, our air-to-ground integration force.

Thank you for your leadership in passing the FY18 budget. Stable predictable funding is critical to addressing readiness. The FY18 budget adds 2,300 active duty Airmen and raises Air Force levels to 325,100. We will also add an additional 1,000 reservists and 900 guardsmen. We are focused on quality of life improvements for our Airmen and their families: a 2.4%

increase in military pay, a 2.2% increase in basic allowance for housing, and a 3.4% increase in subsistence. Growing our end strength to fill existing manpower requirements is the most important step to turn the corner and accelerate the climb to readiness recovery.

Training is another component critical to turning the corner on readiness. Through the FY18 budget we will utilize $6.2 billion to which funds 87% of the Total Force Flying Hour Program minimum training requirement and $12 billion to fund key enabling weapons system sustainment (parts, maintenance and logistics) to near maximum executable levels. We continue to modernize our Operational Training Infrastructure with a blend of live, virtual, and "synthetic" platforms. This synthetic capability provides opportunities to test and train against the world's most advanced threats at a reduced cost and avoid unnecessary wear and tear on advanced platforms.

The FY19 President's Budget, informed by and synchronized with the new National Defense Strategy, will accelerate our multi-year climb to full-spectrum readiness. The FY19 budget will increase our Active, Guard and Reserve end strength by 4,700 Airmen. We will address imbalances in critical fields like aviation, maintenance, ISR, cyber, and unmanned aircraft while also expanding our training capacity.

It is also critical that we increase pilot production and seasoning through expanded flying hour and weapons system sustainment programs. By extension, operational training infrastructure is needed to provide relevant and realistic training for multi-domain, full-spectrum readiness. The budget proposal funds aircraft depot maintenance, parts, logistics support, and invests $2.8 billion in operational training infrastructure needed for relevant, realistic training for the multi-domain environment.

Those trained Airmen will need munitions on hand. To support current operations and prepare for future requirements, this budget fully funds preferred munitions at industry capacity. This includes Hellfire missiles, Joint Direct Attack Munition bombs, the Small Diameter Bomb, and the Advanced Precision Kill Weapon System.

The Air Force is also significantly changing the way we collect operational tempo metrics. Prior methods underreport how much time Airmen are away. By now accounting for temporary duties away from home station for training exercises or mission-related requirements in addition to deployment time, we more accurately capture the true impact of service demands on Airmen, families, and home units.

The Air Force recruits Airmen, but we retain families. In FY19 budget we will continue supporting Air Force families with a military pay raise of 2.6%, increased housing and subsistence allowances, and bolstered family support programs. To improve family support, the budget funds expanded childcare hours, increases off-base childcare support, and funds more respite care and support coordinators for special needs families. We are improving the assignment system so families can better plan for future assignments, sustaining our morale and resilience programs, and implementing initiatives that support unit cohesion in our squadrons.

Today's modernization is tomorrow's readiness. Readiness is not static. It is inherently in decline or on the rise. These iterative efforts in FY19 and beyond will accelerate the climb to full spectrum readiness and provide a force that is ready, lethal, and efficient in this era of great power competition.

5th GENERATION FIGHTERS

Fighter fleet capacity is predicated on the capabilities of the aircraft that make up that fleet and thus, finding the right balance of 5th and 4th generation aircraft will remain fluid as we continually assess evolving threats. The "4th/5th" generation balance discussion is quickly becoming a "5th/6th" generation balance discussion and the Fiscal Year (FY) President's Budget (PB) 2019 adds $2.7 billion over the Future Years Defense Program (FYDP) to fund the next generation of air dominance (NGAD) capabilities. Known as NGAD, this program will utilize an agile acquisition strategy in order to facilitate parallel development and prototyping activities that puts the Air Force on a timeline needed to close air superiority capability gaps identified in the Air Superiority 2030 Flight Plan. The Air Superiority Family of Systems will provide a complementary capability to the F-35A and will not impact JSF program objectives.

The F-35 program continues development of capabilities to ensure lethality and survivability against emerging high-end threats. The program recently delivered full (Block 3F configuration) warfighting capability and system development and demonstration is on track to complete this calendar year. The price per copy of an F-35A is now less than $100 million and the FY19 PB procures 48 aircraft for the Air Force as the program readies to jump to 54 a year in FY21. FY19 will also see the F-35 modernization program begin to shift to a Continuous Capability Development and Delivery (C2D2) acquisition strategy that will deliver continuous modernization, enhancements, and improvements that will deliver Block 4 capability.

The F-22, currently the only U.S. fighter capable of operating in highly contested environments, is also an integral piece of the Air Force's force structure modernization plan. Its stealth, super cruise, integrated avionics and sensors combine to deliver the Raptor's unique capability. We plan to retain the F-22 until the 2060 timeframe, and the FY19 PB reflects this commitment as we look to increase its capabilities and mission effectiveness through a myriad of

modernization efforts. These efforts include sensor enhancements, datalink upgrades, open software architecture, enhanced GPS and the integration of a new helmet mounted display cueing system.

In Fiscal Year 2017, the Air Force continued experimentation efforts, including executing Phase I of the Light Attack Experiment. This was a live-fly event conducted at Holloman Air Force Base, New Mexico in August 2017 which assessed the military utility of various non-developmental, light-attack platforms. This first phase of the experiment allowed the Air Force to assess the potential of these off-the-shelf, light attack aircraft to accomplish various permissive, close air support missions. The Air Force leveraged Other Transaction Authority (OTA) agreements, including industry cost-share agreements, to execute the experiment within *five months of authorization*. The Air Force plans to hold Phase II of the Light Attack Experiment in Fiscal Year 2018 as we develop the acquisition strategy for a potential procurement in the coming years.

Air Superiority, or the ability to control the air without prohibitive interference from an adversary, underwrites the full spectrum of joint operations. Increased threat capabilities, as well as the enemy's ability to engage in space and cyberspace, highlighted gaps in the Air Force's projected force structure. As a result, the Chief of Staff of the Air Force chartered the Air Superiority 2030 (AS 2030) Enterprise Collaboration Team (ECCT). The purpose of the charter was to develop capability options to enable joint force Air Superiority in the highly contested environment of 2030 and beyond. The charter examined and quantified needs, and explored materiel and non-materiel, multi-domain solutions to mitigate these gaps. Ultimately, recognizing that no "silver bullet" solution existed, the charter recommended the USAF develop a family of systems within five capability development areas: Basing and Logistics; Find, Fix,

Track and Assess; Target and Engage; Command and Control; and Non-Materiel (Doctrine, Organization, Training, Materiel, Logistics, Personnel, Facilities, and Policy [DOTMLPF-P]). Developing next generation systems along these lines of effort is vital to ensuring Air Superiority in 2030 and beyond.

4th GENERATION FIGHTERS

In addition to pursuing new capabilities and modernizing fifth generation fighters, the Air Force also seeks to extend the service life and modernize critical capabilities of key fourth generation aircraft. Doing so will help maintain Service capacity and readiness to meet the needs of the Warfighter while ramping up the F-35 production line and developing the Air Superiority Family of Systems.

The Air Force continues to assess fleet sustainability and alternatives for meeting warfighter close air support (CAS) demands, particularly in permissive environments. The A-10 has been the backbone of the CAS mission for more than 40 years and has proven to be the most cost-effective 4th generation fighter platform but has exceeded its original service life. This year the original A-10 re-winging program completes as the 173rd wing set will be installed later this summer. Additionally, a new re-winging program is on track to begin third quarter of FY18 with the release of an RFP for up to 109 additional wing replacement sets. The new wing program will aim to avoid any further groundings beyond 2025 and will ensure a minimum of six combat squadrons remain in service until 2032.

To ensure the F-16's lethality and air prominence in permissive environments, we are pursuing an active electronically scanned array (AESA) radar upgrade that offers advanced capabilities and improved reliability and maintainability. We are also upgrading the mission computer, display generator, electronic warfare components, and the ALQ-131 self-protection jamming pod to enable advanced technology jamming techniques. Additionally, the legacy

service life extension program (SLEP) will extend the F-16 airframe structural service life from the current 8,000 hours to 12,000+ hours, adding fifteen to twenty years of service for selected F-16s.

Along with the F-16, the Air Force expects the F-15E to be an integral part of our fighters through at least 2040, and we are pursuing a new electronic warfare self-protection suite, the Eagle Passive/Active Warning Survivability System (EPAWSS) for the Strike Eagle fleet. The F-15C/D fleet is funded through the FYDP and will undergo multiple offensive and defensive upgrades to ensure its warfighting effectiveness until any recapitalization plans are completed.

BOMBERS

As with the fighter force, the total bomber inventory has also been significantly reduced. To provide perspective, in 1991 we had 290 aircraft available within the bomber fleet versus 158 B-1s, B-52s, and B-2s today. The current number is insufficient to meet Defense Planning Guidance and nuclear guidance while sustaining current operational demands and maintaining sufficient training and readiness capacity.

B-21

The B-21 program remains one of the Air Force's top priority programs with regards to investment in research, development, test and evaluation with $2.3 billion for Engineering and Manufacturing Development in the Fiscal Year 2019 President's Budget. The B-21 continues to make measured, positive progress and remains on track to deliver its initial capability in the mid-2020s.

The program successfully completed a Preliminary Design Review in 2017 demonstrating that the Air Force, along with its industry partners, are continuing to develop the design maturity of this platform. The development phase of the program is well on the

path to detailed design.

The Air Force remains committed to a fleet size of a minimum of 100 B-21s. This fleet will provide capabilities necessary to meet future Combatant Commander requirements. The B-21 remains an absolute national defense priority, and we are grateful for your continued support of this critical program.

LEGACY

Until the B-21 is fielded, it is equally important that we continue the commitment to modernize our legacy bomber fleet to maintain the ability of our Air Force to provide Nuclear Deterrence Operations, Nuclear Response, Global Strike, and Global Precision Attack. The 20 remaining B-2 aircraft, currently the only low-observable, Anti-Access/Area Denial asset capable of penetrating advanced enemy defensive systems, are approaching 30 years of service and require engine, avionic, communications and defensive systems upgrades to maintain viability in the face of advancing enemy capabilities.

Similarly, the 62 remaining B-1s have been in service for nearly 35 years and are receiving upgrades to their avionics and flight systems, as well as an engine service life extension program. These upgrades will ensure the B-1's viability into the mid-to-late 2030s. The B-52H will continue its proud tradition of service through 2050, putting the remaining fleet of 76 at nearly 100 years of service. To sustain this venerable capability there are a number of modernization efforts currently in work to include new engines, replacement radar, improved/integrated avionics, weapons management, and communication upgrades.

MUNITIONS

Over the past year, the demand for munitions has continued to grow. To meet this demand, the Air Force continues to work with the other services and industry partners to efficiently ramp production capacity across the preferred munitions programs. The FY19 Budget Request

continues to leverage overseas contingency operations (OCO) funding to replenish the vast number of munitions expended to date in operations around the globe. The budget request also incorporates more Air Force base funding to build munitions inventories to support the National Defense Strategy and meet future operational requirements. As we work to expand the munitions industrial base, the Services continue to balance today's immediate needs with a long-term, sustainable capacity, ultimately fueling a more resilient industrial base for the future.

Hellfire missiles continue to provide a time-sensitive, direct-strike capability for our remotely-piloted vehicles and remain in high demand. Partnering with the Army, production capacity was ramped from 9,500 missiles per year in FY18 to 11,000 missiles per year starting in FY19. The Air Force plans to procure 4,338 missiles in FY19. With the other Services' and critical foreign military sales (FMS) partners, the production line will remain funded to maximum production capacity for the foreseeable future.

The Joint Direct Attack Munition (JDAM) is also a weapon of choice for today's operators with an average of 50-70 expended daily to support ongoing operations. JDAM production capacity increased to 45,000 tailkits per year in FY18 to meet the needs of the Services and FMS partners. The Air Force plans to procure 36,000 tailkits in FY19 with Navy and FMS partners procuring the remaining 9,000 tailkits available in FY19.

In another significant achievement, the Air Force teamed with the Navy and industry to rapidly procure and field the Advanced Precision Kill Weapon System (APKWS). The Services have teamed with industry to ramp production from roughly 2,700 guidance kits per year to 20,000 guidance kits starting in FY19. The Air Force plans to procure 7,279 kits in FY19.

Small Diameter Bomb I (SDB I) continues to provide precision, lethal strike capacity with reduced collateral damage effects and increased load-out per sortie for our warfighters. The Air

Force has ramped the production line from 3,000 weapons per year in FY15 to 8,000 weapons in FY18. The Air Force plans to order 6,826 weapons in FY19, with 1,174 weapons for partner nations. All of these production increases expedite the inventory replenishment of our critical munitions and build stockpiles.

As the Air Force responds to current operational demands, we are also looking toward the future to ensure we are prepared to defeat more advanced threats as directed in the National Defense Strategy. Advanced weapons capabilities are necessary to address sophisticated threat systems. The FY19 Budget request reflects the Air Force's plan to continue investing in advanced weapon capability, specifically with the Advanced Medium Range Air-to-Air Missile (AMRAAM), Joint Air-to-Surface Standoff Missile-Extended Range (JASSM-ER) and SDB II. These weapons provide unique capabilities in a more contested, anti-access/area denial (A2/AD) environment.

Production of AMRAAM missiles, a critical air dominance weapon, remained consistent with FY18 procurement levels as industry partners continue to work through parts obsolescence issues through the Form Fit Function Refresh (F3R) effort. JASSM-ER is the premier A2/AD weapon for striking advanced ground threat systems, and production will remain at maximum capacity in FY19 and beyond. The Air Force plans to procure 360 missiles in FY19 while also improving the weapon's capabilities and addressing upcoming parts obsolescence issues. Finally, SDB II enters its fifth and final low-rate initial production lot in FY19, and in conjunction with the Navy, the Air Force's order of 510 weapons maximizes the production capacity as it prepares to ramp up in FY20. Though not yet fielded, the SDB II will soon provide a key air-to-ground capability to kill mobile and fixed targets through adverse weather from standoff ranges.

INTELLIGENCE, SURVEILLANCE AND (ISR)

The RQ-4 Global Hawk provides a continuous, high altitude, long endurance, all weather, day/night, wide area reconnaissance and surveillance unmanned aircraft system. The Office of Secretary of Defense approved the RQ-4 modernization approach in September 2015 to include the MS-177 sensor integration, a Ground Segment Modification Program and a Communication System Modification Program. The MS-177 development and integration work began in November 2015 and the sensor is on track for Initial Operating Capability (IOC) in Third Quarter FY18. The MS-177 will utilize the Block 30 Integrated Payload Adapter (IPA) that has been fully tested and can be applied to future modifications. The FY19 PB request is for $309.5 million in investment dollars for this program.

The Ground Segment Engineering & Manufacturing Development (EMD) contract was awarded in July 2016. Installation of cockpits at Grand Forks AFB and Beale AFB will begin in Second Quarter FY19. The Communication System Modification Program (CSMP) effort is in the Requirements Definition/Market Research phase. This program is finalizing requirements for modernization of Ground and Air Vehicle communications equipment, which will both improve communications capability and alleviate Diminishing Manufacturing Sources (DMS) issues with the equipment. We expect to release the Request for Proposal for CSMP in second Quarter FY19.

The funding request for the MQ-9 investment dollars in FY19 is $ 1.2 billion. This program continues to modernize it's fleet and capabilities it provides to Combatant Commanders. It accomplishes this by sustaining the MQ-9 program of record and incorporating planned modernization efforts, while a separate program of record develops and tests those modernizations making them ready for the program at large. This process keeps the MQ-9s current and able to meet Combatant Commanders demands, while keeping an eye on the future

for emerging requirements. Such efforts include the new Ground Control Station – Block 50 that is actively being developed, the new DAS-4 sensor package that will fly on the MQ-9 platform and the Extended Range enhancement to the MQ-9 Block 5 aircraft. Additionally, the MQ-9 program is actively engaged in a study to determine the actual service life of the MQ-9 platform. The first phase of that study will be completed in Summer 2018, with phase two being completed by FY21. The results of this study will better inform the Air Force's decision on long-term sustainment of the MQ-9 program.

Gorgon Stare has been delivering Wide Area Motion Imagery (WAMI) in support of Operation Freedom Sentinel and Operation Inherent Resolve areas of responsibility since 2012. The Air Force has no plans to fund additional capability at this time but will sustain this MQ-9 podded WAMI capability in its current state. The FY19 request is for $76.7 million in Operation and Maintenance funding for this sustainment effort. The Air Force is migrating its primary ISR Processing, Exploitation and Dissemination (PED) weapon system, the Distributed Common Ground System (DCGS), to an open architecture. To support this effort $454.8 million has been requested in the FY19 PB. The previous architecture required 5-7 years of development, test, and fielding per major release. Open architecture will support software releases in weeks and months instead of years. This accelerated development and fielding timeline will enhance our ability to get inside the adversaries decision cycle, enable our ISR analysts to leverage cutting-edge analytic tools, and allow increased access to more intelligence sources and Intelligence Community capabilities.

MULTI-DOMAIN COMMAND AND CONTROL (MDC2)

An MDC2 capability generates effects that present the adversary with multiple dilemmas at an operational tempo that cannot be matched. The Air Force is focused on creating feasible investment options throughout its Battle Management Command and Control (BMC2) portfolio that drive towards the attainment of an advanced MDC2 capability for the joint force. To achieve this evolutionary shift, the Air Force is transitioning from a primarily aircraft centric to a net-centric approach using sensors across the battlespace linked by agile, resilient communications to provide the warfighter persistent capabilities across the full range of military options, uncontested and highly-contested, to meet the Nation's future needs. The key for future success is to establish a family of systems capable of integrating and fusing sensor information from all domains and bridging resilient communications across multiple pathways at all security levels.

To that end, the Air Force did not request funding in the FY19 PB for the Joint Surveillance Target Attack Radar System Recapitalization program. A recapitalized JSTARS platform will not be viable in future contested environments, putting the Battle Management Command and Control (BMC2) and Ground Moving Target Indicator (GMTI) missions at risk in a peer engagement. Therefore, the Air Force will embark on an alternative approach to fulfill the Combat Commander requirements for Ground Moving Target Indication and Battle Management Command and Control. The Air Force is pursuing a three-phased "incremental approach" to regain a strategic advantage and strengthen long-term lethality for the joint force. Increment 1 builds up resilience by incorporating technologies assessed at low technical risk and will continue to employ the current E-8C JSTARS fleet in the manner in which it operates today, and begins investment in agile communications and advanced sensors. The FY19 PB requests $24.9M in FY19 and $74M across the FYDP to maintain the current E-8C JSTARS fleet.

Additionally, Increment 1 efforts include the Airborne Early Warning Contol (AWACS) weapon system as it evolves to integrate multi-domain inputs to provide air, land, and sea Battle Management and Command and Control (BMC2). The FY19 PB includes a request for $471 million for the AWACS program. The Air Force is reversing its decision to divest seven AWACS and restoring the fleet to 31 aircraft. Additionally, multiple AWACS modernization activities are underway with the most notable being the upgrade to the Block 40/45 mission system which is the foundation for all future AWACS capability improvements. To ensure the United States maintains multi-domain dominance, the Air Force is initiating and integrating multiple communications upgrades such as improved Link 16, enhanced SATCOM, and resilient UHF radios.

Follow on Increments 2 and 3 in future budget requests will culminate in the full operational capability of the Advanced Battle Management System (ABMS). Increment 2 builds upon capability improvements by integrating advanced sensors and Open Mission System software into ground and air-based BMC2 platforms. This increment also fully incorporates joint and coalition sensors, as well as fifth generation aircraft sensors, which provide the ability to sense targets in highly contested environments. Finally, Increment 3 realizes the full potential of the proposed incremental approach with full operational capability of the ABMS. The ABMS system is envisioned to be an evolutionary leap in capability intended to achieve Initial Operational Capability in accordance by the the end of AWACS' projected service life in 2035.

The Air Force envisions the ABMS as an open architecture system, capable of ingesting new sensors and leveraging communications capabilities as the science and technology communities deliver them. Ultimately, the Air Force anticipates a more robust, resilient, reliable, and survivable architecture than currently exists. This open architecture will provide the means to integrate new technologies and create a more lethal force capable of operating in all environments.

If we continue down last year's path, we will spend billions of dollars and end up with today's capability and capacity that will only be effective in small portions of the world.

The Air Operations Center (AOC) Weapon System (WS) interoperability with the MDC2 vision remains essential to the AOC way ahead. The fielded AOC WS 10.1 legacy system will not support the vision for MDC2 without significant improvement/modernization and the Air Force is still committed to fielding a modern architecture for the AOC that enables MDC2. The AOC WS 10.1 program is a sustainment effort fielding hardware and software to replace end-of-life or end of support components to keep the AOCs interoperable, supportable, and cyber security compliant while the Air Force continues to modernize the AOC enterprise. In response to Combatant Commanders' needs for rapid development of new capabilities in the current fight and to outpace our near-peer competitors, the Air Force initiated the AOC Pathfinder effort in August 2017, and subsequently terminated the AOC WS 10.2 program in January 2018. AOC Pathfinder seeks to rapidly deliver a subset of the AOC WS 10.2 requirements using industry software development best practices. These best practices include using cloud-native computing technologies, lean agile software development methodologies, and an entrepreneurial management structure. If the AOC Pathfinder proves successful, which it is showing great progress to date, its development approach will become the model for continued AOC modernization, and provide a system capable of being the foundation of MDC2 operations. The legacy AOC 10.1 infrastructure would then sunset by the end of Fiscal Year 2020, three years earlier than originally AOC WS 10.2 acquisition program. The FY19 PB request includes $106.1 million in the AOC WS program element to support the AOC WS Modifications project which includes the AOC Pathfinder modernization efforts.

CYBER

The Air Force continues to build its contribution to joint cyber mission forces (CMFs) by developing the next generation cyber warrior, adding manpower for offensive and defensive cyber operations (OCO & DCO), and equipping them with the right capabilities to ensure effective operations. The Air Force is shifting from a 20th century network-centric infrastructure to a 21st century data-centric infrastructure. This transition will enable power projection through information integration and reallocation of critical Information Technology manpower towards emerging cyber warfighting missions.

The ability to effectively operate in cyberspace is vital to deliver airpower and conduct the Air Force's core missions. We are fielding and sustaining cyber resilient capabilities, which provide mission assurance against adept and continually evolving adversaries. The Air Force's strategic vision, which reflects Congressional direction, implements a multi-pronged approach providing assurance, resilience, affordability, and power projection within and through the cyberspace domain. These pillars enable the Air Force's assured cyber advantage to ensure our ability to fly, flight, and win in air, space, and cyberspace.

As Executive Agent for both Unified Platform (UP) and Joint Cyber Command and Control (JCC2), the Air Force is leading the growth of cyberspace capabilities for the DoD. UP and JCC2 are partnerships across all Services and with USCYBERCOM. UP integrates disparate cyber platforms to conduct full-spectrum (OCO & DCO) cyberspace operations, whereas JCC2 integrates joint, coalition and inter-agency command and control to enhance multi-domain operations. Rapidly delivering initial capability in FY18 through Developmental Operations (DevOps), these programs directly enable the CMFs support to Combatant Commander requirements resulting in a shorter kill chain. Furthermore, the Air Force continues development

of the Distributed Cyber Warfare Operations (DCWO) portfolio. This portfolio provides organic Air Force offensive cyberspace capabilities to hold adversary systems at risk, thereby enabling Air Force mission execution.

Signed in November 2015, our Air Force Cyber Campaign Plan (CCP) has two goals: 1) to “bake in” cyber resiliency in new weapon systems and 2) mitigate critical vulnerabilities in fielded weapon systems. It consists of seven Lines of Action (LOAs) which are designed to be the “engine” behind increasing the cyber resiliency of all Air Force new and legacy weapon systems. The CCP addresses the first goal by integrating cyber resiliency into the system engineering processes to ‘bake in’ resiliency before systems are fielded. It also institutionalizes adaptable subsystem architectures for enterprise technology baselines and business processes, when designing and building new weapon systems. Concurrently, the plan addresses the second goal by pursuing top-down and bottom-up methodologies to find and mitigate mission ‘critical’ cyber vulnerabilities. Other LOAs include cyber workforce development, creation of a cross-cutting common security environment, the development of counter cyber intelligence capability, and robust defensive cyberspace operations. AF DCO provides defensive cyber capabilities to protect Air Force missions against unwanted influence by an adversary.

We are committed to building out the Air Force’s contributions to USCYBERCOM’s CMF to support the Nation and the Department of Defense’s Joint Information Environment (JIE) framework.

SPACE

The Air Force re-capitalized almost every satellite system in the space portfolio in the early 2000s. As those satellites transition to operations and space emerges as a warfighting domain, the Air Force is focused on fielding defendable, resilient, and more capable systems as soon as possible. Our National Security Strategy clearly states that unfettered access and

freedom to operate in space are vital interests of the United States. The FY19 Budget Request marks a bold pivot to support space warfighting and represents the Air Force's commitment to making wise, risk-informed, space superiority investments. The FY19 PB request for space investments of $8.5 billion reflects a 7.1% increase over the FY18 PB and the Air Force's continued dedication to provide critical space-based capabilities to Joint and Allied warfighters. Our investments in these capabilities continues over the FYDP, an increase of over 18% from last year's FYDP will continue to improve space situational awareness, increase our ability to defend our nation's most vital space assets, build more jam-resistant GPS satellites, improve missile warning, and expand partnerships to shape the strategic environment.

To counter adversary advances, the FY19 PB Request transitioned the Space Based Infrared System (SBIRS) 7 and 8 procurement to funding the Next-Generation Overhead Persistent Infrared (OPIR) program to rapidly field a strategically survivable missile warning architecture by the mid-2020s. Next-Generation OPIR will serve as the core of an enterprise that uses space sensors to monitor space, air, land, and sea for infrared signatures. The delegation of Milestone Decision Authority back to the Air Force allows us to maintain flexibility in order to move fast to acquire this vital next generation capability.

The Air Force is also simultaneously modernizing all segments of our unparalleled Positioning, Navigation, and Timing capability through the acquisition of new space-based systems, the transition to a new ground segment, and the development of Military-code capable user equipment. GPS continues to be the world's gold standard for Positioning, Navigation, and Timing, delivering these vital capabilities to America's warfighters, civil users, and our allies around the world. The first GPS III space vehicle will launch later this year and will provide greater accuracy, new civil signals compatible with the European Galileo system, and enhanced

military signal power. Earlier this year, the Air Force released a request for proposals for our future GPS satellites, known as the GPS III Follow-On (GPS IIIF).

The Air Force is also continuing its efforts with the GPS Next Generation Operational Control System (OCX), the ground system to command and control the next generation of the Air Force's GPS satellites. The OCX program will provide greater cybersecurity for the GPS enterprise, protecting a capability that is critical to the United States Armed Forces, the American economy, and billions of civilians. The OCX program is currently on track, most recently evidenced by the Air Force's acceptance of Block 0 capability, which will support GPS III launch and checkout, in October 2017. The Air Force is continuing to monitor the progress of the Block 1 and 2 system closely. Finally, the Air Force is leading the multi-service effort to provide more accurate and reliable PNT capability through the Military GPS User Equipment program.

The Air Force is modernizing the SATCOM architecture through the acquisition of the both the ground and space segments – to include both free-flyer and hosted payload opportunities. We're also exploring new and innovative acquisition approaches and leveraging the acquisition authorities granted by the NDAA to procure these capabilities faster. We're working to partner with Norway on a hosted payload arrangement to provide a critical protected Polar SATCOM capability in 2022. Our partnership with Norway will allow the Air Force to provide a critical capability two years earlier and with an estimated $900 million in savings over a free-flyer option. The Air Force is working to address future risks in our protected SATCOM enterprise with next-generation systems that meet both protected strategic and tactical requirements. For wideband communications, the Air Force is currently examining innovative

acquisition approaches and partnering with commercial providers to ensure worldwide SATCOM coverage and capability.

While the Air Force continues to modernize our space- and ground-based assets, we are also committed to our unparalleled record of mission success in providing National Security Space assets a ride to space through our Evolved Expendable Launch Vehicle program. The Evolved Expendable Launch Vehicle program purchases launch services from certified commercial providers to lift medium, intermediate, and heavy Department of Defense and Intelligence Community payloads into their intended orbits. In accordance with the law, the Air Force is moving to instill competition in our launch procurements while simultaneously working to transition away from the use of the Russian-built RD-180 engine through our Rocket Propulsion System Other Transaction Authority agreements. In our Launch Service Agreements strategy, we are working with industry through public-private partnerships to ensure the United States possesses assured access to space – that is, maintains two or more families of commercially-available launch vehicles – that satisfies National Security Space launch requirements.

The Air Force is committed to providing the Joint Force with critical space-based capabilities that will allow us to fight and win a war that extends to space. To enable this shift in warfighting posture, we are making investments in more resilient and survivable space architectures and employing unique acquisition approaches like Other Transaction Authority agreements, increasing the speed of acquisition decisions thanks to the newly-delegated milestone decision authorities, and partnering with industry to take advantage of technological advancements and best practices. We believe the FY19 President's Budget request marks a

turning point ensuring our space assets are defendable, resilient, and more capable and, we hope to continue our modernization and resiliency efforts with your support.

CONCLUSION

The demand for air, space and cyber continues to grow and our competitors continue to close technology gaps and negate our traditional advantages. In the midst of the challenges ahead, we will aim to keep these programs on track and deliver these systems-not only as a vital capability to our forces-but also as a best value to the taxpayer. The Air Force seeks to balance risk across capacity, capability, and readiness to maintain an advantage, however persistently unstable budgets and fiscal constraints have driven us to postpone several key modernization efforts such as UH-1N recapitalization and Long Range Stand-off Weapon. We are grateful for the recent fiscal relief, but we still face uncertainty. Sustainable funding across multiple fiscal year defense plans is critical to ensure we can meet today's demand for capability and capacity without sacrificing modernization for tomorrow's high-end fight against a full array of potential adversaries.

As critical members of the joint team, your U.S. Air Force operates in a vast array of domains and prevails in every level of conflict. However, we must remain focused and maintain our advantage in order to continue providing our nation the security it enjoys. We look forward to working closely with the Committee to ensure the ability to deliver combat air power for America when and where we are needed.