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DEFENSE SPACE PARTNERSHIPS: A STRATEGIC PRIORITY

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The United States has not fully leveraged its allies and defense partners in the space domain. This is partly due to significant obstacles, like classification and releasability, that have impeded more and deeper defense space partnerships. It also reflects the legacy of the Cold War, a period when space was dominated by a few major powers. A new space era is upon us. Allies and partners are developing significant space systems that can enhance U.S. capabilities. Concurrently, potential adversaries are developing weapons that could threaten U.S. and allied assets. The seriousness of the threat demands a more concerted and international approach. In this new space era, U.S. leadership should treat defense space partnerships as a strategic priority.

Introduction

The United States has defense agreements with countries that represent nearly a quarter of humanity, many of which are spacefaring nations.[1] Yet, the United States has only had limited success in converting some of its defense relationships into space security relationships. In 2019, the United States and Norway agreed to include U.S.-protected communications payloads on Norwegian satellites that will be launched in late 2022, which will mark the first time the United States has put operational national security payloads on a foreign satellite.[2] Although NATO's nuclear deterrent posture comprises a mix of U.S. and allied capabilities, and British submarines deploy U.S.-made submarine-launched ballistic missiles, we are just beginning to leverage the capabilities of our international partners for military space assets and operations.[*3]

Unlike during the Cold War, when space was dominated by a few major powers, space has become increasingly democratized. As of 2019, over 60 countries have a national space budget, over 70 countries own or operate satellites in orbit, and nine countries—plus the European Space Agency—can independently launch into orbit.[4] This growing international engagement in space presents enormous opportunities for defense space partnerships.

This new era also presents serious risks. Space is becoming increasingly contested. In April 2020, Russia tested a direct ascent anti-satellite missile.[5] A few months earlier, U.S. officials called out Russian satellites for trailing a U.S. national

[*] NATO's nuclear deterrent posture includes U.S. nuclear weapons forward deployed in Europe as well as capabilities and infrastructure from Allies, including dual capable aircraft, which NATO says are "central to NATO's nuclear deterrence mission." The Trident II submarine-launched missile is deployed on U.S. Ohio-class submarines as well as the United Kingdom's Vanguard-class submarines.

security satellite.[6] Also in April 2020, Chris Ford, a senior official in the State Department, said that China was exploring capabilities to attack U.S. satellites, including in high orbits such as those of U.S. nuclear command, control, and communications satellites.[7] The seriousness of the threat underlines the importance of defense space partnerships—the United States should not try to manage these threats purely on its own.

To enable more international defense space partnerships, U.S. leadership will need to treat such partnerships as a strategic priority, not as an afterthought or add on. This chapter looks at advantages, challenges, and mitigations for broadening and deepening security space partnerships that could prompt key decision points during the next presidential term.

Advantages of Partnerships

Defense space partnerships offer considerable advantages. These include allowing the United States to expand and improve its network and capabilities with fewer resources, deter adversaries from attacking its systems, and coalesce allied and partner thinking on space security concepts.[8] A look at some common space maturity metrics suggests that many of the most mature space nations in the world are partners of the United States. Specifically:

- The United States and its close partners make up 11 out of the top 15 countries with the biggest national space budgets.[9]
- Of the roughly 2,700 active satellites in orbit, over 500 are operated by international partners and over 1,300 are operated by the United States.[10]
- Among the world's 22 active space launch centers, six are operated by partners and five by the United States.[11]

Many allies are also taking steps to emphasize the seriousness of space security. In the past year, France and Japan have established their own military units dedicated to space.[12] The United Kingdom officially recognized space as an operational domain in 2018.[13] And NATO, which historically has said little on space, came out with a space policy in 2019.[14] Given the space maturity of many of its allies and partners, and the shared recognition of the importance of the domain, the time is advantageous for the United States to place more priority on establishing and deepening space partnerships for defense.

Expand and Improve Networks and Capabilities. Partners have capabilities that can improve U.S. systems and networks in geographically dispersed and strategic locations. This is particularly true in space situational awareness, an area in which a diverse set of geographically-distributed sensors can more accurately and completely capture the operational environment.[15] Partners can help us collectively attain more persistent surveillance and continuous global coverage of satellites and debris, which is only possible if we have more and better sensors in a variety of locations. Radars and optical telescopes spread around the world can also more comprehensively identify space threats. For example, Japan is developing a deep-space radar that will observe objects in geosynchronous orbit. Given the counterspace threats from potential adversaries, the radar could also be invaluable to the United States because of its capability and location.[16]

Additionally, space capabilities and operations are expensive. A clear advantage of military space partnerships is that they generate opportunities for sharing the financial burden of operating in space. As an example, the United States putting its security payloads on the Norwegian satellite will reportedly generate up to $900 million in savings.[17] Hosting U.S. payloads on foreign systems, like this example, represents an area in which the United States could leverage allied and partner capabilities more so than it does currently. Hosted payloads offer affordable means to expand protected communications satellites; position, navigation, and timing satellites; and space situational awareness capabilities, among other systems. Rather than host payloads, partners can also simply contribute to the cost of a satellite system. For example, through multilateral agreements, Canada, Denmark, Luxembourg, the Netherlands, and New Zealand provided funding for the U.S. Wideband Global SATCOM-9 satellite that launched in March 2017.[18] Or the United States can use partners'

satellites. For example, the United States partners with Japan and Europe to obtain weather information from space-based sensors, providing accurate weather information to warfighters around the world and avoiding the need to field additional U.S. systems.[19] And it is not just satellites and payloads. Partners have terrestrial infrastructure and user equipment, including for position, navigation, and timing and satellite communications, that can be used collectively to achieve needed capabilities more efficiently. Leveraging allied systems can offer technological insights, system improvements, and capability expansions at lower costs.

Deter Aggression. Partnerships can create opportunities for integrating allied and partner capabilities, such as incorporating combined systems in satellite networks and ground infrastructure. Such integration can strengthen the cohesiveness of a defense partnership, which could also help deter an attack. A potential adversary may consider an attack on a purely U.S. system differently than an attack on a system that incorporates several allied and partner capabilities. Deployment of NATO's multinational battlegroups in the eastern part of the Alliance (Estonia, Latvia, Lithuania, and Poland) is an example of this concept in the ground domain. If Russia's military were to invade Estonia and attack the multinational forces there, the invasion could be seen as not just an attack on Estonia but on all of the countries represented in those forces and perhaps all of NATO.[20] A May 2017 NATO fact sheet on its multinational forces reaffirms this: "[The multinational] presence makes clear that an attack on one Ally will be considered an attack on the whole Alliance."[21] Similarly, in the space domain, an attack on a U.S. constellation of satellites with U.S. payloads might prompt a response from the United States; an attack on a satellite constellation with a mix of U.S. and partner capabilities might prompt a response from several countries acting collectively, which may help deter a potential adversary from attacking in the first place.

With integrated allied and partner systems, U.S. satellite networks and ground infrastructure, as well as other equipment and capabilities, can become more resilient. The more systems you have, the larger an attack would need to be to take out a given percentage of capability: all else equal, two satellites would be more resilient than one, three satellites more resilient than two, and so on. The resilience offered by integrating allied and partner capabilities into a network, therefore, may also contribute to deterring a potential adversary from attacking the network.

Coalesce Allied and Partner Thinking on Space Security Concepts. As part of defense space partnerships, allies can more thoroughly discuss the threats to space systems and potential space conflict scenarios. If the United States wants to fully leverage its allies and partners in any future conflict in space, the United States would benefit from having more discussions with its allies about the possibility and nature of such a conflict: how it might emerge, how the respective allies can contribute, the capabilities the allies should pursue in advance, and the actions that might constitute "red lines" or cross thresholds that are more severe than others.

In recent years, the United States has taken important steps to collaborate with allies and partners on space threats and space conflict. International partners participate in military space exercises such as Space Flag, Global Sentinel, and the Schriever Wargame.[22] The Five Eyes (the United States plus Australia, Canada, New Zealand, and the United Kingdom) along with France and Germany all are members of the Combined Space Operations initiative.[23] Experts we spoke to told us that the United States should continue and expand these efforts. Partner preparation for space conflicts could be valuable from an operational and geopolitical perspective. Todd Harrison, Director of the Aerospace Security Project at the Center for Strategic & International Studies, stated the following:

> Rotating allies in the [Combined Space Operations Center as part of the Combined Space Operations initiative] is important because it gives those countries experts on space security issues. Let's say Russia or China start interfering with our nuclear command and control and early warning satellites. Any allied country needs to have their own experts so they understand our response—they need folks who can say, "Yes, I understand why the Americans are escalating over this."[24]

In a conflict in space, even if an allied country does not have significant defense space capabilities, it should have an understanding why the United States or other allied countries are taking the actions that they are. That understanding might help that country support the United States and allies politically and militarily in other domains.

The United States and its allies having a shared understanding of space threats and space conflict will help in peacetime too. General John Raymond, the Chief of Space Operations, has prioritized developing norms for operating in space.[25] These could include something like taking steps to not create debris and announcing planned maneuvers into other orbits.[26] With a similar understanding of the issues, the United States and its allies will be better equipped to develop common ideas for responsible behavior in space. This will also help with multilateral discussions, such as United Nations (UN) proposals on space security. Our partners have not always supported U.S. positions on UN space security proposals, including our negation of proposals made by Russia and China. For example, in the 2014 UN vote on Russia's proposed draft resolution on No First Placement of Weapons in Outer Space, only three countries voted with the United States against the resolution and 125 voted for it with Russia.[27] New and deeper partnerships will create more commonality in assumptions and objectives for fostering a safe and secure space environment.

Challenges

Of course, there are legitimate reasons why the United States has not actualized more defense space partnerships. Part of this stems from the legacy of the Cold War in which the United States and the Soviet Union were the two major powers in space. A RAND report from 2000 says, "Historically, the predominance of U.S. investment in and experience with space systems has minimized the consideration of space as an area with potential interoperability problems," noting that "the United States has provided the bulk of products and services derived from space assets."[28] Because the United States had overwhelming capabilities in space relative to allies, little could be gained by defense space partnerships. Nowadays, it is rare to hear arguments against collaborating in the defense space domain. But there are deceptively simple yet significant obstacles in the way of realizing more defense space collaboration. Among these are classification and releasability of information; technology and logistics; and organizational issues. Although the mindset has changed around defense space partnerships, these mundane challenges will need to be addressed for the United States to establish more and deeper space partnerships.

Classification Levels and Releasability. No issue presents a greater impediment to defense space partnerships than an inability to share information. In conversations with allied attachés and exchange officers, classification and releasability routinely came up as the biggest obstacle they perceived to more effective security space collaboration. We need to protect information that helps the United States maintain its advantage, but it is possible to overdo secrecy, and we should continuously evaluate the classification and releasability of information in the space domain to better balance secrecy with collaboration.[29] Defense space information is frequently classified and often with a NOFORN (not releasable to foreign nationals) caveat. Such classification or dissemination control limits defense space collaboration. For example, a foreign partner could share sensing data with the United States, which is then processed through NOFORN software and made unavailable to the very country that captured it.

This issue has received attention at senior levels. General John Hyten has stated the need to remove NOFORN designations where possible.[30] In 2019, then Air Force Chief of Staff, General David Goldfein said with respect to space collaboration: "One of the challenges we have is that we over-classify things and that gets in the way of information sharing."[31] The Air Force is currently implementing a security classification review looking to improve information sharing for space operations. The experts we spoke with noted that although the United States has been making progress in this area, classification remains a major obstacle for defense space partnerships.

Compatibility in Standards and Technology. Defense space partnerships present logistical hurdles for sharing information too, including not having compatible systems and standards. Even in cases where U.S. officials are permitted to share sensitive information with partners, experts we spoke with pointed out that the United States and the partner country

often cannot collaborate because they do not have the same or compatible classified conferencing capabilities or networks. The DOD's classified SIPRnet Secret-level computer network, for instance, was not designed to be a combined or allied system.[32] In some cases, defense space partnerships also require allies to align their standards, such as for data. In space situational awareness data sharing, for instance, government, industry, and international organizations have been adopting various standards for sharing orbital information, which is requiring complex data translation services or preventing sharing altogether.

Organizational. Another challenge is that with the myriad of organizations in the U.S. government that work on defense space partnerships and sharing, it is not easy for allies to know whom to talk to. Roles and responsibilities are spread out across the Department of Defense, the Intelligence Community, the Department of State, and others, and there is no single clear entry point for partners or potential partners to engage. The U.S. Space Force headquarters could be the entry point for training and exercises, U.S. Space Command for space operations collaboration, Office of the Director of National Intelligence for intelligence sharing, the National Geospatial-Intelligence Agency for imagery sharing and training, Space and Missile Command for combined space system acquisition, the Office of the Secretary of Defense for broader discussions. This issue surfaced in our discussions with allied attachés and foreign exchange officers. One official from a partner nation offered an anecdote in which an official from a separate nation called for help because he was unable to connect with the right people on the U.S. side. Many said that navigating the "U.S. space behemoth," as one official put it, and knowing whom to contact is extremely challenging.[33] Figure 1 captures the organizations that have a role in international security space collaboration.

The establishment of U.S. Space Command and the U.S. Space Force could spur changes in roles for defense space partnerships. It could create more opportunities for synchronizing departmental and U.S. government responsibilities for international security cooperation in space, but it could also bring more organizations into an already complicated landscape. Streamlining could benefit current and potential partners.

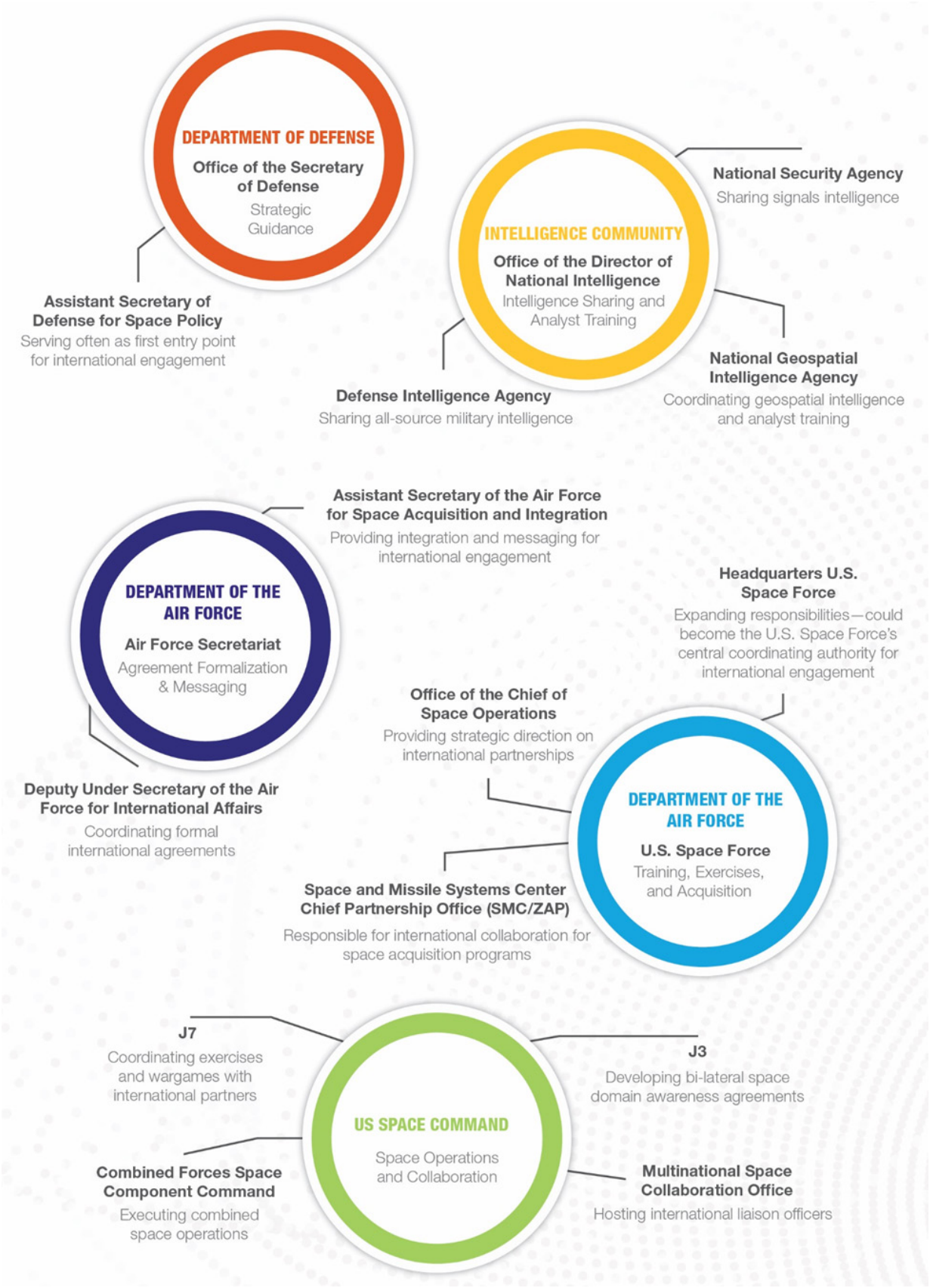

Figure 1: U.S. defense organizations responsible for international security space collaboration.

A Way Forward

Despite the impediments, the United States has made progress in broadening and deepening defense space partnerships. The Air Force has allowed allied and partner participation in military space courses on space fundamentals, operations, space domain awareness, and orbital mechanics. The United States has managed to share intelligence information on space with some allies, including the Five Eyes. In addition to the hosted payload agreement with Norway, Japan is scheduled to launch satellites with U.S. national security payloads in 2023, which will be the first time the United States has done this with a foreign satellite aboard a foreign launch vehicle.[34] U.S. Space Command has agreed to space domain awareness bilateral sharing agreements with 25 other countries.[35] Canada, the Netherlands, and the United Kingdom use the U.S. nuclear-hardened Advanced Extremely-High Frequency communications system.[36] Global Sentinel, a space situational awareness exercise, expanded its international participation in 2017 and now includes Australia, Canada, the United Kingdom, France, Spain, Germany, Italy, Japan, and the Republic of Korea.[37] These are just some examples of international space security collaboration.

Options for Enhancing Collaboration

- Lower classification levels and distribution restrictions to allow more sharing with allies and partners
- Involve more foreign programs in exercises and wargames
- Imbed foreign experts into USG programs across the space domain
- Increase experts in USG to liaise with foreign counterparts
- Streamline DOD organization for current and potential partners
- Prioritize ease of data sharing and interoperability with allies and partners through standardization
- Take more time and effort, and corresponding funding, to foster trusted space partnerships
- Develop common norms of behavior in partnership with other nations to strengthen cohesion and deterrence

But more can be done. We could invite more countries to engage in exercises and training, could seek out more opportunities for hosted payloads and combined systems, and design satellite networks and ground infrastructure with international partners in mind. U.S. leadership should consider lowering classification levels, reducing distribution restrictions like NOFORN, and involving more countries in space exercises. Information systems, like classified conferencing and messaging networks, could be required to be compatible with allies. Leadership could increase the number of trained experts who understand foreign information dissemination policy—people who can help organizations share information appropriately with allies—and imbed them in operational space commands, task forces, and operational centers. Our defense organizations need appropriate experts fluent in the minutiae of defense space partnerships—alignment of standards, technologies, and processes.

Our leadership should also tackle cultural issues that impede greater defense space partnerships. The security community is risk-averse and compliance-oriented; it is hard for the operational and political-military communities to work around the security officials knowing that one mistake can be career-ending. Good intentions run into implementation realities. New and deeper defense space partnerships will require higher tolerance for risk and deviations from traditional practice.

These partnerships will also require flexibility. Officials from allied and partner nations told us they want to meaningfully contribute to our common space defense—to include integrating forces and capabilities to deter and respond to aggression—rather than just supply data and intelligence. The United States spends more money on space than all other countries combined; therefore, any partnership or collaboration—particularly one in which allies are empowered to be equal partners—will require more time and effort.[38] These partnerships should not be viewed simply as a transactional benefit but as a strategic objective itself.

There are encouraging signs. As of May 2020, a number of allies were invited to engage with U.S. Space Command in the U.S. military's baseline operational plan—Operation Olympic Defender—to provide space-based capabilities to

warfighters around the world. General Raymond, in his role as the Commander of U.S. Space Command, signed the order, which noted that the United Kingdom was the first country to sign up.[39] In June 2020, the Department of Defense released its Defense Space Strategy, which emphasizes international space partnerships. One of the objectives of the strategy is to "[i]ntegrate allies and partners into plans, operations, exercises, engagements, and intelligence activities."[40] The commitment to international defense partnerships reflects continuity with other relevant strategic documents, including the 2018 National Defense Strategy and 2011 National Security Space Strategy.[41]

The challenges should be understood too. Classification, shareability, and technological limitations are not the flashiest of issues. They may not seem as if they warrant senior-level attention. But if U.S. decisionmakers seek to broaden and deepen U.S. defense space partnerships, these challenges must be addressed. Decisionmakers will need to impress upon their organizations the importance of defense space partnerships and charge them with managing these obstacles.

In 2018, when the U.S. Air Force transitioned the Joint Space Operations Center to the Combined Space Operations Center, General Raymond said: "No one nation can do this alone… the partnerships we are forming today will no doubt lead to a more stable and sustainable space domain for years to come."[42] Partnerships hold the promise of leading to better resilience, stronger deterrence to attack, unified messaging to potential adversaries, lower costs, shared information, shared capabilities, and diplomatic progress for the United States to remain the world leader in space. Alliances and defense partnerships have been critical throughout our nation's history, dating even as far back as the French involvement in our Revolutionary War. During World War II, Winston Churchill reportedly said, "There is only one thing worse than fighting with allies, and that is fighting without them." Defense space partnerships may be difficult but are crucial—as such, U.S. space leadership should give them the priority they deserve.

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