Opportunities for U.S.-Japan and U.S.-ROK Space Cooperation: Talk for Hudson Center and Nonproliferation Policy Education Center

Sam Wilson, June 2022

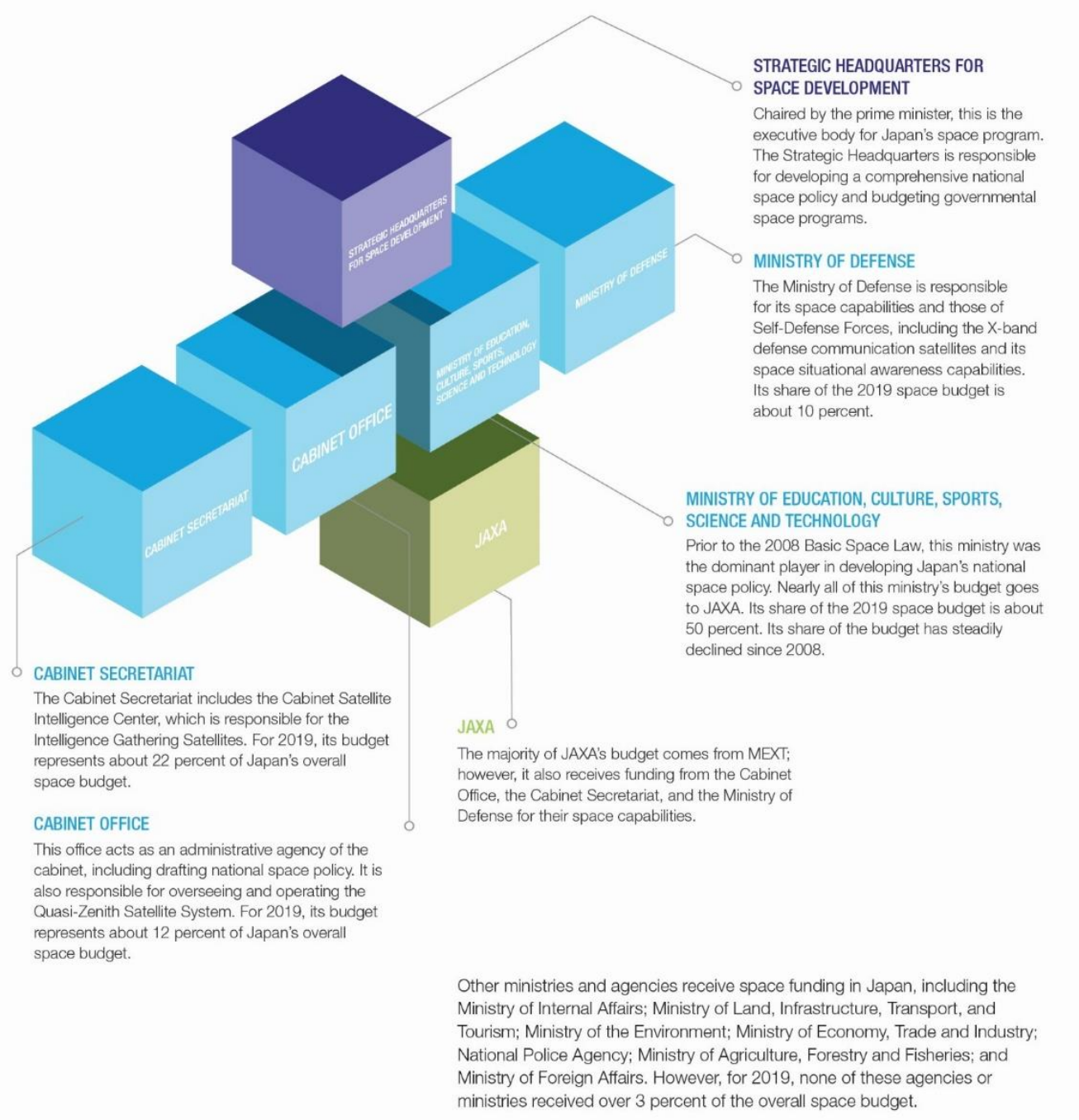
Importance of Defense Space Partnerships for the United States

Defense space partnerships are important for the United States, including for the following reasons:

(1) Defense space partnerships can save money. Operating in space is much more affordable than it used to be, but it is still expensive. As one example, scheduled for 2023, the United States and Norway are planning to launch a Norwegian satellite that will be hosting U.S. national security payloads. This is projected to save the United States up to 900 million.[i]
(2) Another reason is that you can better leverage some of the unique capabilities and technologies from partner nations. Japan's development of a deep-space radar is one example.
(3) A third reason is deterrence. Commingling capabilities with foreign partners could complicate an adversary's targeting because now striking that satellite is not just an attack on the United States but an attack on all the countries that that capability is tied to.[ii]

Japan as a Defense Space Partner

Japan is a valuable country for the United States to partner with because it is an extremely close ally in an important region, and it is one of the most mature space nations in the world. As of 2022, it has the third largest space budget and the fourth most satellites in orbit.[iii] The country is one of five that has its own positioning, navigation, and timing satellites, and of one of six, plus the European Space Agency, that can independently launch into higher orbits.[iv] Japan also has its own reconnaissance satellites and is developing its own defense satellite communications system. The responsibilities for these capabilities are split among several Japanese ministries, as reflected in the figure.



(Source: Aerospace Corporation, Japan's Gradual Shift Toward Space Security | The Aerospace Corporation)

The United States and Japan have a robust defense space relationship. As one example, the Space Force is also placing some of its sensor payloads on the next round of Japan's navigation satellites. The launching of those satellites, planned for 2023, will mark the first time the United States has put operational national security payloads on a foreign satellite and foreign launcher.[v]

There are also some areas where the partnership could expand.

(1) Space situational awareness represents a potential area for further collaboration. Given the counterspace threats in GEO from potential adversaries, Japan's system could be extremely advantageous for the United States.[vi] The United States has found it difficult to ingest space situational awareness data from allies and partners due to technical challenges and policy constraints, such as sensor calibration requirements. However, progress is being made along these lines, including the recent U.S. adoption of a more flexible approach toward calibration requirements.[vii] Collectively, the impressive Japanese capability plus the U.S. reconceptualization of how to use partner space situational awareness data could make this an important opportunity for expanded collaboration.
(2) Missile warning is another area in which the United States and Japan could collaborate further. In 2020, Japan's legislative body (Diet) approved the newest version of the country's national space policy, which was last updated six years prior. The new policy says that, in cooperation with the United States, Japan will study small-satellite constellations with infrared sensors for missile warning. [viii] In 2021, Japan released its implementation plan of the national space policy, which also discussed missile warning. With the United States pursuing a new architecture of missile warning and tracking systems in diversified orbits, there could be opportunities for more collaboration.

South Korea as a Defense Space Partner

South Korea is also one of the biggest space nations in the world. Among the 10 biggest spenders in space, South Korea has its own military communications satellites, earth observation satellites, and indigenous launch capability.[ix] Like Japan, it is one of six nations—plus the European Space Agency—that can independently launch into high orbits. South Korea also has ambitious plans for their defense space activity, to include:

- Developing their own positioning, navigation, and timing satellites (the Korean Positioning Satellite System to be fielded in 2034)
- Pursuing reconnaissance satellites
- Planning more investment in space situational awareness

These ambitious plans extend to commercial ventures as well. For example, Hanwha Systems, is planning to deploy a constellation of 2,000 communication satellites in low Earth orbit by 2030.[x] For context, as of May 2022, there were fewer than 6,000 satellites in orbit, although that number is set to rise dramatically.[xi]

Economic indicators also suggest South Korea's role in space will continue to grow. It is not only one of the biggest economies in the world, but its economy is growing at a high rate relative to other countries with high GDP. Among the countries with the top 15 highest GDPs, only India has a higher rate of growth in GDP than South Korea.[xii]

South Korea occupies an interesting position because it not only has deep relationships with the United States but also with China, their biggest economic partner. China is actively pursuing space partners too.[xiii]

South Korea and the United States have cooperated on space, although this has not yet extended to developing capabilities jointly. The two have a Space Cooperation Working Group (SCWG). In April 2022, the two countries announced an agreement at their 2022 session, which included cooperation on space

situational awareness for military purposes—to "share intelligence about outer space, nurture space experts through training and exercises, and enhance interoperability for combined space operations."[xiv] In August 2021, the two countries signed a memorandum of understanding on forming a joint space policy consultative body at Peterson Air Force Base in Colorado Springs, Colorado. Under the agreement, the two sides have reportedly "run a joint consultative body on space policy, shared information on space surveillance and worked together to enhance joint space operations capabilities such as missile defense."[xv] Given South Korea's ambitious plans, there should be more opportunity for defense space collaboration between ROK and the United States in the coming years.

---

[i] Nathan Strout, "How 2 Space Norway satellites will help the Air Force in the Arctic." C4ISRNET (July 5, 2019).
[ii] For more discussion on the importance of defense space partnerships for the United States, please see: Sam Wilson, Colleen Stover, and Steven R. Jordan Tomaszewsk, "Defense Space Partnerships: A Strategic Priority," The Aerospace Corporation, (September 2020).
[iii] "Government space budgets driven by space exploration and militarization hit record $92 billion investment in 2021 despite covid, with $1 trillion forecast over the decade," Euroconsult, Government Space Programs, (January 2022); Union of Concerned Scientists Satellite Database. Union of Concerned Scientists. (Data updated as of May 1, 2022).
[iv] China, India, Japan, Russia, the United States, and the European Space Agency operate their own navigation satellites. China, India, Iran, Japan, Russia, and South Korea have independent space launch capabilities to reach Medium-Earth Orbit and Geosynchronous Orbit. "Competing in Space," National Air & Space Intelligence Center, December 2018.
[v] Sandra Erwin, "Japanese military strength ties with U.S. Space Command," SpaceNews (April 1, 2021).
[vi] Robert S. Wilson, "Japan's Gradual Shift Toward Space Security," The Aerospace Corporation (May 2020).
[vii] Lauren Hale, Justin C. Last, Jordan L. De Namur-Paul, and Richard Barber, "Partnering Not Bossing: Leveraging International Capabilities for Space Domain Awareness," The Aerospace Corporation (August 2021).
[viii] Robert Sam Wilson, "OPINION: Japan's studying missile warning fits within long-term trends," Kyodo News (August 28, 2020).
[ix] "Government space budgets driven by space exploration and militarization hit record $92 billion investment in 2021 despite covid, with $1 trillion forecast over the decade," Euroconsult, Government Space Programs, (January 2022).
[x] Park Si-soo, "Hanwha Systems to launch 2,000 LEO communications satellites by 2030," SpaceNews (March 30, 2021).
[xi] Union of Concerned Scientists Satellite Database. Union of Concerned Scientists. (Data updated as of May 1, 2022).
[xii] GDP. Data from the World Bank (Accessed August 23, 2022).
[xiii] Ralph Jennings, "In China-US Space Race, Beijing Uses Space Diplomacy," Voice of America, (October 25, 2021).
[xiv] Park Si-soo, "U.S., South Korea agree to cooperate on space situational awareness for military purposes," SpaceNews (April 26, 2022).
[xv] Park Si-soo, "US, South Korea agree to enhance security cooperation in outer space," SpaceNews (August 30, 2021).