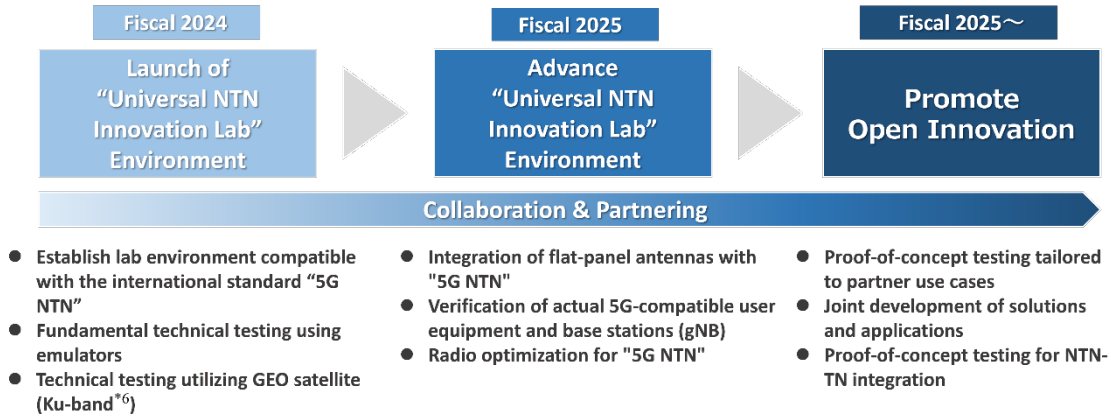
November 25, 2024
SKY Perfect JSAT Corporation

SKY Perfect JSAT Launches "Universal NTN Innovation Lab" Environment at Yokohama Satellite Control Center to Advance "Universal NTN (Non-Terrestrial Network)"

SKY Perfect JSAT Corporation (Head Office: Minato-ku, Tokyo; Representative Director, President and CEO: Eiichi Yonekura; "SKY Perfect JSAT") has launched the "Universal NTN Innovation Lab" ("NTN Lab"), an environment equipped for technical testing of Non-Terrestrial Network (NTN)[*1] within its Yokohama Satellite Control Center (YSCC) as of November 1st, 2024. The NTN Lab will serve as a testing hub for the realization of the "Universal NTN", a pioneering concept aiming to deliver robust and reliable connectivity anywhere, anytime leveraging GEO[*2], Non-GEO[*3] satellites, and HAPS[*4] with technology that enables automatic routing to the optimal communication path. The NTN Lab's initiatives will focus on 5G NTN[*5] technologies and support the development of new communication technologies utilizing satellite communications.



Purpose and Vision of the NTN Lab

The 5G NTN technology is designed to integrate terrestrial and non-terrestrial networks, enhancing connectivity infrastructure globally and across diverse environments. The NTN Lab is equipped with the first testbed environment for SKY Perfect JSAT to conduct technical testing aligned with 3GPP's[*7] 5G NTN standards. Leveraging our geostationary satellites and the infrastructure of YSCC, the NTN Lab will provide a foundation for the commercial deployment of NTN technology.

The NTN Lab will expand in phases. Initially, it will focus on verifying the core technologies of 5G NTN, utilizing SKY Perfect JSAT's satellites and facilities, with support from partner companies. By the second half of fiscal year 2025, SKY Perfect JSAT plans to open the NTN Lab to various companies and organizations, enabling collaborative trials and technical development for future use cases and applications.

State-of-the-Art Testbed Environment

The NTN Lab is equipped with high-performance simulators for 5G NTN-compatible user equipment (UE)[*8] and base stations (gNB)[*9], including the "TM500" by Viavi Solutions in the United States and the "CMX500" by Rohde & Schwarz in Germany. This equipment enables extensive technology validation with a focus on commercial deployment, supporting a wide range of testing scenarios.

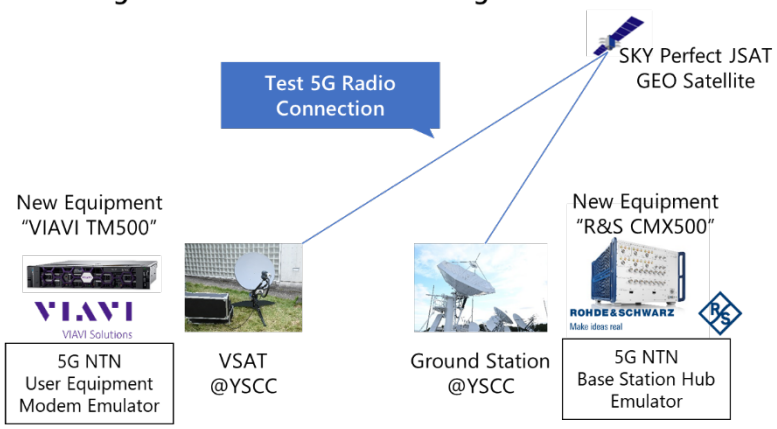
(Left) Emulators at Universal NTN Innovation Lab

(Right) VSAT used for Technical Testing

Initial Testing and Future Prospects

The initial phase of the NTN Lab includes technical testing using the Ku-band and 5G NTN technology, as defined in 3GPP Release 19[*10]. These testing aim to establish a high reliability communication environment over satellite and ensure seamless connectivity between terrestrial and non-terrestrial networks.

Image of 5G NTN Technical Testing in Fiscal 2024



SKY Perfect JSAT will utilize the NTN Lab as a hub to support the communication infrastructure of the future, driving technological innovation while collaborating with companies and research institutions. Through these efforts, we are committed to advance the commercialization of NTN technology and the creation of new business opportunities.

*1 NTN (Non-Terrestrial Network):A network using non-terrestrial platforms, such as satellite and HAPS, to provide communication coverage beyond traditional terrestrial networks (TN).

*2 GEO (Geostationary Earth Orbit): Orbit located approximately 36,000 km above the equator, where satellites synchronize with the Earth's rotation and appear stationary from the Earth's perspective.

*3 non-GEO (non-Geostationary Earth Orbit): Any Earth orbit other than GEO.

*4 HAPS (High Altitude Platform Station): Unmanned aircraft that operate at around 20km altitude in the stratosphere, providing communication and observation services. HAPS is expected to enable high-speed, large-capacity, and low-latency communication with devices such as smartphones, particularly in remote areas with limited communication infrastructure.

*5 5G NTN: A new radio access technology specified by 3GPP*7 for the 5G (fifth generation) mobile communication system.

*6 Ku-band: Frequency range from 12GHs to 14GHz, commonly used for satellite communications.

*7 3GPP (3rd Generation Partnership Project):An international project that develops standards for mobile communication systems.

*8 UE (User Equipment): Devices such as smartphones, tablets, and PCs connected to communication networks.

*9 gNB (gNodeB): A base station compatible with 5G technology.

*10 3GPP Release 19: In 3GPP, a release represents a functional set of technical specification developed by international standardization bodies. For Release 19, the inclusion of the Ku-band as a 5G NTN band is under consideration.

■ News Releases Related to “Universal NTN”

- November 18, 2024, News Release: “SKY Perfect JSAT to Advance Development of ‘Universal NTN (Non-Terrestrial Network)’”
  https://www.skyperfectjsat.space/en/news/detail/_universal_ntn_en.html
- May 28, 2024: Japanese Consortium Achieves World's First Demonstration of 5G Communication from Altitude of 4km Using 38GHz Band -- Major Step Toward Realization of 5G Communication from Stratosphere --
  https://www.skyperfectjsat.space/en/news/detail/japanese_consortium_achieves_worlds_first_demonstrationof_5g_communication_from_altitude_of_4km_usin.html
- May 27, 2024: SKY Perfect JSAT selects Thales Alenia Space to build a new cutting-edge software-defined satellite "JSAT-31"
  https://www.skyperfectjsat.space/en/news/detail/sky_perfect_jsat_selects_thales_alenia_space_to_build_a_new_cutting-edge_software-defined_satellite_.html
- December 7, 2023: Space Compass, NTT DOCOMO, NTT and SKY Perfect JSAT to Develop Direct-to-Device Service via Space-based Non-terrestrial Network
  https://www.skyperfectjsat.space/en/news/detail/_space_compass_ntt_docomo_ntt_and_sky_perfect_jsat_to_develop_direct-to-device_service_via_space-bas.html
- November 28, 2023: Amazon's Project Kuiper and NTT/SKY Perfect JSAT Form Strategic Collaboration to Bring Advanced Satellite Connectivity Options to Japan
  https://www.skyperfectjsat.space/en/news/detail/amazons_project_kuiper_and_nttsky_perfect_jsat_form_strategic_collaboration_to_bring_advanced_satell.html
- April 26, 2022: NTT and SKY Perfect JSAT Agree to Establish Space Compass Corporation -Novel Space Integrated Computing Network Enterprise to Aid Realization of a Sustainable Society-
  https://www.skyperfectjsat.space/en/news/detail/ntt_and_sky_perfect_jsat_agree_to_establish_space_compass_corporation_-novel_space_integrated_comput_1.html
- January 17, 2022: Airbus, NTT, DOCOMO and SKY Perfect JSAT Jointly Studying Connectivity Services from High-Altitude Platform Stations (HAPS) -- Targeting future global wireless-connectivity services combining satellites and HAPS –
  https://www.skyperfectjsat.space/en/news/detail/airbus_ntt_docomo_and_sky_perfect_jsat_jointly_studying_connectivityservices_from_high-altitude_plat.html
- May 20, 2021: NTT and SKY Perfect JSAT conclude collaboration agreement on new space enterprise to aid realization of a sustainable society
  https://www.skyperfectjsat.space/en/news/detail/ntt_and_sky_perfect_jsat_conclude_collaboration_agreement_on_new_space_enterprise_to_aid_realization.html
- March 25, 2021: SKY Perfect JSAT signs contract with Airbus to build Superbird-9 telecommunications satellite
  https://www.skyperfectjsat.space/en/news/detail/sky_perfect_jsat_signs_contract_with_airbus_to_build_superbird-9_telecommunications_satellite.html