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CURRENT STATUS OF FY-2B AND FY-2A

Summary and purpose of paper

This paper describes the status of FY-2B and FY-2A satellites as of 30 September 2002.

STATUS OF FY-2B AND FY-2A

1. FY-2 B Satellite

1.1. Launch and Location

FY-2B is the second Chinese geo-stationary meteorological satellite. It was launched on June 25, 2000 with Long-March 3 vehicle from Xichang Satellite Launch Center. The satellite is spin-stabilized and is stationed at 105^0E.

1.2. Primary Payload and Mission

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

Table.1 The spectral channels of VISRR

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

The mission 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

to monitor space environment

1.3. Normal Operation Schedule

On January 1, 2001, the FY-2B was declared operational and started broadcasting S-VISSR and WEFAX images.

The operation of ground system is commanded and scheduled by SOCC (Satellite Operation and Control Center) to automatically acquire VIS, IR, and WV images. 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 through FY-2B.

Normally, the operational schedule is made considering the following facts:

The FY-2B is scheduled 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 4 times a day except when the satellite is performing orbit, or attitude control or equipment check.

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

- Some equipment in the satellite must be switched off during autumn and spring 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 to14.

1.4. 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 were made after the satellite came out of the earth shadow and that brought the DCP subsystem back to work again first.

Through further implementation of temperature control, the transponder works 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-metre antenna, the bit error rate of transmission signal is comparatively high and the quality of imagery is affected.

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

1.5. 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 degrees. It pressures much upon energy supply to maintain this condition. Therefore, during eclipse period when energy supply is less, FY-2B has to stop the image transmission completely to ensure enough energy for the safe management of satellite during eclipse period.

2. FY-2A Satellite

2.1 Launch

The first Chinese geo-stationary meteorological satellite FY-2A was launched on 10 June 1997. On 17 June, 1997 FY-2A was located at 105°E.

2.2. Problem

The satellite started operational imagery transmission on 1 January1998. The operation was disrupted on 8 April due to the defect of satellite de-spin subsystem that is designed to drive the S-band antenna to spin in counteraction of the spinning of the satellite itself, by so doing to keep the antenna pointing toward the earth all the time. Since 6 July 1998, FY-2A had to work

discontinuously everyday in order to rest to cool down the frictional heat built up between the antenna and satellite.

2.3. Current status

On 26 April, 2000, FY-2A was moved to the position 86.5°E to make room for FY-2B.

On July 27, 2000 the check out for FY-2A showed that after 3 years in the orbit the FY-2A satellite system remained a good condition except for the S-band antenna that cannot be allowed to work long everyday. FY-2A satellite was switched from aboard system A to system B (redundancy) successfully in the process, then the system B was checked out thoroughly. The results showed the system B works as well as system A.

During the interruption of FY-2B transmission, a contingent plan was implemented to let the FY-2A work 4 hours a day in order to replace FY-2B in case the latter cannot be recovered. A test was made on FY-2A, during which, FY-2A transmitted 6 full disc images, undertook the turn around ranging 3 times.

Since the FY-2B is recovered, FY-2A is closed. It is closed as long as FY-2B works everyday. Ground system makes only the orbit control and the eclipse management.