

STATUS OF GEOSTATIONARY METEOROLOGICAL SATELLITES

The purpose of this document is to present the status of Japanese geostationary meteorological satellites.

No action required

Status of Geostationary Meteorological Satellites

1. GMS-5

GMS-5, launched on 18 March 1995, has been in operation at 140E. It was scheduled that GMS-5 would be replaced with MTSAT by the end of March 2000. However, as a result of MTSAT's unsuccessful launch, GMS-5 was to be kept as an operational satellite until the summer of 2003, the start of MTSAT-1R (Replacement) operation.

GMS-5 has been operated satisfactorily and provided 28 full-disk earth images per day, which consist of 24 images for hourly observations and 4 images for wind observations. In addition, special wind observations are carried out once a day whenever typhoons exist within a specific area. The GMS-5 operations are summarized in Attachment-1.

As one of problems on GMS-5 operation, the lubricant build-up problem on the VISSR scan mirror arose recently and reached to the operational limit of the scanning motor torque. In order to continue stable operation, the observation area of 64 lines from the southern-end was reduced on 29 May 2000, and additional 64 lines were diminished on 5 June. As a result, there is small lack on southernmost part of each GMS-5 full-disk earth imagery. However, no effect on image utilization is anticipated (see Attachment-2).

The North-South maneuver will be carried out three times: in January, July and October 2001. Thereafter, the maneuver is not planned because of the lack of fuel for maneuver. Therefore, it is anticipated over 1.0 degree of the GMS-5 orbital inclination angle in around April 2002 and becoming 2.0 degrees in around summer of 2003. Nevertheless, S-VISSR signal could be received with the bit-error rate (BER) less than 10^{-4} at typical Medium-scale Data Utilization Station (MDUS) until October 2003. This allows S-VISSR data to keep its quality required for operational use by the meteorological services. It is also anticipated that the impact of an expansion of stationkeeping range is negligible for reception of WEFAX signal on Small-scale Data Utilization Stations (SDUSs) until the summer of 2004 when the range of stationkeeping exceeds to +/-3.0 degrees in latitude .

2. The end of GMS-4 Operation

GMS-4, launched on 6 September 1989, stationed at 120E since July 1995 as a backup to GMS-5. However, because of the critical degradation of the battery cells found out on 14 February 2000, it was estimated that the batteries might be unable to supply enough electric power to maintain the spacecraft function for the eclipse time. Consequently, after GMS-4 was moved to approximately 600km higher orbit from the geostationary orbit, the operation of GMS-4 was completely finished by shutting down its signal transmission at 14:00(UTC) on 24 February 2000

3. Launch Failure of MTSAT

MTSAT planned to be a successor to GMS-5 was launched by the H-II Launch

Vehicle No.8 from the Tanegashima Space Center at 07:29(UTC) on 15 November 1999. The main engine of the Launch Vehicle stopped unexpectedly about 4 minutes after the lift-off, and the Launch Vehicle deviated from its planned trajectory. At 07:36 (UTC) on 15 November, the destruction command was transmitted to the Launch Vehicle with MTSAT from the Center. As a result, MTSAT was not put into its planned orbit.

4. Influence of GMS operation by strong scintillation

The scintillation is usually confirmed by 1 to 3 times every month on GMS down link. The frequency of scintillation occurrence usually increases to 10 or 20 times in total a month between May and August. In recent years, GMS system has sometimes been suffered from strong scintillation with big fluctuation, which had ranging from +5dB to -14dB compared with nominal input power level. They occurred on 6 June, 26 August, 9 November 1998, 18 February 1999, 12 February, 30 March and 13 July 2000. In particular, the most remarkable one occurred at around 13 UTC on 13 July 2000 and continued intermittently for about six hours. Other two cases occurred in 2000 continued for one or two hours. The influences to the GMS operation during these scintillation occurrence were TRRR invalid operation, frame loss of VISSR data and WEFAX transmission error.

Attachment-1

Summary of GMS-5 operations**1. Summary of observations (From July 1999 through June 2000)**

	ROUTINE OBSERVATIONS	OMISSIONS	CANCELLA TIONS	SPECIAL OBSERVATIONS
Jul. 1999	860	7	1	8
Aug.	830	38	0	26
Sep.	772	68	0	26
Oct.	830	37	1	18
Nov.	825	15	0	4
Dec.	867	0	1	0
Jan. 2000	868	0	0	0
Feb.	798	14	0	0
Mar.	797	71	1	0
Apr.	814	20	6	0
May	866	0	2	8
Jun.	840	0	0	0

ROUTINE OBSERVATIONS - Number of Completed Routine Observations.

OMISSIONS - Number of Canceled Observations by Eclipse, test, maneuver, or maintenance.

CANCELLATIONS - Number of Canceled Observations caused by troubles in ground sub-systems or trouble of computer system.

SPECIAL OBSERVATIONS - Number of Typhoon observations or observations for special purpose.

2. Summary of maneuvers

The maneuvers performed between July 1999 and June 2000 was as follows,

-East-West maneuvers : 29 July, 12 September, 20 October, 21 December 1999,
16 February, 12 April, 7 June 2000

- North-South maneuvers : 27 March 2000

- Spin rate maneuvers : 12 September 1999, 27 March 2000

- Attitude maneuvers : 21 March, 30 March, 23 May 2000

The orbital inclination angle is 0.70degrees as of 15 June 2000.

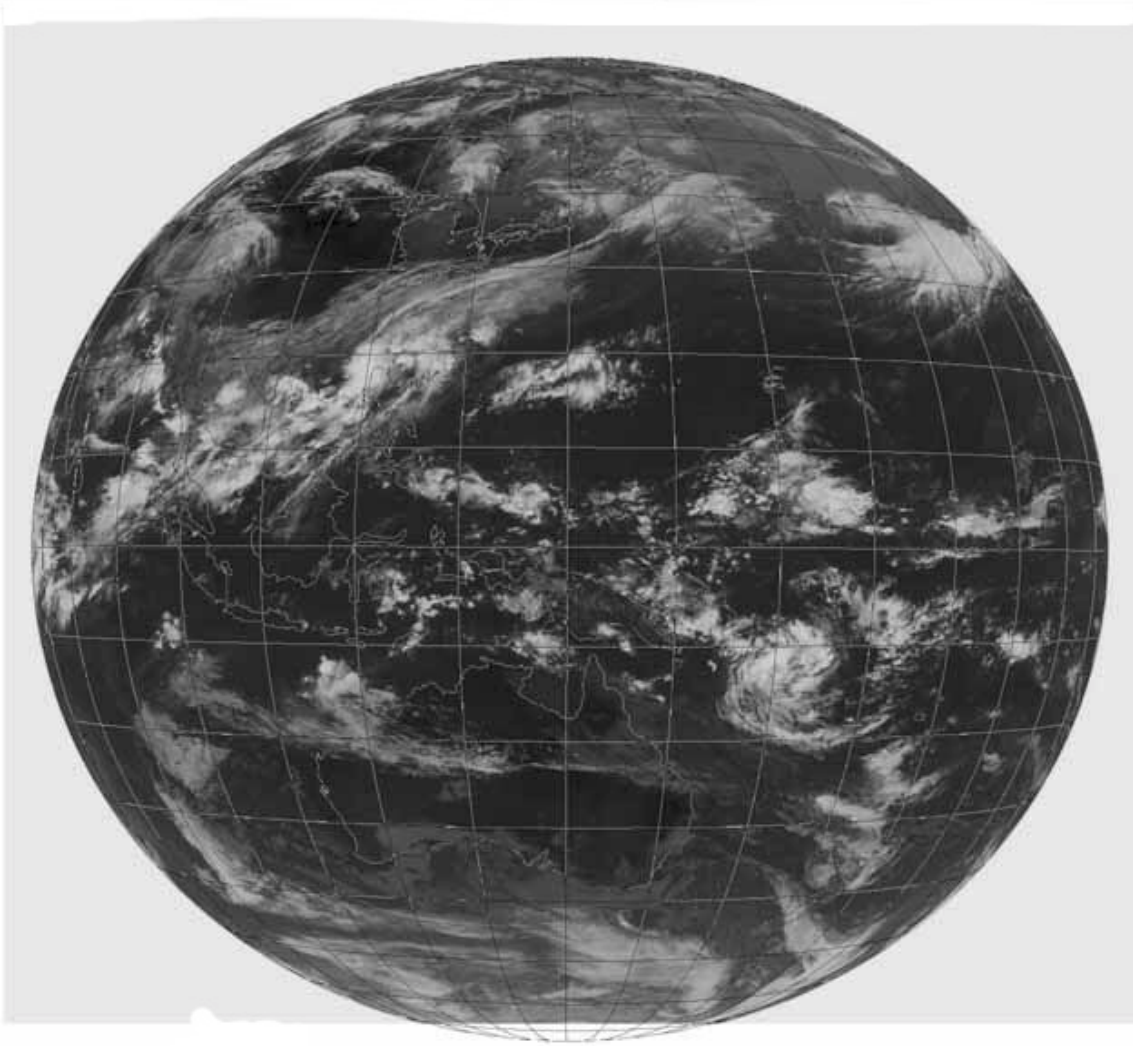
3. Eclipse operations

The eclipse operations performed between July 1999 and June 2000 was as follows,

- Earth eclipse : between 30 August 1999 and 15 October 1999,
between 24 February 2000 and 10 April 2000.

- Lunar eclipse : 13 July 1999.

Attachment-2



IR-FULL DISK IMAGE