GLAST Large Area Telescope:

Tracker, W.B.S 4.1.4

Face-To-Face March Meeting

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Tower Status

- **Towers A/B: RFI**
- **Tower 1:**
  - **One ladder shorted to its wire bonds while in thermal-vacuum testing. A bubble under the bias circuit pushes the ladder upward when in vacuum.**
  - **INFN Pisa has devised a procedure to remove and replace the two top trays without full tower disassembly.**
  - **The plan is to retest Tower-1 in parallel with Tower-3. The two towers thus will arrive simultaneously at SLAC.**
- **Tower 2:**
  - **Just successfully completed vibration testing.**
  - **An review is in progress to simplify and shorten the thermal-vacuum testing. Hopefully this can be applied to Tower-2.**

Tower Status

- **Tower-3**
  - **Trays are being stacked and cabled today.**
    - **An MRB yesterday approved use of 3 cables (on 3 different sides) from panels with bad coupons.**
  - **Sidewalls will arrive the middle of next week.**
- **Tower-4**
  - **Steve Lungren is getting on a plane today to carry 22 MCMs to Pisa for Tower-4 trays.**
  - **A few trays are built, or being built, with old MCMs.**
  - **19 MCMs are in burn-in at SLAC. 5 will finish Saturday and the rest next Wednesday. We are arranging another hand carry to Pisa for the end of next week.**

MCM Production

- **We have not yet seen any evidence of encapsulation delamination and wire bond breakage during thermal cycles.**
  - **2 MCMs had ~20 missing channel connections initially at Teledyne. I'm still waiting to see if they change during thermal cycles.**
  - **1 MCM was reported yesterday to have a missing bias connection after thermal-cycles and burn-in. This needs more investigation.**
- **Problems with trace cracking have been almost eliminated. The new bonding fixture and the Dyconex pitch adapters will improve it even more.**

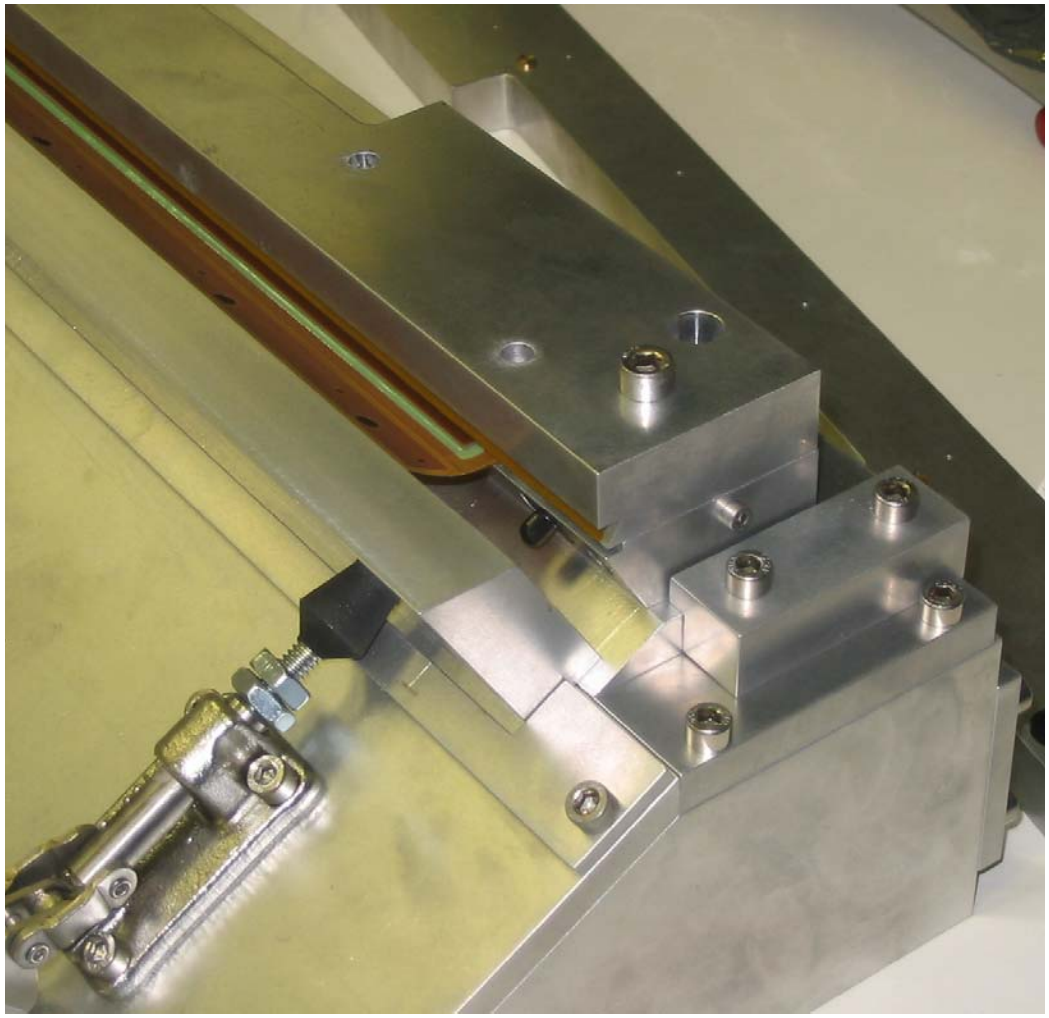
MCM Production Restart

Week	Starts	Mip-1	Mip-2	Mip-3	Receive
1/31	10	2			
2/7	25	13			
2/14	28	21	10		
2/21	22	15	7	3	
2/28	28	21	26	20	23
3/7	16	23	19	16	16

MCM Production Issues

- **Parts problems**
  - **Pitch-adapter trace width (Titan)**
  - **PWB riser location error on tall boards**
  - **Kapton cover-layer on back side (DDI does it different on every lot, regardless of what our drawing says).**
- **Process problems**
  - **Pitch-adapter bonding; lots of rework and lots of rejects**
    - **Poor alignment reproducibility**
    - **Voids in the epoxy**
    - **Problems with peeling**
  - **Pitch-adapter trimming**
    - **Cutting into the PWB fiberglass**
    - **I'm having this reviewed to make sure we don't reject parts for purely cosmetic reasons (the fiberglass under the pitch adapter has no copper in it and hence no active parts).**
- **Teledyne management asked our program manager to shut down our production line because of cost over-runs associated with all the rework!**

New Bonding Tool



- One tool has been tested and is at Teledyne (the photo here is before anodizing).
- Three more arrive at SLAC today.
- The results are far superior to the old Teledyne fixture.
  - Perfect alignment every time.
  - No voids.
  - Much less peeling.
  - Better flatness and perpendicularity for wire bonding at G&A.
- Rework and rejects should be drastically reduced.

LAT Efforts to Improve MCM Production

- Senior SLAC physicist working nearly full time on MCM production management (Charlie Young).
- Full time LAT QA inspector working in the production cell.
- LAT electrical test and inspection personnel in the production cell every working day.
- Frequent (weekly or more) trips to Teledyne by LAT QA (Richard Gobin).
- Frequent (twice weekly or more) trips by LAT physicists to oversee production at Teledyne.
- Second burn-in setup is functioning now at SLAC.
- Second pitch-adapter tester is working at Teledyne.
- New bonding fixtures should go into the production line next week.
- Improvements in the PWB layup to reduce short circuits.
- Pitch-adapter improvements, including 2nd vendor.

Flex-Circuit Cables

- The barrel plating separation problem seems to be solved.
- But coupons still fail for annular ring violations. This is obviously going to be a potential issue for such long parts, and we are finding that we have to use cables from such panels. Risk of a failure is small, especially since most of the vias have redundant partners.
- Lots of other production problems, including contamination and workmanship issues.
  - Parlex is rejecting a majority of the parts before they complete fabrication.
- There is a very real possibility of delays in tower assembly because of lack of cables.
- We are back to pursuing the second vendor.