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## Is the world ready for space security to go “live”?

**By Jana Robinson**

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### **Worsening geopolitical tensions**

Over the past year, attention has focused as never before on the implications of geopolitical tensions spilling into outer space. Space operators have managed a variety of mostly natural threats from the space environment throughout the space age, but today they face a particularly troubling and growing arsenal of multidimensional threats (e.g., cyberattacks, jamming, etc.), from both, state and non-state actors, that are designed to deny or otherwise compromise space-related benefits. The continued testing and development of anti-satellite weapons and the shrinking opportunity to separate activities in space from geopolitical flashpoints on Earth also represent more active threats than in the past. How ready is the global space community to manage a significant counterspace situation that transitions from a threat to an actual disruption of services?

Adding to the complexity of ensuring space safety and security are the persistent problem of space debris; the vagaries of space weather; fierce competition for a share of the radio-frequency spectrum and satellite orbits resulting from growing user numbers and exploding traffic; the trend toward small satellites and large constellations; inadequate (but improving) space situational awareness; greater use of commercial space assets and services for military operations; and the multilateral space governance conundrum. These and other urgent considerations complicate high-level decision-making and more frequently demand swifter solutions than present multilateral capabilities and institutions are equipped to manage. Although the scope of this Assessment does not permit fuller treatment of these issue areas, this year’s *Space Security Index* report provides updates concerning these activities and processes, which are both shaping the space environment and posing hazards to space operations.

### **Vulnerabilities of space systems**

Despite the ITU regime, harmful interference in space activities is growing rapidly. Global space utilities and the services offered by commercial space actors can be profoundly affected, especially when these actors operate in politically sensitive regions (for example, Eutelsat in Iran), or when they provide security and defense-related services for the military. Intentional, including state-sponsored, jamming is often used to accomplish military, political, and societal objectives. A failure to respond to these jamming and other disruptive incidents can be mistakenly perceived as indicating that they are somehow acceptable and/or will go unpunished.

Those companies that provide services to the U.S. military, such as Boeing or Intelsat, are investing in additional protection measures. Planned upgrades for the U.S. Joint Space Operations Center Mission System include new capabilities for real-time alerts of

jamming or other hostile acts against U.S. space-based sensors. Last year the United States also announced plans to develop a common architecture for satellite ground stations. Laser communications are seen as a means to avoid interference, jamming, and hacking. The ESA is, for example, developing the European Data Relay System, which uses a new generation Laser Communication Terminal technology. It should be fully operational by 2017. In June 2016 ESA made public its first satellite images (from Sentinel-1 satellite) sent via EDRS.<sup>1</sup> Technical responses are, however, only half of the solution; in many instances top-level political intervention offers the only remedy to protracted jamming.

Cyberattacks against satellites and ground stations are another fast-moving threat. The dependency of space systems on cyberspace exposes them to asymmetric risks of disruption. Indeed, cyberspace is believed by some experts to be the single largest vulnerability of space systems.<sup>2</sup> The unequivocal attribution of perpetrators continues to pose a problem as “fake flags” and other diversionary techniques shelter the real offenders. This is, in no small part, a result of the still elusive nature of situational awareness in this manmade domain. As with jamming, the costs of not responding to this insidious form of disruption exceed those incurred by laying down clear markers that treat cyberattacks as the equivalent of physical attacks, under certain circumstances.

The continued development and testing of ASAT systems is viewed with some alarm. In 2015 China reportedly tested the Dong Neng-3 anti-missile system (the eighth such test since 2005)<sup>3</sup> and Russia conducted its first successful test of its Nudol rocket.<sup>4</sup> Both technologies can be modified for ASAT purposes. It seems clear that these nations are not yet persuaded that an actual ASAT attack could be viewed as an act of war, with all the adverse consequences accompanying such a determination.

### **Institutional responses to space-related threats**

The European view of the global threat environment can be gleaned from the EU Global Strategy, released in June 2016, which sets out the EU’s core foreign policy interests and principles. The Global Strategy confirms that the EU will seek to strengthen the security of its space-based services and concentrate on establishing principles for responsible space behavior, which could be adopted as a multilateral voluntary code of conduct.

The EU is now drafting a European Defence Action Plan that will likewise emphasize the need to cultivate synergies between security and defense, including for space. The European Commission will soon release a new Space Strategy for Europe and ESA is preparing its Space Security Policy.<sup>5</sup> These plans and policies point to a recognition of the pressing nature of the counterspace threat to the space environment and the need to bolster substantially protective measures, including through public diplomacy.

China has emerged as an ambitious space power that appears threatening to many countries, including the United States. Although its civilian space activities are widely advertised, Beijing is also engaged in a robust counterspace program that remains largely covert. The People’s Liberation Army operates many of China’s satellites and all terrestrial launch and support facilities. Civilian space applications are integrated into the country’s higher priority military milestones and strategies.<sup>6</sup> In 2015 President Xi Jinping announced a radical overhaul of the military, with major implications for China’s strategy and operations. Experts argue that the PLA Navy will be the largest beneficiary of this reallocation of resources as China seeks to be prepared for high-intensity combat in the South China, East China, and Yellow Seas.<sup>7</sup> These are worrying developments from a space security perspective.

Russia’s increasing estrangement from the West also has ominous implications for the global space security community. Geopolitical tensions between Russia and Europe color the relationship between Moscow and Washington, which are also widely viewed to be at a low point. Russia’s repeated use of energy supplies as leverage to advance its strategic political objectives, its efforts to compromise and/or shape the political leanings of smaller NATO member states and countries on NATO’s periphery, and its apparent opening of a new front in the Ukraine conflict centered on Crimea and Black Sea energy resources are likely to elevate tensions with the West further, with implications for space. It is no secret that Russia is developing capabilities to deny the United States and its allies access to certain space-related services in a potential conflict scenario and appears intent on multiplying such targets.

The United States has, in the past year, expressed serious concerns about Russia and China, describing these countries as “most stressing competitors.”<sup>8</sup> To improve “space protection”—that is, assuring that space assets are available to its Department of Defense and its intelligence community under any and all circumstances<sup>9</sup>—the United States has implemented significant strategic and programmatic changes. This includes a new position of Principal Department of Defense Space Advisor, a new experimental Joint Interagency Combined Space Operations Center to test how the DoD and intelligence community would perform during an actual conflict in space, and the Joint Space Doctrine and Tactics Forum, chaired by the Commander of USSTRATCOM and Director of the National Reconnaissance Office. Some \$2-billion was allocated to the Pentagon for “space control”<sup>10</sup> (out of more than \$5-billion for new space investments).<sup>11</sup> In short, the United States is readying itself for space instability.

In a global environment short on trust, the ability of Washington and its allies to act as the “rule-makers” for space has been somewhat diminished, and has even been regarded as suspect by some space actors that view the space domain as an opportunity to enhance their strength and challenge U.S. primacy. Communicating effectively with these actors and bringing them into consensus are proving extremely difficult. Regrettably, it may require an actual military space incident—and the harsh blowback associated with it—for some actors to appreciate the value of behavioral norms.

Indeed, today’s geopolitical tensions in the Asia-Pacific region and Eastern Europe create the potential for miscalculation of the type that could spark a military incident/conflict, which, in turn, could rather quickly cascade into the space domain. Of particular concern are existing and prospective maritime flashpoints characterized by a number of fast-moving pieces, including the maneuverings of ships and aircraft, on largely “message-sending” missions specifically designed to push the envelope, sometimes to a perilous degree.

### **Maritime flashpoints as a key concern**

Of all the terrestrial disputes that could spill into space, maritime tensions in the South and East China Seas should probably top the list. In the case of the darkening clouds over the Black Sea—specifically, Moscow’s efforts to consolidate control over Crimea’s huge offshore oil and gas reserves (estimated by some to be the size of the original North Sea find)<sup>12</sup>—the space community likely has a year or two to ready itself, should this prediction prove correct.<sup>13</sup> Russian moves to exploit Ukraine’s richest energy reserves should serve as ‘early warning’ that the relative stability of the present situation could deteriorate rapidly.

In the South and East China Seas, however, there is a more imminent risk of a flare-up that could implicate space activities, centered on the informal U.S. “red line” surrounding

Scarborough Shoal off the Philippine coast. China's potential militarization of certain drill rigs<sup>14</sup> operating in the vicinity of Japan's Senkaku islands and/or actions to enforce its declared Air Defense Identification Zone in the East China Sea also fall into this "flashpoint" category.

This is not to suggest that China and Russia are seeking maritime conflict or wish to stimulate space-related effects. These warnings are more of a call for accelerated contingency planning and preemptive communications to these space powers (including spelling out the potentially dangerous consequences of continued military probes and provocations). The United States and its allies also need to ensure that they are correctly assessing Chinese and Russian thinking concerning space stability, strategy, and doctrine in an effort to bolster domain security.

Returning to the title of this Assessment: Is the global space community truly ready to manage a more serious counterspace incident designed, for example, to disrupt intelligence, surveillance, and reconnaissance (ISR) activities and/or communications in a theater of conflict? The answer is almost certainly no, beyond a coordinated U.S. response with select allies. The kind of broader multilateral cooperation being sought on space security, including contingency planning and agreed space crisis management modalities, are not sufficiently mature at this time to take on an actual space security emergency unfolding in real time. Progress is being made, but it is seemingly being outstripped by the velocity of the threat.

### **Implications for the governance of space activities**

As Theresa Hitchens observed in her comprehensive *Global Assessment for Space Security Index 2015*, "multilateral cooperative space governance efforts are on a slow boat." This continues to hold true. The UN General Assembly did convene its initial First and Fourth Committees meeting in October 2015 in an effort to address possible challenges to space security and sustainability. There is, however, a long and complicated road ahead in establishing a workable consensus on space security bottom lines. Transparency and Confidence-Building Measures have the potential to be the connective tissue here.

Important progress, however, was made on long-term sustainability of outer space activities in the UN COPUOS in 2016, despite some frustrations during its Scientific and Technical Subcommittee (STSC) session in February. The Working Group on the Long-term Sustainability of Outer Space Activities held eight meetings between 16-26 February 2016, as well as informal consultations during the UN COPUOS STSC 2016 session, but was unable to reach consensus on adopting its report, originally scheduled for release in 2014, mainly due to objections by Russia.<sup>15</sup>

After another Working Group meeting in Vienna before the main COPUOS session on 6-7 June 2016, countries were able to reach consensus on the first set of 12 guidelines. Together, they provide guidance concerning "the development of policies, regulations and practices that support space sustainability; safety of space operations; international cooperation measures; and scientific and technical matters (e.g. space objects and space weather-related information exchange)."<sup>16</sup> The next planned steps are to develop a second set of guidelines to be agreed upon during the 55<sup>th</sup> session of the STSC. This document, together with text of the preamble (still to be approved by consensus) and the first set of guidelines, are to form a final list to be adopted by the COPUOS and referred to the UNGA in 2018.<sup>17</sup>

There has been forward movement on crafting an International Code of Conduct for Outer Space Activities, after a period of inadequate progress on negotiating, much less signing such an accord. Ostensibly, such a delay was due to procedural concerns (i.e., its conduct outside



of the UN framework) raised by Russia, China, and a number of non-aligned states, which gathered at UN Headquarters in New York in July 2015. In the wake of this disappointing New York meeting, the EU member states decided to continue to work toward a voluntary accord based on three overarching goals: to continue to manifest leadership in space-related TCBMs; to continue to promote a non-legally binding agreement that would cover both civil and military activities; and to negotiate an agreement in the UN when (and if) the conditions are right.

The immediate exercise undertaken was to condense the substance of the Code into the following five principles: increase international cooperation in space; establish standards of responsible behavior across the full range of space activities; commit to non-interference in the peaceful exploration and use of outer space; facilitate equitable access to outer space; and strengthen the transparency of outer space activities. Three EU member states (Italy, the UK, and Germany), together with the EU, are mandated to take this process forward.<sup>18</sup> This initiative, since its inception, has served as an important barometer of international relations and demonstrated that certain countries are presently unwilling to make an open political commitment to space security, which bodes ill for adequate readiness to face a near-term space crisis.

In the meantime, countries will tend to rely on bilateral and regional commitments. The United States and China, for example, held the inaugural Civil Space Dialogue in Beijing in June 2015 (with a commitment to hold a second dialogue before October 2016), and the first Space Security Exchange in May 2016 in Washington, DC, established under the auspices of the U.S.–China Security Dialogue.

## **Conclusion**

An effort was made in this Assessment to focus on what is arguably the most troubling aspect of the space security portfolio today: purposeful counterspace actions connected to a maritime or land-based military incident or conflict. Although elements of it may appear gloomy or even somewhat alarmist, it was deemed useful to advance the notion of a more immediate shock to established space security mechanisms, both diplomatic and operational, including space crisis management tools and procedures. Regrettably, the scenarios offered do not require much of a leap of imagination, given escalating global tensions.

Assuming that the world avoids the unwelcome precedent of a near-term “live” counterspace situation, the substantive space security initiatives presently under way are encouraging and hold real promise. Accelerating assemblage of this policy and technical architecture, however, would be advisable, as some space actors have amply communicated their selective disregard for common behavioral norms and international law, even when observing these norms and laws would be squarely in the longer-term interests of these same actors.

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## Global Assessment Endnotes

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