

Prepared by KMA
Agenda Item: C.2
Discussed in Plenary

UPDATE ON COMS PROGRAM

This document is to update the COMS program as a part of CGMS-34-WMO-WP-25. This includes the status of COMS payloads development, the information about the observation channels, and the HRIT/LRIT.

1. Introduction

Korea Meteorological Administration (KMA) has started the first Korean multi-purpose geostationary satellite program named by the Communication, Ocean and Meteorological Satellite (COMS), in cooperation with three other government ministries since 2003. Multi-missions of COMS are intended as not only meteorological and oceanic observation for the public welfare, but also in-orbit test of developed communication payload to be used for the next geosynchronous satellite.

2. Updated COMS program (*Section 2.8 in CGMS-34-WMO-WP-25*)

The Korea Aerospace Research Institute (KARI) has been developing COMS for KMA. COMS will be a multi-purpose satellite, 3-axis stabilised. Table 1 records the planning details as known so far. Figure 1 is an artist's rendering of the satellite.

Table 1. Chronology of the COMS programme

Satellite	Launch	End of service	Position	Status (Aug 2007)	Instruments
COMS-1	2009	Expected \geq 2016	116.2°E /128.2°E (TBD)	Being defined	Meteorological imager (MI), Geostationary Ocean Color Imager (GOCI)
COMS-2	2014	Expected \geq 2021	116.2°E /128.2°E (TBD)	Being defined	(TBD)

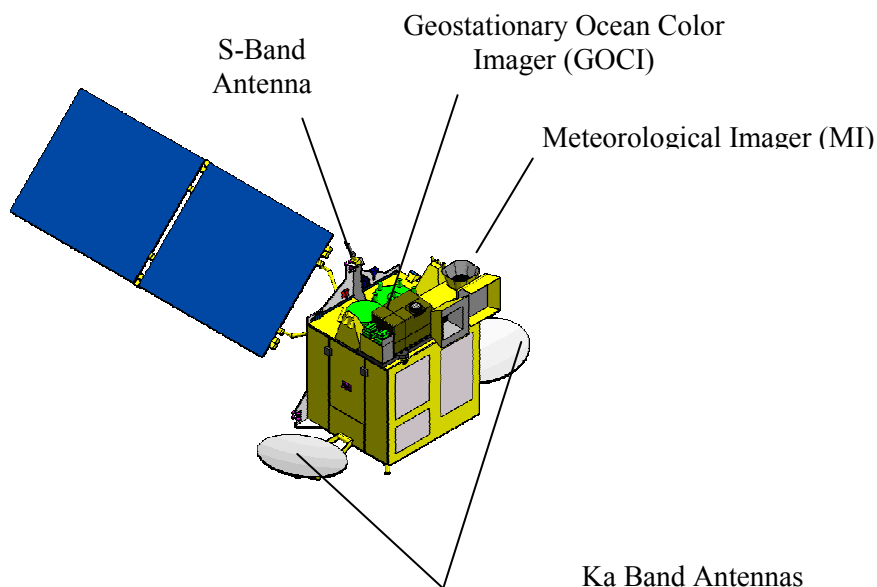


Figure 1. Artist's rendering of COMS

(1) The COMS payload for earth observation

- A Meteorological Imager with 5 channels in the range 0.55-12.5 μ m, resolution of 1 km in 1 VIS channel, 4 km in 4 IR channels, 27 min for full disk imaging (proportionally less for limited areas). See instrument sheet in Annex A3.1.
- An Geostationary Ocean Color Imager with 8 narrow-band channels in the range 400-865 nm for ocean color monitoring; resolution of 500 m over a limited coverage (2500 km x 2500 km). See instrument sheet in Annex A3.1.

(2) Data transmission from COMS

Raw data are transmitted to:

- Meteorological Satellite Center (MSC/KMA) and Korea Ocean Satellite Center (KOSC), and to the Satellite Operation Center:
 - Frequency of 1687 MHz, bandwidth of 6.0 MHz, RHCP/LHCP polarisation, 6 Mbps data rate.

After ground processing at MSC and/or KOSC, data are re-transmitted to the users by:

- HRIT (High Rate Information Transmission)
 - Frequencies of 2040.9(up) and 1695.4(down) MHz; bandwidth of 5.2 MHz; RHCP/LHCP polarisation
 - Antennas : diameters of 13 m(up) and 3.7 m (down), G/T ~ (TBD) dB/K, 3 Mbps data rate;
- LRIT (Low Rate Information Transmission)
 - Frequencies of 2037.64(up) and 1692.14(down) MHz; bandwidth of 1 MHz; RHCP/LHCP polarisation
 - Antennas : diameters of 13 m(up) and 1.2 m(down), G/T ~ (TBD) dB/K, 256 kbps data rate.

(3) Test of COMS

The COMS Meteorological Imager has undergone the performance test since 2007 Spring at ITT Industry, USA. The Critical Design Review (CDR) of COMS spacecraft was on March 2007, and the Assembly, Integration Test (AIT) has begun in September 2007.

A3.1 Operational meteorological satellites - COMS updated as of October 2007 -

Table A3.1.2 - List of the provided instrument sheets ordered by type of sensor and satellite

GEOSTATIONARY	Meteosat	GOES	MTSAT	Elektro-L	FY-2	INSAT-3A and 3D	Kalpana	COMS
Imager	MVIRI, SEVIRI	IMAGER	JAMI	MSU-GS	S-VISSR	VHRR, CCD, IMAGER	VHRR	MI, GOCI
Advanced imager	MTG Imager	ABI						
Sounder		SOUNDER				SOUNDER		
Advanced sounder	MTG Sounder	HES						
Earth radiation	GERB							
Lightning mapper	MTG Lightning	GLM						

MI	Meteorological Imager
Satellites	COMS 1 and 2
Status (August 2007)	Being designed – To be utilised in the period 2009 ~2021
Mission	Providing atmospheric variables over the Asia-Pacific region thru VIS/IR channels
Instrument type	5-channel VIS/IR radiometer (Instrument of COMS2 is TBD)
Coverage/cycle	Full disk in 27 min. Limited areas in correspondingly shorter time intervals
Resolution (s.s.p.)	1 km IFOV in 1 VIS channel, 4 km IFOV in 4 IR channels

Central wavelength	Spectral interval	Radiometric accuracy (NEΔT or SNR)
0.675 μm	0.55 - 0.8 μm	10:1@5% albedo, 170:1@ 100 % albedo
3.75 μm	3.50 - 4.0 μm	0.10 K @ 300 K
6.75 μm	6.5 – 7.0 μm	0.12 K @ 300 K
10.8 μm	10.3 – 11.3 μm	0.12 K @ 300 K
12 μm	11.5 – 12.5 μm	0.20 K @ 300 K

GOCI	Geostationary Ocean Color Imager
Satellites	COMS 1 and 2
Status (August 2007)	Being designed – To be utilised in the period 2009 ~ 2021
Mission	Ocean color and aerosol monitoring of seas around the Korean peninsula
Instrument type	8-channel VIS/NIR radiometer
Scanning technique	Snapshots of 2 mega pixel slot
Coverage/cycle	Area of 2500 km x 2500 km, hourly in daylight
Resolution (s.s.p.)	500 m IFOV

Central Wavelength	Band Width	Radiometric Accuracy (SNR @ Specified input radiances)
412 nm	20 nm	1000 @ 0.100 W m ⁻² sr ⁻¹ μ ⁻¹
443 nm	20 nm	1090 @ 0.086 W m ⁻² sr ⁻¹ μ ⁻¹
490 nm	20 nm	1170 @ 0.067 W m ⁻² sr ⁻¹ μ ⁻¹
555 nm	20 nm	1070 @ 0.056 W m ⁻² sr ⁻¹ μ ⁻¹
660 nm	20 nm	1010 @ 0.032 W m ⁻² sr ⁻¹ μ ⁻¹
680 nm	10 nm	870 @ 0.031 W m ⁻² sr ⁻¹ μ ⁻¹
745 nm	20 nm	860 @ 0.020 W m ⁻² sr ⁻¹ μ ⁻¹
865 nm	40 nm	750 @ 0.016 W m ⁻² sr ⁻¹ μ ⁻¹