

UPDATE ON COMS DATA SERVICE PLAN

This paper reports on the planned data dissemination methods of COMS. All observation data from the COMS is planned for dissemination over the direct broadcasting and the Internet.

Update on COMS data service plan

1 Introduction

The Korea Meteorological Administration (KMA) will use the direct broadcast and the Internet to disseminate the Communication, Ocean, and Meteorological Satellite (COMS) remote sensing data. The dissemination is scheduled for start at the 6 month after the launch of COMS (the second half of 2010), with completion of In-Orbit Test (IOT).

2 Dissemination via Direct Broadcasting

The KMA will directly broadcast the High Rate Information Transmission (HRIT) for Medium-scale Data Utilization Stations (MDUSs) and Low Rate Information Transmission (LRIT) for Small-scale Data Utilization Stations (SDUSs). The HRIT will be broadcasted from COMS to user stations equipped with 3.7-Meter antenna with 3 Mbps data rate. And LRIT will be broadcasted from COMS to user stations equipped with 1.2-Meter antenna with 256 kbps data rate. The HRIT/LRIT is free for charge; however user station needs to be registered with National Meteorological Satellite Center (NMSC) to receive the decryption key of the direct broadcasting data.

The HRIT service will provide two types of data as below:

- Image data : Full Disk(FD), Asia and Pacific in Northern Hemisphere (APNH), Extended Northern Hemisphere (ENH), Limited Southern Hemisphere (LSH)
- Ancillary data : Alphanumeric text, Encryption key

The image data of the HRIT will be the full spectral bands with 10 bit resolution.

The LRIT service will provide two types of data as below:

- Image data : FD, APNH, ENH, LSH
- Ancillary data : alphanumeric text, encryption key, meteorological data, meteorological analysis data from COMS Meteorological Data Processing System (CMDPS), GOCI imagery, and binary data

Table 1 COMS MI Image data

Region	Channel	Resolution	
		HRIT	LRIT
FD	Visible	11,000×11,000	2,200×2,200
	Infrared	2,750×2,750	
APNH	Visible	4,056×3,060	810×611
	Infrared	1,014×765	

ENH	Visible	7,736×6,176	1,547×1,234
	Infrared	1,934×1,544	
LSH	Visible	7,736×3,184	1,547×636
	Infrared	1,934×796	

The image data of LRIT will be the full spectral bands with 8 bit reduced resolution.

The structure and the formatting of the COMS HRIT/LRIT followed the global specification of Coordination Group of Meteorological Satellites (CGMS). Table 2 specified the parameter sets of the HRIT communication link.

Table 2 Parameters of HRIT Communication Link

Parameters	Values
Information data rate*	3 Mbps
Coding	Reed-Solomon (255/223, 4) and Convolutional coding (1/2, K=7)
Pulse shaping	Root-Raised Cosine with 0.5 of roll-off factor
Modulation	NRZ-L/QPSK
Bandwidth	≈ 5.2 MHz
Center frequency	1695.4 MHz
Polarization	Linear in horizontal direction
Satellite EIRP	55.0 dBm
Satellite to MDUS distance (MDUS antenna elevation angle = 10 degree)	40586 km
Free space loss	189.27 dB
Atmospheric loss	0.5 dB
MDUS G/T**	11.1 dB/K
Implementation loss of receiver	1.5 dB
Link margin	3.2 dB

*Information data rate is the HRIT CADU data rate prior to convolutional encoding. According to the rate of convolutional encoding, transmission data rate is 6Mbps after convolutional encoding.

The parameter sets of the LRIT communication link are specified in the Table 3.

Table 3 Parameters of LRIT Communication Link

Parameters	Values
Information data rate*	256 kbps
Coding	Reed-Solomon (255/223, 4) and Convolutional coding (1/2, K=7)
Pulse shaping	Root-Raised Cosine with 0.5 of roll-off factor
Modulation	NRZ-L with BPSK
Bandwidth	≈ 1 MHz
Center frequency	1692.14 MHz
Polarization	Linear in horizontal direction
Satellite EIRP	55.0 dBm
Satellite to SDUS distance (SDUS antenna elevation angle =	40586 km

10 degree)	
Free space loss	189.27 dB
Atmospheric loss	0.5 dB
SDUS G/T**	1.9 dB/K
Implementation loss of receiver	1.5 dB
Link margin	5.6 dB

Information data rate is the LRIT CADU data rate prior to convolutional encoding. According to the rate of convolutional encoding, transmission data rate is 512 Kbps after convolutional encoding.

The HRIT/LRIT will be broadcasted from COMS to user stations with in 15 minute after the end of a scanning. Figure 1 shows a sample of the HRIT/LRIT dissemination schedule.

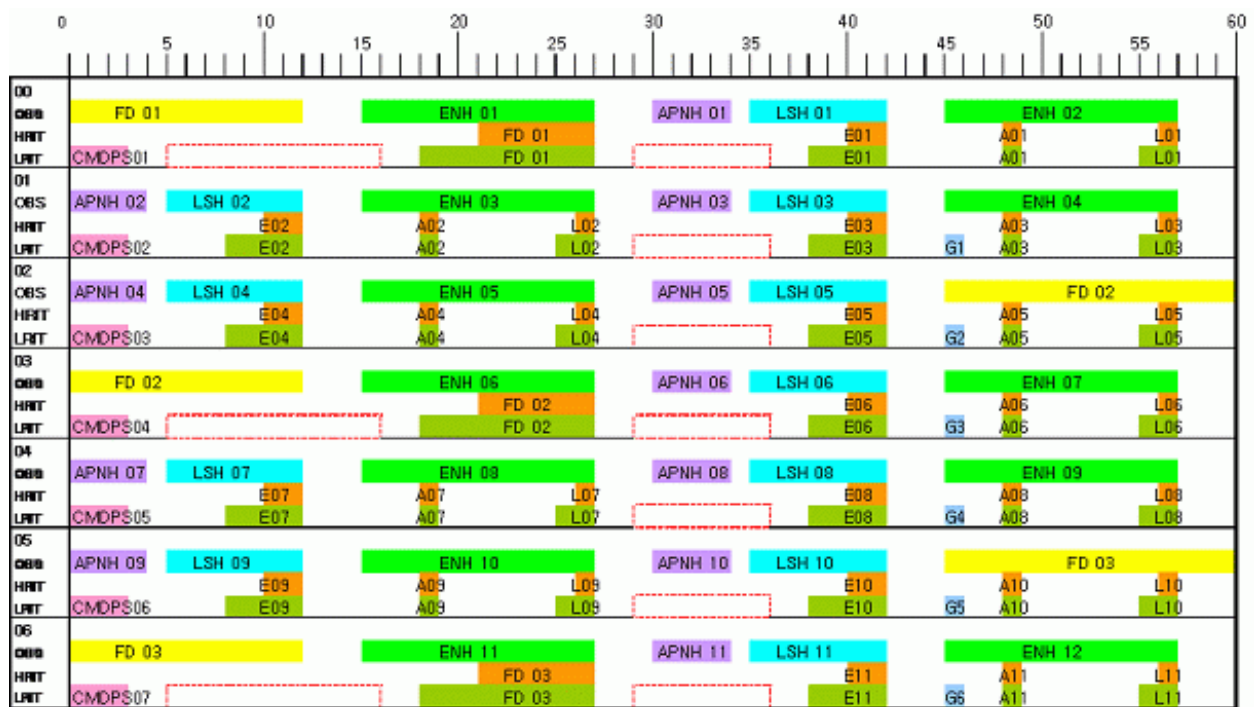


Figure 1 A sample of the HRIT/LRIT dissemination schedule

3 Dissemination via Internet

On 30 July 2009, KMA opened the website (<http://nmssc.kma.go.kr>) of National Meteorological Satellite Center (NMSC) to provide not only the remote sensing imagery (and data) of COMS Meteorological Imager (MI) but also the operation information and the calibration information of COMS MI, the remote sensing imagery of COMS Geostationary Ocean Color Imager (GOCI).

To provide more detailed information, the mission specification of HRIT and LRIT will be posted on the website at November 2009.