

Infrared Sky Camera: The Production Model

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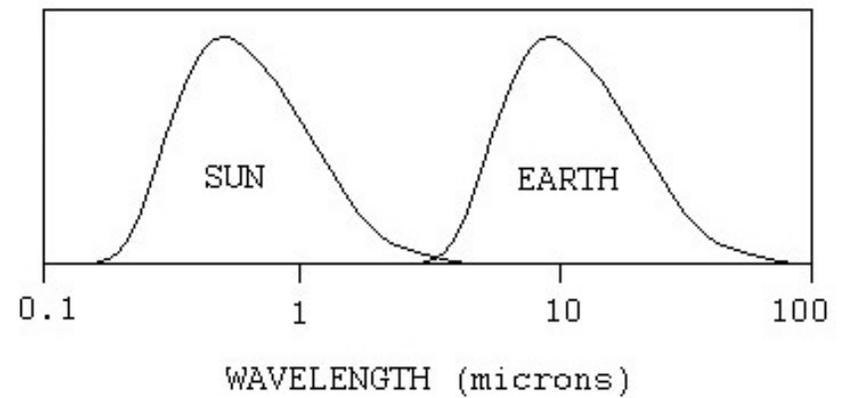
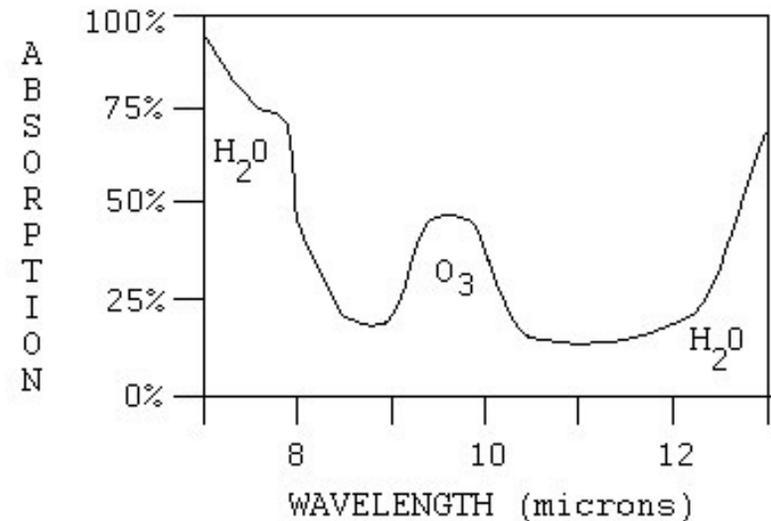
Dr. John J. Degnan, NASA/GSFC

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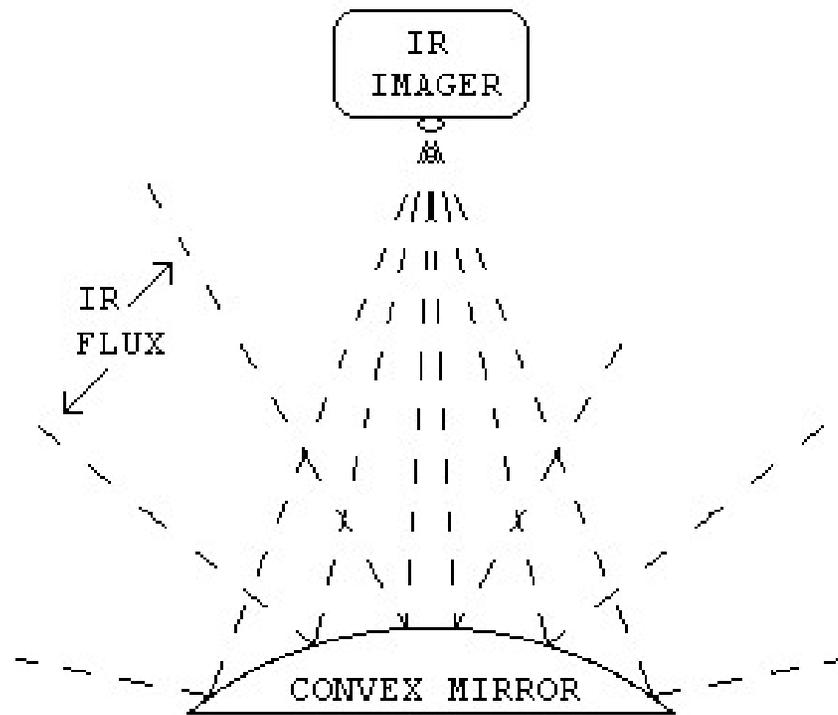
Judith M. Mackenzie, Raytheon Engineering & Production

SkyCamIR Principles

- Clouds are detected by their IR radiation
- Images acquired with 10 micron thermograph
- Wavelength is centered on 'window' in H₂O absorption band
- Works day or night because Sun is a weak IR source

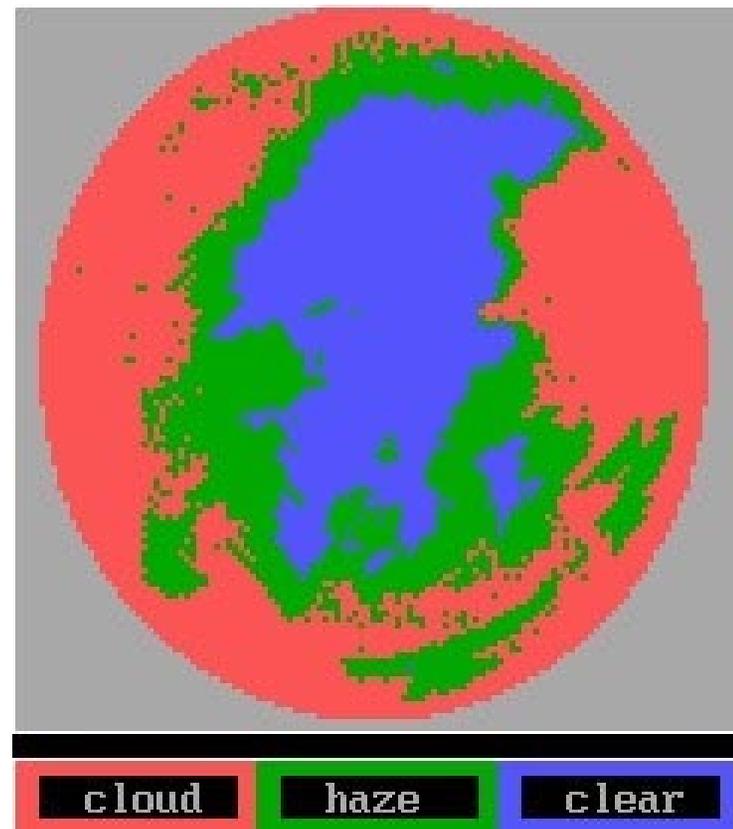


Prototype Instrument



Instrument Development and Performance

- Cloud maps agree closely with visual sky assessment
- No problems with IR thermograph after 2 years and 10^6 images
- High speed system produces full map in 15 seconds
- Electroplated mirror selected from several candidate types



Instrument Calibration

- Self reading of **ambient temperature** assures accurate cloud maps
- No chopper or other external moving parts
- Calibration to -50°C permits operation in almost any climate
- Geometric calibration gives sky condition at any azimuth/elevation

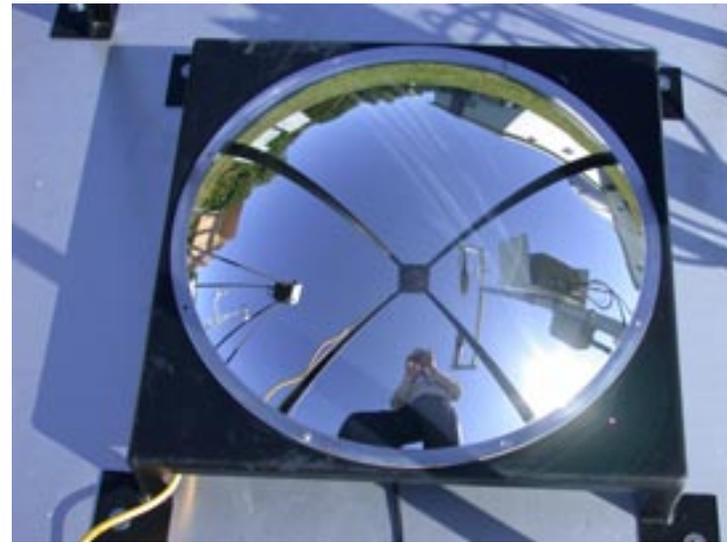
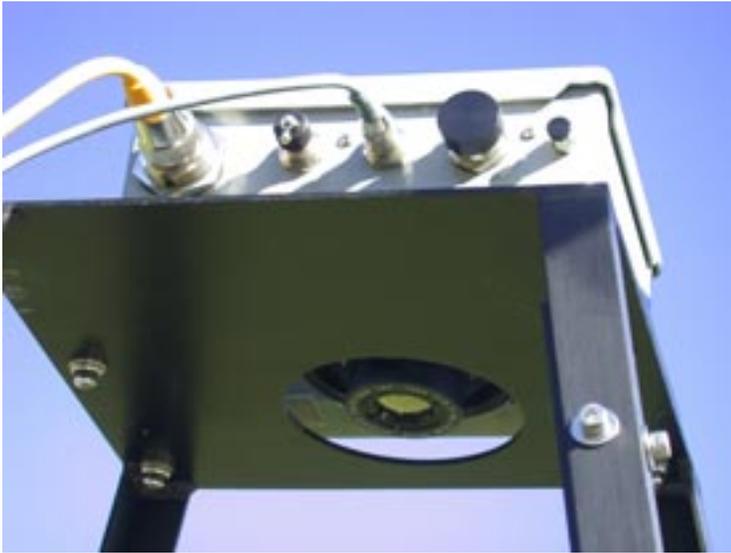


Production Model

- Manufactured by Raytheon Engineering & Production
- New support structure for better optical alignment
- Thermograph sealed in NEMA-4 enclosure
- Electroplated mirror insures long life
- Can be shipped anywhere
- Easy to assemble and operate



Production Model Photos



Features of SkyCamIR Production Model

- Reliable day- and night-time sky transparency information from sealed 10 μ thermograph
- New support structure for better optical alignment and accurate geometric calibration
- Durable electroplated mirrors insure long life
- Easy to ship and setup in the field
- Software that is user friendly and adaptable