Space Business Monthly News

September 30, 2021, Satellite Business Network Co., Ltd.

Satellite Business Network

Editor: Mr. Tsuyoshi Oishi
Publishing manager: Mr. Shigeki Kuzuoka

Editorial 01: Governmental space-related budget request (Kuzuoka)

In Sept. 2021, the National Space Policy Secretariat of the Japanese Cabinet Office announced its space-related budget requests for each government ministry. Let's take a look.

Of course, budget requests consist of certain content and actual amounts for each government ministry, so it is not yet known how much can be secured, as it depends on budget negotiations between each ministry and Japan's Ministry of Finance. However, by looking at the budget requests and the amounts listed, it is possible to get a feel for what kind of space-related policy each ministry is considering for next year. In the case of Japan's space business, this is all highly dependent on the government budget, so, by analyzing the budget requests, we can infer the trajectory of Japan's space business for next year.

First, as a whole, the budget request value of all ministries as related to space for 2022 was 484.7 billion yen, which is a large increase from past figures, and this is an increase of 35.1 billion yen compared to the total of the initial budget for 2021 plus the supplementary budget for 2020 (actual budget for 2021) of 449.6 billion yen. For the past 10 years, the budget has been in the 300 billion yen range every year (the initial budget plus the supplement budget), but there was a significant increase in the budget in 2021. This amount will be surpassed in 2022 as well, with the aim of further increasing the budget.

Looking at the information as pertaining to each ministry, the Ministry of Education, Culture, Sports, Science and Technology, which houses JAXA, shows a budget of 212.5 billion yen (up 38%), the Ministry of Defense shows 88.8 billion yen (up 61%), and the Cabinet Secretariat shows 78.7 billion yen (up 26%). The ministries, etc., requesting budgets are requesting further significant increases (above, comparison with the initial budget in parentheses). The requirements show 38.1 billion yen for the Artemis project, 20.5 billion yen for the development and sophistication of the H3 rocket, 11.6 billion yen for the development of the X-ray Imaging and Spectroscopy Satellite (XRISM), and 27.8 billion yen for the quasi-zenith satellite system. It can be inferred that requesting such large budgets for satellite and rocket projects is normal, as these will start in earnest and are about to be launched in 2022. Also, as stipulated in the Basic Plan on Space Policy, regarding space security, the Ministry of Defense's Space Situational Awareness (SSA) system, at 16 billion yen, and the Cabinet Secretariat's 10 information-gathering satellites, at 78.7 billion yen, are major factors. Furthermore, ministries, etc., that use satellite data such as the Ministry of Land, Infrastructure, Transport and Tourism, the Ministry of the Environment, and the Ministry of Agriculture, Forestry and Fisheries are also demanding a large increase, although the final amount is small. Also, the Ministry of Agriculture, Forestry and Fisheries budget has been increased significantly by 173% from the previous year. The budget content requests consist of efforts in smart agriculture and in the forestry and fisheries industry, such as for labor saving by automating agricultural machinery via satellite positioning technology and quality improvement using satellite images, and these are reinforcing items requested in the past, but food utilization business activities in space such as for lunar missions (and the related necessary R&D for such) is interesting in that it is a completely new space-related budget item.

In looking at these ministry budget requests, I was concerned about one thing: the term "constellation" appears here and there in the budget request items from each ministry. First, the Cabinet Office will spend 5.8 billion yen to promote space development and utilization for the construction of smallsat constellations, etc., the Ministry of Education, Culture, Sports, Science and Technology will spend 8.8 billion yen on satellite constellation-related technology development, and the Ministry of Economy, Trade and Industry is asking for 2.3 billion yen for the development of basic microsatellite constellation technology. Furthermore, the Ministry of Defense has requested 1.6 billion yen (based on contractual amounts) for the examination of utilization of satellite constellations for missile defense and is requesting a budget for AI technology for satellite communications using satellite constellations and for the tracking of moving targets and for research & development related to the use of constellations.

In the past, Japan's government satellites were only single satellites (not constellations), but now it seems that they have suddenly turned toward realizing the use of satellites constellations. Of course, the Ministry of Education has been innovative when it comes to satellite technology demonstrations, the Ministry of Economy, Trade and Industry has put into practical use space parts and components utilizing consumer technology as part of the research & development of technology related to the space equipment industry, and the Ministry of Defense has a different aim that consists of conceptualization studies for hypersonic gliding weapon (HGV) detection and tracking satellites. All of these aims are different from each other.

However, for those not familiar with the actual state of space activities in terms of budget negotiations with the Ministry of Finance, there is the risk that satellite constellations could be seen as duplicate budget requests from each ministry, etc., and this is the basis for my concern. In terms of how to position constellations with satellites developed by the Japanese government, the relationship with large satellites such as the ALOS series and ETS-9, and the division of development among ministries, etc., the overall plan for government satellite constellations will need to become unified at some point. It will be necessary to organize it all in a targeted manner.

Note:
Japan government budget 2022 covers from April 2022 to March 2023. The budget will be agreed with Ministry of Finance by December. It will be authorized by the Diet by March 2022.
In case of the necessity, the government will authorize the supplement budget during the fiscal year.

Continued on the next page

Editorial 02: Orbital TPL insurance – The canary of small constellations? (Oishi)

In terms of smallsat mega constellations, such as those of SpaceX and OneWeb, various trends have been seen over this month. In relation to this, let's take a look at two cases: 1) Space insurance contracts as provided by OneWeb and 2) the in-orbit tool by Slingshot Aerospace for collision avoidance.

First, the OneWeb space insurance policy will secure US$ 1B for the remaining 10 launches of its target constellation. OneWeb's insurance coverage covers only the first launch phase of constellation deployment and does not include orbital insurance, which is common for large GEO satellites. Even in the same mega constellation, Starlink does not provide space insurance because it launches in-house and entails sufficient redundancy as a system configuration.

Second, as for the in-orbit collision avoidance tool by Slingshot, the company announced that from now 53% of all LEO constellations, including OneWeb, Spire Global, and Orbit Fab, will participate in pilot program testing.

Satellite 2021 was held just this month in Washington, D.C., but the two phrases of "space insurance" and "orbital collision" bring to mind last year's Satellite 2020 announcement regarding "the stopping of offering insurance plans to cover the risk of low-Earth-orbit satellite collisions" by space insurance company Assure Space. This, in terms of space insurance, is related to "third-party compensation (TPL) insurance," which is different from "launch insurance" and "orbital insurance" as per OneWeb's coverage.

Traditionally, many satellite operators have determined that the probability of an in-orbit collision is "extremely low to low," and it is thus felt that there is no need for such insurance. Therefore, the Assure Space policy itself does not seem to have significant impact in the short term. In addition, it is unclear whether it will lead to a re-discussion related to in-orbit government compensation systems in terms of problems in the development of related laws and rules.

However, in the space insurance market, where supply & demand can change rapidly due to the occurrence of orbital accidents, etc., as mentioned above, the fact that some insurers have withdrawn from the TPL insurance market should be taken into consideration in terms of space environmental risks in the current situation where mega constellations are actually deployed one after another. Regarding avoidance of in-orbit collision, at the Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference this month, SpaceX also emphasized the need for coordination to avoid conflicts with commercial and government operators.

The idiom of "Canary in the coal mine" involves the idea of sending a decoy into a situation to ensure that danger is not imminent. Although it is metaphorical, if we consider "Kessler syndrome" (when satellites, etc., collide one after another and when space debris eventually covers low-Earth orbit like a belt) = "a large-scale, difficult-to-recover-from coal mine accident," which is the worst-case scenario of an orbital collision problem, we can say that "an environment where insurance companies can provide on-orbit TPL insurance" = "an environment where canaries can be used to ensure safety.“

Whether or not to actually use insurance is at the discretion of each operator, but for the space insurance company landscape, we believe that clean and controlled in-orbit environment maintenance and system construction that enables space insurance companies to provide in-orbit TPL insurance is important for ensuring that the space business is sustainable into the future.

Editorial 03: Outlook regarding launch services (Murakami)

Usually held in March every year, Satellite 2021 was held this year over September 7–10, in Washington D.C., U.S. The change in timing was due to the influence of the COVID-19 pandemic.

The participants were mainly from the U.S., and I had the feeling that it would still take some time for the world in general to return to normal. (I had no choice but to participate in the first part via online only.) In order to grasp the trends of satellites and launches, I think it is meaningful to hold such conferences, albeit gradually, in order to be aware of how economic activities can be normalized.

Also, this December, World Satellite Business Week will be held by Euroconsult. By this time, I hope that vaccine passport systems will be ready and that many people from all over the world can finally gather.

I took some time to try to organize all the launch services seen at Satellite 2021, and I feel that numerous satellites launches can be expected to be realized. The number of large geostationary satellites in use has dropped to about 5 to 8 recently, but this is expected to recover by 15 to 20 craft and can be expected to act as a base load. In addition, demand for low-Earth-orbit satellites such as Starlink is high, and the launch market is expected to trend upward toward 2030. Launch service companies said the outlook was bright.

On the other hand, Starlink will be launched by SpaceX, and Kuiper will use its own rocket when its New Glenn is developed in the future. From that point of view, it is doubtful that the number of accessible satellites used in constellations, which accounts for a large part of the increase, will be greatly expanded.

In terms of launch cost, the low-priced routes led by SpaceX will have large impact, and we believe that costs will continue to decline. If the development of Starship, which SpaceX is currently developing, goes smoothly, it will become a major market force due to its large transportation capacity and the possibility of complete pricing monopoly due to its ability to reuse all launcher.

One of the recent characteristics of satellites is that, after a satellite development is completed, there is a need to launch it promptly, and by responding to such needs as exhibited by Rocket lab, I would think that it is possible to remain competitive and to steer away from pricing monopoly.

The H3 rocket under development by Japan is set to be launched in 2021, and the Ariane 6 rocket under development in Europe is set to be launched in 2022. I also heard that the Valcan rocket under development in the U.S. by United Launch Alliance is also set for a debut in 2022. All of these rockets are designed to reduce cost via mass production and by increasing the number of launches made, but we believe that it is difficult to secure launch opportunities for each business model seen given the number of satellites currently being considered.

I think that, in the end, three large satellite launch companies and two smallsat launch companies will remain as the main players, as has always been the case. The thing that I finally realized is that only reliable and user-friendly launch service providers can survive, achieving competitive pricing.

September 2021 Space Business-related Topics by Business Position/Market Field

Satellite Business Network

OldSpace, etc.

Satellites

- US Space Development Agency to acquire 144 satellites from multiple vendors (no.003)
- W-Cube satellite transmits first 75 GHz signal from space (no.008)
- Yahsat selects Airbus to build next-gen "Thuraya" 4-NGS (no.009) (Fig.1)
- COVID pandemic hinders launch of NASA's Landsat 9 satellite (no.011)
- GAO continues to criticize DoD's management of narrowband satellite communications (no.012)
- "Beidou No.3" global system to provide 7 types of services (no.041)
- China launches "Zhongxing-9B" satellite that supports 4K and 8K video transmission (no.053)
- US Department of Defense taps industry for nuclear-powered propulsion for smallsats (no.054)
- Successful launch in China of the "Gaofen 5 (02)" hyperspectral Earth observation satellite (no.055)
- Satellite operators: Requiring more-accurate SSA data (no.075)
- "BeiDou" satellite version upgrade, rescue request possible even without mobile radio waves (no.078)
- Northrop Grumman wins DARPA contract for PNT payload Phase II effort (no.080)
- L3Harris opens manufacturing facility for DoD missile-defense satellites (no.082)
- Space community ponders right-of-way rules for space traffic (no.086)
- Tianzhou-3 spacecraft docks with Chinese space station (no.090)
- Telespazio selects Hughes for airborne satellite communications (no.092)
- Viasat secures two DOD contracts to support 5G research for the battlefield (no.097)
- Hughes and SES demonstrate first multi-orbit SATCOM (no.102)

Launching

- South Korea: Spends US$ 593M on rocket technology transfer to public and private sectors (no.037)
- "Long March 4" rocket launches high-spectrum observation satellite (no.042)
- Purpose of secret satellite unknown, after China launches twice within two hours (no.116)

Others

- Russia announces its own construction of space station (no.006) (Fig.2)
- China develops its own Mars rotocraft (no.007) (Fig.3)
- South Korea's Defense Acquisition Program Administration to invest US$13.6B to bolster space technology development (no.016)
- NASA rover succeeds in sampling Mars rocks (no.028) (Fig.4)
- Cobham manufactures Thuraya 4-NGS ground system (no.043)
- NASA selected 5 companies for research into lunar modules (no.067)
- Raytheon plans SEAKR Engineering acquisition (no.068)
- SSTL contracts with ESA as anchor customer for Lunar Pathfinder (no.077)
- Euroconsult's latest report: Revealing the satellite connectivity + video market to double (no.103)
- Quad-country cooperation and restraining China in becoming "space powerhouse" (no.104)
- Northrop to launch new satellite service for commercial and government-affiliated companies (no.109)
- British government announces national space strategy (no.115)

From Japan

- "Unmanned Ship Project," a full-scale navigation experiment equipped with SKY Perfect JSAT's satellite communication system, to be conducted within the fiscal year (no.024) (Fig.13)
- "MICHIBIKI" quasi-zenith satellite launched on 10/25, as a successor to the first "MICHIBIKI" satellite (no.048)
- Ministry of Economy, Trade and Industry supports Vietnam with small satellites (no.100) (Fig.14)

Mixed space, etc.

Satellites

- Spire Global receives data distribution contract order from NOAA (no.022)
- OneWeb and AT&T form partnership to expand US coverage (no.033)
- Black Sky wins US$ 30M/5-year contract from NGA (no.039)
- Eutelsat completes OneWeb equity investment (no.040)
- Xenesis and MBS Lab forge pact to test optical communications (no.044) (Fig.5)
- Hughes and OneWeb announce agreements for low-Earth-orbit satellite service in the U.S. and India (no.050)
- BAE Systems acquires In-Space Missions (no.059)
- DARPA seeking satellite laser terminals that can talk to any space network (no.061)
- OneWeb signs distribution deal with Peraton, broadens reach into military market (no.074)
- SpaceX emphasizes coordination with other satellite operators (no.079)
- Spanish government authorizes Sateliot to initiate 5G IoT communications from space (no.091)

Launching

- SpaceX wins contract to launch Yahsat's Thuraya 4-NGS satellite (no.032)
- Korean consortium invests US$ 50M in US launch startup Relativity Space (no.046)
- SpaceX to launch Turksat 6A (Turkey's first domestic communications satellite) (no.081)
- Blue Origin, Rocket Lab, SpaceX, and ULA win US Space Force rocket technology project contract (no.110)

Others

- U.S. Space Force backs development of commercial orbital debris removal systems (no.073)
- UK's D-Orbit contracts with ESA to develop debris removal technology (€ 2.197B) (no.087) (Fig.6)

From Japan

- Axelspace signs partnership agreement with Remote Sensing Technology Center for AxelGlobe data sales (no.004)
- SPJ announces "SPACE PORT MAP" (no.015) (Fig.15)
- Axelspace Corp. and the Disaster Prevention Research Institute entrusted for demonstration support work for establishing flow for utilizing small optical satellites in the event of disaster (no.025)
- KDDI partners with SpaceX (no.057) (Fig.16)
- Synspective signs 3 launch contracts (no.076)
- Astroscale selects Rocket Lab to launch Phase I of JAXA's debris removal demonstration project (no.094)
- Spaceports & government support: Manned space transportation systems development (no.111)
- ALE, etc.: Launch of professional AETHER platform for industry-academia collaboration (no.114) (Fig.17)
- Synthetic and Seiren collaborate on small SAR satellites (no.119)

NewSpace, etc.

Satellites

- OneWeb secures US$ 1B insurance policy for remaining constellations (no.013)
- SpaceX says Amazon's call to dismiss Starlink amendment is delay tactic (no.014)
- Rocket Lab expands spacecraft component production (no.021) (Fig.7)
- Swissto12 and Saturn to collaborate on small GEO satellites (no.036)
- Bridgecomm provides customers with inter-satellite links (no.046)
- BlackSky announces completion of merger with Osprey Tech (no.049)
- Public company BlackSky moves to expand sales and marketing (no.056)
- SpaceX launches first dedicated polar Starlink mission (no.058)
- Spire buys exactEarth as first acquisition as a public company (no.060)
- SpaceLink: Second customer agreement for Mynaric's optical terminal (no.063) (Fig.8)
- New SAR data program launched By Capella Space (no.064)
- OneWeb's BB constellation reaches midpoint (no.066)
- Tomorrow.io orders demonstration satellite for storm-tracking constellation (no.095)
- Xona completes financing for GPS-alternative demo mission (no.101)
- SpaceX succeeds in launching Starlink satellite ver1.5 for first time (no.107)
- Spire and SpaceChain announce on-orbit blockchain demonstration (no.117)

Launching

- Firefly Aerospace's Alpha rocket explodes during first launch (no.019) (Fig.9)
- Virgin Orbit eyes growth in military "responsive" launch field (no.020)
- Up-and-coming rocket company "Astra" fails to launch rocket (no.026)
- Rocket Lab wins multi-launch deal for IoT constellation (no.034)
- Spaceflight Inc. announces first lunar and GEO rideshare mission: "GEO Pathfinder" (no.069)
- Falcon Heavy next mission, Astranis debut satellite launch (no.106)

Others

- SpaceX to increase Starlink antenna production rate (no.029)
- Kymeta announces successful OneWeb antenna tests (no.030)
- SpaceX makes history with first all-civilian spaceflight (no.065) (Fig.10)
- SpaceX launches Crew Dragon on first private mission (no.072)
- Crew Dragon landing, Inspiration4 mission completed (no.085)
- OneWeb, GW antenna test accelerated via drones (no.096) (Fig.11)
- US$ 15B in 1H 2021: Investment in space and VC capital heating up (no.099)
- Orbit Fab to launch propellant tanker to fuel GEO satellites (no.108) (Fig.12)

From Japan

- Space Walker and Comlead complete absorption-type merger (no.002)
- Kyushu Institute of Technology to launch into space a micro satellite developed mainly by students within the fiscal year (no.005)
- Spaceports, one after another: Toward igniting regional revitalization (no.094) (Fig.18)
- GITAI's demonstrative work robot arrives at ISS (no.105) (Fig.19)

From around the world

From Japan

OldSpace, etc.

Fig.1: "Thuraya" 4-NGS is based on Airbus's fully electrified Eurostar Neo platform, equipped with a 12 m diameter L-band antenna and a P/L with routing flexibility for up to 3,200 channels (no.009).

Fig.2: "ROSS" space station announced by Russia to be developed independently (Roscosmos YouTube channel) (no.006)

Fig.3: Prototype for a Mars surface cruise drone developed by NSSC in China (credit: NSSC/CAS) (no.007)

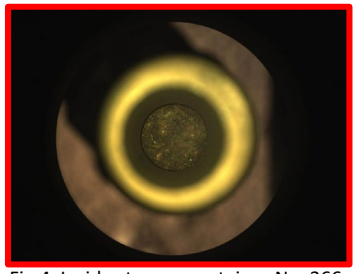

Fig.4: Inside storage container No. 266 before sealing, taken by Perseverance's CacheCam; core rock sample as collected visible at center (credit: NASA/JPL-Caltech) (no.028)

Mixed space, etc.

Fig.5: Xenesis Xen-node optical ground terminal (credit: Xenesis) (no.044)

Fig.6: D-Orbit's UK starting point: € 2,197M contract with ESA; demonstration of development phase 1 and the in-orbit “Deorbit Kit” (no.087)

NewSpace, etc.

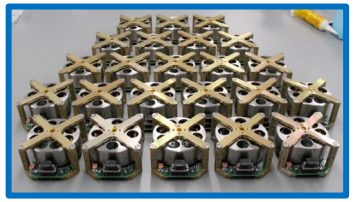

Fig.7: Rocket Lab expands annual production of reaction wheels for satellites to 2,000 in New Zealand (credit: Rocket Lab) (no.021)

Fig.9: Firefly's Alpha rocket explodes about 2.5 minutes after lift-off (credit: SpaceNews/Jeff Foust) (no.019)

Fig.11: OneWeb uses QuadSat drone for gateway testing (credit: QuadSat) (no.096)

Fig.8: Mynaric announces second customer of CONDOR Mk 3 two weeks after debut of next-generation optical terminals at 36th Space Symposium (no.063)

Fig.10: World's first mission consisting of only civilians, on Inspiration4 (credit: SpaceX's Twitter account) (no.065)

Fig.12: Design concept of Orbit Fab's Tanker-002 (credit: Orbit Fab) (no.108)

Fig.18: Future map of the Hokkaido Spaceport (credit: Space Cotan) (no.094)

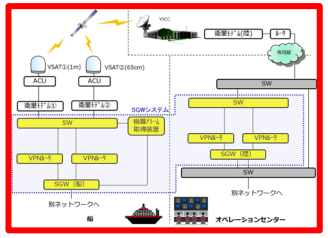

Fig.13: Overall configuration of satellite communications for the "Unmanned Ship Project" demonstration experiment (no.024)

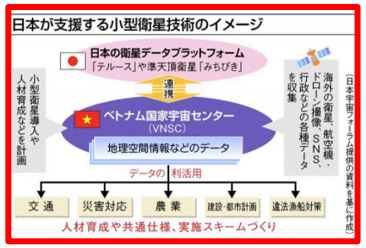

Fig.14: VNSC requests Ministry of Economy, Trade and Industry to cooperate in formulating a basic plan for smallsat constellations (no.100)

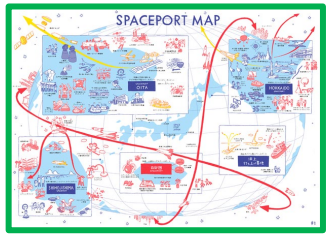

Fig.15: "SPACE PORT MAP" in Japan announced by SPJ (no.015)

Fig.16: KDDI President Makoto Takahashi explaining the alliance with SpaceX (Credit: KDDI) (no.057)

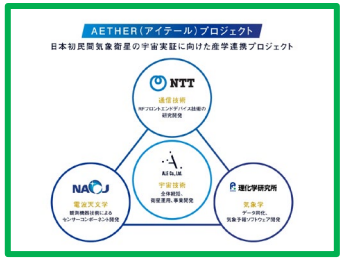

Fig.17: Japan's first project aiming at in-space demonstration of a civilian meteorological satellite (no.114)

Fig.19: Robot for assembling solar panels developed by GITAI Japan (no.105)