

## **CURRENT STATUS OF FY-1C METEOROLOGICAL SATELLITE**

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### Summary and purpose of paper

FY-1C was launched on May 10, 1999. It has been operating beyond the designed lifetime. This paper briefly describes the status of the satellite as of September 30, 2003.

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## CURRENT STATUS OF FY-1C METEOROLOGICAL SATELLITE

### Launch

The polar orbiting meteorological satellite FY-1C was launched on 10 May 1999. This three-axis stabilized satellite has been operating for more than 4 years.

### Orbit Characteristics

The major orbital characteristics of FY-1C are shown in table 1.

Table 1. Orbit Parameters of FY-1C satellite

Orbit	Altitude	Inclination	Eccentricity	Descending node
Sun-synchronous	862 km	98.79 <sup>0</sup>	0.00188	6:45 am

### Primary Instrument Payload

FY-1C carries a multi-channel visible and infrared scan radiometer (MVISR) that has 10 channels including 4 visible channels, 3 near IR channels, 1 short wave IR channel and 2 long wave IR channels. The wavelength of each channel and primary usage is shown in Table 2.

Table 2. MVISR channels and primary use

Channel	Wavelength ( $\mu\text{m}$ )	Primary Use
1	0.58-0.68	Daytime cloud, ice and snow, vegetation
2	0.84-0.89	Daytime cloud, vegetation, water vapor
3	3.55-3.95	Heat source, night cloud
4	103.-11.3	SST, day/night cloud
5	11.5-12.5	SST, day/night cloud
6	1.58-1.64	Soil moisture, ice/snow distinguishing
7	0.43-0.48	Ocean color
8	0.48-0.53	Ocean color
9	0.53-0.58	Ocean color
10	0.90-0.965	Water vapor

### Transmission Modes

Real time picture transmission:

- CHRPT format: real-time transmission

Delayed picture transmission:

- GDPT Format: daily global data coverage of 4 channels(0.58-0.68  $\mu$  m,0.84-89  $\mu$  m,10.3-11.3  $\mu$  m,11.5-12.5  $\mu$  m) with 3.3 km spatial resolution.
- LDPT Format: pre-selected local-area data coverage of 10 channels with 1.1 km spatial-resolution at nadir.

### **Operating beyond the Design Lifetime**

FY-1C has been operating for more than four years, exceeding the design lifetime of two years.

Some significant events happening during its operation are recorded as follows.

On February 7, 2002, the MVISR/B was turned off. The MVISR/A was turned on. MVISR/A's degradation is less than MVISR/B.

On October 17, 2002, the satellite attitude was troubled and data broadcast interrupted. This interruption was attributed to the leakage of attitude control gas from the valve of gas container.

The attitude control effort was rewarded with the satellite being stabilized three days after. When the satellite regained stability, the heating process was implemented to remove contamination to the IR channels by the gas leakage.

On October 25, 2002, the data transmission recovered.

The satellite is operating well currently.

### **MVISR Adjusted Calibration Coefficients**

After four years of operation, the signal of each channel of the MVISR instrument attenuates dramatically. Calibration coefficients are therefore being adjusted with the measurements at the calibration field.

MVISR Adjusted Calibration Coefficients

Channel	Slope	Intercept
1	0.0959	-1.0552
2	0.1142	-1.3704
6	0.0645	-0.8384
7	0.2199	-3.0787
8	0.2205	-2.6460
9	0.0758	-0.9091
10	0.1163	-1.5122