GLAST Large Area Telescope:

Tracker Subsystem
WBS 4.1.4

Subsystem Managers Meeting

Robert Johnson
Santa Cruz Institute for Particle Physics
University of California at Santa Cruz
Tracker Subsystem Manager

rjohnson@scipp.ucsc.edu
The PRR was completed at Teledyne yesterday.

Only two action items for Teledyne
- Verify that the epoxies being used are thoroughly degassed.
- Release the process instructions, with LAT MIPs included.

Other gates to starting flight production:
- Dimensionally screen pitch-adapter flex circuits and ship to TET.
- Send machined PWBs from coupon-tested panels to TET.
- New male connectors from Omnetics (due this week).
- Ship other parts to TET.
- Finish release of the MCM test procedure.
- Finalize the P.O. with TET.

New issue:
- We have to start up a new vendor for machining the PWBs.
- High incidence of PWB panels failing coupon testing.
Bottom Tray/Grid Interface

- Mike Menning and Martin Nordby are in Pisa. They are still finding details that need changed or added in the drawings, especially after reviewing the assembly procedure with Sandro.
- Martin estimates Feb 16 earliest to release the drawings to make the titanium parts and the bottom tray closeouts.
- The schedule worked out in the meeting in Pisa last month assumed that we would order those parts about 4 weeks earlier than this.
- Getting the titanium parts and making bottom trays is the critical schedule item now, so this slips the Tower A delivery from beginning of July to the beginning of August.
Mid Tray Fabrication

• A delta-PRR was completed last month.
  – Still a latent disagreement between Jerry and Sandro about the procedure for gluing in the grounding tubes; need to get this closed.
  – Jeff Tice is looking for an epoxy ink for marking the tray serial numbers.
  – The drawing package is complete pending resolution of the grounding tube issue. Can’t get Mike and Martin to sign off on them, however.
  – Bias circuits are raising their ugly heads…
• Plyform started gluing face sheets to cores early last week.
• Bare panels will be completed by the end of this month.
• Tungsten and Kapton will start going on in early March.
• Ben Rodini joined the review and also worked sidewall issues. He is working with the prepreg vendors on specifications.
Bias Circuits

- Sandro submitted a serious NCR Monday concluding that the circuits are not suitable for flight production. All have been made ($90k).

- I have not yet been able to understand thoroughly the issues, in particular whether it is an error in the drawings or in the fabrication or both.

- LAT QA is getting some circuits measured here, to compare against the drawings.

- The design files were the same as used last summer for some prototypes, which Sandro concluded worked well on EM trays.

- However, Jerry changed the vendor to Parlex. He claims that the local vendors, which actually deliver circuits quickly and conform to the dimensional tolerances, are not suitable to NASA. Parlex delivered pitch adapter flex circuits that are systematically shrunk, and it appears from the NCR that we have the same situation with the bias circuits.

- Parlex is very slow. If we don’t resolve this in the next 2 weeks the schedule slips more.
Flex Circuit Cables

- Martin Nordby’s team cleaned up the 3-D models with proper constraints and tied them to the fabrication drawings.
- The design was modified to
  - include the new resistors to limit current into the address lines in case of a short and
  - add 5 mm in the Grid flange region for a strain-relief loop and
  - moved termination resistors to the opposite side of the cable.
- Hartmut is pushing again to get the detailed layouts finished.
- Near term goal is to order C0 cables for EGSE, which is the earliest need.
TKR Flex Cable Issues

Mechanical
1. Grid – Flex Cable Interface
2. CTE mismatch Tower – Grid (introduce loop)
3. Cable – Wall interference: move resistors
4. Cable – TEM interface (take out loop)
5. Stiffener at D connectors (TEM side)
6. Assembly Procedure (NO pre-bend)
7. Bend Tool

Electrical
1. Doubling Vias
2. Via Stay-clear in Bend Area
3. Resistors to Improve GTRC margins (out)
4. Resistors to Improve Polyswitch Functioning (in)
Way to TKR Flex Cable: Milestones

- 06/23/2003  Start of my clock
- 08/26/2003  PRR Readiness Review
- 09/09/2003  Update Report in Engineering Meeting
  "Cetere censeo: need to finalize cable length by today the latest!"  Cato, ~150 BC
- 09/10/2003  Specs signed off LAT-PS-01132
- 09/23/2003  SOW signed off LAT-PS-02463
- 10/27/2003  TKR Interface Design Report
- 11/28/2003  Original target for TKR IDD
- 01/23/2004  New Layout Crew on board
- 02/10/2004  Finalize interface GRID-TKR Flex cable C0
  "You are here"
- 02/11/2004  Finalize electrical layout cable C0
- ??????  PO!  Start Production of 12 non-flight C0 cables for INFN
- 02/20/2004  All cables designed and laid out, ready for PRR
- 02/25/2004  Start Production of Short Cables
- ??????  PRR,PO!  Start Production of Flight Cables
- 03/15/2004  Flight connectors available
End of March Highlights

- Tower-A MCMs completed and burned in.
- Tower-A mid trays completed.
- Bottom/Top tray fabrication in progress.
- Integration of MCMs and ladders onto mid trays in progress.
- Tower-A sidewall fabrication in progress.
- EM Thermal-Vacuum test completed.