

Done!
12/10/94

MODIS Team Meeting Minutes

Minutes of the MODIS Team Meeting held on Tuesday January 3, 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.

100. Devise an electronic distribution and communication system to use when GSFCMAIL shuts down. Assigned to Bauernschub 10/25/94. Due 11/29/94. CLOSED 1/3/95

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. Revised due date 1/17/95

105. Review and report on the assigned SBRC test specifications and procedures. Assigned to Daelemans 10/31/94. Due 11/22/94 CLOSED 1/3/95

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

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 Mocarisky
	Sal Cicchelli	Helen Phillips

The following items were distributed:

- 1) SBRC Memos submission from week #162

MODIS Technical Weekly January 6, 1995

Richard Weber

The entire system works together from the photon inputs to the digital data analysis using the Ground Support Equipment (GSE). At this time, the instrument detects 60 cycles. (This may be related to overhead lights.)

Larrisa Graziani

The scan mirror was cleaned according to the very vague SBRC procedure (CO2 snow cleaning). Six passes over the surface were done, heating it in between to prevent condensation. The procedure does not specify the number of passes required. The mirror started out as follows:

- 1) 3604 particles >10 microns
- 2) 15 particles >350 microns
- 3) 4 particles >500 microns

After cleaning, the results were:

- 1) 296 particles >10 microns
- 2) 5 particles >350 microns
- 3) 3 particles >500 microns

Though it is significantly improved, the large particles drive the cleanliness level extraordinarily high. We will clean it once more before submitting it to the materials branch for analysis. Gloria Park will work with U of M to use their new scanning microscope to determine the size of scratches and digs on the surface. (or attempt to, at least). They will not charge us for this service since our sample is part of their education process. Code 300 will have this equipment available at GSFC in the Spring.

Bob Silva

Phone message from Rob Leighty, forwarded by Bob Silva on 1/5/95: Three new failure reports:

1. FR 01001

PF NIR detector assembly, duty cycle dead time failed. The spec was 10 microseconds. It is 10.7 microseconds. Plan is to relax spec.

2. FR 01002

PF SWIR/MWIR SN005 detector assembly

The SCA was wire bonded to the motherboard. Visible inspection found some degradation of the traces. This is believed to be mechanical damage. The assembly subsequently went on to test, where it showed up that the DC power was too high.

3. FR 01003

Schaeffer Magnetics - Torque margin requirement is 300% for low temperature. At the low qualification temperature (-5 degrees C.), torque margin equalled 198%. Will finish other low temperature plateau performance tests and ramp up to temperature steps to -3, 0, +3, and 5, as needed, until the 300% margin is achieved.

Cherie Congedo

Cherie has written a memo dated December 15 regarding SBRC's recommendation to waive the modal survey. An, email draft of this memo was commented on in the Quarterly Management Review evaluation which was emailed on December 23. To summarize some key points here:

Since the first mode of the structural model was 20 Hz below the results based on the NASTRAN model (Florida vibration results) and we do not know the mode shape of this mode, it is clear that the NASTRAN model currently being used for EOS-AM coupled loads analysis is not accurately representative of the MODIS instrument.

If an instrument is not correlated to a NASTRAN model, then design limit loads could not be verified and guaranteed. Loads could exceed the design limit loads and break the instrument.

For any significant mode (10% or more of modal mass) below the requirement of 70 Hz, it is important to verify both the frequency and the shape, since the transfer of loads is dependent on mode shape.

Nelson Ferragut

A repeat of a test similar to the one performed in Florida might be adequate for a modal survey if the following changes were made: larger shaker, rigid mounting fixture, and better control. An alternative approach would be to mount MODIS on a seismic block and use stinger excitation.

Gene Waluschka

MISR is considering putting black glass between the bands to reduce filter crosstalk. The filter would be the same type as we have for MODIS (multi layer, vapor deposited, interference filter). However, each band would have a thick substrate above and below the filter. Black glass would then be glued on the edge of the filter (from the top of the top substrate to the bottom of the bottom substrate. This would prevent filter crosstalk between bands. In principle, this could be done for each detector to prevent in band filter crosstalk.

Some power could be added to the top substrate so that light reflecting back would not be dispersed (reducing optical ghosting). At this time it seems we have to test what we have as a system and analyze performance versus specification before even thinking of any of these possible ways of improving performance.

SHI-YUE Qiu (pronounced Chu) is continuing working on a detailed ghosting analysis for MODIS. For a ten band focal plane, he is tracing one million rays (100,000 rays per band, ray one for band 1,... ray 10 for band 10, ray 11 for band 1, etc.). The pattern is a narrow slit which moves across the focal plane. The computer runs are on a DEC Alpha. Each slit position takes 20 minutes. The plan is to do this for each focal plane. The number of slit positions per focal plane is TBD. The goal is to compare computer results with test results. This will be a challenge since the test results will include other spurious optical signals.

Bob Martineau

Photoresist was found between the two pieces of the S/MWIR hybrid for S/N 108. The detector division had mixed up MODIS parts with another program. The MODIS hybrid was put in a processing line for another program and photoresist was put on the hybrid. At some point it was determined that the hybrid was in the wrong processing line. The photoresist was cleaned off. When the hybrid was cooled down as part of MODIS testing, photoresist which had wicked between the detector and readout expanded and caused the hybrid parts to separate.

It seems the detector division has experienced a number of similar occurrences; for example, a PC detector cracked due to inappropriate storage in a container. This would suggest that a review of internal QA

procedures and stringent adherence to accepted procedures is needed. This also indicates the need for bonded storage now.

For the LWIR sister chips, a residue was found on the indium bumps. The detector chip had been covered with photoresist before dicing and not all of the photoresist had been removed. SBRC plans to temperature cycle old LWIR hybrids 150 times to see if this is a problem. If all goes well, expect a half month delay in the delivery of the LWIR detectors. No hybrid problems related to delamination have been noticed to date.

Jose Florez

A working electronics system has been delivered to integration and test. The Main Electronics Module (MEM) can not be installed in the instrument (fit problem).

Engineering Model Formatter

From: Clement, John E on Tue, Jan 3, 1995 5:40 PM

Subject: Current EM Formatter Problems

To: Alferd, Vernon W; Gallagher, Fred A; Glick, Arnold E; Kus, Steven M; Mehrten, John A; Pagano, Thomas S; Rogers, David L; Tessmer, Arnold L

There are two known problems with the Engineering Model Formatter at this time:

1. Currently we are not able to perform four-to-one Time Delay and Integration (TDI) on Bands 27-30 (though the two-to-one TDI for Bands 13 and 14) is working correctly).
2. We cannot generate the correct 12-bit packet checksum.

The first problem is most likely fix-able in Writeable Control Store (WCS) microcode software. At the moment we are only transmitting the first of four samples from each of these bands (per IFOV) instead of the adjusted sum of the four samples. We are concentrating on updating the board designs for Protoflight and hope to get to this problem by the end of January or early February. However we need to know well in advance if this is going to cause any problems during Systems Integration and Test so that we can address it in time.

The second problem is hardware related and will need to be fixed during the re- design of an Actel FPGA. Since it is not causing any problems with the receipt or analysis of Science Data we do not intend to fix the Engineering Model hardware, but will only fix the Protoflight Model hardware. Please let us know if you know any reason to fix this problem sooner.

Tom Pagano's response (email 1/3/95 11:22 pm): Ed.

The impact to system performance of the lack of TDI (really aggregation of 4 samples) for bands 27 through 30 is that we will experience #195#2 lower SNR. This may result in us not meeting our specifications. This will be OK since we can extrapolate the #195#2 back to what we'd get for PFM. Also we will experience a better MTF which is no problem. The worst of it is that we will see a misregistration of those bands by roughly $2.5/8 = .3125$ pixels. This is more of a problem, but again, we can explain it away if we need to, but I'd rather not.

I'd like to know more.

Tom

MSAP

From Tom Pagano, 1/4/95 2:43 pm

The MODIS Systems Analysis Program (MSAP) has been update to make the file directory structure cleaner. In particular, transmission/reflection files for the filters and dichroics for EM and PF are now contained in folders. Pathnames are therefore required in the transmission input folders. The program and files lie in a shared folder on my hard disk called "MSAP".

Tom Kampe will be updating the spectral files and reports of system spectral performance and throughput since he is closest to the component measurements.

Thanks

Tom

Mitch Davis

There is a concern that for worse case analysis there has not been a consistent closing of the loop between identifying a potential problem and assuring any necessary changes have been implemented. Initial action is on QA.

Electronic engineers are designing and testing stiffeners for the MEM electronics box. Mechanical engineers need to be involved to assure that these designs are structurally adequate and have an acceptable impact on the rest of the structural design.

Mike Roberto
January 5, 1995

MODIS Technical Team

		Code	Bldg	Room	
Ken Anderson	6-6845	421	16W	N81	Technical Officer
John Barker	6-9498	925	22	354	MCST
Bill Barnes	6-8670	970	22	274A	Instrument Scientist 6-1494
John Bauernschub	6-6395	421	16W	N84	System Manager
Sal Cicchelli	6-7853	723.3	5	C355	Structural/Mechanical
Cherie Congedo	6-4386	721.1	5	C302	Systems Analyst
George Daelemans	6-3301	724.3	7	231	Thermal Engineer
Mitch Davis	6-4114	738.1	19	S1	Electrical Systems (AEM)
Jack Ellis	6-7954	303	16W	N125	Flight Assurance Manager
Nelson Ferragut	6-8453	723.3	5	338	Structural/Mechanical
Jose Florez	6-2789	738.0	20	1	C&DH Engineer (MEM)
Gerry Godden	6-6445	925	22	C387	MCST
Stephanie Gorman	6-9533	421	16W	N70	Document Control
Larissa Graziani	6-6283	724.4	16W	N70	Contamination Engineer
Bruce Guenther	6-5205	925	22	390C	EOS Calibration Scientist MCST Leader
David Jones	805-562-7433	FAX - CPU	7090,	Sec 7527	GSFC MODIS Rep at SBRC
Bob Kiwak	6-5827	300.1			Materials Engineer
Ed Knight	6-2382	925	22	356	MCST
Bob Martineau	6-9479	718.1	11	E41	Focal Plane Engineer
Ed Masuoka	6-7608	920.2	22	166D	SDST Leader
William Mocarasky	6-7156	733	11	E241	GSE/I&T
Harry Montgomery	6-7087	925	22	390	MCST
Mike Roberto	6-4004	421	16W	N75	Sr. System Engineer
Rick Sabatino	474-1700				Software - Omitron
Harvey Safren	6-5507	733.4	20	1	GSE & IT&T Engineer
Lisa Shears	6-2900	421	16W	N32	Software Manager
Bob Silva	6-0787	421	16W	N70	Flight Assurance Representative
Neil Square	6-0838	284.4	16	243	Contracting Officer
Rick Stickle	6-6426	421	16W	N53	Systems Safety
Les Thompson	6-8382	975	22	288	EOS PM Project Scientist
Rosemary Vail	6-1574	421	16W	N124	Resources Analyst
Gene Waluschka	6-2616	717.4	5	W17	Optics Engineer
Richard Weber	6-5992	421	16W	N83	Instrument Systems Manager
Patricia Weir	6-1453	422	16	124	MODIS PM Instrument Manager

Goddard Area Code & Exchange are 301-286-xxxx

January 9, 1995 3:54 PM

C:\AMPRO\DOCS\NAMESORT.SAM



SI&T PLANS FOR W/E 1/13/95

TLK - 6
1/7/95

HUGHES

SANTA BARBARA RESEARCH CENTER
a subsidiary

- **MAINFRAME INTEGRATION & MANUFACTURING SUPPORT**
 - **ACTION ITEM TASK LEADERS: J. NEUMANN & D. ECHELBERGER**
 - + Fab Cover to Protect Scan Mirror Against Inadvertant Starts - Need ASAP
 - + Mount FAM & CLAM onto EM Mainframe - Due 1/9 (PM)
 - + Mount Space Background Simulator Plate - Due 1/10 (PM)
 - + Set-Up for Cold Testing FPAs - Due 1/11 (Early AM)
 - + Receive Replacement MEM Top Plate - Due 1/11
 - + Prepare MEM Top Plate for Installation (Paint & Vacuum Bake) - Due 1/20
 - + Prepare MEM Radiative Cover for Installation - Due 1/20
 - + Rework MEM Rollover Cart & Move Behind Mainframe - Due 1/13 (PM)
 - + Set-Up Polarization Source Assy - Due 1/16 (Move Sat 1/14)
 - + Set-Up Scattering Measurement Assy - Due 1/20
 - + Support GSFC Thermal Blanket Installation - Due 1/30 (Bortfeldt/Neumann)



SI&T PLANS FOR W/E 1/6/95 - Continued -

TLK - 7
1/9/95

HUGHES

SANTA BARBARA RESEARCH CENTER
a subsidiary

- **ELECTRONICS/STE INTEGRATION**
 - **SI&T ACTION ITEM TASK LEADERS: S. KUS & D. ROGERS**
 - + Complete WCS Check-out of FAM/CLAM with FPA Emulator- Due 1/9 (AM)
 - + Complete MFI-07 Command & Telemetry Test - 1/9 (Early PM)
 - + Set-Up TAC in Hi-Bay & Interconnect to STE - Due 1/9 (PM)
 - + Electrically Integrate FAM/CLAM & SAM With All FPAs - Due 1/9 (PM)
 - + Electrically Integrate Blackbody - Due 1/10 (AM)
 - + Correct & Check-Out FPA Bias & DC Restore Software - Due 1/10 (AM)
 - + Check-Out Temperature Telemetry H/W & S/W - Due 1/10 (AM)
 - + Complete MFI-12 (Power Profiles) - Due 1/10 (PM)
 - + Complete MFI-13 (Input Current Transients) - Due 1/10(PM)
 - + Correct Gain & Offset Software - Due 1/10
 - + Data Stream Verification (MFI-10) - Use STR-013 - Due 1/11
 - End-to-End Test with VIS, NIR, SW/MWIR & LWIR PV FPAs
 - End-to-End Test with PC LWIR FPA
 - + Set Gains & Offsets - Due 1/12
 - + Acquire Initial Baseline Data Set - Due 1/13



Systems Engineering Activities for Week of 1/9



SANTA BARBARA RESEARCH CENTER
A Subsidiary

Task	Due	REA
Complete and Integrate the Following Software <ul style="list-style-type: none"> • DN Function • DN Analyzer • Gain & Offset Software, Including Upload • Charge Sub Software • Polarization Software • Near Field Response Software 	MON MON TUES WED FRI MON'	Augustine/Therr Pagano Bauer Bauer Therrien Pagano
<ul style="list-style-type: none"> • Collect Mid Scale Radiances VIS, NIR FPAs, Scanning • Analyze Baseline and Mid Scale Levels • Calculate VIS, NIR Gains & Offsets 	TUES	Therrien Pagano/Bauer Pagano/Bauer
<ul style="list-style-type: none"> • Upload VIS, NIR Gains and Offsets • Collect Mid Scale Radiance VIS, NIR FPAs • Collect Baseline (No Light) IR FPAs • Optimize / Upload C-Sub 	WED	Therrien Therrien Therrien Pagano
<ul style="list-style-type: none"> • Collect Mid Scale Radiances IR FPAs • Analyze Mid Scale Levels : Optimize Gains & Offsets • Re-collect Mid Scale Radiances IR FPAs 	THURS	Therrien Pagano/Bauer Therrien

7090 P.03

ANYONE REQUESTING DOCUMENTATION PLEASE
CONTACT THE MTPE LIBRARY AT X5641 LINDA
FATAHI -YAR OR X4406 JANET WASEK