

CURRENT STATUS OF FY-2B GEOSTATIONARY SATELLITE

Summary and purpose of paper

The report gives status of FY- 2B geo-stationary spacecraft. FY-2B at 105 E is functioning on limited operation Capability, transmitting S-VISRR images only for the Earth northern hemisphere. There isn't updated information about FY-2B since the 31st CGMS meeting in November, 2003, Ascona.

STATUS OF FY-2B GEOSTATIONARY SATELLITE

Launch and Location

FY-2B is the second geo-stationary meteorological satellite of China. It was launched on June 25, 2000 with Long-March 3 launching vehicle from Xichang Satellite Launch Center. The satellite is spin-stabilized and is stationed at 105⁰E.

Mission and Primary Payload

The mission objective of FY-2B is

- to acquire visible, infrared and water vapor cloud images;
- to re-transmit S-VISSR images and low resolution images
- to collect data from auto weather stations
- to monitor space environment

The Visible and Infrared Spin Scan Radiometer (VISSR) is the primary instrument payload on FY-2B. The spectral channels of VISSR are given in Table 1.

Table.1 The spectral channels of VISSR

Channel	Wavelength(μm)
VIS	0.50-1.05
IR	10.5-12.5
WV	6.3-7.6

Operation Schedule

On January 1, 2001, the FY-2B was put into operation and started broadcasting S-VISSR and WEFAX images.

The SOCC (Satellite Operation and Control Center) controls the operation of the ground system. The system is scheduled to automatically acquire VIS, IR, and WV raw data. After being registered at the IAS (Image Acquisition System) of CDAS (Command and Data Acquisition Station), the S-VISSR images are generated and retransmitted to users via FY-2B.

Normally, the operation is scheduled based on the facts that FY-2B is to acquire 28 earth images a day, among which 4 images are for wind observation. FY-2B broadcasts WEFAX images 16 times and takes ranging measurement 4 times a day except when performing the orbit maneuvering or equipment check.

The whole ground operation breaks from 01:00 UTC to 03:45 UTC every Tuesday for system maintenance.

Some equipment on the satellite must be switched off during autumn and spring
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eclipses (92 days per year in all) due to the limitation of energy. Therefore the number of images will be reduced to 25 and WEFAX broadcasting to 14.

Problem with the Transponder

On February 28, 2001, the first day after the satellite entered the spring eclipse, the up-converter of the transponder ceased working, leading to interruption of image transmission and anomaly of DCP subsystem.

It turned out that the local oscillator of the up-converter is too much sensitive to temperature.

During the whole eclipse period, the satellite temperature was carefully controlled. Several adjustments made after the eclipse brought the DCP subsystem back to work again.

Through further implementation of temperature control, the transponder worked again, but the power output decreased. On June 18, 2001, image transmission recovered; however, the EIRP (Effective Isotropic Radiated Power) is 8dBW below the normal level. Though it is possible for user to receive the data using a 2.4-meter antenna, the bit error rate of transmission signal is comparatively high and the quality of imagery affected.

Since its recovery, the up-converter of responder has been working normally. The image acquiring, data transmission, data collection and turn around ranging have all recovered for operation.

Eclipse Break of Image Transmission

The working state of FY-2B's transponder is susceptible to the change of temperature that must be kept precisely within a very narrow range around 8.4 C°. It pressures much upon energy supply to maintain this condition. Therefore, during eclipse period when energy is less supplied, FY-2B has to stop the image transmission completely to ensure enough energy for the management of satellite through the whole eclipse period.

Northern Hemisphere Scanning of VISSR

On June 8, 2003, the scan mirror of VISSR was stuck due to insufficient lubrication in the process of mirror retrace from scanning the south. The quality of the image was affected. The VISSR was then reset to get back the image quality. To prevent the problem from becoming deteriorated, hemispheric scanning mode has since then been implemented to let VISSR scan only the north hemisphere.