

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-33-WMO-WP-23. This includes the status of COMS payloads development and the information about the observation channels and the HRIT/LRIT.

1. Introduction

Korea Meteorological Administration (KMA) has started the first multi-purpose geostationary satellite program named by the *Communication, Ocean and Meteorological Satellite (COMS)* in cooperation with 3 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-33-WMO-WP-23)

The Korea Aerospace Research Institute (KARI) is developing COMS for KMA. It will be a multi-purpose satellite, 3-axis stabilised. *Table 2.8.1* records the planning details as known so far. *Fig. 2.8.1* provides an idea of the spacecraft structure.

Table 2.8.1 - Chronology of the COMS programme

Satellite	Launch	End of service	Position	Status (Aug2006)	Instruments
COMS-1	2008	Expected \geq 2015	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)

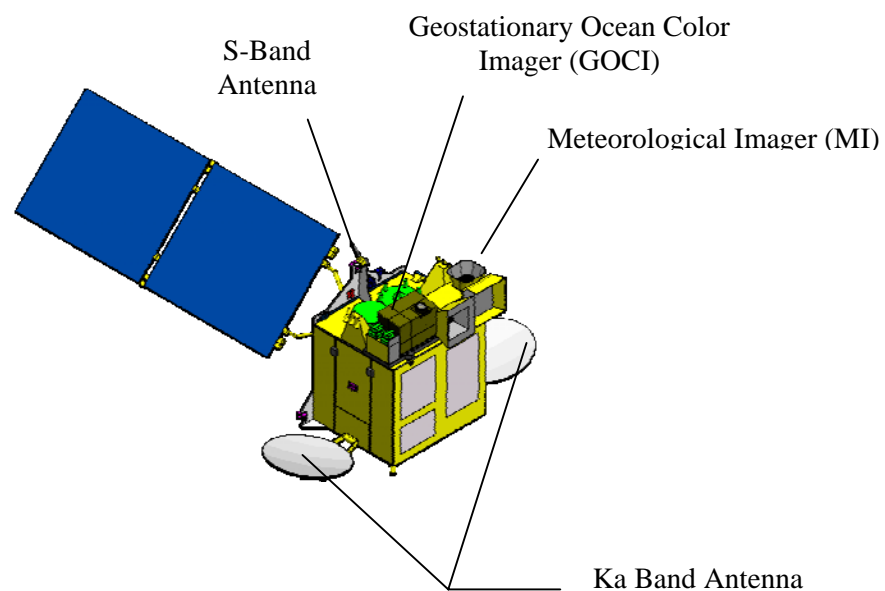


Fig. 2.8.1 Sketch view of COMS.

The *COMS payload* for Earth Observation includes:

- A *Meteorological Imager* with 5 channels in the range 0.55-12.5 μ m, resolution 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 500 m over a limited coverage (2500 km x 2500 km). See instrument sheet in Annex A3.1.

Data transmission from COMS

Raw data are transmitted to:

- The *Meteo/Ocean Data Application Center (MODAC)*. *MODAC includes* Korea Meteorological Satellite Center (MSC; TBD) and Korea Ocean Satellite Center (KOSC), and to the Satellite Operation Center:
 - Frequency 1687 MHz, bandwidth 6.0 MHz, RHCP/LHCP polarisation, data rate 6 Mbps.

After ground processing at MODAC, data are re-transmitted to the users by:

- *HRIT (High Rate Information Transmission)*. Main features:
 - Frequency: 2040.9(up) 1695.4(down) MHz; bandwidth: 5.2 MHz; polarisation: RHCP/LHCP
 - Antenna diameter ~ ...13 m (up)/3.7 m (down), G/T ~ (TBD) dB/K, data rate 3 Mbps;
- *LRIT (Low Rate Information Transmission)*, similar to MSG, GOES and MTSAT. Main features:
 - Frequency: 2037.64(up)/1692.14(down) MHz; bandwidth: 1 MHz; polarisation: RHCP/LHCP
 - Antenna diameter ~ 13 m (up)/1.2 m (down), G/T ~ (TBD) dB/K, data rate 256 kbps.

3. Future Plan

The COMS Meteorological Imager was under contract with ITT Industries in USA as a meteorological payload on COMS, and the manufacturing readiness review (MRR) was held in April 2006. Currently, the COMS S/C is preparing for the critical design review (CDR) scheduled in March 2007 since the preliminary design review (PDR) has been finished in January 2006.

After the successful launch of the COMS in the end of 2008, KMA will provide COMS meteorological observations and products internationally. Therefore, KMA will organize the user community, train the end-users, and provide useful information of COMS continuously.

A3.1 Operational meteorological satellites - COMS updated as of October 2006 -

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 2006)	Being designed – To be utilised in the period 2008 to ~ 2021
Mission	Multi-purpose VIS/IR imagery and wind derivation by tracking clouds and water vapour features
Instrument type	5-channel VIS/IR radiometer
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 m	0.55 - 0.8 m	10:1@5% albedo, 170:1@ 100 % albedo
3.75 m	3.50 - 4.0 m	0.10 K @ 300 K
6.75 m	6.5 – 7.0 m	0.12 K @ 300 K
10.8 m	10.3 – 11.3 m	0.12 K @ 300 K
12 m	11.5 – 12.5 m	0.20 K @ 300 K

GOCI	Geostationary Ocean Color Imager
Satellites	COMS 1 and 2
Status (August 2006)	Being designed – To be utilised in the period 2008 to ~ 2021
Mission	Ocean color and aerosol
Instrument type	8-channel VIS/NIR radiometer
Scanning technique	Bushbroom, 6000 pixel/line (3700 useful), swath 1420 km
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
680nm	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