

**NOT FOR PUBLICATION UNTIL RELEASED  
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: MILITARY SPACE PROGRAMS IN REVIEW OF THE DEFENSE  
AUTHORIZATION REQUEST FOR FISCAL YEAR 2013 AND THE  
FUTURE YEARS DEFENSE PROGRAMS**

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

**March 21, 2012**

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## **Introduction**

Mister Chairman, Senator Sessions and distinguished members of the Subcommittee, it is my honor to appear before you today as the Commander of Air Force Space Command (AFSPC).

I am privileged to lead over 42,000 Active Duty, Guard and Reserve Airmen; government civilians; and contractors delivering space and cyberspace capabilities around the world for our Nation. The men and women of AFSPC accomplish our mission at 134 worldwide locations, yet we operate in the space and cyberspace domains where borders are nonexistent. AFSPC space and cyberspace capabilities are integral to Joint warfighting, as well as the daily lives of all Americans, and our professionals are passionate in their commitment to excellence and mission success.

This year AFSPC celebrates its 30th anniversary, and for over two of those three decades, the Command has been involved in continuous combat operations. While AFSPC has evolved over the years, with the inclusion and then departure of intercontinental ballistic missile responsibilities, and the relatively new addition of cyberspace operations, a single focus has endured: providing the best capability possible to ensure success on the battlefield.

On January 5, 2012, the Secretary of Defense released a new strategy document titled Sustaining U.S. Global Leadership: Priorities for 21st Century Defense. This new strategy identifies the need to operate effectively in space and cyberspace by stating, “Modern armed forces cannot conduct high-tempo, effective operations without reliable information and communication networks and assured access to cyberspace and space.” Space and cyberspace forces are key components to the Nation’s ability to project power. In concert with the strategy, our mission is to provide resilient and cost-effective space and cyberspace capabilities for the

Joint force and the Nation. AFSPC's activities are guided by three priorities: support the current fight; control space system costs and deliver capabilities on time and on budget; and for the purpose of organizing, training and equipping, we are operationalizing and normalizing Air Force efforts involving cyberspace. From these general priorities we have adopted three goals to ensure mission success: provide assured full spectrum space and cyberspace capabilities; field resilient, integrated systems that preserve the operational advantage; and provide highly skilled and innovative space and cyberspace professionals. The remainder of the statement is organized around these goals.

### **Provide assured full spectrum space and cyberspace capabilities**

Our ability to detect launches, track missiles, navigate with precision, detect nuclear events, support military communications requirements, improve space situational awareness, predict weather, and perform operations in cyberspace are all foundational to the way the Joint force fights today. We depend on the vast capability of our Fourteenth Air Force, Twenty-Fourth Air Force (24 AF), the Space and Missile Systems Center (SMC), Air Force Network Integration Center (AFNIC), Space Innovation and Development Center (SIDC), and the Air Force Spectrum Management Office (AFSMO) to acquire and operate these space and cyberspace systems. The precision and responsiveness needed to deter aggression and win America's wars stem from our ability to integrate and synchronize capabilities across the full range of military operations and all warfighting domains. In space, the Command is deploying the next generation of spacecraft and continuing to provide technologically advanced capabilities. Also, we are pursuing international agreements to expand missile warning, space-based communication capabilities and space situational awareness (SSA). In cyberspace, the

Command is expanding collaboration with our Joint, interagency, and international partners on several initiatives to safeguard our access to the domain. We are operationalizing the Air Force's approach to cyberspace with emphasis on protecting the Air Force infrastructure, developing expertise to meet mission needs, and accelerating our acquisition processes to match the rate of change in cyberspace.

***Missile Warning (Launch Detection and Missile Tracking)***

Our ability to provide strategic missile warning is critical to the Nation's survival. Ballistic missiles also pose a significant threat to deployed U.S. forces and our allies. AFSPC operates both space- and ground-based sensors, providing correlated data that supports the strategic and tactical missile warning missions. Our space professionals continue to improve upon our missile warning capabilities and processes to better alert and inform our commanders. In United States Central Command (USCENTCOM), Captain Kara Sartori, Chief of the Combat Operations Division Space Cell at the Combined Air and Space Operations Center, built revolutionary new procedures which provide more accurate and timely missile warning, thereby better protecting personnel assigned across the USCENTCOM theater of operations.

***Space Based Infrared Systems (SBIRS)***

The Space Based Infrared System (SBIRS), along with the legacy Defense Support Program satellites, provide advanced early warning of hostile missile threats, allowing our warfighters to take swift and precise action. The Active Duty and Reserve Airmen of the 460th Space Wing, Buckley Air Force Base (AFB), CO, as well as assigned British, Canadian and Australian personnel, provided United States Combatant Commanders (COCOMs), coalition partners and allies assured warning for nearly 200 missile launches in 2011. They also reported 7,100 special infrared events--an 82% increase from 2010. Part of that increase was due to the

work of Captain William Sanders and Staff Sergeant Justin Rutherford, 11th Space Warning Squadron, Schriever AFB, who developed new and innovative ways to use the data from these sensors to identify more events of interest to the warfighter.

In May 2011, AFSPC launched the program's first SBIRS Geosynchronous Earth Orbit (GEO) satellite and early mission data are exceeding expectations. This system detects dimmer, shorter duration infrared events and provides more accurate missile launch and impact point predictions than the Defense Support Program satellites. To reduce costs on future acquisitions of these vital satellites, Colonel Michael Guetlein from SMC, Los Angeles AFB, CA, and his program management team streamlined schedules, reduced contractor overhead, and achieved production efficiencies. This effort, and many more like it, will ensure affordable capability well into the future.

The Air Force FY13 request for SBIRS Research, Development, Test and Evaluation (RDT&E) and Procurement is \$950M, paced by ground development and continuing efforts on SBIRS GEO satellites 3 and 4 as well as the procurement of SBIRS GEO satellites 5 and 6. We are requesting the use of advance appropriations to fully fund satellites 5 and 6.

#### *Upgraded Early Warning Radar (UEWR)*

The UEWR radars are ground-based components of missile warning and missile defense against current and emerging ballistic missile threats. They also provide space object tracking data to help achieve space situational awareness. Throughout 2011, we continued work with the Missile Defense Agency to finalize UEWR deployments to Beale AFB, CA, Royal Air Force Fylingdales, United Kingdom and Thule Air Base, Greenland. In 2012, we will begin the process to upgrade Clear Air Force Station, AK and Cape Cod Air Force Station, MA to the UEWR configuration. At the operational units, long-time system experts, like Mr. Clennis

Burress at Beale AFB, CA, analyzed data from the upgraded radar to assess performance on recent space and missile events. Using his experience and creativity, he has devised ways to extract even more capability from these radars.

### ***United States Nuclear Detonation (NUDET) Detection System (NDS)***

The NDS has maintained the global situational awareness needed by our national decision-makers and monitored nuclear treaty compliance since the early 1960s. NDS payloads are hosted on the Global Positioning System (GPS) satellites and our Defense Support Program satellites. This capability is also included in the next generation of GPS satellites. The Department of Energy and AFSPC are conducting studies to determine the most effective solution to a long-term space-based NDS architecture.

### ***Positioning, Navigation and Timing (PNT)***

It is difficult to overstate the impact of GPS on the world. On-line banking, vehicle navigation systems, precision farming, cellular phone location for emergency purposes, precise military operations--these are all enabled by GPS. Last October, I was honored to accept, on behalf of the GPS program, an award from the International Astronautical Federation on the occasion of their 60th Anniversary. The award was given to the program which most benefitted mankind throughout the entire 60 year history of the Federation. I was joined by Colonel (Retired) Bradford Parkinson, who is universally regarded as the father of GPS, and the current program manager, Colonel Bernard Gruber.

The GPS program made great strides in 2011. We improved the security and functionality of GPS-enabled military systems by providing for over-the-air distribution of rekeying for our military receivers. Under the leadership of Captains Vernon Reddick and Jayson Andersen from the 2nd Space Operations Squadron, Schriever AFB, we completed the

final phase of an operation called “Expandable 24”--the largest satellite repositioning effort in GPS history. The constellation is now optimized for terrestrial coverage in challenging environments such as cities with tall buildings and the mountains and valleys of Afghanistan.

Through the summer and fall of 2011, Captain Justin Deifel from SMC’s GPS System Program Office, Los Angeles AFB, expertly led three rigorous tests on behalf of the National Space-Based PNT Systems Engineering Forum to quantify the potential for interference to military and civilian GPS users from LightSquared’s proposed terrestrial network. His technical prowess and objectivity ensured these nationally significant tests were professionally accomplished in a thorough, fact-based manner.

We currently have 34 GPS satellites on-orbit with a combined 380 years of service. The oldest GPS operational satellite on orbit was launched 21 years ago. The second launch of our newest version, GPS-IIF, occurred in July 2011. Captain Steve Dirks from our GPS Reserve Associate Unit, 19th Space Operations Squadron, Schriever AFB, led the check-out of the satellite, integrating it into the operational constellation in August 2011. GPS-IIF satellites are a major component of the GPS modernization process: introducing greater accuracy through advanced atomic clock technology, providing military signals that are more resistant to jamming, adding a new “safety of life” civilian signal, and lowering operating costs through a longer design life. Development of the next generation satellite, GPS-III, is on-cost and on-schedule. These satellites add a fourth civil signal to the constellation and complete the deployment of two civil signals and military signal capabilities that began with earlier GPS satellites. GPS-III will allow us to affordably sustain and modernize the constellation. AFSPC will continue to be proud stewards of this incredible capability, and in line with the National Space Policy, we will strive to ensure it remains the gold standard for global timing and navigation.

With the ubiquitous use of space systems, to include GPS, in the USCENTCOM Area of Operations, AFSPC forward deploys experts to ensure warfighter needs are satisfied. Captain Bryony Veater, assigned to the 504th Expeditionary Air Support Operations Group in Afghanistan, provided critical forward-based space expertise and training to help deployed forces fully exploit GPS capabilities. As an example of the versatile use of GPS, USCENTCOM performs the precision airdrop of supplies with the Joint Precision Air Drop System, using GPS guided, steerable parachutes. In November 2011, USCENTCOM used this system to airdrop 18,000 pounds of winter fuel to Air National Guard soldiers from my home state of Oklahoma, at Combat Outpost Herrera in eastern Afghanistan.

The Air Force FY13 request for GPS III in RDT&E and Procurement is \$1.264B, which continues GPS III space and ground segment RDT&E and procures additional GPS III Space Vehicles.

### ***Military Satellite Communications (MILSATCOM)***

The demand for MILSATCOM continues to grow as warfighters increasingly depend on information relayed from space, especially for today's distributed operations in this era of information-enabled warfare. Our protected and survivable MILSATCOM supports Presidential communications, forms the backbone of our Nuclear Command and Control System, and provides services for operations in contested environments. MILSATCOM also enables day-to-day communications in more benign environments. There are 18 MILSATCOM satellites on-orbit with a combined 183 years of service.

### ***Advanced Extremely High Frequency (AEHF)***

The first satellite in the next generation of protected and survivable MILSATCOM, AEHF-1, reached geosynchronous orbit in October 2011, approximately 14 months after a



spacecraft propulsion anomaly had stranded the satellite far short of its operational orbit. The AEHF-1 operations team designed an innovative orbit-raising strategy to preserve the planned 14-year design life of the satellite. The team, led by Mr. David Madden, SMC, is a finalist for an Aviation Week Laureate Award to recognize their extraordinary achievement. Each AEHF satellite will provide a ten-fold throughput increase over Milstar in secure, jam-resistant communications for national leaders, COCOMs and our international partners--Canada, the Netherlands and the United Kingdom.

The Air Force FY13 request for AEHF RDT&E and Procurement is \$786M, which provides for remaining development efforts and continued procurement of AEHF Space Vehicles 5 and 6. We are also requesting the use of advance appropriations to fully fund satellites 5 and 6.

*Wideband Global SATCOM (WGS)*

The WGS system provides flexible, high-capacity communications to the Department of Defense, the White House Communications Agency and the State Department. Each satellite improves on the communications capacity, connectivity and flexibility of legacy systems, allowing for seamless crossbanding between users with X and Ka frequency band terminals. WGS supported the Reagan Carrier Strike Group as it provided humanitarian assistance and disaster relief support to Japan in the aftermath of the 2011 Tohoku earthquake and tsunami, allowing users outside of Japan with Ka-terminals to communicate directly with users in Japan with X-band terminals.

WGS-4, the first WGS Block II satellite, launched this past January. These satellites were developed in direct response to warfighter feedback and will support the transmission of airborne intelligence, surveillance and reconnaissance imagery at data rates approximately three times greater than those currently available on Block I satellites. In addition, we are exploring

future enhancements to WGS that will deliver even more flexibility and capacity as we incorporate commercial technology advances and cost-saving practices into the system.

We are especially proud of the robust international partnerships we have formed as part of this program. Australia provided funding for WGS-6, and in January 2012, the Department of Defense and counterpart agencies from Canada, Denmark, Luxembourg, Netherlands and New Zealand signed a Memorandum of Agreement to procure WGS-9 through a cooperative effort.

### *Space Situational Awareness*

SSA is fundamental to everything we do in space. As our dependence on space capabilities increases, and as the number of space faring nations and objects in space increase, so does the need to improve our SSA. We have a vast amount of SSA data, but we cannot yet fuse those data into a single, correlated, comprehensive situational awareness picture. The Joint Space Operations Center (JSpOC) Mission System (JMS) program will correct this shortfall.

### *Joint Space Operations Center*

The JSpOC, at Vandenberg AFB, is the primary national security space command and control center for our Nation. Thanks to the dedicated efforts of Airmen such as Major Brian Capps and Master Sergeant Thomas Clark, during one noteworthy surge period, the JSpOC provided simultaneous support to day-to-day global space missions, USCENTCOM activities, United States Africa Command military operations in Libya and humanitarian assistance and disaster relief efforts in Japan. In 2011, JSpOC personnel provided SSA in support of COCOMs by processing 155 million sensor observations and tracking approximately 22,000 man-made objects. They provided reentry warning and analysis for 72 high-interest objects, including the National Aeronautics and Space Administration's decommissioned Upper Atmosphere Research Satellite, and most recently, the Russian Phobos-Grunt spacecraft.

While accomplishing their complex missions, JSpOC personnel manage and update the catalog of all man-made objects that orbit the earth using a system called the Space Defense Operations Center which has been operational since the mid-1980s, and which hasn't had a major software upgrade since the early 1990s. The replacement for this legacy system is the JMS. It will automate many of the tasks done manually today and will incorporate traditional and non-traditional sensor inputs to produce relevant, actionable information for the Commander, Joint Functional Component Command for Space, currently Lieutenant General Susan Helms. In 2011, we completed the restructure of the JMS acquisition program to significantly lower costs, better align initial capability deliveries with warfighter needs and more efficiently execute the program. This streamlined approach leverages existing industry and government investments, while providing on-ramps for industry to contribute products. Initial Operational Capability of the first increment is scheduled for the end of 2012.

The Air Force FY13 request for JMS in RDT&E is \$54.6M, which continues incremental upgrades to SSA and Space Command and Control capabilities.

### ***Weather***

The Defense Meteorological Satellite Program (DMSP) celebrates its 50th anniversary in 2012. We will extend the tradition of a half century of unique and superb weather forecasting capabilities when we launch the final two DMSP satellites later this decade. Following the Congressional direction in the FY12 budget, the follow-on program to DMSP was cancelled. We will conduct a study this year to define a lower cost, yet capable, weather satellite follow-on program.

## *Cyberspace*

National and Department of Defense leaders recognize the criticality of operations and freedom of action in cyberspace. As the pace of technological, environmental and geopolitical change quickens, the ability of Joint Force Commanders to defend America's interests will increasingly rely on the access, persistence and awareness provided by cyberspace systems and capabilities. To that end, 24 AF is taking a disciplined approach to cyberspace operations to significantly increase our security posture, defend freedom of action, leverage our effectiveness across Joint and coalition operations, and be more efficient with resources consumed for and by our Air Force cyberspace enterprise.

We are presenting cyberspace capabilities, organized by fixed and expeditionary forces, to support our Air Force and Joint Commanders' objectives and required effects. In 2011, cyberspace operators from 24 AF supported five COCOMs in more than 25 operations. Our deployed cyberspace experts facilitated interaction with the COCOMs, contributing to the success of these Joint operations. For Operation ODYSSEY DAWN, Captain Michael Piersimoni deployed from the 624 Operations Center (OC) to assist with United States Africa Command's efforts to leverage cyberspace effects.

In the area of cyberspace operations and innovation, we are pursuing practices to expeditiously leverage new technologies in a cost-effective manner--essential to staying ahead of emerging threats and achieving desired end states. With the help of programmers like Staff Sergeant Ryan Knight and testers like Captain Benjamin Truax, the 688th Information Operations Wing, Lackland AFB, is exercising rapid cyberspace capability innovation processes. In just seven days, they met COCOM needs by developing and testing a new cyberspace capability; creating tactics, techniques and procedures; and training operators. Using similar

processes, we were able to expeditiously deliver 28 new cyberspace enhancements to support warfighter urgent needs in 2011.

We are also building a consolidated Air Force Network, known as the AFNet. Major General Suzanne Vautrinot, 24 AF Commander, leads the operation and defense of this network for the Air Force as the AFNet Operations Commander. We continue to make progress toward consolidation of the AFNet projected for completion by the end of FY13. As of February 13, 2012, Major Gregory Roberts, 561st Network Operations Squadron, Detachment 3, Scott AFB, IL, and Mr. Nick Davenport, AFNIC, also at Scott AFB, led the migration of 34 bases onto the AFNet, retiring 30 legacy networks and collapsing 104 connections to the Global Information Grid to 16 defensible gateways. These significant steps reduce the costs to operate and enable us to better defend our complex network, supporting over 845,000 users. Operating the network under the principle of centralized control and decentralized execution cleared the way for Senior Airman Zane Williams and other members from the 561st Network Operations Squadron's Detachment 1 at Hickam AFB, HI, to restore AFNet connectivity and services less than five hours after the Tohoku earthquake and tsunami.

Our Combat Communications units execute another facet of the cyberspace mission by extending our networks and providing communications to disadvantaged users. Due to the planning efforts of individuals such as Captain David Cox, 54th Combat Communications Squadron, Robins AFB, GA, combat communications personnel provided "last out" communications for redeploying United States combat forces from Iraq. In one case, members of the 263rd Combat Communications Squadron, an Air National Guard unit, volunteered for a short notice deployment, establishing critical communications for the 332nd Air Expeditionary Wing as it relocated from Joint Base Balad in Iraq. In Afghanistan, Staff Sergeant Stephen

Herron, from the 52nd Combat Communications Squadron, Robins AFB, received the Bronze Star for his actions as the sole communications member assigned to an Explosive Ordnance Disposal Joint Task Force where he provided tactical communications and force tracking capabilities for ten teams. Within the United States, our Combat Communications Guardsmen supported firefighters near Bastrop, Texas, as well as recovery efforts following the tragic tornado in Alabama.

### *Director of Space Forces*

Our space professionals are assigned and deployed to COCOMs around the globe. In January, I met with Colonel Clinton Crosier, the Air Force Central Command Director of Space Forces, and his team. Captain Tracy Lloyd is revolutionizing how the DoD is providing operations planning products for GPS-enabled systems--making them more combat relevant. Major Natalie Mock and Captain Abraham Brunner are using the multi-spectral Operationally Responsive Space-1 (ORS-1) satellite to solve tough intelligence problems in theater. Colonel Crosier's staff is working hand-in-hand with Lieutenant Colonel Chad Le'Maire, from the Cyber Operations Liaison Element, to oversee systems that bring to bear the full synergy of integrated space and cyberspace capabilities in the USCENTCOM Area of Responsibility.

Colonel Alan Rebholz, the Pacific Air Forces Director of Space Forces, and the team of space professionals in the Pacific are integrating space at new levels as the emphasis increasingly turns to this area. Major Robert McConnell, a space professional in the Strategy Division of the 613th Air and Space Operations Center, and his teammates are planning the space operations portion of Exercise TERMINAL FURY 2012, which will be conducted simultaneously with United States Strategic Command's GLOBAL LIGHTNING exercise. This combined exercise will have an unprecedented, robust space scenario involving participants across the globe.

## **Field resilient, integrated systems that preserve the operational advantage**

Our second goal is to field resilient, integrated systems that preserve the operational advantage. As the Air Force lead for the space and cyberspace domains, AFSPC is working hard to build efficient architectures and processes. We are defining better ways of doing business to decrease cost while delivering resilient, integrated and affordable space and cyberspace systems--without compromising mission assurance. As part of our efficient approach, the Command is leveraging the Total Force—Active Duty, Guard, and Reserve Airmen; government civilians; and contractors--across all areas within the Command.

### ***Launch, Ranges, and Networks***

Every on-orbit space capability begins with a successful launch--there is no room for error in the launch business. Our 45th Space Wing at Patrick AFB, FL, and our 30th Space Wing at Vandenberg AFB, operate the Eastern and Western Ranges, respectively. They supported a combined 19 commercial and government launches in 2011, including the final 3 Space Shuttle missions. They also conducted over 2,500 weapon system tests, aeronautical tests and launch support operations. Our emphasis on mission assurance underscores an unprecedented record in the history of space flight--83 consecutive successful National Security Space launches since 1999. Mission assurance is a rigorous, structured and disciplined application of systems engineering, risk management, quality assurance, and program management principles throughout a space system's life cycle.

Launch is often the greatest risk to any space system. There are many examples of how rigorous mission assurance detected and corrected issues that would have led to launch failures if uncorrected. We have a dedicated team of mission assurance technicians at both launch bases performing meticulous quality control for launch operations. On the East Coast, Master Sergeant

Michael Claus, 5th Space Launch Squadron, identified a safety violation during hardware movement operations, preventing costly damage to the Atlas V assigned to the Navy's Mobile User Objective System satellite. On the West Coast, Staff Sergeant Paul Lillie from the 4th Space Launch Squadron, Vandenberg AFB, observed and reported a leak in a valve during processing of an Atlas V in preparation for an April 2011 National Reconnaissance Office mission. Failure of this component during launch would have prevented proper orbital insertion of the payload, leading to mission failure.

Mission assurance also includes careful oversight of spacecraft processing at the launch base in preparation for launch. Captain Amanda Zuber and other members of the 45th Launch Support Squadron, Patrick AFB, performed spacecraft mission assurance activities for the first SBIRS GEO spacecraft, which is now exceeding performance expectations on-orbit. Air Force launch and range services are on track to support 11 Evolved Expendable Launch Vehicle missions in 2012: 8 National Security Space launches, 2 National Aeronautics and Space Administration launches, and 1 commercial Orbital Test Vehicle launch.

Due to the critical dependence of the space mission on our launch capabilities, the Air Force established a Program Executive Office for Space Launch to provide a focused effort as we define the future of space launch. In November 2011, the Air Force Service Acquisition Executive approved a new acquisition strategy addressing industrial base viability and cost growth while making provisions to leverage emerging competition. The Air Force, in cooperation with the National Reconnaissance Office, is committed to an annual production rate of launch vehicles, creating more predictability and stability in the program. In addition, the Air Force published a New Entrant Certification Guide, providing a structured certification process by which prospective commercial launch providers become eligible to compete for national



security launch service contract awards. Both the annual production rate commitment and the leveraging of new entrants are key elements we must balance as we conduct the FY13 through FY17 acquisition program, led by Colonel William Hodgkiss, our program manager at SMC. This acquisition program will define the landscape for National Security Space assured access into the next decade.

The Air Force FY13 request for the Evolved Expendable Launch Vehicle Procurement is \$1.680B, which provides launch infrastructure and boosters for national security space launches.

For many of our Nation's most critical satellites, the Air Force Satellite Control Network provides launch support, the capability to receive satellite data, and command and control of these spacecraft once on-orbit. In 2011, our space professionals used the network to conduct over 159,000 satellite contacts, support 15 launches and more than 20 space vehicle emergencies, averaging 450 satellite contacts per day. The network added a new operational antenna in Diego Garcia, doubling our capacity in the Indian Ocean to support satellite operations and to meet near-real-time warfighter, weather, missile warning, PNT, surveillance and communication needs. We are modernizing the Air Force Satellite Control Network by replacing its decades-old communication, scheduling, and antenna systems.

### ***Commercially Hosted Infrared Payload***

One avenue AFSPC is exploring for improving system resiliency is the concept of hosting government payloads on commercial satellites. The Commercially Hosted Infrared Payload is a government infrared payload hosted on the SES-2 commercial spacecraft. From program initiation to launch in 39 months, this payload successfully reached orbit with its host, after launch on a European Ariane V rocket from Kourou, French Guiana in September 2011. This mission is providing lessons learned on the operational- and cost-effectiveness of hosting

government payloads on commercial satellites, while also demonstrating a potential approach to mission resiliency.

### ***Defensive Space Control***

We rely on resilient architectures complemented with passive and active defense measures to deter, and if necessary, defeat potential adversary attacks against our forces. In the defensive space control mission, the Rapid Attack, Identification, Detection, and Reporting System Deployable Ground Segment-0 (RDGS-0), continues its trend of sustained excellence in the USCENTCOM Area of Responsibility. In the past year, the members of the 16th Space Control Squadron, Peterson AFB, CO, and its collocated Reserve Associate unit, the 380th Space Control Squadron, deployed the Bounty Hunter system to increase the capability of RDGS-0. The current deployment team, led by Major Matthew Wingert from the 380th Space Control Squadron, and Master Sergeant Timothy Tennerman from 460th Space Wing, are helping protect the vital communications links across all of USCENTCOM's operations.

### ***Responsive Capabilities***

In 2011, the Air Force launched two space systems demonstrating responsive space principles. ORS-1 launched in June 2011 on a Minotaur I rocket from the National Aeronautics and Space Administration Wallops Flight Facility, Wallops Island, VA, only 32 months from program initiation. USCENTCOM began using the imagery products from this satellite one month later. Personnel from the 1st Space Operations Squadron and their Reserve Associate Unit, the 7th Space Operations Squadron, at Schriever AFB, are using the Multi-Mission Satellite Operations Center to command and control the satellite. This command and control suite is AFSPC's first step toward a common ground system across multiple satellite programs,

with the goal of reducing ground system costs for new programs. Captain David Gwilt from SMC is leading the maturation of this architecture.

The second Orbital Test Vehicle, X-37B, mission launched in March 2011 and has surpassed the first mission's eight-month duration, proving the flexibility of this unique system. Major Scott Babb, from the SIDC 3rd Space Experimentation Squadron, is leading the operations team as they explore the capabilities of this system.

### ***Electromagnetic Spectrum***

Electronic devices are pervasive in modern warfare, increasing the demand for electromagnetic spectrum access. AFSPC's AFSMO preserves access to the electromagnetic spectrum for Air Force and selected Department of Defense activities. Mr. Joseph Sulick and his team maintained over 30,000 frequency assignments essential to test, training, Joint and Service exercises and operations. AFSMO's strategic planning efforts, led by Mr. Frederick Moorefield, focus on assuring the continued and improved spectrum access required for critical military systems as both national and international demand increases for finite spectrum resources. Within the United States, they are supporting the President's direction to identify spectrum for broadband wireless services. Internationally, they are engaged with the U.S. delegation to the United Nations International Telecommunication Union's World Radiocommunication Conference to protect United States and Air Force spectrum interests.

### ***Single Integrated Network Environment***

The Air Force requires an integrated enterprise network to assure core cyberspace capabilities. Colonel Rizwan Ali, Commander of AFNIC at Scott AFB is forging the AFSPC Single Integrated Network Environment into reality. Mr. Frederick Chambers and his team of professionals are collaborating with leaders from SMC, 24 AF and my staff to achieve the

desired end state of seamless information flow across terrestrial, air and space domains.

Networthiness, as a component of the Single Integrated Network Environment, will offer integration and interoperability for Air Force networks.

To fuse partnerships with industry leaders, Lieutenant Colonel Jeri Harvey led the Air Force's inaugural Software Development Forum. During the forum, AFNIC announced upcoming changes to Air Force standards for integrating and supporting applications across the AFNet. These standards will increase our security posture while reducing the number of network resources required. The Software Development Forum, along with other efforts, will help us to provide cyberspace network-centric capabilities to the warfighter.

### **Provide highly skilled and innovative space and cyberspace professionals**

Our third goal is to provide highly skilled and innovative space and cyberspace professionals. AFSPC is educating, training and cultivating experts skilled in space and cyberspace capabilities and their integration across the full range of military operations in all domains. They are tactically and operationally proficient, and are ready to deploy at a moment's notice.

#### ***Space Education, Training, Wargames and Exercises***

Each year, the SIDC's Advanced Space Operations School (ASOpS) provides advanced training to more than 1,930 DoD personnel, while the National Security Space Institute (NSSI) provides space professional certification courses to over 800 personnel from all Services and military representatives from select allied nations. At the end of 2011, the Air Force had over 13,000 certified space professionals. The MILCON project to house ASOpS and NSSI on Peterson AFB is near completion and a ribbon-cutting ceremony is scheduled for this spring.

The Schriever Wargame series is a valuable tool for examining the opportunities and threats inherent to the space and cyberspace environments. The Wargame Director, Major David Manhire, from the SIDC, Schriever AFB, will execute the Schriever 2012 Wargame in two phases with a renewed focus on the operational level of planning. The International Wargame is based on a contingency operation, involving North Atlantic Treaty Organization nation participation on the game floor for the first time. In September 2012, Australia, Canada and Great Britain will join the United States in executing the second phase of the Wargame.

Last year marked the first time a tactical space unit participated in a Distributed Mission Operations exercise from their home station. The SIDC's Distributed Mission Operations Center for Space served as the environment for the 2nd Space Warning Squadron at Buckley AFB, to provide theater ballistic missile warning to the 612th Air and Space Operations Center at Davis-Monthan AFB, AZ. SIDC also premiered the GPS Environment Generator during a Blue Flag exercise. This system generates realistic degraded navigation effects and weapons accuracy, allowing operators and planners to see the direct influence of anticipated hostile and non-hostile GPS interference. Further integration of this model is in work to allow aircrews to plan and employ weapons in a virtual environment.

### ***Cyberspace Education, Training and Wargames***

The Air Force must have professionals capable of integrating cyberspace capabilities across the warfighting domains. Under the Cyberspace Professional Development Program, Total Force personnel receive continuing education to progress from a foundation of fundamentals, through demonstrated depth of knowledge of experience and application, to a strategic understanding of cyberspace. In December 2011, the Air Force formalized this

program to include a certification process. We now have over 5,200 Air Force Total Force personnel certified as cyberspace professionals.

In partnership with Air Education and Training Command and Air Combat Command, AFSPC continues to build a highly skilled cyberspace work force by providing cyberspace training at all levels of the Air Force. The 333rd Training Squadron at Keesler AFB, MS graduated the first class of enlisted Cyberspace Defense Operators. With the dedicated efforts of Airmen such as Captain Laura Sepeda, the 39th Information Operations Squadron, Hurlburt Field, FL, graduated the first class of students from Intermediate Network Warfare Training in 2011. They also developed the first Initial Qualification Training, allowing cyberspace operators to arrive at operational units fully qualified to perform the mission. Members of this squadron received the 2011 United States National Cybersecurity Innovation Award from the SANS Institute for “Developing World-Class Cyberspace Talent” through their use of simulators and training ranges to allow students to conduct defensive cyberspace operations. The Air Force Institute of Technology’s Cyberspace Technical Center of Excellence began conducting the Cyberspace 200 and 300 intermediate and advanced professional development courses in June 2010. Through the end of 2011, they have graduated 754 people from these courses. In June 2012, the United States Air Force Weapons School at Nellis AFB, NV will conduct the first Cyberspace Weapons Instructor Course. Once the students complete this difficult six-month course, the initial cadre of weapons officers will be instrumental in developing unit level tactics and supporting operational level planning to meet the challenges of evolving cyberspace threats.

Red Flag is the Air Force’s advanced aerial combat training exercise. During Red Flag 2011-3 missions, Major Benjamin Montgomery, 624 OC, made history as the first cyberspace operator to lead an exercise event as the designated Mission Commander--integrating full

spectrum capabilities into Air and Space Operations Center mission planning and operations. Red Flag is the ideal venue for demonstrating and exercising full spectrum cyberspace capabilities and we intend to continue on this path.

Our cyberspace operators reached a major milestone with the planning and execution of the first Cyber Flag in October 2011 at Nellis AFB, NV. This Joint exercise fused cyberspace across the full spectrum of operations against a realistic and thinking enemy in a virtual environment. Personnel from the AFNIC Simulator Training Exercise Division, led by Major Russell Montante, gave cyberspace operators the opportunity to gain hands-on experience in protecting, defending and fighting in a safe realm without impact to operational networks.

Technically educated U.S. citizens are a national resource--vital to national security, and essential to our ability to operate in, from and through the space and cyberspace domains. The Air Force provides world class space and cyberspace education and training that builds on our Airmen's secondary and university education. However, increasingly fewer of our Nation's students are pursuing STEM (science, technology, engineering and math) degrees. As many STEM-educated professionals reach retirement age in this country, the lack of technically educated U.S. citizens creates serious shortfalls in many industries, which results in tough competition for this vital resource. As a Nation, we must comprehensively address this shortage in technical talent if we hope to maintain our advantage in an increasingly complex global environment.

**Continue to take care of people--our most treasured asset, America's sons and daughters**

As AFSPC reaches our three goals, we remember that our first and highest priority is to support our Nation's warfighters in harm's way--to give them the tools needed to fight and win as

quickly and safely as possible. At the same time, we maintain a continuing focus on ensuring our military and their families have access to necessary services on the homefront.

In Colorado Springs, AFSPC partnered with the local community on several initiatives. One element of this partnership is providing resources for those dealing with Post Traumatic Stress Disorder and Traumatic Brain Injuries as they transition to civilian life.

This summer, the Los Angeles AFB Airman and Family Readiness Center, working with the Air Force Recovery Care Coordinator for California, intervened in the military out-processing of one of our highest decorated heroes. They guided him through the process to receive a medical retirement, vice separation, allowing for continued access to the medical care he needs to recover. The team also provided support when this quiet hero lost a family member in combat in Afghanistan.

This spring, Colorado Springs is once again hosting the Warrior Games. These athletic endeavors allow wounded and seriously ill service members to incorporate sports training as a part of their overall transition and recovery plan. It is the Command's privilege to support this event and help honor our Nation's Wounded Warriors.

Unfortunately, not all of our warriors return home. This year AFSPC remembers two of our own who fell on the battlefield: Major Charles Ransom and Airman First Class Matthew Seidler. Their sacrifice serves as a very personal reminder that we owe our best efforts to our warfighters each and every day. We will never forget them and we pray that their families find comfort in their loved one's contribution to freedom.



## **Conclusion**

The members of AFSPC have a passion about service to our Nation. Our professionals are innovative. They continue to provide the world class space and cyberspace capabilities for which AFSPC is known, and they have the courage to not only do the right things, but also to do things right. Our Command is about producing excellence--every day. We believe passion, innovation and courage lead to that excellence. And because we operate in domains that reach well beyond the globe, our slogan is Excellence, Global and Beyond. It is truly a privilege to command AFSPC and I appreciate the opportunity to represent this great Command before the Subcommittee.