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STATUS OF COMS GROUND SYSTEM AT METEOROLOGICAL SATELLITE CENTER

This paper describes COMS ground system at Meteorological Satellite Centre (MSC/KMA). MSC/KMA would have a number of functional systems, for COMS operation and meteorological product generation.

Status of COMS Ground System at Meteorological Satellite Center

1 INTRODUCTION

This paper describes *Communication, Ocean, and Meteorological Satellite* (COMS) ground system at *Meteorological Satellite Center* (MSC/KMA). COMS operation and meteorological products application service system of MSC/KMA would be consisted of a number of functional systems, such as Data Acquisition and Transmission System, Image Preprocessing System, *Low (High) Rate Information Transmission* (LRIT/HRIT) Generation System, COMS Meteorological Data Processing System, and Interactive Satellite Data Analysis System.

Section 2 briefs COMS ground segment configuration. The meteorological mission and functions of MSC/KMA are described in Section 3. Section 4 introduces the functional components of *COMS operation and meteorological products application service system* (COMPASS) at MSC/KMA. Finally, Section 4 offers the future development plan of COMPASS.

2 COMS ground segment configuration

COMS is the first Korean geostationary multi-purpose satellite, scheduled to be launched at the June of 2009. COMS mission includes a meteorological service, ocean monitoring, and Ka-band satellite communication. The COMS *Ground Segment* (GS) consists of four ground centers: *Meteorological Satellite Center* (MSC/KMA), *Korea Ocean Satellite Center* (KOSC), *Communication Test Earth Station* (CTES), and *Satellite Control Center* (SOC).

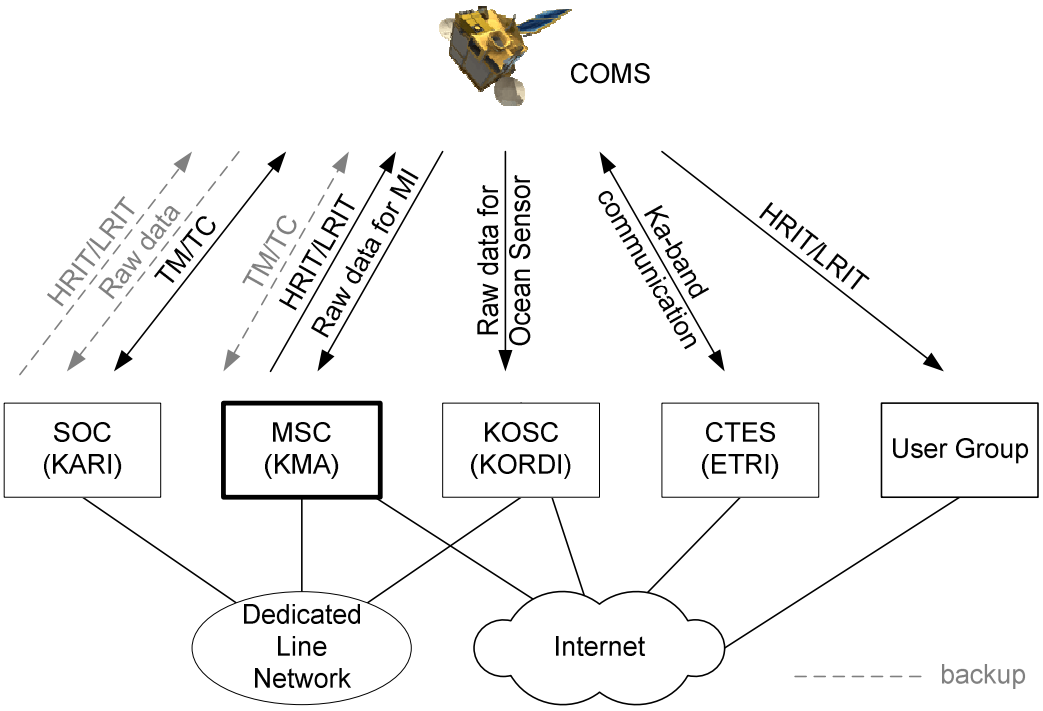

Figure 1. COMS ground segment architecture

MSC/KMA would receive *Meteorological Imager* (MI) sensor data, process various applications, disseminate and archive them for user groups operationally. KOSC would receive its ocean sensor data, process, and disseminate them for research activities. CTES would monitor RF signals to check the status of Ka-band communication system. SOC would perform the satellite operation and monitoring. Figure 1 shows the schematic overview of COMS ground segment.

3 MSC/KMA mission

The meteorological mission of MSC/KMA has the following goals:

- Continuous monitoring of imagery and extracting of meteorological products with COMS meteorological imager
- Early detection of severe weather such as typhoon, flood, dust storm, etc
- Extraction of data on long-term change of climate.

In accordance with missions, user data format and dissemination media will be different. Processed MI data will be delivered to users by using *Low Rate Information Transmission* (LRIT) and *High Rate Information Transmission* (HRIT). Users can receive MI data via LRIT/HRIT reception stations, Internet or off-line retrieval service.

MSC/KMA receives raw data and applies radiometric and geometric correction. *COMS Meteorological Data Processing System* (CMDPS) produces meteorological applications using preprocessed MI Level 1B data. The MI Level 1B data and selected meteorological applications are disseminated to users in LRIT/HRIT data format via the spacecraft.

MSC/KMA is in charge of the following duties :

- Mission request for MI operation
- Reception of MI sensor data
- Radiometric and geometric correction
- Generation of LRIT/HRIT data and dissemination of the data to users
- Extraction of meteorological products
- Meteorological products analysis

In addition, MSC/KMA may be a backup station for satellite control, in case of emergency situation on *Satellite Ground Control System* (SGCS) at SOC.

4 COMS Operation and Meteorological Products Application Service System

To fulfil the missions, the *COMS Operation and Meteorological Products Application Service System* (COMPASS) of MSC/KMA is consisted of a number of functional systems. Figure 2 depicts the block diagram of functional components of COMPASS.

Data Acquisition and Transmission System (DATS) performs the front-end process. It receives sensor data from the antenna system and demodulates MI raw data. It also modulates LRIT/HRIT and transmits them to the spacecraft. *Image Preprocessing System* (IMPS) receiving raw data from DATS, performs radiometric and geometric correction. It generates Level 1B data as well. The generated Level 1B data are sent to the *LRIT/HRIT Generation*

System (LHGS) for user dissemination service CMDPS for further data analysis. LHGS performs the LRIT/HRIT formatting for user dissemination service. CMDPS produces 16-baseline meteorological applications using the Level 1B data and ancillary data, and transmits them to LHGS and *Interactive Satellite Data Analysis System* (ISDAS). Moreover, CMDPS products will be used for the various purposes for nowcasting, numerical weather prediction model as satellite data assimilation, climate monitoring, and so on. ISDAS receives meteorological products from CMDPS and ancillary data for analysis such as numerical weather prediction model. It also provides interactive analysis interface to operators.

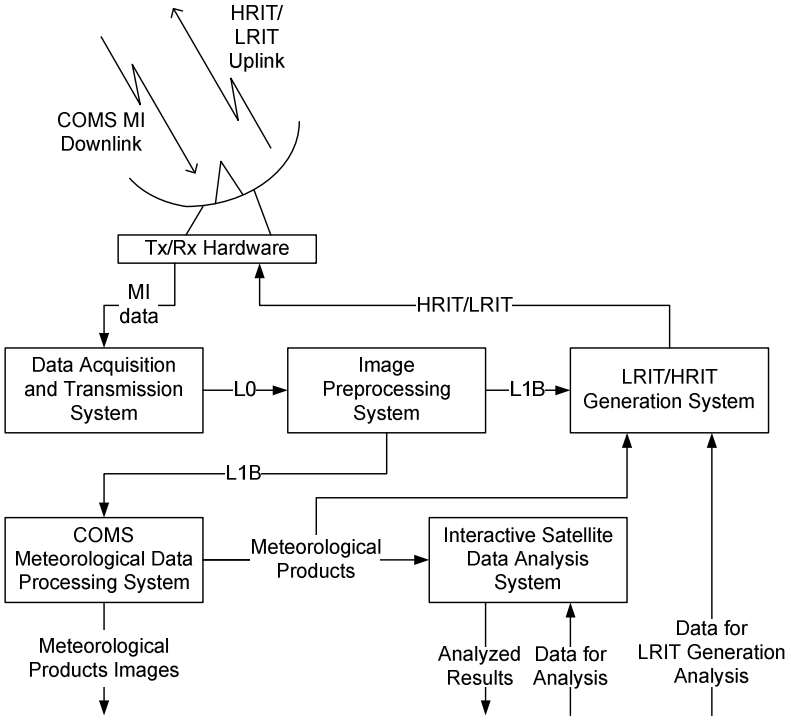

Figure 2. Functional components of COMPASS

5 Future plan

The preliminary and detailed designs of the functional components of COMPASS are finished. The functional components of COMPASS would be developed, installed and tested in the end of 2007 or the beginning of 2008. And then COMPASS would be integrated and tested before the launch of COMS in June 2009. Finally, COMPASS would be implemented throughout in-orbit test in the latter half of 2009.