GLAST Large Area Telescope:
Face to Face Meeting
May 11, 2005
AntiCoincidence Detector (ACD) Subsystem
WBS: 4.1.6

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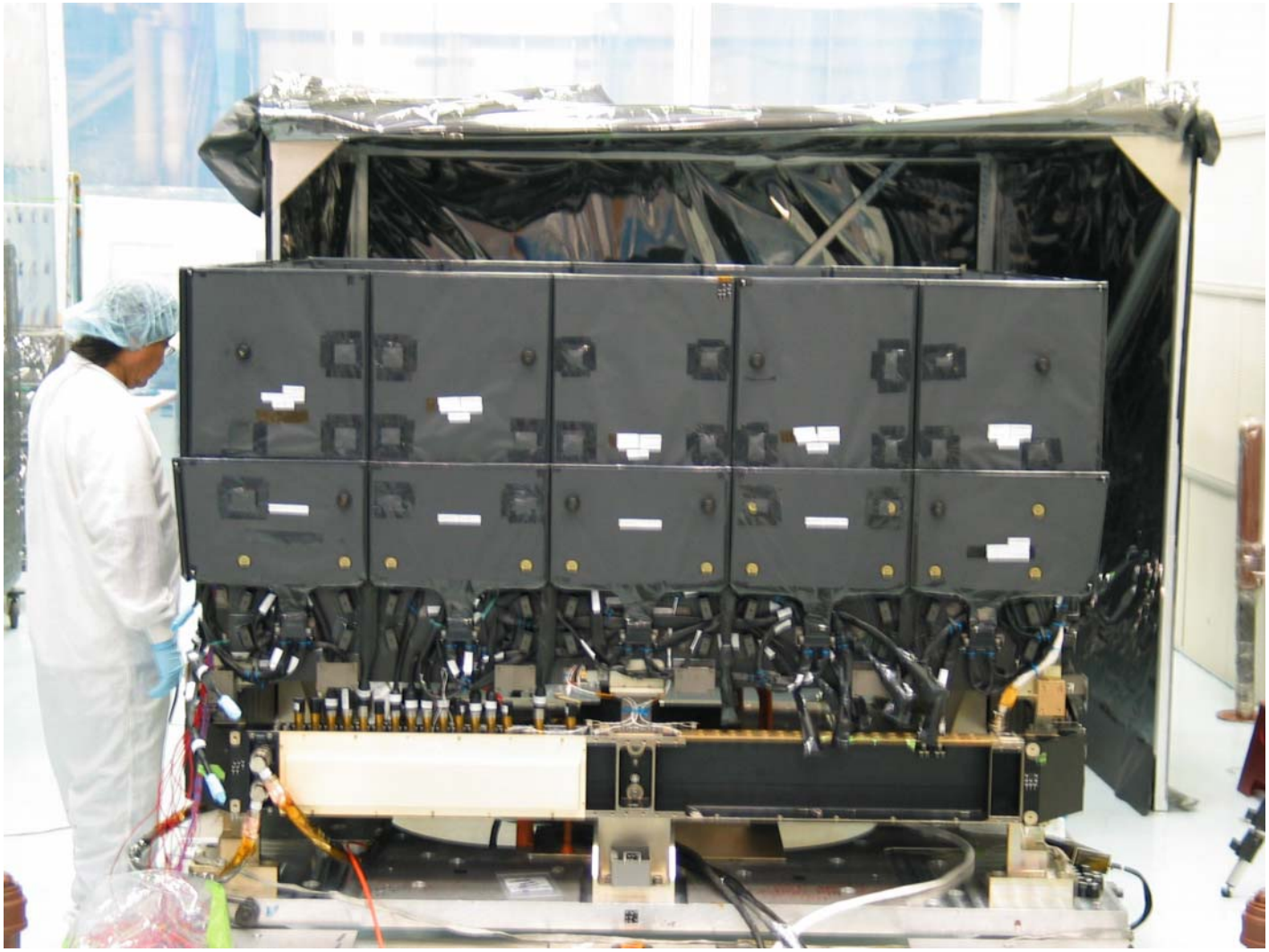
Accomplishments/Status

- Made significant progress on resolving the noise anomaly (details on next slide).
- Successfully completed the EMI/EMC re-test on a flight Electronics Chassis.
- Completed environmental testing on all Electronics Chassis. The final chassis will be delivered to ACD I&T this week. Four chassis have been installed on the ACD.
- Working several facility issues. Resolved silicone contamination due to cleanroom garments.
- Operated ACD channels with an external trigger, using a muon hodoscope to emulate a tracker.
- Started final assembly of the micrometeoroid shield.

Noise Anomaly - Summary

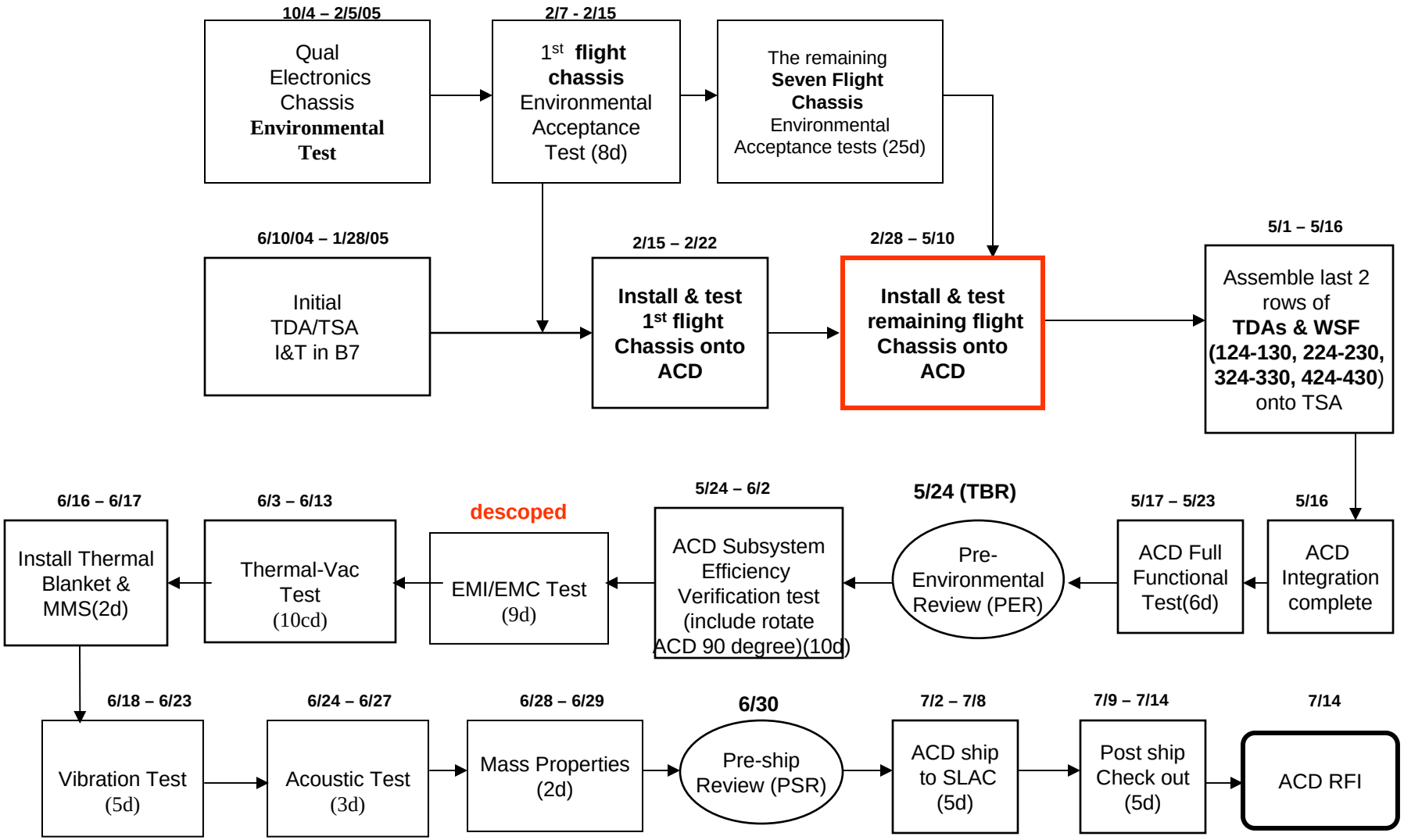
- Identified 6 (3 flight and 3 spare) phototube assemblies with a noise problem (rapid increase of noise after some running time at high voltage).
- We have not found additional noisy channels during long duration testing/screening of the Electronic Chassis.
- Have determined that the noise pulses are smaller than the signals from real particles and that the noise only occurs at voltages higher than we expect to operate. 4 of the 6 noisy tubes have returned to a quiet state after additional running.
- The root cause has been narrowed down to the PMT
  - Hamamatsu believes the root cause is discharge between two electrodes across an insulator, similar to a process called "popcorn noise."
  - A noisy PMT has been sent to them. Their testing reproduced the problem. They have also tested 40 of their own tubes of this model and found one that is noisy. Hamamatsu representative visited Goddard last week and will ask Hamamatsu Japan for some additional testing.
- All noisy tubes in the flight electronic chassis have been replaced.
- Continuing with final integration of the ACD.

ACD Assembly and Light-Tight Testing



ACD Micrometeoroid Shield Assembly

Schedule Flow



Risks to this Schedule

- Schedule for the final assembly work is very aggressive.
- EGSE remains a concern. We have not connected multiple chassis to the GASU before. We had a problem with a card in the VME crate (thanks, Neil, for letting us borrow one of yours). We have not run scripts with multiple chassis operating simultaneously. GSFC test engineers are reluctant to put the GASU into a vacuum chamber without additional testing.
- Schedule assumes testing descopes, eliminating ACD level EMI and thermal balance tests. The CRs for these descopes have not yet been approved.
- We have lots of documentation to prepare before the required Pre-Environmental Review.

Backup

Near Term Milestones

Milestone Description	Date	New Date	Status/Notes
(4) electronic chassis vib/ tvac tested and RFI	3/5/05	4/26/05	COMPLETED
(4) electronic chassis vib/ tvac tested and RFI	3/28/05	5/9/05	COMPLETED
ACD Integration Complete	4/6/05	5/16/05	Assuming noise issue is resolved next week and limited re-testing is performed. Slipped 17 days from last months WAG.
ACD Functional Test	4/13/05	5/23/05	EGSE and Test Scripts are the primary schedule threat.
ACD PER	5/24/05		Working with Mark Goans to finalize date.
Efficiency Verification Test	6/3/05		Recently resolved a data format and analysis issue.
Thermal Vacuum	6/15/05		Two issues. 1. MMS/TB will not be ready for start of test. 2. Need to complete test by 6/24 due to facility constraints.
MMS/TB Installation	6/17/05		Completion date for MMS is June 1, TB is June 15.
Vibration	6/23/05		

Thermal Balance Testing

- **Issue: The LAT Instrument Performance Verification Plan (LAT-MD-00408) specifies that all instrument subsystems shall perform thermal balance testing. This causes the ACD the following issues.**
  - Doubles the length and cost of the thermal vacuum test.
  - The ACD Thermal Blanket is behind schedule and there is a risk it will not be completed in time for TVAC testing.
  - Requires us to simulate the LAT thermal interfaces, which is not a trivial task.
  - Increases handling and lifting of the ACD and may require specialized lifting equipment for this single test. This increases the risk of damage to the ACD.
  - Our latest schedule has the ACD TVAC date conflicting with the Building 7 lab shut down
- **Solution: Perform thermal vacuum testing on the ACD without the thermal blanket installed and forego thermal balance testing until LAT instrument level testing.**
  - This would save approximately 10 days of set up and test time. A cost savings of approximately $140K ($257K full cost)
  - The ACD TVAC test would be moved ahead of vibration testing so that it would be the first test performed, thereby avoiding the Building 7 lab shut down.
  - It would eliminate the need for a minimum of $25K worth of special fixtures to support a thermal balance test.

ACD Problem /Failure Report Status

As of 4/29/05 a total of 250 PR's have been opened (42 opened this month)

- 216 PR's have been closed (74 closed this month)
- 34 PR's open (32 less than last month)
  - 31 for test script failures, 1 BEA Mech, & 1 TSA

A total of 18 PFR's have been opened (4 opened this month)

- 5 PFR's are open
  - **3 Red, 2 yellow**
- 13 PFR's closed (3 closed this month)