

June 13, 1995

To: Harry Montgomery  
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Subject: On-Orbit and Pre-Launch Data Parameters Necessary to Radiometric Calibration of the MODIS Thermal Channels

The following is a list of input parameters and related information necessary to calibrate the MODIS thermal channels as planned for ATBD 1995

### **On-orbit Telemetry**

Digital number output of A/D converter during 15 blackbody, 15 space view, and all Earth view samples.

Capability to determine angle of scan mirror for each Earth sample.

All gains and offset voltages applied to the focal plane output of the current scan (4 gains and 1 offset for the PV channels and 2 gains and 2 offsets for the PC channels)

All thermistors readings specifically including

- 12 OBC Blackbody thermistors
- Scan Mirror thermistor
- Cavity thermistors
- Detector thermistors
- A/D converter thermistors

Know whether SRCA, SDSM, or solar diffuser is on

Know whether space craft maneuver is being performed

Know whether blackbody heater is on

May need to know orbital position to aid in cavity temperature determination

### **Pre-launch Information**

Reflectivity of each side of the scan mirror as a function of channel and angle for each polarization state (especially for the pre-launch and on-orbit calibrator angles)

Emissivity of the blackbody as a function of channel for each polarization state

Normalized transmission of the optical path for each channel for each polarization state

All of the on-orbit telemetry but applied to the BCS, SVS, IAC and OBC blackbody.

Effective temperature of the BCS, IAC, and SVS (from emissivity measurements and thermistors)

Responsivity coefficients for the A/D converter (or input "voltage" vs output "counts" test data sets)

Effective solid angle for the Earth view port directly visible to the OBC blackbody

### **Derived On-orbit Information**

Centerwavelength corrections from SRCA measurements

Know whether moon is in space port

Responsivity coefficients for the A/D converter from on-orbit ECAL