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HOUSE ARMED SERVICES COMMITTEE

STATEMENT BY

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BEFORE THE STRATEGIC FORCES SUBCOMMITTEE

HOUSE ARMED SERVICES COMMITTEE

ON SPACE AND NATIONAL POWER

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Mr. Chairman, Congressman Reyes and Members of the Subcommittee:

Thank you for this opportunity to discuss the critically important contribution that space capabilities make to national defense and the consequences of the loss of these capabilities.

Space capabilities are inextricably woven into the fabric of American security, scientific, and economic activities. Thanks in large part to space systems, American leaders have more accurate and current information on developments, issues, and crises in virtually all parts of the world. American military forces know more about their adversaries, see the battlefield more clearly, and strike more quickly and precisely than any military in history. Space capabilities have revolutionized the way we fight today by providing our forces with battlefield situational awareness, environmental understanding, precise weapons effects, and the ability to control and synchronize military operations on a global scale.

SPACE AND THE MODERN SECURITY ENVIRONMENT

While we must still be mindful of traditional threats from nation states and standing armies, the adversaries we face today threaten to employ asymmetric means to strike. Weapons of mass destruction (WMD) in the hands of terrorists, proliferation of ballistic missiles, and our military and commercial dependence on global information networks offer adversaries potential methods and avenues to strike deeply within the United States or against US Allies and interests worldwide with little or no warning. Emerging threats are fleeting and nearly

invisible, are scattered globally, and may strike anywhere, anytime. Decision times are severely compressed.

Space capabilities contribute immeasurably to our ability to deter, dissuade and defeat both traditional and new threats. Space capabilities allow us to see, hear and act at the speed of the information age, at global distances, and in denied and contested areas. Space capabilities including position navigation and timing (PNT), communications, environmental sensing, and surveillance and reconnaissance are integral to the daily execution of virtually every military campaign, operation and exercise involving U.S. forces today, and have proven themselves in combat to be a tremendous strategic advantage for the United States and our allies.

This strategic advantage is magnified when space capabilities are integrated with capabilities on land, in the air, and at sea. Since Operations Desert Shield and Desert Storm, the United States has made great strides in integrating space capabilities and the professionals who operate them into military activities at all levels.

THE ROLE OF SPACE IN MODERN WARFARE

Our capabilities in space are integral to defeating terrorist threats, defending the homeland in depth, shaping the choices of countries at strategic crossroads and preventing hostile states and actors from acquiring or using WMD. They are also vital to our daily efforts throughout the world in all aspects of modern warfare.

Land Warfare. Secure satellite communications, reconnaissance, and precise PNT from the Global Positioning System (GPS) have revolutionized ground warfare in the late 20th and early 21st century,

and have transformed our thinking on the age-old military precepts of mass, maneuver, fog, and friction. These capabilities allow our ground force commanders to understand the battle space more completely and to make and execute decisions in combat faster than their opponents. As an example, during Operation Iraqi Freedom (OIF) the commander of the 3rd Infantry Division was able to maintain control of a division dispersed over a 230 km front while involved in two distinct fights. Satellite based command and control (C2) capabilities allowed the commander to track the location of his forces, direct those forces and balance resources within the division while both the commander and his forces were on the move.

During OIF, satellite-enabled Blue Force Tracking allowed units to fight in terrain where they had not expected to fight and in some cases had no paper maps. Even in the midst of a major sandstorm, commanders were able to utilize GPS, space and air weather and reconnaissance assets to maneuver troops and avoid enemy strong points that could not be sighted visually because of the storm. The actual performance of Blue Force Tracking in improving battlefield situational awareness is difficult to quantify. However, during exercises at the National Training Center and Joint Readiness Training Center, units employing Blue Force Tracking systems had much lower simulated casualty rates than units not utilizing these satellite based systems. Units not only had reduced fratricide but also better situation awareness – they knew where injured soldiers were on the battlefield, where the nearest medical facility was and where the transportation assets were to evacuate the simulated injured soldiers.

Air Warfare. One week after the start of Operation Iraqi Freedom, the region was hit by one of the largest sandstorms in recent history. Despite reducing visibility to 100 meters during some periods of the storm, the same space-based weather, PNT and intelligence, surveillance and reconnaissance assets that were in use by the land component commanders allowed a continued air offensive using GPS aided precision weapons against enemy targets that were seemingly obscured by the storm.

Space has dramatically increased U.S. combat aircraft effectiveness. Nearly identical weapons that achieved 100 meter accuracy in Viet Nam and 10 meter accuracy in Desert Storm routinely achieve 3 meter accuracy today. In 1945 a typical raid on Berlin required over 1000 bombers escorted by hundreds of fighters and dropped over 2000 tons of bombs on the target. Over 10,000 airmen would be in the air and at risk. Today a single B-2 armed with GPS aided munitions and its two man crew are more effective than an entire fleet of World War II aircraft.

Space has also improved the responsiveness of air support to ground forces. Satellite Communications (SATCOM) enables targeting updates to be transmitted to aircraft in flight. The days-long targeting cycle typical of the first Gulf War has been replaced by an agile process that puts weapons on target within hours or even minutes. In Operation Enduring Freedom (OEF) a B-52 in flight was able to put weapons on target within 20 minutes of being tasked. A Northern Alliance commander, accompanied by an Air Force controller, needed to cross a valley occupied by a large concentration of Taliban troops. The controller used SATCOM to request an air strike from the Combined Air

Operations Center (CAOC). The CAOC relayed the request to an on-station B-52 and directed it to contact the controller directly for target coordinates. Using a laser range finder, a digital map display and a GPS receiver, attack coordinates were relayed via SATCOM to the B-52. Within 20 minutes of the initial request bombs had destroyed a Taliban garrison with no U.S. casualties.

Of the nearly 30,000 weapons dropped during major combat operations in OIF, more than 11,300 were aided by GPS. However, the precision of these weapons resulted in an 85% reduction of total weapons employed in OIF compared to Operation Desert Storm. This not only increased the accuracy of allied air support and reduced collateral damage, but also reduced logistics requirements and exposed fewer aircraft and aircrew to hostile fire.

Most recently, the effect of space-enabled precision strike capabilities were dramatically displayed as an on-call air delivered GPS guided weapon played a role in ending the long manhunt for the terrorist Abu Musab al-Zarqawi.

Space capabilities have also improved the probability that a downed aircrew will be rescued before they fall into enemy hands. In April 2003, an F-14 crew ejected over an area in Iraq that still had a surface to air missile threat. The space cell in the CAOC coordinated with what is now the Joint Space Operations Center at Vandenberg AFB and other elements of the space community to determine the exact location of the downed crew and provide updated local threat data which allowed the search and rescue forces to ingress and egress quickly and without incident. A global network of space capabilities permitted recovery of the F-14 aircrew after spending only 100 minutes on the

ground before they were back in friendly hands. As combat leaders throughout the joint force will tell you, space has taken the search out of search and rescue.

Sea Warfare. The sea launched Tomahawk Land Attack Missile (TLAM) system played a major role in the opening days of OIF. More than 800 TLAMs were fired between March 19 and April 3, 2003. When compared to the TLAMs fired during the first Gulf War over a decade earlier, missions that used to take days to plan were planned in just a few hours. Satellite capabilities are involved in every phase of a TLAM strike except for the actual launch of the weapon. These include intelligence preparation of the battle space, target location, strike C2, weather, navigation and battle damage assessment.

The sea services also make extensive use of satellite communications and space-based surveillance and reconnaissance, and are among the largest military users of remote global environmental sensing to predict weather and understand the maritime environment. Naval air activities also rely heavily on space capabilities and Naval Aviators fully understand and appreciate the space-enabled advances in combat search and rescue.

Logistics. During Operations Enduring Freedom and Iraqi Freedom, small GPS units were placed on containers and vehicles entering the theater. By leveraging methods used by the commercial trucking industry, this project provided significant improvements in logistics responsiveness and tracking.

Using Satellite communications, deployed forces have easy access to technical and logistic support from depots, contractor facilities and

other resources within the United States. Similarly, medical personnel from even the smallest ship or unit have access to medical expertise from major stateside medical facilities via satellite.

Satellite Communications. Just as land, sea and air assets are needed to carry people and equipment to the fight, a robust, global communications architecture is necessary to move ever increasing amounts of information both to and from the battlefield and among commanders and forces deployed around the theater and the globe. SATCOM provides the information backbone to our expeditionary forces and has allowed the U.S. to transform its force structure into a smaller, mobile, synchronized force that achieves dominance in network-centric operations across the spectrum of conflict.

SATCOM allows the Joint Force commander to limit his footprint in the theater by providing reach back to C2, logistics, intelligence and other elements that can remain within the United States. For example, unmanned aerial vehicles flying reconnaissance missions in the Central Command area of responsibility are routinely controlled from ground stations in the continental United States.

While today's bandwidth requirements stretch our resources, it extends the reach of our combatant commanders. For example, during OEF, Central Command (CENTCOM) maintained its war fighting headquarters in Tampa, Florida, reducing its footprint in theater. The CENTCOM CAOC was located at Prince Sultan Air Base in Saudi Arabia, over 1200 miles from the battle. Aircraft carriers and other naval forces at sea in the Mediterranean, Arabian Sea and the Indian Ocean were seamlessly integrated into campaign plans. All of this was made possible through the use of SATCOM.

Long range unmanned aerial vehicles (UAV) rely on space to provide persistent battlefield support to troops on the ground. During the first weeks of OIF, a Marine reconnaissance team near Basra reported that it was surrounded. 5000 miles away in Langley, Virginia, an Air Force team working in a distributed ground station vectored a U-2 reconnaissance aircraft and a Predator UAV over the trapped Marines. Imagery specialists were able to determine the location of Iraqi forces in the area and designate a safe landing zone for reinforcements. Within two hours after the initial request by the Marines, reinforcements were on the way.

Missile Warning and Defense. Space based systems are at the core of our capability to detect and defend against a ballistic missile attack on the United States and our Allies and to detect and report nuclear detonations in the atmosphere and space.

Since the late 1960s the Defense Support Program has provided space based infrared detection of strategic missile launches and nuclear detonations. Based on emerging threats following the Cold War, the system evolved to also provide theater commanders with detection of short range ballistic missile launches.

Our current ballistic missile defense architecture is dependent on space not only for launch detection, but also for launch preparation indications, weather prediction, communications and timing. Satellite connectivity provides the global C2 network that coordinates and synchronizes the growing global network of missile defense sensors and weapons.

THREATS TO OUR SPACE CAPABILITIES

Our known and potential adversaries understand that space enables a new style of American warfare that is global in scope, faster, more efficient, and more lethal than traditional modes of combat. We are watching as real and potential enemies develop the means to employ their own space capabilities, either developed on their own or purchased on the open market, to generate military effects and to threaten our own space capabilities.

In 2001, the Congressionally appointed Commission to Assess United States National Security Space Management and Organization reported:

"The relative dependence of the U.S. on space makes its space systems potentially attractive targets. Many foreign nations and non-state entities are pursuing space-related activities. Those hostile to the U.S. possess, or can acquire on the global market, the means to deny, disrupt, or destroy U.S. space systems by attacking satellites in space, communications links to and from the ground or ground stations that command the satellites and process the data. Therefore, the U.S. must develop and maintain intelligence collection capabilities and an analysis approach that will enable it to better understand intentions and motivations as well as the capabilities of potentially hostile states and entities."

The Commission went on to state: "The nation's leaders must assure that the vulnerability of the United States is reduced and that the consequences of a surprise attack on U.S. space assets are limited in their effects."

This was not idle speculation about future challenges to space

assets. GPS jamming has occurred as has jamming of commercial telecommunications satellites. Disruptions of U.S. space capability have the potential to impact all areas of national power – military, civil and commercial. Open source reporting has cited examples of incidents, both intentional and unintentional, that have impacted space capabilities and caused a ripple effect in the commercial world. While none of these incidents proved catastrophic, our enemies clearly understand the reliance we place in our space capabilities and we should expect the level and sophistication of efforts to deny us the advantages of space to increase in future conflicts. We can not assume space will be a sanctuary for U.S. national security assets and must take prudent steps to ensure that we have the capability to protect our space assets and to guarantee our freedom of action in space.

COMMERCIAL SPACE ACTIVITIES

DoD relies on commercial organizations to provide a multitude of space services. About 80% of military bandwidth requirements are currently met with commercial providers. DoD also utilizes the commercial sector and works with other government agencies to provide imagery and weather forecasting data. This close relationship with industry and other government agencies will remain vital as our reliance on space continues to grow.

The U.S. does not have a monopoly in space. Commercial space capabilities are readily available to our adversaries and can even be purchased on the Internet. A large percentage of the commercial satellite sensing market is purchased by foreign governments. Navigation, communications and weather services are also available on the open market. While not a direct threat to our current advantage in

space, commercially available space products allow our adversaries, both nation states and non-state actors, to reap the benefits of space without having to invest in a space infrastructure.

MAINTAINING OUR STRATEGIC ADVANTAGE IN SPACE

Our Warfighters understand the critical contribution of our space systems. The QDR recognized this as well and stated that we will stay one technology generation ahead of any foreign or commercial space power and that the future force will place a premium on capabilities that are responsive and survivable.

We have already taken a number of steps to improve the protection of our space assets and their supporting communications links and ground facilities. We are also moving to improve the responsiveness of our systems across the board to bring more agility and flexibility to our space architectures and to our joint commanders.

In addition to operationally responsive space capabilities, we are working hard to improve our situational awareness of the near Earth space environment, and to better coordinate among the military, the industrial base, and the science and technology community to ensure that the military can deploy, maintain and respond to threats against our space infrastructure.

CONCLUSION

Space capabilities provide a decisive strategic advantage for our national security, empowering critical economic as well as defense related activities. Our space assets are right now keeping an eye on global threats, giving the U.S. the ability to see, hear and act

promptly, decisively and with great precision anywhere in the world. It is imperative that we maintain this strategic advantage to assure our allies, dissuade unhealthy competition and deter coercive or damaging acts, and, above all else, defend our citizens, allies and coalition partners and defeat those who threaten them. Thank you for your support.