



CGMS-35, CMA-WP-04
Prepared by CMA
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Summary of the Working Paper.

CMA informs CGMS in CMA-WP-04 about the development of FY-3, the new series of polar-orbiting meteorological satellites. There will be 7 satellites in the series, starting with FY-3A and ending with FY-3G, and covering the period from 2008 to 2021. FY-3 will operate either the morning or afternoon orbit. Main instruments include the Medium Resolution Spectral Imager (MERSI), the Microwave Radiation Imager (MWRI), in addition to Visible and Infrared Scanning Radiometer (VISR). Sounding instruments include the Infrared Atmospheric Sounder (IRAS), the Microwave Temperature Sounder (MWTS), and Microwave Humidity Sounder (MWHS). Also, there will be a Total Ozone Unit and Solar Backscatter Ultraviolet Sounder (TOU/SBUS). There is also an Earth Radiation Budget instrument on board.

FY-3 Polar-Orbiting Programme

I Introduction

The **FY-3** polar-orbiting series is being developed and include 7 flight models. All satellites are 3-axis stabilised, in sun-synchronous orbit. The following table records the chronology of the FY-3 programme.

2 Chronology of the FY-3 Programme

Chronology of the FY-3 programme

Satellite	Launch	End of service	Height	LST	Status (Sept 2006)	Instruments
FY-3A	2008	expected \geq 2011	836 km	10.00	Being built	VIRR, MERSI, MWRI, IRAS, MWTS, MWHS, TOU/SBUS, SEM
FY-3B	2010	expected \geq 2013	836 km	14.00	Planned	VIRR, MERSI, MWRI, IRAS, MWTS, MWHS, TOU/SBUS, SEM
FY-3C	2013	expected \geq 2016	836 km	TBD	Planned	VIRR, MERSI, MWRI, IRAS, MWTS, MWHS, TOU/SBUS, SEM
FY-3D	2015	expected \geq 2018	836 km	TBD	Planned	VIRR, MERSI, MWRI, IRAS, MWTS, MWHS, TOU/SBUS, SEM
FY-3E	2017	expected \geq 2020	836 km	TBD	Planned	VIRR, MERSI, MWRI, IRAS, MWTS, MWHS, TOU/SBUS, SEM
FY-3F	2019	expected \geq 2022	836 km	TBD	Planned	VIRR, MERSI, MWRI, IRAS, MWTS, MWHS, TOU/SBUS, SEM
FY-3G	2021	expected \geq 2024	836 km	TBD	Planned	VIRR, MERSI, MWRI, IRAS, MWTS, MWHS, TOU/SBUS, SEM

3 Payload of FY-3

- **VIRR (Visible and Infra Red Radiometer)**, 10-channel VIS/IR radiometer for multi-purpose imagery, resolution 1.1 km, swath 2800 km.
- **MERSI (Medium Resolution Spectral Imager)**, 20-channel radiometer (19 in VIS/NIR/SWIR + one TIR at 10.0-12.5 μm) for ocean colour and vegetation indexes; resolution 250 m for 4 VIS/NIR and the TIR channel, 1 km for all other channels; swath 2800 km.
- **MWRI (Micro-Wave Radiation Imager)**, 6-frequencies / 12 channels (all frequencies in double polarisation) for multi-purpose MW imagery. Conical-scanning radiometer, resolution 9.5 x 15 km at 90 GHz, 30 x 50 km at 19 GHz, swath 1400 km.
- **IRAS (Infra Red Atmospheric Sounder)**, 26-channel IR radiometer (including one VIS) for temperature/humidity sounding, resolution 17 km, swath 2250 km.
- **MWTS (Micro-Wave Temperature Sounder)**, 4-channel MW radiometer for nearly-all-weather temperature sounding, 54 GHz band, resolution 70 km, cross-track scanning, swath 2200 km.
- **MWHS (Micro-Wave Humidity Sounder)**, 4-frequency / 5-channel (one frequency in double polarisation) MW radiometer for nearly-all-weather humidity sounding, 118 GHz band, resolution 15 km, cross-track scanning, swath 2700 km.
- **TOU/SBUS (Total Ozone Unit and Solar Backscatter Ultraviolet Sounder)**, a suite of two UV spectro-radiometers, one (TOU) with 6 channels in the 308-360 nm range, resolution 50 km, swath 3000 km, for total ozone; the other one (SBUS) with 12 channels in the range 252-340 nm, resolution 200 km, nadir viewing, for ozone profile.
- **SEM (Space Environment Monitoring)** for *in situ* observation of charged particles in solar wind.

4 Data transmission from FY-3

The data rate of the MERSI instrument requires moving to X-band, both for global data recovery and for full information real-time transmission. Global data stored on board are transmitted as:

- **Delayed Picture Transmission (DPT)**: frequency 8146 MHz, bandwidth 149 MHz, data rate 93 Mbps.

Direct read-out is provided according to two systems:

- **MPT (Medium-resolution Picture Transmission)**, for full information in X-band. Main features:
 - frequency: 7775 MHz; bandwidth: 45 MHz; polarisation: right hand circular
 - antenna diameter ~ 3 m, G/T ~ 21.4 dB/K, data rate 18.7 Mbps;
- **AHRPT (Advanced High Resolution Picture Transmission)** for selected information in S-band. Main features:
 - frequency: in the range 1704.5 MHz; bandwidth: 6.8 MHz; polarisation: right hand circular
 - antenna diameter ~ 3 m, G/T ~ 6.8 dB/K, data rate 4.2 Mbps.

5 Launch of FY-3A

The first FY-3 satellite, FY-3A, is planned to be launched in April 2008.