



**GLAST Large Area Telescope:
Cost/Schedule Review
September 1, 2004
AntiCoincidence Detector (ACD)
Subsystem
WBS: 4.1.6**




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Significant Accomplishments

- **Completed all flight Front End Electronics Boards.**
- **Closed out hole location error on 11 TDAs. PFR closed.**
- **Delivered “Mini-ACD” to LAT I&T.**
- **Selected solution for Photomultiplier Tube glass crack issue. Successfully tested 4 solution paths.**
- **Completed grass roots update.**
- **Found and resolved a noise issue on the HVBSs. Corrective action taken involves adding a capacitor to the HVBSs.**
- **Completed re-assembly of the first Electronics Chassis (Qual/Spare Unit) following rework of the HVBSs.**
- **Performed science simulation to ensure that the ACD efficiency requirement of 0.9997 is met. It is!**
- **Completed performance testing of the ribbon detectors and the upper 45 TDAs with clear fiber cables.**
- **Completed TSA instrumentation with the exception of winchester connector installation.**

Recent Accomplishments - Electronic Component Status

ITEM	Quantity Required Flight (Spare)	Assembly Complete	Functional Testing	Conformal Coating	Thermal Testing	Ready for next assembly
Front End Electronics Boards 	12 (4)	16	16	14	16	14
High Voltage Bias Supply 	24 (6)	30	30	30	28	28
Photomultiplier Tube Assembly 	196 (40)	80	45	80	45	20

Near Term Milestones

Milestone Description	Date	New Date	Status/Notes
Complete Flight HVBS	<u>6/30/04</u>	<u>7/30/04</u>	<u>Was completed on 7/30/04. However, capacitors are being added to correct noise problem. Will complete by 9/15/04</u>
Complete Flight FREE Boards	<u>6/30/04</u>	<u>8/15/04</u>	<u>COMPLETE</u>
Complete PMT Assembly	January, 2004	<u>11/05/04</u>	<u>First group completed mid-October. See back up material for more information on PMT issue</u>
Complete Qualification Unit Electronics Chassis Assembly	<u>5/20/04</u>	<u>8/6/04</u>	<u>Unit was tested, noise issue found and then repaired. Has been re-assembled and is in testing.</u>
Mechanical Subsystem delivered to I&T	<u>5/17/04</u>	<u>6/1/04</u>	<u>Complete!</u>
Complete Flight Mechanical Drawings	September	<u>8/10/04</u>	<u>One assembly drawings remains. Designers have been focused on revisions and Eos.</u>
Complete Fab of Clear Fiber Cables	August	<u>8/3/04</u>	<u>Complete!</u>
Complete Fab of Flight TDAs	November	<u>8/15/04</u>	<u>Complete</u>

Interdependencies

1. **EGSE/G3 – Ongoing development with I&T and Electronics groups.**
 - Issues with software updates and software rate counters.
 - Full EGSE/G3 delivery planned for August. Shipping containers returned to SLAC so that full EGSE could be shipped to Goddard
2. **Delivery of ACD Calibration Unit or subset to LAT I&T**
 - “Mini-ACD” delivered to LAT I&T last week.
3. **ICD, IDD, etc – Rich Bielawski is helping track a set of needed changes.**
 - Mass CR has been released and approved.
 - Electrical Issues CR has been released, but needs to be approved
 - IDD (LAT-DS-00309) update has been sent to us for review. Required for closeout of several open Problem Reports. Rob Black has been provided necessary information and background on connector location and rotation issues.
 - ACD/LAT ICD sent out for review and approval yesterday.
4. **Funding.**
 - FY04 Funding issues resolved via CCB last week

Issues, Concerns, Documentation, & Qual Program

- **Issues**
 - **PMTs**
 - **Electronics Chassis testing**
- **Concerns**
 - **PMTs**
 - **Numerous “minor” technical issues causing schedule and cost concerns.**
- **Documentation**
 - **CM system works great**
 - **PR/PFR system is working and team members are learning how to use it efficiently (20 PR/PFRs closed this month)**
 - **Status of PR/PFRs**
 - **70 PR’s Closed**
 - **1 PFR Closed**
 - **12 PR’s Open**
 - **6 PFR’s Open (1 green, 1 yellow, 2 orange, 2 red)**

ACD Schedule Variances

- 4.1.6 – ACD Subsystem (-\$547K cum, -\$122 current)
- 4.1.6.3 - TSA Schedule Variances (-\$24K cum, -\$20K current)
 - Procedures and TDA Assembly and Test
- 4.1.6.4 BEA Schedule Variances (-\$359K cum, -\$69K current)
 - Nearly all variance is due to the PMTs, remainder caused by delay in electronics chassis assembly and test.
- 4.1.6.7 ACD I&T (-\$101K cum, +\$0K current)
 - (\$101K) – Technical issues have delayed progress.
- 4.1.6.B GSE (-\$30K cum, -\$7K current)
 - (\$30K) – Shipping container and MMS GSE work being pushed out to reduce current manpower.

ACD Cost Variances

- 4.1.6 ACD (-\$419K cum, -\$608K current period)
- 4.1.6.1 ACD Project Management/Sys Eng/Science (+\$169K cum, -\$27K current period)
 - (+\$150K) - Labor support lower than planned
 - (-\$20K) – Materials.
 - (+\$38K) MPS lower than planned
- 4.1.6.2 Safety and Mission Assurance (+\$21K cum, +\$22K current period)
- 4.1.6.3 Tile Shell Assembly (-\$121K cum, -\$239K current period)
 - Fermi invoicing/costing for the TDA's this month
 - Fabrication chargebacks

ACD Cost Variances

- **4.1.6.4 Base Electronics Assembly (-\$619K cum, -\$283K current month)**
 - **(-\$585K) – M&S**
 - **(\$11K) - Labor**
 - **(-\$46K) - SLAC ASIC charges.**
- **4.1.6.5 MS/TB (+\$13K cum, -\$10K current month)**
- **4.1.6.6 ACD Mech Qual and Cal Unit (-\$30K cum, -\$15K current month)**
- **4.1.6.7 I&T (-\$4K cum, -\$13K current month)**
- **4.1.6.B Ground Support Equipment (+\$105K cum, -\$42K current month)**
 - **(+\$59K) – Labor. Costs lagging on mechanical design and EGSE support.**
 - **(+\$46K) – Materials. Not billed for work completed**

Threats to Schedule and Cost

- 1. PMT Assembly**
- 2. GASU/G3 EGSE**
- 3. Electronics assembly and test**
- 4. Minor Technical Issues that require manpower and time to resolve.**