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STATEMENT BY

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Introduction

Mr. Chairman, Ranking Member Sessions, and distinguished Members of the Subcommittee, thank you for your continued support of our Soldiers, Civilians, and Families. This marks my first appearance before the Strategic Forces Subcommittee of the Senate Armed Services Committee, a body that has been a strong supporter of the Army and the key capabilities that space affords our Warfighters. Your past and future support is vital as we pursue Joint efforts to provide critical space capabilities for our Nation, our fighting forces, and our allies. Thank you for your continued support.

In my current assignment, I have three distinct responsibilities. First, as the Commander of the U.S. Army Space and Missile Defense Command, I have Title 10 responsibilities to organize, man, train, and equip space and missile defense forces for the Army. Second, as the Commander, Army Forces Strategic Command, I am the Army Service Component Commander (ASCC) to the U.S. Strategic Command (USSTRATCOM). I am responsible for planning, integrating, and coordinating Army space and missile defense forces and capabilities in support of USSTRATCOM missions. Third, as the Commander of USSTRATCOM's Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), I am responsible for synchronizing missile defense plans, conducting ballistic missile defense operations support, and also serve as the Warfighter's advocate for missile defense capabilities.

Today, I am honored to appear with General Shelton to provide this subcommittee insight on the critical space-based capabilities that our respective commands continuously provide the Warfighter.

As the Army's proponent for space, USASMDC/ARSTRAT coordinates with the other members of the Army space enterprise, to include the Army intelligence, signal, and geospatial communities. We are engaged across the broader Army community to ensure space capabilities are maximized and integrated across our entire force and that

potential vulnerabilities to our systems are, to the greatest extent possible, mitigated. We also collaborate with USSTRATCOM, its Joint Functional Component Command for Space (JFCC Space), and other members of the Joint community to provide trained and ready space forces, as well as space-based and space-enabled ground-based capabilities to the Warfighter. Additionally, we work closely with acquisition developers in the other Services to ensure the enhancement of systems that provide the best capabilities for ground forces.

Providing Army Space Capabilities—Today, Tomorrow, and the Day-After-Tomorrow

My focus today is to impress upon the Subcommittee the need to ensure our space capabilities are maintained, if not further enhanced, during the present environment of increasing threats and declining resources.

The Workforce—Our Greatest Asset

At USASMDC/ARSTRAT, as is the case within all the Army, our people are our most enduring strength. The Soldiers, Civilians, and Contractors at USASMDC/ ARSTRAT support the Army and Joint Warfighter each and every day, both those stationed on the homeland and those deployed overseas. Within our command, we strive to maintain a cadre of space professionals to support our Army.

In step with the Army, our USASMDC/ARSTRAT leadership team embraces the imperatives of Sexual Harassment / Assault Response and Prevention (SHARP). As stated by the Chief of Staff of the Army, sexual harassment and sexual assault violate everything the U.S. Army stands for including our Army Values and Warrior Ethos. At USASMDC/ARSTRAT, I will continually assess the effectiveness of our SHARP efforts to ensure we are meeting the needs of our Soldiers, Civilians, and family members. Our workforce deserves nothing less.

Reliance on Space-Based Capabilities

Our Army provides a globally responsive and regionally engaged force that supports the Joint Team with critical enablers and, as directed, responds to crises at

home and abroad. The Army is dependent on space capabilities to execute Unified Land Operations in support of the nation's objectives. Army space forces contribute to the Joint Force and the Army's ability to be adaptive, versatile, and agile to meet tomorrow's security challenges. Simply put, space capabilities are critical elements of the Army's ability to see, shoot, move, and communicate.

The Army is the largest user of space-enabled capabilities within the DoD. Our ability to achieve operational adaptability and land dominance depends on the benefits derived from key assets in space. Integrating space capabilities enables commanders, down to the lowest echelon, to conduct Unified Land Operations through decisive action and operational adaptability.

> ***"The Army's warfighting functions, weapons and battle systems are vitally dependent on space."***
>
> **--Army Strategic Planning Guidance 2013**

There are currently six Army warfighting functions that contribute to operational adaptability: mission command, movement and maneuver, intelligence, protection, fires, and sustainment. Space-based capabilities leveraged and employed across the National space enterprise enable each of these warfighting functions. Virtually every Army operation relies on space capabilities to enhance the effectiveness of our force.

When combined with other capabilities, space systems allow Joint forces to see the battlefield with clarity, navigate with accuracy, strike with precision, communicate with certainty, and operate with assurance. Dependence on space as a force multiplier will continue to grow for the Army of 2020 and beyond, especially in an era of tight fiscal resources, a smaller force structure, and possibly, a further reduced forward presence. The bottom line is the Army depends on space capabilities in everything we do. Retaining our global space superiority is a military imperative.

Space in Support of Army Warfighting Functions

There are five space force enhancement mission areas: (1) satellite communications (SATCOM); (2) position, navigation, and timing; (3) intelligence, surveillance, and reconnaissance; (4) missile warning; and (5) environmental

monitoring. Commanders and Soldiers leverage these space force enhancement capabilities to conduct warfighting functions. They are critical enablers to our ability to plan, communicate, navigate, and maintain battlefield situational awareness; target the enemy; provide missile warning; and protect and sustain our forces. Joint and Army forces require assured access to space capabilities and, when required, have the ability to deny our adversaries the same space-based capabilities.

Joint interdependence is achieved through the deliberate reliance on the capabilities of one or more Service elements to maximize effectiveness while minimizing vulnerabilities. As the DoD Executive Agent for Space, the Secretary of the Air Force is responsible for leading the development, production, support, and execution of military space operations. USSTRATCOM is the combatant command headquarters responsible for planning and advocating for space capabilities for the Warfighter. The Army continues to utilize national, Joint, and commercial systems for additional capabilities while pursuing cross-domain solutions that support Unified Land Operations. The Army must continue to influence Joint requirements and new solutions that provide compatible space capabilities in support of our warfighting functions. Finally, we must actively engage in focused experimentation, smart developmental test and evaluation, and timely military utility demonstrations to take advantage of dynamic technological advances in space.

> ***"Modern Armed Forces Cannot Conduct High-Tempo, Effective Operations Without…Assured Access to Cyberspace and Space."***
>
> ***--Defense Strategic Guidance January 2012***

Today's Operations —Provide Trained and Ready Space Forces and Capabilities

While the Army is the largest DoD user of space, we are also a provider of space-based capabilities. Each day, USASMDC/ARSTRAT provides trained and ready space forces and capabilities to combatant commanders and the Warfighter. Within our 1st Space Brigade, approximately 1,000 Soldiers and Civilians—forward-deployed, forward-stationed, or serving at home—provide space capabilities that are essential in all phases of operations. The Brigade, a multi-component organization comprised of

Active, Army Reserve, and associated National Guard Soldiers, provides flexible, reliable, and tailored support to combatant commanders and Warfighters by conducting continuous global space support, space control, and space force enhancement operations. The Brigade's three battalions provide satellite communications, space operations, theater missile warning, and forward-deployable space support teams.

Army space professional personnel policy is the responsibility of USASMDC/ARSTRAT. We serve as the Army's proponent and developer of training for space professionals and provide training assistance for Space-Enabler indentified positions. Our Army Space Personnel Development Office (ASPDO) is the focal point for all Functional Area (FA) 40 Space Operations Officers matters and executes the personnel development and life-cycle management functions on their behalf. Additionally, ASPDO develops policies, procedures, and metrics for the Army Space Cadre. The Army's Space Cadre, utilizing FA 40s as its foundation, is comprised of over 3,000 Soldiers and Civilians. The Space Cadre and Space Enablers consist of Soldiers and Civilians from multiple branches, career fields, disciplines, and functional areas.

"Access to these capabilities is achieved through the Warfighting Functions by Soldiers and a Space Cadre…"
--Army Space Operations White Paper April 2012

Today, there are approximately 400 multi-component FA 40s serving in Joint and Army organizations across all echelons of command—tactical, operational, and strategic. These Space Operations Officers, along with members of the Army's Space Cadre, directly influence the execution of strategic operations in support of operational and tactical level ground maneuver forces. Their principal duties include planning, developing, acquiring, and integrating space force capabilities. Over recent years, the maturity of the career field and the capabilities these officers provide to the Army and its Joint partners has led to an increased demand for FA 40 personnel. As the Army continues to reduce its overall end strength, FA 40 billets have fared well in the support of our corps and divisions. We have actually realized a slight increase in billets due to the requirements of the Special Forces community. During the past year,

USASMDC/ARSTRAT space professionals have supported over a dozen major exercises, several mission rehearsal exercises for units deploying in support of Operation Enduring Freedom, and other named operations.

An overview of some of the critical space capabilities provided by Army space professionals is highlighted below.

Army Space Support Teams: The Army deploys specialized Army Space Support Teams to support Army corps and divisions, other Services, Joint task forces, and multinational forces. The teams, which maintain a continuous presence in the Afghanistan theater, provide space-based products and services to commanders and Warfighters. The teams are on-the-ground space experts, pulling key commercial imagery, forecasting the impact of space weather, and providing responsive space support to their units. During 2013, USASMDC/ARSTRAT deployed four Army Space Support Teams and Commercial Imagery Teams to U.S. Central Command's area of operations. Since this era of persistent conflict began, we have deployed teams on 86 occasions. These teams bring tailored products and capabilities that meet critical theater commander needs.

> ***The Army "requires access to space capabilities to exercise effective mission command and support combatant commanders."***
>
> ***-- Army Capstone Concept***
> ***December 2012***

Satellite Communications: Our mission in satellite communications (SATCOM) is to ensure reliable and resilient access to tactical Warfighter networks and the DoD Information Network primarily through the successful execution of satellite payload operations and the management of regional satellite communication centers. USASMDC/ARSTRAT conducts payload and transmission control for all DoD-owned wideband SATCOM bandwidth, including communications carried over the Defense Satellite Communications System (DSCS) and Wideband Global SATCOM System (WGS) constellations.

Additionally, we serve as the Consolidated SATCOM System Expert (C-SSE) for the DoD narrowband and wideband SATCOM constellations, which include the DSCS, the WGS, the Mobile User Objective System (MUOS), the Ultra High Frequency

SATCOM (UHF), and the Fleet Satellite Communications System. As the SATCOM System Expert for MUOS, the Army is responsible for DoD's use of our next generation tactical system, which will transform tactical SATCOM from radios into secure cellular networked communication tools. During 2013, our Wideband C-SSE experts conducted detailed testing on the recently activated WGS-5 and WGS-6 satellites that are now providing increased Wideband SATCOM resources to Combatant Commanders. In 2013, we supported the early activation of the MUOS-1 legacy payload and will soon directly support the testing and activation of enhanced capabilities on the MUOS-2. The Army also has a significant role and assigned responsibilities in DoD's expanding use of military satellite communications through a number of growing programs and initiatives, and is the operational lead for multiple international partnerships.

USASMDC/ARSTRAT also mans and operates the Wideband Satellite Communications Operations Centers (WSOCs) and the Regional Satellite Communications Support Centers (RSSCs). The satellite communications control missions of the DSCS and the WGS are performed by the 1st Space Brigade's 53rd Signal Battalion and Department of the Army Civilians utilizing the capabilities of the globally located WSOCs and RSSCs. Support to the Joint community, agencies, and our allies continue to grow exponentially as use of military SATCOM increases. SATCOM is the Army's top space priority. We are actively transforming our concept of operations and upgrading our capabilities to defend vital mission command links and provide assured access to SATCOM. For example, we recently replaced aging antennas and terminal equipment at the Wahiawa, Hawaii WSOC. The new WSOC at Fort Meade, Maryland will be completed this year, and we broke ground for the construction of a new WSOC facility in Germany. Modernization and equipment replacement are required so that the centers remain compatible with the fleet of new and expanding WGS assets being deployed by the Air Force.

Friendly Force Tracking: Friendly force tracking (FFT) systems support situational awareness enroute to and throughout areas of operation. Joint and Army forces require precise position, navigation, and timing information to enable confident,

decisive maneuver by both ground and air assets. The DoD's Friendly Force Tracking Mission Management Center, operated by USASMDC/ARSTRAT from Peterson Air Force Base, Colorado, receives more than one million location tracks a day to provide a common operating picture to command posts and operations centers. This capability, performed on behalf of USSTRATCOM, is an essential worldwide enabler to both military and other government agencies.

> ***"Future forces require the ability to conduct integrated FFT operations that include joint forces and a wide array of unified action partners."***
>
> ***--Army Space Operations White Paper April 2012***

Ballistic Missile Early Warning: Early warning is a key component of indications and warning for missile defense. Army forces need assured, accurate, and timely missile warning launch location, in-flight position, and predicted impact area data. The 1st Space Brigade's Joint Tactical Ground Stations (JTAGS) Detachments, operated by Army personnel, monitor adversary missile launch activity and other events of interest and then share this information with members of the air and missile defense and operational communities. Our JTAGS Detachments are forward-stationed across the globe, providing 24/7/365 dedicated and assured missile warning to theater level commanders.

Geospatial Intelligence (GEOINT) Support: USASMDC/ARSTRAT provides geospatial intelligence in direct support of the combatant commands as an operational element of the Army's National-To-Theater Program and as a member of the National System for Geospatial Intelligence. The Army's space and intelligence experts exploit a variety of commercial, civil, and DoD imagery data derived from space and airborne sources. Additionally, they aid in the exploration of emerging spectral system technologies and in transitioning new capabilities to the Warfighter. During 2013, our GEOINT professionals created over 17,000 geospatial intelligence reports which provided essential support to the geographical and functional combatant commands. Late last year, our GEOINT Team was presented the 2013 Military Achievement Award by the U.S. Geospatial Intelligence Foundation for its work in developing a process to

speed the exploitation of large volumes of hyper-spectral imagery data from DoD's experimental Tactical Satellite-3 platforms.

Operations Reach-back Support and Services: Our Operations Center, located in Colorado Springs, Colorado, continues to provide daily reach-back support for our space experts deployed throughout the operational force and enables the Army to reduce our forward-deployed footprint. This center maintains constant situational awareness of deployed elements, continuously responds to requests for information, and provides the essential reach-back system of connectivity with technical subject matter experts.

As Land Force Structure is Reduced, Strategic Enablers Such as Space and Cyber Become More Important

Strategic Space Surveillance: The Army also operates facilities and assets that are of utmost importance to protecting the Nation's use of space. The Ronald Reagan Ballistic Missile Test Site (RTS), located on the U.S. Army Garrison - Kwajalein Atoll (USAG-KA) in the Marshall Islands, is a national asset that provides unique radars and sensors that contribute to USSTRATCOM's space situational awareness mission, enabling protection of the Nation's manned and unmanned space assets. This strategic site also serves as a critical asset for ballistic missile testing and is ideally located to provide equatorial launch benefits.

Addressing Tomorrow's Requirements—Building Future Space Forces

Over the past two decades, Army operations have transitioned from being "supported" by space capabilities to being truly "enabled" by them – space capabilities are an integral part of military operations. Military and civilian space technology has dramatically improved access, processing, and dissemination of data collected by space-based capabilities. To ensure our continued access to space-based capabilities, we must continue active participation in defining space-related requirements. These identified needs equip us to develop and mature Joint and Army force structure and concepts of operations in sync with the deployment of capabilities, thereby enabling our forces to conduct tomorrow's full range of military operations. Assured access to space

is our focus— ensuring the requisite capabilities and effects are delivered to the tactical Warfighter on time, every time demands that our space capabilities and architectures become more resilient against attacks and disruption. We must ensure the Army is prepared to conduct operations in a space-degraded environment.

In our second core task of building space forces for tomorrow, we use our capability development function to meet future space requirements. We continue to use both established and emerging processes to document our space-based needs and pursue validation of Joint, Army, and coalition requirements. This regimented approach helps ensure limited resources are applied where Warfighter operational utility is most effectively served. This approach enhances our pursuit and development of necessary capabilities across Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) domains to address threats and vulnerabilities while sustaining land force operations. In addition to conducting and evaluating experiments, war games, studies, and analysis, our Battle Lab develops and validates concepts leading to space related DOTMLPF alternatives and solutions.

Preparing Today's Warfighter for the Challenges of Tomorrow

In 2011, the Secretary and Chief of Staff of the Army approved the Army's Strategic Space Plan. This document, shaped by national level guidance such as the National Space Policy and the National Security Space Strategy, outlines the Army's space enterprise path for strategic planning, programming, and resourcing.

The essence of our space strategy and the guiding vision of the Army space enterprise are to ensure Army forces conducting Unified Land Operations have access to resilient and relevant space-enabled capabilities. To achieve this, our space strategy rests on three tenets that link Army strategic planning and programming for space to the guidance in national and DoD space policy and strategy. The three essential tenets are:

- To enable the Army's enduring mission by providing requisite space-enabled capabilities to support current operations, as well as future transformation efforts;

- To leverage existing DoD, national, commercial, and international space-based capabilities; and
- To employ cross-domain solutions to create a resilient architecture to address threats and vulnerabilities, and assure access to critical capabilities needed to sustain land force operations.

The initial implementation tasks of this strategy are complete. This past November, the Army completed a Space Capabilities Based Assessment to identify critical space gaps and potential solutions. These solutions are currently being evaluated and prioritized to ensure the most critical and affordable solutions are pursued. The Army also implemented a Space Training Strategy last year. This strategy seeks to improve the Army's understanding and utilization of space capabilities, to improve operations in contested operational environments, and to create an integrated and seamless continuum of career-long space education and training.

The Day-After-Tomorrow—Continued Space Technology Materiel Development

Our final core task entails our materiel development function—pursuing essential capabilities for the day-after-tomorrow. Our goal is to expand technological capabilities to ensure space and space-based products provide Warfighters, especially those who are remotely located, with dominant battlefield advantages. While we are very much aware that today's, and likely tomorrow's, fiscal realities will limit technology modernization efforts, we strongly believe that we must continue to conduct research, development, and demonstrations of capabilities that return maximum advances in our combat effectiveness. We cannot afford to mortgage future combat readiness by continuing to defer research today. As such, we continue to prioritize, leverage, and invest in promising space research and development technologies.

Space-Based Products—Providing Greater Capabilities to Future Warfighters

In conjunction with both DoD and non-DoD agencies, we continue to advance three responsive space Joint Capability Technology Demonstration (JCTD) Program

efforts that have the potential to provide enhanced space capabilities to ground commanders and Warfighters. A summarized update of these three initiatives follows.

SMDC Nanosatellite Program-3 (SNaP-3): Future constellations of relatively low cost nanosatellites deployed in mission-specific, low earth orbits can provide a cost effective, beyond-line-of-sight data communications capability. This capability is targeted for users who, without it, have no dedicated access to satellite communications. These satellites are also very useful in exfiltrating data from unattended ground sensors that have been placed in remote locations to track enemy troop movement, thereby reducing the friendly force footprint. SNaP-3, an OSD-approved JCTD, seeks to utilize small satellites to provide dedicated coverage to a wide range of under-served users in remote areas. The Army is building and will launch three SNaP-3 nanosatellites to address this communications shortfall. We are hopeful that, in the near future, this initiative will transition to a program of record.

Kestrel Eye Visible Imagery Nanosatellite*:* Kestrel Eye is an endeavor to manufacture and fly three electro-optical near-nanosatellite-class imagery satellites that can be more responsive in support to ground Warfighters. Weighing about 30 pounds and capable of producing 1.5 meter resolution imagery, data from each Kestrel Eye satellite will be down-linked directly to the same tasking Warfighter via a data relay system, also accessible by other theater Warfighters, without any continental United States relay pass-through or data filtering. The intent of this program is to demonstrate a small, tactical space-based imagery nanosatellite that could be employed in large numbers to provide a cost effective, persistent capability for ground forces. Each satellite would have an operational life of greater than two years in low earth orbit. The initial Kestrel Eye launch is scheduled for 2015.

Soldier-Warfighter Operationally Responsive Deployer for Space (SWORDS)*:* SWORDS, an OSD-approved JCTD, is an initiative to develop a very low-cost launch vehicle that can respond to a combatant commander's launch request within 24 hours. This launch system is designed to take advantage of low-cost, proven technologies and materials to provide an affordable launch for small weight payloads to low earth orbit with a goal of about one million dollars per launch vehicle. SWORDS employs a very simple design, using commercial off-the-shelf hardware from outside the aerospace

industry. It incorporates a benign bi-propellant liquid propulsion system, and uses simple and low cost launch support and launch site hardware. NASA is providing reimbursable support for development of the SWORDS launch vehicle.

Conclusion

The Army is the largest user of space and space-based capabilities. USASMDC/ARSTRAT is actively engaged in organizing, manning, equipping, and training space forces for the Army. We also work with other organizations to continue to develop and enhance technology to provide our Warfighters with the best battlefield capabilities. We will continue to rely on and advocate for space products and services provided by the DoD, other government agencies, our allies and coalition partners, and commercial entities in order to see, shoot, move, and communicate. In adapting to the budget realities, space capabilities will become even more critical to enabling adaptive Army and Joint Forces.

Space—The Ultimate High Ground

While continued technological advances are critical, the most critical space asset we possess are the dedicated Soldiers, Sailors, Airmen, Marines, and Civilians who develop, field, and operate space technology and deliver its capabilities to the Warfighter. The men and women of USASMDC/ARSTRAT will continue to focus on providing trained and ready space forces and capability enhancements to these Warfighters, the Army, the Joint community, and to the Nation.

I appreciate having the opportunity to speak on these important matters and look forward to addressing any questions you may have. Secure the High Ground!