



Space Compass, NTT DOCOMO, NTT and SKY Perfect JSAT to Develop Direct-to-Device Service via Space-based Non-terrestrial Network

TOKYO, JAPAN, December 7th, 2023— Space Compass, NTT DOCOMO, INC., Nippon Telegraph and Telephone Corporation (NTT) and SKY Perfect JSAT Corporation (SKY Perfect JSAT) jointly announced today that they have been selected by the National Institute of Information and Communications Technology (NICT) to develop direct-to-device (D2D) mobile services, which will be deployed via a space-based non-terrestrial network (NTN) using high-altitude platform stations (HAPS).

The project is part of the NICT's Innovative ICT Fund Projects for Beyond 5G/6G, known as Beyond 5G, which envisions a society where connectivity is assured over the air, sea, and space regardless of user location.

The project comprises two phases:

Early commercialization (Phase 1)

The four participating companies aim to solve various technical issues and demonstrate a communication service using HAPS positioned in the stratosphere over Japan, with the goal of accelerating the commercialization of HAPS D2D communication services.

System evolution (Phase 2)

Research and development (R&D) will be conducted on high-speed, high-capacity technology and time-division duplex (TDD) communication (downlink and uplink use same frequency band but in different time slots), aiming to expand the business scope and applicability of HAPS services in the coming 6G era. Phase 2 will also focus on upgrading the feeder link, including increasing its capacity, and installing a satellite backhaul system for flexible operation in areas where it is not possible to install terrestrial gateway stations connecting HAPS and terrestrial networks.

Space Compass, which plans to launch HAPS services in Japanese fiscal year 2025, will lead the project, define network service requirements and evaluate demonstrations conducted under the project. DOCOMO, which plans to develop a HAPS-based mobile communications business spanning air, sea and space for 5G evolution and 6G, will mainly develop ground base stations and HAPS-equipped base stations for mobile communications, focusing on maximizing service-link efficiency and capacity. NTT will mainly develop the control technology of the HAPS feeder link, such as site diversity and control of the transmit power, for robust service quality. SKY Perfect JSAT, which plans to offer the NTN business by connecting satellites and HAPS networks to multi-terrestrial networks, will mainly focus on developing alternative feeder link methods, such as satellite-backhaul and improvement of connection rates through the multi-connection of ground gateway stations.

Through this R&D project and beyond, the four participating companies are committed to improving the quality, efficiency and flexibility of HAPS services, extending mobile coverage to extreme levels, and ensuring seamless connectivity.

Previously, the four companies began jointly researching and developing a space-based radio access network (RAN) as an NTN, with HAPS serving as key components to support ultra-wide mobile communication services in air, sea and space. In the coming future, HAPS-based networks are expected to facilitate the broad expansion of communication services, such as support for disaster communications, ship and drone connectivity, and communications in mountainous and remote areas such as islands.

More details on the project will be presented at docomo Open House '24, which will be held in Tokyo from January 17, 2024.

About Space Compass Corporation

Space Compass is a joint venture company between NTT, Japanese Information and Communications Technology (ICT) leader, and SKY Perfect JSAT Corporation, Asia's largest satellite operator. We will launch a Space Integrated Computing Network to aid the realization of a sustainable society. For more information, visit our corporate website,

<https://space-compass.com>

About NTT DOCOMO

NTT DOCOMO, Japan's leading mobile operator with over 88 million subscriptions, is one of the world's foremost contributors to 3G, 4G and 5G mobile network technologies. Beyond core communications services, DOCOMO is challenging new frontiers in collaboration with a growing number of entities ("+d" partners), creating exciting and convenient value-added services that change the way people live and work. Under a medium-term plan toward 2020 and beyond, DOCOMO is pioneering a leading-edge 5G network to facilitate innovative services that will amaze and inspire customers beyond their expectations.

<https://www.docomo.ne.jp/english/>

About NTT

NTT contributes to a sustainable society through the power of innovation. We are a leading global technology company providing services to consumers and business as a mobile operator, infrastructure, networks, applications, and consulting provider. Our offerings include digital business consulting, managed application services, workplace and cloud solutions, data center and edge computing, all supported by our deep global industry expertise. We are over \$95B in revenue and 330,000 employees, with \$3.6B in annual R&D investments. Our operations span across 80+ countries and regions, allowing us to serve clients in over 190 of them. We serve over 75% of Fortune Global 100 companies, thousands of other enterprise and government clients and millions of consumers.

<https://group.ntt/en/>

About SKY Perfect JSAT

SKY Perfect JSAT is Asia's largest satellite operator with a fleet of 17 satellites, and Japan's only provider of both Multi-channel Pay TV broadcasting and satellite communications services. SKY Perfect JSAT delivers a broad range of entertainment through the "SKY PerfectTV!" platform, the most extensive in Japan with over 2 million subscribers. SKY Perfect JSAT's satellite communications services, which cover Asia, Indian Ocean, Middle East, Pacific Ocean and North America, play a vital role in supporting communications infrastructures for mobile backhaul, government, aviation, maritime, oil & gas and disaster recovery. For more information, visit our corporate website (<https://www.skyperfectjsat.space/en>) and Space Business website (<https://www.skyperfectjsat.space/jsat/en/>).