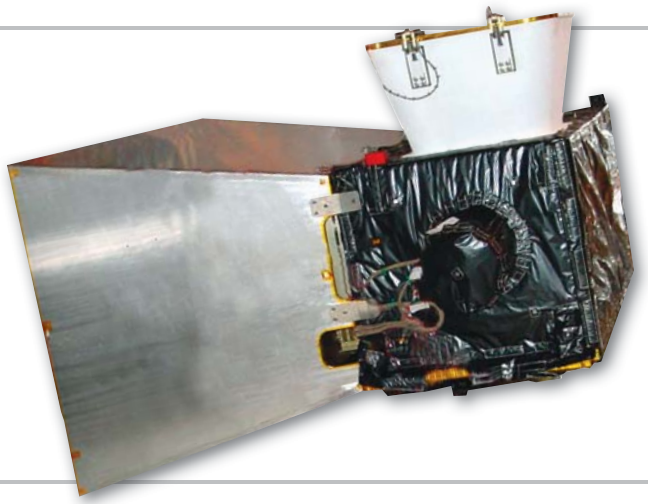
Raytheon

Japanese Advanced Meteorological Imager (JAMI)
Japan's Multifunctional Transport Satellite (MTSAT-1R)



The Japanese Advanced Meteorological Imager provides timely, high-quality, full-disk multispectral imagery for the operational weather needs over Japan, East Asia, and Australia.

Benefits

- Efficient full Earth coverage with superior image quality
- Much higher radiometric sensitivity and better spatial sampling than current operational systems
- Fully programmable Earth scan data collections
- Onboard calibration obtained for all bands to enable better weather products

Meteorological Observation

Since 1960, when the United States launched the world's first meteorological satellite, TIROS-1, weather forecasters have come to rely heavily on data from an ever-growing array of sophisticated instrumentation aboard Earth-orbiting platforms.

In 1966 the Raytheon-designed Multicolor Spin-Scan Cloud Camera demonstrated that essential high-resolution meteorological data could be acquired from a spacecraft in geosynchronous orbit. Since then, for more than 40 years, Raytheon has produced a wide variety of advanced radiometric sensors for use on polar-orbiting and geosynchronous meteorological satellites launched by the National Aeronautical and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), Japan Aerospace Exploration Agency (JAXA), and Japan Meteorological Agency (JMA).

Japanese Advanced Meteorological Imager (JAMI)

The Multifunctional Transport Satellite (MTSAT) is Japan's geostationary satellite that fulfills Japan Civil Aviation Bureau (JCAB) communication and JMA mission requirements with a single satellite. MTSAT's meteorological mission is to provide timely, high-quality, full-disk multispectral imagery for operational weather needs over Japan, East Asia, and Australia.

Raytheon developed JAMI as an imager subsystem for the MTSAT-1R satellite. The follow-on to GMS-5 Visible/Infrared Spin-Scan Radiometer (VISSR) on the GMS satellites, JAMI offers enhanced weather imaging performance in a compact footprint. Its performance enhancements include:

- 0.55 to 12.5 µm spectral coverage using four IR bands and one solar reflective band
- Large-format detector arrays enable faster full-disk coverage rate with slower scan rate
  - Benefits of slower scan rate include longer dwell time, higher spatial resolution, and longer life scanner
- Two-axis gimbaled scan mirror, which provides improved modulation transfer function around local midnight
- Covers full-disk with calibration scans in 24 minutes
- Onboard calibration system for all bands

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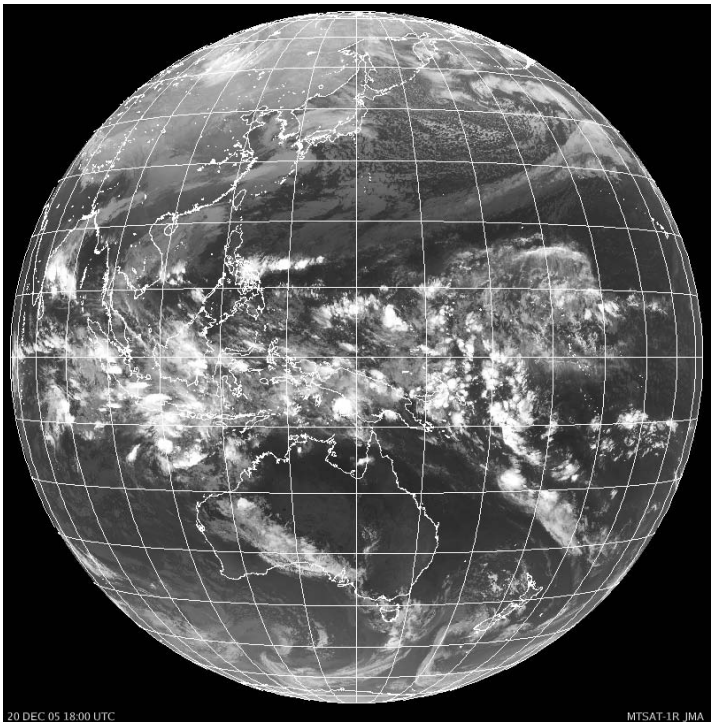

Full Disk Infrared Image – December 20, 2005 – JAMI/MTSAT-1R
Image courtesy Japan Meteorological Agency (JMA)

Instrument Specifications	
Orbit:	Geosynchronous
Scanner:	2-axis scan system
Ground Resolution:	1.0 km (Visible), 2 km (IR)
Spectral Bands:	0.55 - 0.90 µm 10.3 - 11.3 µm (IR1) 11.5 - 12.5 µm (IR2) 6.5 - 7.0 µm (IR3) 3.5 - 4.0 µm (IR4)
Detectors:	Monolithic silicon (Visible) PV HgCdTe (IR)
Data Rate:	2.8 Mbps
Delivery:	May 2003 (concept to delivery in 38 months)

JAMI's design is based on advanced imager technologies that have already been space-qualified and flown in Raytheon-built hardware:

- Two-axis gimbaled scan mirror with qualified optical and mechanical elements which have been derived from many Raytheon programs with demanding requirements for spaceflight operation including: Moderate Resolution Imaging Spectroradiometers (MODIS), Geostationary Operational Environmental Satellite/Geosynchronous Meteorological Satellite (GOES/GMS), Landsat Thematic Mapper, and Tropical Rainfall Measuring Mission / Visible and Infrared Scanner (TRMM/VIRS)
- Compact off-axis 3-mirror telescope design, perfected by Raytheon optical design engineers, and based on multi-mirror systems such as SeaWiFS, THEMIS, and other DoD payloads
- Photo-Voltaic HgCdTe focal plane arrays that incorporate qualified designs with direct flight experience in TRMM/VIRS and MODIS
- Processing hardware and software derived from MODIS and processing algorithms which have already been proven on Landsat, the Hubble Space Telescope, and many other spaceflight programs
- Pioneering use of an active cooler in Geo with flight design perfected over more than 15 years
- Onboard blackbody calibrator that has already been qualified and spaceflight proven on TRMM/VIRS and MODIS with four years of on-orbit operation

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