

## **Protecting Global Security in Space**

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The space age began as a two-power race for security and prestige. Over fifty years later, human activities in space are no longer confined to two powers or solely a matter of security and prestige. Space activities are increasingly global in nature and woven into the fabric of our societies and economy.

Many of you probably mapped your route here on a mobile personal device. That mapping was enabled by signals from U.S. Air Force global positioning satellites. If you stopped at an automated teller to withdraw cash, those same signals probably helped make the transaction. When you go home and turn on your television and computer, the programming and internet may be brought to you by satellite.

Satellites monitor treaties, warn of storms, beam world news into societies both open and closed, and support safety at sea and disaster relief ashore.

Space also remains crucial to our collective security. Like all of us, our sailors, soldiers, airmen, and marines are daily users of space-based capabilities. These capabilities help our armed forces see with clarity, communicate with certainty, navigate with accuracy, and strike with precision.

American and Singaporean troops serve together in Afghanistan, where satellites help our forces communicate over long distances and see over the next ridgeline. Our sailors operate together off the coast of Somalia, conducting anti-piracy patrols also enabled by space.

### **New Challenges in Space**

While space is increasingly important to the global community, it is also increasingly congested, contested, and competitive -- what we call "the three Cs":

- **Space is increasingly congested.** There are over 1,100 active systems on orbit, and an additional 21,000 pieces of trackable debris. We estimate that there are hundreds of thousands of pieces of smaller debris. Debris can damage a satellite or space station. If the amount of debris continues to grow, whole orbits could become unusable. The frequency spectrum is also becoming congested, with an increasing number of transponders on communications satellites.

- Space is increasingly contested. A number of countries are developing counterspace capabilities and integrating them into their military doctrine and forces. China tested a direct-ascent anti-satellite capability in 2007 and is developing other capabilities to disrupt and disable satellites. Counterspace capabilities are also being developed by others. Iran, for example, regularly jams foreign satellite broadcasts to deny outside information to its own public.
- Space is increasingly competitive. Space is no longer the preserve of a small number of countries. Eleven countries operate 22 launch sites. More than 60 nations and government consortia operate satellites. Singapore recently launched its first satellite and is developing a strong foundation in space research and development. The growing number of actors in space creates new challenges in ensuring its safety and security. However, it also opens opportunities for international cooperation – including in Asia.

To address these challenges, the U.S. Secretary of Defense and Director of National Intelligence approved a first-ever National Security Space Strategy in 2011.<sup>1</sup> This strategy both informed and was reinforced by the January 2012 Strategic Guidance for the Department of Defense.<sup>2</sup> A leading objective of the new strategy is to strengthen safety, stability, and security in space.

Today I would like to discuss three aspects of implementing the strategy to make space more safe, stable, and secure:

- first, promoting responsible use of space;
- second, cooperating with allies and partners; and
- third, deterring and protecting against attacks on space capabilities.

### **Promoting Responsible Use of Space**

Under the new strategy, the United States continues to lead in promoting responsible use of space. Every day, the U.S. Strategic Command (USSTRATCOM) tracks the growing number of objects in space and, when necessary, provides warning to owner-operators in order to help avoid collisions. Over the past year, USSTRATCOM's Joint Space Operations Center at Vandenberg Air Force Base in California provided over 1300 warnings to satellite operators across the world, including six to satellite operators in Singapore.

The United States is also a leading participant in several international fora to strengthen peacetime norms of responsible behavior. Developing such norms can promote a shared understanding of what it means to act responsibly in space -- while calling out irresponsible behavior.

The United States is actively participating in work of the UN Committee on the Peaceful Uses of Outer Space to define "international best practice guidelines" for the long-term sustainability of

<sup>1</sup> An Executive Summary of the National Security Space Strategy can be found at: [http://www.defense.gov/home/features/2011/0111\\_nsss/](http://www.defense.gov/home/features/2011/0111_nsss/).

<sup>2</sup> Sustaining U.S. Global Leadership: Priorities for 21<sup>st</sup> Century Defense, January 2012, available at: [www.defense.gov/news/Defense\\_Strategic\\_Guidance.pdf](http://www.defense.gov/news/Defense_Strategic_Guidance.pdf)

our space activities. By developing these guidelines with other national and non-governmental space experts, we seek to enhance spaceflight safety for all space operators and preserve the right of all nations to use and explore space.

The United States also looks forward to participating in an upcoming UN Group of Governmental Experts on space transparency and confidence building measures. By developing a multitude of ways to exchange information and provide assurances about activities in space, we can help prevent mishaps, misperceptions, and mistrust.

Earlier this year, the United States decided to join with the European Union and other space-faring countries to develop an International Code of Conduct for Outer Space Activities. As Secretary Clinton said in announcing this decision:

“The long-term sustainability of our space environment is at serious risk from space debris and irresponsible actors. Ensuring the stability, safety, and security of our space systems is of vital interest to the United States and the global community....

Unless the international community addresses these challenges, the environment around our planet will become increasingly hazardous to human spaceflight and satellite systems, which would create damaging consequences for all of us.”<sup>3</sup>

The European Union is consulting with space-faring countries on a draft code of conduct. We think that the EU’s draft provides a good starting point. The draft focuses on reducing the risk of creating debris and increasing the transparency of space operations. It builds on the United Nation’s voluntary standards for debris mitigation and reinforces USSTRATCOM’s ongoing efforts to avoid collisions through the sharing of space data.

I am here in Singapore to discuss such the Code with your government. The United States is also engaging other countries in the region about a space code of conduct and responsible use of space. We welcome the readiness of the Government of Vietnam to host the first space security workshop of the ASEAN Regional Forum later this year or early next year.

### **Cooperating with Allies and Partners**

In the past, space was a domain in which the United States operated largely alone or with only a few close allies. Under the new strategy, we plan to step up international cooperation and operate increasingly in coalition, as we do routinely in other domains.

More and more of our allies are developing space capabilities, and all our armed forces increasingly rely on space. We need to ensure that operations in other domains -- land, sea, air -- can be effectively enabled by space. And we need to ensure that we can effectively coordinate the use of space assets in support of those operations.

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<sup>3</sup> Press Statement by Secretary Clinton, January 17, 2012, available at: <http://www.state.gov/secretary/rm/2012/01/180969.htm>

Cooperative programs can play an important role. The U.S. Air Force's Wideband Global Satellite Communication system is a good example. Six allies, including Australia and New Zealand, have bought into the system. This increases the size and capacity of the constellation while sharing the expense.

Cooperation can also take the form of information sharing. In 2011, the U.S. Secretary of Defense and his Canadian counterpart signed a statement of principles for partnership on space situational awareness. Based on these principles, the two countries just announced an agreement to share data from Canada's new Sapphire satellite system. Sapphire, which will be launched in the coming months, has an electro-optical sensor to track objects in space from space.

In another step toward increased cooperation, USSTRATCOM is preparing to transition the Joint Space Operations Center at Vandenberg Air Force Base to a Combined Space Operations Center. In non-military terms, this means establishing procedures, communications, and command and control arrangements that allow us to operate together. The goal is to integrate into combined space operations those allies ready to commit space capabilities so that we can share information, increase resilience, and leverage each other's space capabilities. Combined operations promote collective security, including in space.

Just two weeks ago, the U.S. Air Force Space Command concluded the seventh Schriever wargame for space, which included combined space operations. This was the first Schriever wargame to be international, with participation by Australia, Canada, the United Kingdom and other NATO allies. The wargame examined ways to optimize space efforts from multiple allies in support of coalition operations and to increase the resilience of space capabilities in a contested environment. During the exercise, allies committed capabilities to boost space situational awareness, improve intelligence, surveillance, and reconnaissance, and increase communications bandwidth while countering challenges posed by debris and adversary anti-satellite capabilities.

In the Asia-Pacific, Australia is a key ally in space, as reflected in its participation in the Schriever wargame. In 2010, the U.S. Secretary of Defense and his Australian counterpart signed a statement of principles on space situational awareness similar to the one signed with Canada. Based on those principles, we are now working closely with Australian Ministry of Defense to improve our collective capabilities for space surveillance, particularly over the southern hemisphere.

Japan is another ally with strong potential for cooperation in space. The United States and Japan are entering negotiations for sharing services and information related to space situational awareness. USSTRATCOM worked closely with Japan, as it did with Australia, to be ready to monitor North Korea's failed satellite launch. The U.S. President and Japanese Prime Minister just issued a statement laying out a broad set of areas for space cooperation.

My State Department counterpart and I have active discussions on space security with both Australia and Japan. Last December, for the first time, we held a trilateral dialogue with Foreign and Defense Ministry officials from countries. I participated as the senior Pentagon representative, and was struck by the strong convergence in views among the three countries.

Australia, Japan, and the United States all support development of an international code of conduct for outer space activities. All three also recognize the importance of cooperation, both to leverage our respective space capabilities and to bolster collective deterrence against emerging threats to the space environment.

Cooperation begins with a common understanding of operating domain. I am pleased to report that the very first Asian-Pacific student to study space operations at the U.S. Naval Postgraduate School in California is from Singapore.

### **Deterring and Protecting Against Attack**

As I mentioned at the outset, space is increasingly contested. Multiple countries are developing and fielding counterspace capabilities that range from jammers and lasers to direct-ascent anti-satellite missiles. Some capabilities, such as jammers, are readily available on the commercial market and have already been used to disrupt commercial satellite broadcasts. The same countries developing counterspace capabilities are also actively developing cyber attack capabilities, which could be turned against space systems.

China is making a significant investment in counterspace capabilities. China's 2007 test of a direct-ascent ASAT against a Chinese weather satellite created fourteen percent of the space debris that we track today. China is also developing other types of counterspace capabilities, as described in the U.S. Defense Department's annual report on Chinese military and security developments.<sup>4</sup> Chinese diplomats speak against weaponizing space, but the People's Liberation Army is actively developing, testing, and deploying anti-space weapons.

Other countries are also developing counterspace capabilities. Russian officials have spoken publicly of deploying anti-satellite weapons. Iran and Syria have jammed commercial communications satellites, in violation of their international commitments. North Korea has jammed signals from global positioning satellites, endangering civil aircraft using those signals.

The United States, together with its allies, is strengthening deterrence against any attack on space assets critical to national security. Under the new National Security Space Strategy, the United States is pursuing a multi-layered approach:

- The first layer of deterrence is the establishment of peacetime norms of responsible behavior. This helps separate responsible space-faring countries from those who act otherwise.
- The second layer of deterrence is the establishment of international partnerships. The multinational Wideband Global Satellite Communication system and coalition space operations are prime examples. International partnerships strengthen collective deterrence by forcing a potential adversary to contemplate attacking the capabilities of many countries, not just one.

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<sup>4</sup> 2011 Department of Defense Annual Report to Congress on Military and Security Developments Involving the People's Republic of China, available at [www.defense.gov/pubs/pdfs/2011\\_CMPR\\_Final.pdf](http://www.defense.gov/pubs/pdfs/2011_CMPR_Final.pdf)

- The third layer of deterrence is increasing the resilience of our space-based capabilities and our ability to operate in a degraded environment. Resilience can be strengthened in many ways, from spreading hosted payloads across multiple satellites to leveraging commercial and foreign capabilities. Demonstrated to potential adversaries, this reduces the assessed benefit of attacking our space capabilities and thus the incentive to do so.
- The fourth layer of deterrence is a readiness and capability to respond in self-defense, and not necessarily in space. This further complicates the calculus of a potential adversary contemplating an attack on our space assets.

U.S. National Space Policy states clearly that use of space is vital to our national interests. Thus any country contemplating interference with our space capabilities must understand how seriously we would treat such an infringement.

Attacking our space assets is not just another military tactic. Any leadership contemplating interference with U.S. space capabilities should understand the complex and dangerous nature of such a decision. Interference would infringe our sovereign rights. It would likely engage the interest and capabilities of other countries as well. Interference cannot be assured of success, particularly as we strengthen the resilience of our architectures and the ability of our forces to operate through a degraded environment. On the other hand, interference could prompt an asymmetric response, imposing strategic or operational costs that outweigh any tactical benefits. Finally, interference could create a real risk of miscalculation and rapid escalation.

This is clearly not a decision for a tactical or operational commander, who may be looking for a fleeting military advantage. This is a decision for national leadership, who should better understand the escalation risks, the strategic consequences ... and the wisdom of restraint.

## **Conclusion**

“It is the shared interest of all nations to act responsibly in space to help prevent mishaps, misperceptions, and mistrust.” So states the first principle of the U.S. National Space Policy.<sup>5</sup> The space policy goes on to warn that “irresponsible acts in space can have damaging consequences for all of us.”

The United States intends to promote the responsible use of space for the benefit of all humanity. In a spirit of cooperation, we look forward to working with all responsible space-faring countries to achieve this goal and, as our new Strategic Guidance states, “to promote a rules-based international order that ensures underlying stability and encourages the peaceful rise of new powers, economic dynamism, and constructive defense cooperation.”

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<sup>5</sup> National Space Policy of the United States, June 28, 2010, available at: [http://www.whitehouse.gov/sites/default/files/national\\_space\\_policy\\_6-28-10.pdf](http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf)