

MODIS Team Meeting Minutes

Minutes of the MODIS Team Meeting held on Tuesday January 31, 1995.

Action Items:

94. Provide a detailed (high fidelity) analysis of scatter in the scan cavity. The results would determine the need for PF near field scatter measurements vs scan angle. Assigned to Guenther 8/23/94 Preliminary results due 10/15/94. Final due 2/28/95.
101. Provide an assessment of the SBRC test plan to measure radiometric accuracy as a function of scan angle position (sections 11.6.3 and 11.7 of the Performance Verification Plan). Assigned to Guenther 10/25/94. Due 11/29/94. CLOSED 1/31/95 Reference MCST/PRI 95001-A
108. Prepare a report addressing the status of the MODIS Reliability Program. Reliability elements will include: FMEA, Worst Case, CIL, Reliability Assessment and Parts Device Stress Analysis and Trend Analysis. Assigned to Silva 1/3/94. Due 1/17/95
109. Determine if there are any technical problems associated with the different instrument orientations with respect to gravity when testing MODIS at SBRC versus testing MODIS at the spacecraft integrator. Assigned to Roberto 1/10/95. Due 2/13/95
110. Write up the disposition of the reduced -5°C torque margin on the scan mirror, given increasing torque requirement of test bearings. If the decision is to accept as is, document the rationale. Assigned to Roberto 1/17/95. Due 1/31/95
111. Recommend an optical design for the diffuser screen. Assigned to Waluschka 1/31/95. Due 2/28/95
112. Analyze the ScMA optical design. Assigned to Waluschka 1/31/95. Due 2/7/95

Attendees:

✓ Richard Weber	✓ Bruce Guenther	✓ Larissa Graziani
✓ John Bauernschub	George Daelemans	Bob Martineau
Rosemary Vail	Patricia Weir	✓ Bob Silva
Lisa Shears	✓ Mitch Davis	✓ Robert Kiwak
✓ Mike Roberto	Ken Anderson	✓ Harvey Safren
✓ Nelson Ferragut	Rick Sabatino	✓ Ed Knight
✓ Gene Waluschka	✓ Cherie Congedo	Harry Montgomery
✓ Bill Barnes	✓ Jose Florez	✓ Marvin Maxwell
Les Thompson	✓ Gerry Godden	Bill Mocarsky
✓ John Bolton	Sal Cicchelli	Helen Phillips

The following items were distributed:

- 1) Weekly Status Report #174
- 2) SBRC Memos submission from week #166
- 3) Minutes of the previous team meeting

1. Team Meeting Canceled for February 7.

2. Detector Audit

GSFC plans to conduct a Detector Performance Assurance Audit at SBRC on February 7 - 8, 1995. This audit was prompted by recurring problems in the SBRC Detector Division. The objective of this audit is to review performance assurance controls, primarily as they relate to Short and Mid Wave Infrared detectors for the Protoflight Model, and secondarily as they relate to all needed MODIS focal planes. Attendees will include Bob Martineau, Les Thompson, Bob Silva, Hosea Jemerson, and Dick Weber. ETM will also be represented. Details are provided in a memo from Ken Anderson to Lee Tessmer dated January 19.

3. Thermal Blankets

The thermal blankets were shipped to SBRC by Emery Air carrier to arrive at SBRC on January 31 or February 1. These EM blankets are ready for flight in terms of cleanliness. In addition to being baked out, the blankets were wiped down and inspected. They were sent attention of Bill Anaya, B32/MS24/Room B579, (805) 562-7689. (On February 2, it was confirmed that the blankets were at SBRC.)

The blankets were double bagged inside the shipping box. The outer bag was covered with wrap for additional protection. The shipping box also included templates, cardboard, tape, and lumiloy. There was also additional blanket material which had been baked out. Initially, only the blankets will be going into the clean room. It is recommended that the blankets be kept in their primary bag in the clean room on a flat surface for the blanket installers.

Recommendations for starting the unpacking of the blankets and getting them into the clean room were faxed to Lee Tessmer and David Jones on February 1.

Diane Schuster is currently scheduled to arrive at SBRC early Monday morning,

February 6. She is scheduled to be at SBRC for two days to do fit checks and make needed modifications. She will be working with Jeb Thompson of SBRC.

Diane's GSFC phone number is (301) 286-3971.

The original plan also included the final EM blanket installation (requiring a two person GSFC team). These plans have been changed due to SBRC's desire to continue working with the instrument and to do ambient testing in the DMCF without blankets. The goal now is to prepare SBRC to do the blanket installation so it can be done on an as time is available basis.

4. Systems Telecon 1/30/95

Participants: SBRC: Tom Pagano, Neil Therrien, Jim Young

GSFC: Bill Barnes, Ed Knight, Mike Roberto, Tim Zukowski, Gerry Godden, Jeff Bowser, Bruce Guenther

The thermal blankets were baked out to flight levels. These blankets should be treated like flight hardware. They are double bagged and should be opened in a clean room environment. The blankets are being shipped fed ex to the attention of Bill Anaya. Ken Anderson will provide followup regarding the blankets.

Gerry Godden would like to borrow witness filters from SBRC. This will be discussed with Ken Anderson. Jim indicated there may be more than one set, but they may be of different sizes. Some filters may have coatings on two different pieces. However, they should be equivalent optically.

Ed Knight comments/questions about the TAC software: There was no source code in the delivery. Tom indicated there will be source code in the final delivery. GSFC - the sooner we get the source code or pieces of it, the better.

There is a question about an error in the creation of the UAID files. It may be a good idea to edit the number of files.

For the polarization set, there were only 11 files. Tom: There should be 12 files, from 0 to 330 degrees in 30 degree steps. The 330 degree step was missing.

Have all the template files been setup and edited? Tom: yes. These files are edited by hand.

Does the output file indicate the template file used to edit it? Tom: no.

Gerry Godden: Talked to Bill Cushman about getting drawings of solar diffuser door. Door design recently revised to provide coverage of SDSM port. Gerry is concerned that the handle added to the door may reflect solar light onto the diffuser and result in an erroneous calibration.

Talked to Eric Johnson. For the SRCA PIN diode detector and preamp. Gerry wants the integration timing and noise levels. Also interested in the electronic volume. Wants to determine the effects of the space charge environment on performance of this circuit. Gerry is looking for the instantaneous effect in the noise level and signal output of these detectors as they pass through the South Atlantic Anomaly, horns of the Van Allen Belts, and during solar storms.

Asked Tom Kampe for feasibility of acquiring one of the scan mirror witness samples for an independent measurement of polarized reflectivity in the MWIR and LWIR. Tom indicated SBRC will make this measurement. He thought measured data was the source of the P-polarization reflectivity currently used in their analysis. Tom will provide copies of the measurement report if there is one. If the source of the data was from Thematic Mapper, the MODIS results could be different. SiOx may vary from batch to batch.

Jeff Bowser: How much storage do we need for our GSFC TAC? Would 1 Gbyte + tape files be okay?
Tom and Neil: Maximum file size should be 75 to 100 MB. GSFC may want to consider processing files out there at SBRC. Maybe GSFC should consider buying a jukebox. There is one terabyte in the SBRC jukebox.

Tom Pagano: Continuing work on the TAC S/W development. A lot of it is finished. Doing some system noise analysis. The 240 Hz problem has now become about a 500 Hz problem (Barnes - probably 480 Hz). Starting to put some of the electronics back. More polarization measurements are possible about the weekend.

Jim Young: Looking at the polarization data. Significant falloff on top to a cosine squared function. Could be spatial (seems unlikely) or lamp feedback was not working properly. Still looking.

Calibrating the SIS 100. There is an internally consistent set of data between 0.5 and 1.8 microns. At 4 and 4.5 microns, something is wrong.

The radiance standards have a limited set of wavelengths. Interpolation will be done after the SIS is calibrated.

Neil Therrien: Electronics activity between Jan 31 and 1 Feb. Should be finished by Wednesday. The frame clock was wandering, not synched up. A wiring problem was found.

Neil and Tom: Scattering Feb 3 and 4, Polarization Feb 5. Could slip. Actel Chip (dc restore issue) was burned in over the weekend. Charge subtraction working on SWIR and LWIR. Noise source still outstanding. Will try spectrum analyzer at various test points. Noise may be getting into analog front end.

5. Gerry Godden Trip Report

This trip covered January 19 - 26 and is documented in a report dated January 30. A few highlights here: Gerry discussed the following:

Scan mirror BRDF data review - TMA scan mirror BRDF data probably good for scatter angles greater than 0.2 degrees. We need to extrapolate for angles less than 0.2 degrees because the data is very noisy. Procedures were discussed to extrapolate the TMA data in wavelength and for likely contamination. Tom Kampe mentioned plans to remeasure scan mirror BRDF at El Segundo. He will gather information regarding the equipment at El Segundo for making these measurements.

Near-field scatter test configuration and procedure - Raised scatter concern about overfilling ScMA mirror. Use of aperture stops discussed. Gerry believes even the 1.7 inch diameter stop will result in some overfill and that the results will not be negligible. Procedure calls for using a 1x10 pixel slit using both "approx. white" and spectrally filtered light. Gerry recommended at least one run with a smaller slit. From an MCST point of view, the smaller slit could replace one of the spectral bands. A set of data may be gathered with a 1.5 x 1.5 pixel slit. Gerry recommended:

- Review of ScMA optical design for vignetting and assured underfill of the 12 inch mirror.
- Review Tom Pagano's scattered light data analysis to assure that the underfill of the scan mirror properly represents the inflight scattered light condition.

Near-Field Scatter Test - a black screen was added several feet behind the ScMA mirror assembly to reduce scattered light. The ScMA was refocused to the second focus (there is a tangential and sagittal) and the image width was reduced from about six pixels to about three pixels. The remaining extraneous width was traced to scan timing jitter. Despite timing jitter and 240 Hz noise, near-field scatter tests were performed to get some data for testing/debugging the analysis software. Data was collected for each of the planned wavelengths, with 2.0 and 1.7 inch source apertures, and with the 1 x 10 pixel slit and the 1.5 x 1.5 pixel slit. Gerry recommended:

- Thoroughly review and evaluate the ScMA for focus and alignment. Add steps to test procedure.
- Add sequence to the test procedure to collect data with the high bay clean room lights and other extraneous lights sources off.

Aft optics elements BRDF data review - reviewed with Paul Spyak of University of Arizona the SBRC scatter measurement data of all aft optics elements and filters. Concluded data will be useful except for

diamond turned elements and the instrument profile needs to be removed. Data to be sent to BRO where Spyak will remove instrument profile and analytically fit the resulting valid data for use in the BRO model.

SDSM and SRCA silicon PIN detector data - see above

Solar diffuser door configuration - see above

Scan mirror inspection - Did not have an opportunity to inspect the EM scan mirror or witness samples with a long focal length 30X microscope. Tom Kampe said procedures in place to begin weekly inspections. Tom will inspect witness samples and provide a half page description of his observations

Reflectivity measurements of the scan mirror witness samples - see above.

6. Cherie Congedo

Swales got model information last Friday which will be used in an analysis to determine whether notching is required for the radiative cooler if we do a sine vibration test. Results due one week from this Friday.

7. Mitch Davis

Telecon, February 1, 11:00 am:

Received MEM on 1/31 with new top, new Actel, heaters and temperature sensors; grounding bars added (removed later); working but not functionally tested.

- One problem initially with Formatter not taking to FDDI. Re-insert Formatter - problem solved. Should be ready for scatter and polarizer testing later today.

- Jitter problem solved. Missing wire for scan mechanism that syncs timing generator to scan mirror.

Writable-control store will be checked.

Charge subtraction solution found, missing component, wiring errors to FPA.

Next telecon: Wed 2/8 11:00 am

February 1, 7:30 pm, call from Ed Clement:

Most fixes to MEM have been verified

Noise problem: (note: MEM on floor, SAM in instrument with 12 foot power cable).

Only with SAM:

- turn on NIR FPA okay
- turn on second FPA, start to see noise
- turn on third FPA, see more noise

Noise amplitude and frequency with additional FPAs on. Noise approximately 13 counts peak to peak. IAC running about 600 of 1350 samples (10 IFOV).

Guess it's a head room problem with cable. Tonight making a new cable with breakout and heavier wire.

Ken Shamordola out sick!

High gain channels (PC) not tested.

FAM autobalance is not working/ moving in correct direction only.

Verifying grounding. Meeting 11:00 am Thursday (February 2) for status.

Conference Friday to quantize problem.

8. GSFC Lubricated Space Mechanisms Committee

The Office of Flight Assurance and the Engineering Directorate are jointly sponsoring a committee to consolidate and manage the resolution of issues associated with lubricated space mechanisms for all GSFC flight projects. The charter of the GSFC Lubricated Space Mechanisms Committee (LSMC) is to improve review of lubricated mechanisms in the design phase, investigate problems with GSFC flight project lubricated space mechanisms in a timely and effective manner, and improve the database of knowledge on lubricated space mechanisms. Details of are provided in a memo by Kenneth Hinkle and Richard Marriott in a memo dated January 25.

MR
2/3/95