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BY THE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES
UNITED STATES SENATE

DEPARTMENT OF THE AIR FORCE
PRESENTATION TO THE SUBCOMMITTEE ON STRATEGIC FORCES
SENATE ARMED SERVICES COMMITTEE
UNITED STATES SENATE

**SUBJECT: FISCAL YEAR 2014 NATIONAL DEFENSE AUTHORIZATION BUDGET
REQUEST FOR NATIONAL SECURITY SPACE ACTIVITIES**

**STATEMENT OF: GENERAL WILLIAM L. SHELTON
COMMANDER, AIR FORCE SPACE COMMAND**

April 24, 2013

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Introduction

Mr. Chairman and Senator Sessions, it is an honor to appear before you and your committee today as the Commander of Air Force Space Command.

I have the distinct privilege of leading over 40,000 people who deliver our Nation's space and cyberspace capabilities around the world, 24 hours a day, 7 days a week. From the Fourteenth and Twenty-Fourth Air Forces, to the Space and Missile Systems Center, to the entire breadth of this Command, we embody the fighting spirit, flexibility and ingenuity of the U.S. Air Force. Outstanding Airmen are the core of our team and I will take a moment to highlight a few individuals.

Major Kenneth Holmes spent 140 days deployed to Bagram Air Base, Afghanistan. During that deployment, his leadership and expertise enabled a Joint Task Force to significantly disrupt thousands of hours of enemy communications, ultimately aiding in the capture or elimination of over 1,470 enemies, including 166 high-value individuals. In January 2013, Major Holmes was presented the Forrest S. McCartney National Defense Space Award in recognition of his ability to integrate space capabilities into the fight.

Captain Kathleen Sullivan, a flight test engineer at Buckley Air Force Base, Colorado, led the integration of the Space-Based Infrared System into live-fire Missile Defense tests. She incorporated next-generation missile warning data into the missile defense kill-chain during multiple test campaigns, testing capabilities that will better protect the United States and our allies. Captain Sullivan was also my command's nominee for the Air Force Lance P. Sijan Award, in recognition of her outstanding leadership.

Senior Airman Nicholas Hurt, a member of the 721st Security Forces Squadron, Cheyenne Mountain Air Force Station, Colorado, was responsible for helping secure Bagram Air

Base, Afghanistan. During his deployment, he routinely led 13-person squads on outside-the-wire reconnaissance patrols, located and secured unidentified explosive ordnance and responded to indirect fire incidents. He was one of my Command's Outstanding Airmen of the Year and is now one of the Air Force's 12 Outstanding Airmen of the Year for 2012.

Major Holmes, Captain Sullivan, Senior Airman Hurt, and other members of the Command bring foundational space and cyberspace capabilities to the Nation. It is imperative that the U.S. Armed Services operate effectively in space and cyberspace, as noted in the Secretary of Defense's January 2012 *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* strategic guidance. Additionally, the President's *2010 National Security Strategy* states, the "space and cyberspace capabilities that power our daily lives and military operations are vulnerable to disruption and attack." We are mindful there are ever-changing threats to our systems and to our ability to operate effectively in space and cyberspace. Whether the threats originate from an adversary or are environmental or fiscal in nature, Air Force Space Command forces still have the day-to-day responsibility to conduct global operations in and through space and cyberspace, from peace through crisis and war, fulfilling tactical and strategic objectives on local and global scales.

Since its inception just over 30 years ago, the Command has made tremendous progress in evolving and sustaining space and cyberspace capabilities. In an era of declining budgets, growing threats and increasing requirements, the Command continues providing cost-effective, foundational space and cyberspace capabilities. I have three goals to ensure those foundational capabilities are available to the warfighter and the Nation: to provide assured full spectrum space and cyber capabilities, to develop highly skilled and innovative space and cyberspace professionals and to provide resilient, integrated systems that preserve operational advantage.

This statement is organized around these goals and the Command's national security space activities to fulfill them.

Provide assured full spectrum space capabilities

Space capabilities are critical to the Joint Force Commander's ability to deter aggression, win America's wars and conduct other missions such as humanitarian and disaster relief operations. In addition, the U.S. and global economies rely on space systems to enable vital activities such as navigation, commerce and agriculture. As the Air Force's space superiority lead, I am responsible for organizing, training and equipping our space capabilities. In the current fiscal climate, we are managing increased risks across the enterprise while modernizing, sustaining and acquiring space capabilities, consistent with National, Department of Defense, Joint and Air Force priorities. We have made significant strides in providing game-changing effects to the warfighter and I would submit that, under the strong leadership of Lieutenant General Ellen Pawlikowski, Commander of our Space and Missile Systems Center, we have turned the corner on space acquisition, delivering cost-effective capabilities. Within this context, I would like to highlight some of our space capabilities that are critical to our Nation's security.

Nuclear, Survivable; Protected Tactical and Unprotected Communications

The *2011 National Military Strategy* notes that the interlinked domains of air, space, and cyberspace are essential to the Joint forces' ability to deter and defeat aggression. Our communication satellites link the domains by providing nuclear-survivable communications for the President and national leaders as well as protected, tactical and unprotected communications to the warfighter.

The Advanced Extremely High Frequency Satellite Program and its secure communications capability is one of those protected, vital links. We launched the second satellite in 2012 and the third satellite is on track for a late 2013 launch. We also continue to execute our near-term Space Modernization Initiative investment strategy, establishing a competitive industrial base and demonstrating fundamental elements for a resilient, next-generation, protected military satellite communications capability.

The Family of Beyond-Line-of-Sight Terminals will provide nuclear survivable communications to airborne and ground command posts, manned bombers and manned intelligence, surveillance and reconnaissance aircraft using the Milstar and Advanced Extremely High Frequency constellations. In 2012, to reduce cost risk to the Government, the current terminal development contract was converted from cost plus to fixed price, and competition was injected into the program with the award of an alternate source development contract. More recently, the program office released a Production Request for Proposal for the limited competition of both an Airborne Wideband Terminal and a Command Post Terminal with a planned contract award the first quarter of FY14 and delivery of an initial Command Post Terminal with Presidential, National and Voice Conferencing capability in FY15.

The Wideband Global Satellite (WGS) system provides high-capacity communications to the Department of Defense, the White House Communications Agency, the Department of State and an increasing number of international partners. We launched and tested the fourth satellite in 2012 and it is providing critical wideband communications to U.S. and coalition forces in U.S. Central Command and U.S. Pacific Command. The fifth and sixth satellites are on track for launch during FY13 and are expected to be operational in mid FY13 and early FY14

respectively. Once WGS-5 becomes operational, the constellation will be postured to provide worldwide coverage.

To support our long term investment strategy, we are conducting studies to determine the optimal mix of Department of Defense and commercial solutions to meet the growing wideband demand in the most affordable and resilient manner.

Launch Detection and Missile Tracking

Strategic missile warning is critical to the Nation's survival. Ballistic missiles pose a significant threat to the U.S., our deployed forces, allies and coalition partners. The Command supports the strategic and tactical missile warning missions by providing both space- and ground-based sensors.

The Space Based Infrared System (SBIRS) program, along with the legacy Defense Support Program satellites, provide advanced early warning of missile threats, allowing our Joint warfighters to take swift and appropriate actions. In September 2012, the first geosynchronous orbit SBIRS (GEO-1) began required operational testing. While the mission data is exceeding expectations, we uncovered an unexpected problem which will be resolved shortly with a software update. The fact that the fix is software only gave us the necessary confidence to launch GEO-2 on March 19, 2013.

Ground-based Radars deliver missile warning and missile defense capabilities to counter current and emerging missile threats. We are executing several initiatives to modernize these radars. In addition, we are working several Upgraded Early Warning Radar initiatives with the Missile Defense Agency to improve the radars' ability to provide fire control data for missile defense assets. These initiatives will significantly improve our early warning capabilities by

updating the original 1950's technology and standardizing our operations and sustainment baselines.

Positioning, Navigation and Timing

This has been another successful year for Air Force Positioning, Navigation and Timing capabilities – ensuring the continued health and resilience of the constellation: legacy Global Position System (GPS) IIAs, current generation GPS IIFs and next generation GPS IIIs. Captain Jacob Hempen, a project engineer at our Space and Missile Systems Center, modified satellite battery charging procedures, significantly increasing GPS IIA constellation total battery life by 20 years. Under the leadership of Major Jason Smesny, also from the Space and Missile Systems Center, a combined Air Force and contractor team completed operational checkout of the third GPS IIF four days ahead of schedule. It became part of the operational constellation on November 13, 2012. Between March 2012 and March 2013, we completed production of five GPS IIF satellites, and we will complete production of the final GPS IIF satellite this year, for a total production run of 12 GPS IIF satellites. We plan to launch the fourth GPS IIF in May 2013 and the fifth, sixth and seventh satellites during FY14.

On GPS III, we heeded the lessons learned of the last two decades in terms of management, process rigor, technical discipline and programming to create both a realistic schedule and cost for delivery. As a result, the program team continues to reduce defects, test time and build time while driving down recurring cost. This approach includes the integration of a non-flight satellite testbed space vehicle used for production risk reduction this fiscal year. The team also delivered the propulsion subsystem for the first flight vehicle and completed its first exercise demonstrating space vehicle to ground segment integration. Looking forward to the

production phase, we are also converting the unexercised cost plus space vehicle contract options to fixed price incentive contract options. As a result, GPS III continues to move forward and we fully expect that it will stay within the cost bounds we established in 2008. We are steadfast in the pursuit of affordability and effectiveness initiatives, including examination of alternative architectures as well as exploring dual-launch opportunities to lower costs of launching our next-generation satellites.

The GPS Next Generation Operational Control System, the modernized command and control system, will provide control of GPS IIA, IIF and III, satellites and signals, to include the new Military Code (M-code). The combination of GPS III capabilities, such as M-code, along with modernized user equipment and the new command and control system, will provide Joint warfighters vital capability in challenging environments, such as GPS jamming, as well as robust information assurance. It will ensure the use of the modernized signals by the U.S. and its allies for military purposes.

Space Situational Awareness

Space situational awareness underpins the entire spectrum of space activities, and our focus is on providing forces and capabilities to United States Strategic Command (USSTRATCOM) to detect, track, identify and characterize human-made objects which orbit the Earth. Our efforts contribute to the collaborative, multi-agency endeavor required to ensure comprehensive space situational awareness for the Nation.

Air Force Space Command presents space forces and capabilities to USSTRATCOM through the Fourteenth Air Force, under the command of Lieutenant General Susan Helms. She is dual-hatted as Commander, Joint Functional Component Command for Space (JFCC SPACE),

and therefore is responsible for executing USSTRATCOM's space operations. JFCC SPACE's Joint Space Operations Center (JSpOC) is the avenue through which JFCC SPACE commands and controls space forces and it is the epicenter of the space situational awareness mission. The JSpOC is also the means by which JFCC SPACE coordinates space situational awareness with other agencies.

To support national security space operations in an increasingly challenged environment, the JSpOC collects and processes data from a worldwide network of radar and optical sensors, as well as a dedicated space surveillance satellite. Each day the JSpOC creates and disseminates over 200,000 sensor taskings, which result in nearly 500,000 observations for processing. JSpOC operators use this data to maintain a very accurate catalog for more than 23,000 objects and to perform over 1,000 satellite collision avoidance screenings daily. These operations form the basis of the United States' space situational awareness capability, which is then shared with other operators in the national security, civil and commercial sector of space operations.

The Space Defense Operations Center (SPADOC) is the system of record for cataloging space objects and debris. While essential to safe passage and navigation in space, this system was designed in the 1980s, fielded in the early 1990s, and is at its capacity limits and past its originally projected end-of-life. It is vital to our national security space capabilities that we transition from our current surveillance and catalog maintenance-focused methodology, which limited us to performing forensic analysis during and after a space event (e.g., a collision, break-up or anti-satellite test), to a more holistic space situational awareness capability. We are building the capacity to predict events in space to enable actionable, situational awareness to our space operators, Joint warfighters, allies and other mission partners. This transition requires fielding the next generation system, the JSpOC Mission System (JMS). With its open, service-

oriented architecture, JMS will supply the automation necessary to make better use of the tremendous volume of available sensor data. It will allow improved integration of intelligence data and innovative changes to how we use our systems, thereby providing a more complete, real-time and predictive picture of activity in the space domain.

JMS does not just replace SPADOC, it establishes a baseline for integrating new command and control capabilities in support of the Commander, JFCC SPACE, and Combatant Commanders alike. We achieved a major milestone by completing the operational utility evaluation for the first increment and operational testing was completed on December 13, 2012. It is projected to achieve Initial Operational Capability this Spring.

On November 14, 2012, the U.S. Secretary of Defense and the Australian Minister of Defence signed a Memorandum of Understanding to relocate an Air Force C-band radar on Antigua to Australia. This action represents the next phase in implementing the 2010 U.S. and Australia Space Situational Awareness Partnership.

When the Space Fence program replaces the existing Air Force Space Surveillance System, it will represent an order of magnitude increase in the Nation's Space Situational Awareness capability in Low and Medium Earth Orbits. The program has an approved acquisition strategy that reduces cost, adds much-needed capability, and meets the prescribed initial operational capability timeline. We have selected the Kwajalein Atoll in the Marshall Islands as the first site for the new Space Fence, improving our ability to track objects in all low-earth orbits, and particularly providing unique coverage of low inclination orbits.

The Space Based Space Surveillance satellite, launched in 2010, provides timely, continuous optical surveillance of deep space objects. I declared initial operational capability August 15, 2012, and the Commander of USSTRATCOM accepted the satellite for operational

use on September 10, 2012. We continue to study options for a follow-on program to this vital capability.

Defensive Space Control

The Rapid Attack, Identification, Detection and Reporting System Block 10 program delivers global communication satellite signal interference detection and geo-location capabilities. The current operational prototype provides geo-location on over 500 electromagnetic interference events per month in support of U.S. Pacific Command and U.S. Central Command. Adversaries are getting more sophisticated and we are responding. By 2014, we plan to have global capability to identify and characterize electromagnetic interference and geo-locate electromagnetic interference sources.

Terrestrial Environmental Monitoring

We will extend a half century of Defense Meteorological Satellite Program (DMSP) unique weather monitoring capabilities by launching the final two satellites in the program. DMSP-19 is scheduled to launch in March 2014, and we expect to operate the satellite into 2020. We continue to store and maintain DMSP-20 for a launch on demand. The Joint Requirements Oversight Council has identified potential gaps in meteorological coverage when DMSP reaches its end-of-life in the 2025 timeframe. An Analysis of Alternatives is being conducted to study follow-on options, such as international partnerships, hosted payloads and a new satellite, to continue meteorological support to warfighters in the most cost-effective manner.

Assured Space Access/Spacelift

The 45th Space Wing at Patrick Air Force Base, Florida, and the 30th Space Wing at Vandenberg Air Force Base, California, supported a combined 14 commercial and Government launches in 2012 extending the record-breaking streak to 57 successful Evolved Expendable Launch Vehicle launches since 2002. The Undersecretary of Defense for Acquisition, Technology and Logistics authorized the Air Force to negotiate with the current launch provider, United Launch Alliance, to procure a block buy of launch vehicles while providing an opportunity for new entrant contract awards as early as FY15. Lieutenant Colonel Tobin Cavallari, from the Space and Missile Systems Center, is implementing this acquisition strategy to provide competition and to save over \$1billion.

In the area of new entrants, we have made significant progress toward increasing competition for national security space launches. Jointly with National Aeronautics and Space Administration and the National Reconnaissance Office, we formalized new entrant certification criteria. The Air Force subsequently developed a guide providing a process for certifying a new entrant to launch National Security missions. Additionally, two launch service task orders were awarded to a new entrant under the Orbital/Suborbital Program-3 to provide launch services for the Deep Space Climate Observatory mission and the Space Test Program-2 mission.

Satellite Operations

The Air Force Satellite Control Network, the Command's satellite command and control capability, enables critical missile warning, surveillance, weather and communications for our Joint warfighters. In 2012, Joint and allied space professionals used the network to conduct an average of 427 satellite contacts per day with a 99.37 percent contact success rate. They

supported 13 National Security Space launches and 19 space vehicle emergencies. On September 21, 2012 they accomplished a record 527 satellite contacts in a single day. Over the last two years the network successfully conducted over 316,000 supports – this was the busiest two years in its 50-year operational history.

In addition to this busy operations tempo, we upgraded the legacy electronics for the remote tracking station at Guam, modernizing our satellite control capability in the Pacific. Similar upgrades are in progress at the Hawaii remote tracking station, and upgrades will begin in 2013 at the New Hampshire remote tracking station. In the future, we will transition to a modern, secure internet protocol-based architecture, and we are examining the potential of commercial augmentation of our network.

United States Nuclear Detonation Detection System

In a Joint effort with the Department of Energy and Department of State, many Air Force satellites have hosted sensors supporting detection, location and reporting of nuclear detonations in support of warfighter needs and treaty verification requirements. We will continue to support our partners, and I am confident we can jointly determine how to maximize our limited resources while still satisfying the requirements for these sensors.

Field resilient, integrated systems that preserve the operational advantage

Resilient Architectures

Our satellites provide a strategic advantage for the U.S., and as such, we must consider the vulnerabilities and resilience of our constellations. My staff at Headquarters Air Force Space Command, alongside the team at the Space and Missile Systems Center, is leading efforts at balancing resilience with affordability. They are examining disaggregated concepts and

evaluating options associated with separating tactical and strategic capability in the missile warning and protected communications mission areas. We are also evaluating constructs to utilize hosted payload and commercial services, as well as methods to on-ramp essential technology improvements to our existing architectures. For example, we are learning lessons on how to make hosted payloads a realistic option through the Commercially Hosted InfraRed Payload Program, which is a pathfinder asset on orbit today. Beyond the necessity of finding efficiencies and cost savings, we may very well find that disaggregated or dispersed constellations of satellites will yield greater survivability, robustness and resilience in light of environmental and adversarial threats.

Electromagnetic Spectrum

Peacetime and warfighting operations are enabled via employment of a wide variety of advanced wireless systems, including satellites, aircraft, remotely piloted vehicles, land mobile radios, radars, data links and precision guided munitions. The Air Force Spectrum Management Office, led by Colonel Donald Reese, is tasked with preserving electromagnetic spectrum access for Air Force and selected Department of Defense activities and systems. Their efforts have been crucial to our ability to provide support using a variety of airborne and space-borne platforms to users across the globe.

The global and economic demand for this finite resource is continually increasing. In this environment, we strive to assure access for spectrum-dependent military systems and to maintain over 30,000 frequency assignments essential to Service and Joint operations, testing and training. We also support efforts to implement Presidential direction to identify available spectrum for broadband wireless services while protecting vital Air Force capabilities. We are working

closely with other federal agencies to implement actions to protect and advance U.S. and Air Force spectrum interests.

Provide highly skilled and innovative space and cyberspace professionals

Air Force space and cyberspace professionals are the backbone of our success. They provide expertise and innovation for current and expanding missions. To ensure deliberate development of this expertise, the Command manages the Air Force Space and Cyberspace Professional Development Programs for all Air Force specialties. These programs ensure we are providing a well-educated space and cyberspace cadre to units worldwide.

A highlight of my year was presiding over the opening of the Moorman Space Education and Training Center at Peterson Air Force Base, Colorado. On September, 13, 2012, the Center was dedicated in honor of General (Retired) Thomas S. Moorman, Jr., a champion of space professional development. The opening of this center enhances the training provided to the more than 2,500 space professional students from across the Services and allied nations each year. These students receive specialized space system training and professional continuing education at the Advanced Space Operations School and the National Security Space Institute.

Given the technical nature of the space and cyberspace domains, it is essential we have Science, Technology, Engineering and Math (STEM)-educated people in our units. We are strengthening our education requirements in space and cyberspace, but we realize we compete with decreasing numbers of STEM graduates, a national security problem in its broadest sense. Therefore, we are actively promoting the benefits of STEM degrees, starting with elementary school and continuing through the entire educational process. As an example, our cyberspace professionals in 24th Air Force, under the leadership of their commander, Maj Gen Suzanne

Vautrinot, mentor local teams competing in CyberPatriot, a national high school cyber defense competition created by the Air Force Association. In Colorado, Peterson Air Force Base and Buckley Air Force Base have both applied for acceptance into the STARBASE program, a Department of Defense program exposing youth to technological environments and appropriate role models. We believe our investment today in young people is a cornerstone for our success in the future.

Conclusion

The men and women of Air Force Space Command accomplish our mission through a combination of innovation, passion and courage. They are the core of America's space and cyberspace team operating in domains that span the globe. Our single focus endures: providing the best capability possible to ensure success on the battlefield. The Joint warfighter demands it, and the Nation expects nothing less, and therefore, Air Force Space Command remains steadfast in delivering game-changing space and cyberspace forces.

However, we face a new, daunting challenge: providing these foundational capabilities in an environment of sequestration. The very rigid mechanics of the Budget Control Act of 2011 force us into corners, rather than giving us needed flexibility to accommodate current and future budget reductions. In my Command alone, I had to find \$508 million in FY13 reductions beginning March 1, 2013. The chaos created in my Command by operations and maintenance reductions this large, in this short time period, can't be overstated. It starts with the justifiable angst of my civilian workforce, facing the prospect of a significant pay cut starting in June for the remainder of the fiscal year. AFSPC Headquarters support contracts have been reduced by 50%, which means lost jobs and reduced staff technical expertise. Operationally, two missile

warning radars will not operate at full capacity for the rest of the year, one of which is key to our missile defenses. A unique space surveillance system's coverage will be reduced by one-third, compounding the loss of space surveillance data normally collected by the aforementioned radars we've been forced to scale back. These are not operational decisions arrived at lightly; the so-called "easy" reductions were taken in previous years. We've minimized overall operational impacts as much as possible, but the rigidity in the law dictates we must cut every appropriated line item in our budget, severely restricting our trade space. I strongly ask for your support for the reprogramming actions that will be needed to enable smarter decisions.

I am truly privileged to lead this great Command and I appreciate the opportunity to represent Air Force Space Command before this Committee.