SKY Perfect JSAT launches maritime VSAT broadband service for private commercial vessels

1 Introduction

In this article, I'd like to introduce our maritime VSAT broadband service using Ku band communication satellite. Recently the penetration of always-on connection broadband on land has been driving the demand for broadband services on the sea. However, the always-on connection by conventional communication system was unrealistic due to its late speed and huge service cost. Corresponding to the global increase of demand for maritime broadband, the World Radio Communication Conference (WRC-03) passed a resolution to enable Earth Stations onboard Vessels (ESV) with Ku and C band satellite system. This WRC-03 resolution triggered the emergence of various maritime broadband services.

2 Overview of the Service

SKY Perfect JSAT (SP-JSAT) offers IP based and high speed maritime broadband service with Ku band satellite of which uplink frequency is 14GHz and downlink 12GHz. Two satellites of SP-JSAT fleet, JCSAT-1B and Intelsat 15* contribute to its global service coverage. In the past, ship communications have been generally offered at a metered per-minute rate. But, the new service is expected to help reduce ship communications costs through a set-rate plan. Ku band (14/12GHz) system enables the higher speed connection than the conventional mobile satellite communications system with L band (1.6 / 1.5GHz) and C band (6 / 4GHz). The service has achieved a maximum transmission speed of approximately 1 Mbps (commercially reasonable efforts), improving previous transmission speeds in the same areas.

*** Intelsat 15 (IS-15)**

IS-15 is a successor spacecraft to Intelsat 709, IS-15 will operate in an orbital position of 85˚ East Longitude. Following its launch in late 2009, IS-15 primarily will provide services to the Asia-Pacific, Indian Ocean and Middle East regions. The satellite will be equipped with 22 Ku-band transponders, five of which SP-JSAT will own and operate. IS-15 provides high-speed broadband links to ships in the Indian Ocean and Asian and Oceania waters.

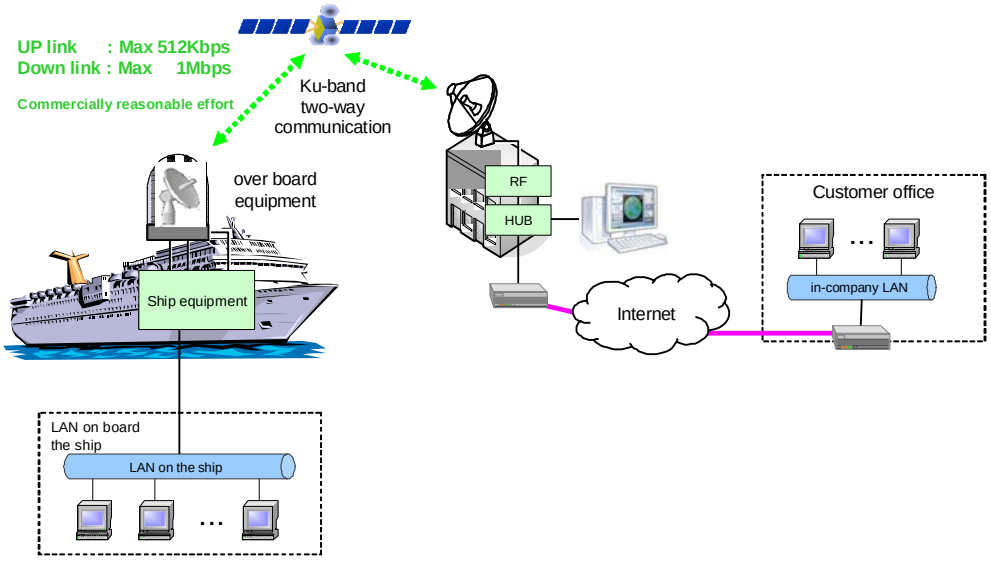

Fig 1. Service overview

Fig 2. Gateway facilities（Yokohama Satellite Control Center）

3 Service Area

Linking up with KVH, which already provides maritime VSAT services for ships in areas such as the Pacific Ocean, and Caribbean Sea, SP-JSAT will offer roaming connections, making it possible with high-speed transmissions between ships in the major marine areas.

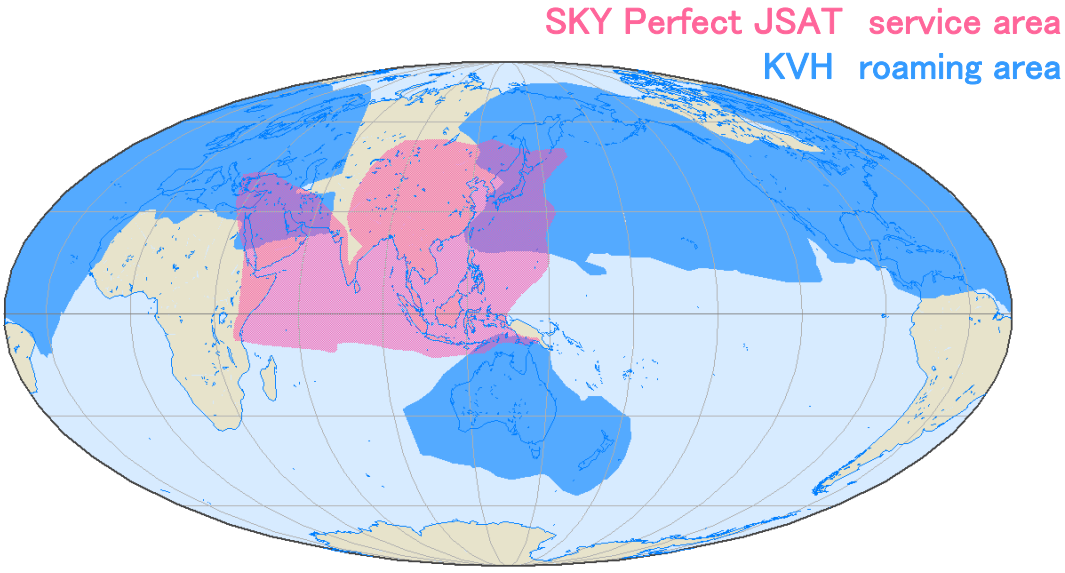

Fig 3. Service area

4 System Overview

4.1 Antenna Equipment

The operation of mobile Ku band terminals requires the regulations with the strict conditions, such as satellite tracking accuracy within ±0.2 degree, to prevent the interference to radio communications. KVH Industries, Inc., a partner of the service, provides theirs customers with “TracPhone V7”, ESV terminal with the following specifications.

1. Antenna diameter: 60 cm
2. Transmission power: 4 W
3. Transmission frequency: 14.0 - 14.5GHz
4. Receiving frequency: 11.7 - 12.75GHz
5. Weight: 30 kg

A Japanese manufacturer is also going to provide with 1.0m antenna so that two types of antenna should be available.

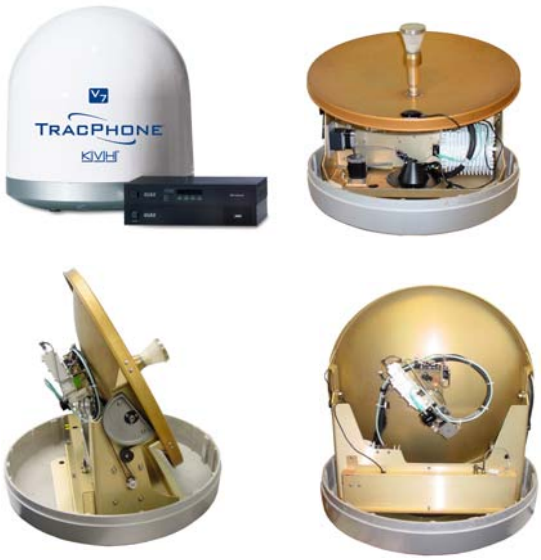

Fig 4. TracPhone V7 antenna unit

4.2 Multiple Access and Modulation Method

The service employs Code Division Multiple Access (CDMA) approach used by cell phone service providers. CDMA significantly reduces contention issues by sending information using TDMA approach. The service also uses modern and efficient spread spectrum technology, which spreads the transmitted signal power over a broader frequency spectrum, thereby lowering the signal’s power spectral density.

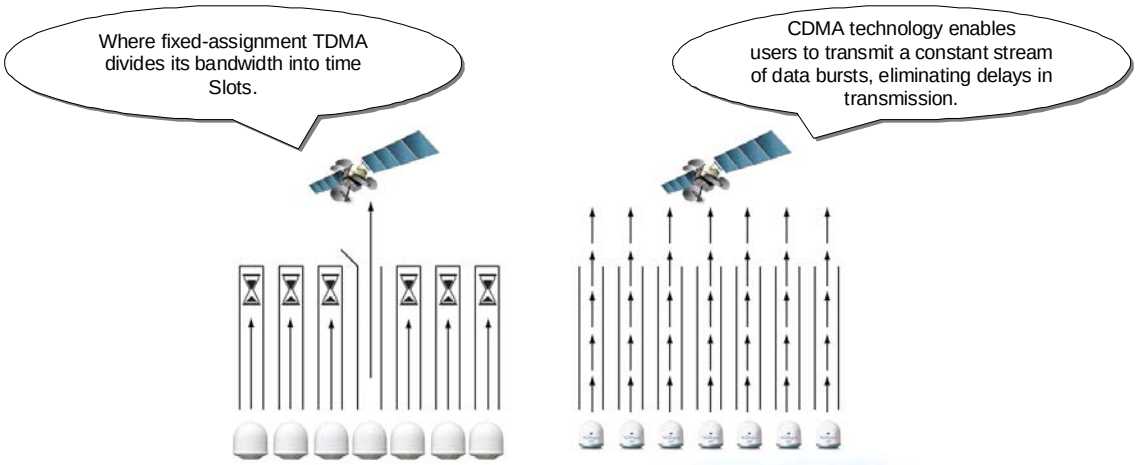

Fig 5. Multiple Access and Modulation Method

5 Service installation to Nippon-Maru

5.1 Outlines of Nippon-Maru

Mitsui O.S.K. Passenger, ltd. is going to adopt the service on their cruise ship, Nippon-Maru.The Nippon-Maru has delivered exceptional vacation experiences with various packages, such as around-the-world cruises and overnight cruises that create memorable weekends.

The service covers the most of navigation area of Nippon-Maru. Nippon-Maru in refurbishment program from November 1st, 2009 to February 28th, 2010, and we will see renovated one with the service in March 2010.

(For more information, see www.nipponmaru.jp)

Fig 6. Artist's rendering of the Nippon-Maru after refurbishment program

5.2 History and Service Launch Schedule

In order to realize the service, the following five companies* worked with an experiment on Nippon-Maru from July 2007 to January 2009. The success of this experiment led to the commercial service of SP-JSAT and its one of launch customers is Nippon-Maru. The service is going to be available on Nippon-Maru from March 2010.

*** Mitsui O.S.K. Passenger Lines, Ltd., Mitsui O.S.K. Lines, Ltd., Mitsui Engineering & Shipbuilding, Co., M.O. Marine Consulting, Ltd. and SKY Perfect JSAT**

6 Future Prospects

The new service will enable the crews and passengers on ships in the service areas to make use of Internet services in an user-friendly communications environment on a par with what is available on land. In addition, the service will contribute to the welfare of crew members, and help eliminate the digital divide on the oceans.

In the future, for example, by transmitting large volumes of data about local shipping conditions, such as weather and waves, and combining it with various transporting information and navigational support systems could be developed that assist ships in selecting the most energy-efficient route. This could contribute to reductions in Carbon dioxide emissions from international marine transport, a goal being promoted by countries around the world.

7 Contact

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