



b) From 10% above per diem to 1.5 times per diem requires a justification memo to the Center Director, Center Director approval, and going to actual expenses. The Center Director can not approve a daily cost that is more than 1.5 times per diem, and the TRAVELER PAYS THE DIFFERENCE.

For travelers to Santa Barbara, the Miramar Hotel can offer very reasonable weekend rates. When a recent weekend rate was \$180. per night at the Pacifica Hotel, a cottage at the Miramar was \$65. per night.

## **General**

The Quarterly Management Review will be held via a video conference on June 30 between 11 am and 5 pm EDT in building 23, room E149.

## **Radiant Cooler Test**

George Daelemans has been reporting in from California on the radiant cooler test. The initial criteria for reaching the cold temperature was for a change of 0.1 K per two and one half to three hours. This rate was being approached on Tuesday morning. By about 3 PM Pacific Time on June 8, the cooler reached its low temperature of about 73.6K. The next step was to heat the focal plane. On June 9, the tentative nominal power case had the focal plane at 80.8K. The radiator was at 79.5K. The temperature difference between the cold focal plane and the radiator was larger than George or Paul had predicted. Heat load applied to the focal plane included 39 mW for the detector bias and 8 mW for the solar backscatter load. There was also an aperture heat load which is yet to be determined (the aperture heat load may be about 7 to 11 mW on orbit). The plate (black honeycomb panel where the window opens to the optics) was at 280K for the zero and nominal power cases. George expects that when the plate is run at 180 K later in this test, it will represent the scene load. This may drop the nominal power case focal plane temperature to about 80 K. Applying 47 mW to the focal plane raised the temperature by 7.2 K. This provided a sensitivity for this nominal case of 6.5 mW per K.

## **Detectors**

Bob Martineau mentioned that SBRC is modifying the probe station to test under low background conditions. There is hope that this will improve the correlation between the cold wafer probe data and the Fanout Detector Array (FDA) data for the S/MWIR detectors.

An anneal step was performed on one S/MWIR wafer. It was baked at 80 degrees C. for 72 hours. The leakage current was decreased by a factor of 2.5.

The detector personnel are saying they have two good S/MWIR sets of subarrays out of ten. The chip sets have not yet been hybridized.

For the PC detectors, the backup testing is on-going. Two of the wafers look good out of four. The responsivity for the PC detectors may have been too high because of stray light.

At this time, Bob does not see a reasonable plan for recovery for the S/MWIR PV and LWIR PC detectors. He has prepared a recommended agenda for a detector meeting on June 29 (the day before the QMR) to review status and recovery plans for the PC and S/MWIR detectors, review flex cable status, and review Protoflight (PF) Sensor Chip Assembly (SCA) and Focal Plane Assembly (FPA) status against the schedules.

## **Compressor Chip**

Conversations were held with Warner Miller on the use of a compressor chip to reduce the MODIS data rate. A thirty percent reduction in the MODIS data rate should be readily doable with the chip. If necessary, the chip can arrange the data for optimum compression. The chip selects one of 16 means to compress the data. A four bit identifier is included with the data so it can be decompressed at its destination. The system is lossless; one option with a small amount of overhead is no compression. The

chip is space qualified and interfaces with FDDI formats. The packets become variable length. A system with compressor chip and the current version of the decompressor chip is working in building 23.

Warner provided rough estimates of the cost of a compressor chip for the MODIS data and the cost of decompressing the data on the ground. Assuming the chip was in its own box on the spacecraft and the engineering and testing for the box was done at GSFC, the cost would be about \$1.5 M. For about \$1.2 M, there would be an EM, two flight models (one could be a spare), and bench test equipment. Estimates for integration and test and paperwork were for about two man years or \$200 K. Facility costs, etc. might be another \$100 K.

For decompressing the data, there are software and hardware approaches. A contractor is helping in the software area. The estimate for the software effort is one year or less, about \$50K. A new decompressor chip with multispectral and low entropy options will be available about the end of the year. The decompressor chip can be used in a Sun Workstation and would run about \$25K, not counting manpower to operate the workstation. If data compression system was used for MODIS, the goal would probably be to integrate decompression of the data into the regular ground system for the MODIS data. This would likely raise the total cost of data decompression.

### **Systems and Calibration Telecon**

The bi-weekly telecon was held on Monday, June 6. Participants included Jim Young, Tom Pagano, Neil Therrien, Dzung Phan, Bill Barnes, Harry Montgomery, Ed Knight, and Mike Roberto.

The GSFC MODIS team is sorry Lloyd Candell is leaving the MODIS program. Lloyd did an outstanding job as Program Manager. Several of us met last week with Lee Tessmer, who will become the new MODIS Program Manager.

Bill Barnes and Dick Weber talked to Space News last week about MODIS.

Tom mentioned he thought it would be a pretty big deal to have the ability to change the night channels.

There is a question about how black is the Blackbody Calibration Source (BCS). Since you can see into it, there is a question about whether or not its emissivity is 0.9997. There are questions about how its emissivity is verified, how it changes with wavelength, BRDF measurements, etc. Jim Young mentioned that BRDF measurements are made using witness samples.

Concern about the lack of identifiable spares for the PV S/MWIR and PC LWIR detectors was mentioned.

A question was asked about the status of the independent review of the MODIS Ground Based Calibrator (MGBC) by the chief scientist of the Systems Division. That review was delayed because of an illness in the family. Tom mentioned that Jim Young had written a memo on the MGBC.

For the spacecraft jitter analysis, Tom Pagano said that since Tom Wolverton and Cherie Congedo agree that Cherie's model should be used, we should use Cherie's model.

Harry Montgomery mentioned that the MODIS Characterization Support Team (MCST) is interested in having a sole source contract with SBRC.

Ed Knight had the following comments:

1. **Data Packages:** Ed is interested in receiving the complete data package for the Integration and Alignment Collimator (IAC). For the Focal Plane Assembly (FPA) data package, text is needed to define the plots; this may need to be discussed.

2. Calibrators: To determine the transmission of the Solar Diffuser Stability Monitor (SDSM) screen, testing a small sample of the screen would be useful. Could a bright light source used to simulate the sun be used to determine transmission through the screen at the system level?
3. MODIS Simulator: How is out of band handled for the MODIS simulator? Neil mentioned it is zeroed out. However, there is a plan to use what MSAP uses for considering the out of band. If out of band is used, the program runs longer. Ghosting is not yet in the simulator.
4. Memos: For memo J03627, the GSFC science personnel are not getting the same value for the background.
5. There are more comments on CDRL 404, Operational In-Flight Calibration Procedures. The final draft is due after the Protoflight model (PFM). Jim Young welcomed the additional comments at any time.
6. Ed is preparing a presentation on the spectral response profiles. This presentation will be reviewed by SBRC. The plan is to have the package on line by the October science meeting.
7. Water absorption in the lab may make a difference between thermal vacuum and ambient for the full system. We may need to purge the optical path.

Tom Pagano updated EM development status. The VIS and NIR focal planes were installed last week. The dichroics are in place. The Brassboard Analog Electronics Module (BAEM) is working. They will start taking IAC data today (June 7). The PCs are working. The focal planes are working with no dead elements.

Jim Young mentioned that several memos will be getting out soon on the MGBC, near field scatter for the reflectance bands, near field scatter for the thermal bands, etc.

Neil mentioned that they plan to get the first digital data by Friday.

### **Mainframe Vibration Test Plan**

Comments and recommendations were prepared on the Honeywell vibration plan for the mainframe, Rev B, dated 24 May 94. Contributors included Tom Venator, Nelson Ferragut, Dick Weber, Bob Silva, and Mike Roberto. The comments are in a memo dated 8 June.

Mike Roberto

June 10, 1994