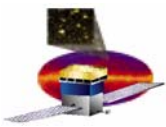


GLAST Large Area Telescope:

Electronics, Data Acquisition &
Flight Software W.B.S 4.1.7

August Status 09-01-04

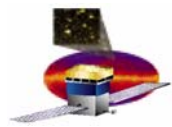
Gunther Haller
haller@slac.stanford.edu
(650) 926-4257



Test-Stand Summary

Client	Shipped	Assemble/Test	Total
Calorimeter (conformal)	8	0	8
Calorimeter	5	0	5
Tracker (conformal)	2	0	2
Tracker	6	3	9
ACD	4	0	4
I & T* (next slide)	5	0	5
DAQ/FSW	11	0	11
Electronics Support	11	0	11
Total	52	3	55

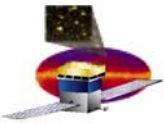
- **Several test-stands tested and shipped last month**
- **ACD complete**
- **Remaining test-stands are**
 - **3 for TKR, have been tested, ready to ship**
 - **We might need to send 2 more CAL (conformal) to NRL, but crunch on CPU's, no spares either**
 - **GASU/PDU for delivered I&T test-stands**
- **Investigated the original ACD G3 #1 box which "smoked" at GSFC**
 - **As expected it was Q43 PNP transistor which rating was exceeded when the powered-off circuit was attached to 28V at the output**
 - **That has been addressed by inclusion of a blocking diode (is implemented on all G3 test-stands at GSFC)**



I & T Test-Stands

Intended USE	SBC	LCB	VME	GASU	TEM	PDU	PDU-load	Xbrd	28V	CABLES	STATUS
Software development	?	0128	0924	0896	0346	Test	Test	0208	0995	0236	In Use
Tower integration(EM2)	0335	0128	1226	1224	?	Assemble	None	0213	0290	Yes	In Use
CAL Integration	0318	0796	0791	None	None	None	None	0191	1334	1311	In Use
TKR Integration	1160	1308	0888	None	0171	None	None	0220	0108	1223	In Use
LAT Integration	0307	0802	0887	0897	None	Assemble	None	0213	0290	1058	In Use

- **I&T received all test-stands with exception of GASU/PDU enclosure**
- **GASUs and PDUs have high priority in production line**
 - **2 GASU are being delivered today**
 - **1 PDU needs one more test before delivery**



TEM/TPS Production Status

- **Very detailed schedule in MS project, to detailed to display**
- **Near Term Milestones**
 - **TEM**
 - **Qual + 2 ship kit to vendor 9/16/04**
 - **TPS**
 - **Qual + 2 ship kit to vendor 9/16/04**
- **Interim Milestones**
 - **TEM/TPS Qual + 2 assembly start 10/27/04**
 - **TEM/TPS Qual + 2 ship to I&T 11/18/04**
 - **TEM/TPS Production units to I&T 3/7/05**
- **Tasks left to be completed**
 - **Release of some modified test procedures**
 - **Release of some remaining EGSE documentation**
 - **Receipt of lead formed parts**
 - **Receipt of Novacap capacitors**
 - **Surge testing of capacitors at GSFC**
 - **Completion of inspection of remaining parts**

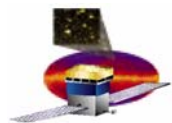
*** Production managed and slide supplied by Brigitte Estey, SLAC**



TEM/TPS Production Status (con't)

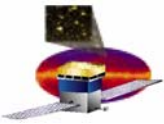
- **Schedule Risks**
 - Critical path to both TEM and TPS is lead forming. Vendor is in process of lead forming and packaging for pick and place machines
 - Successful surge testing and on time receipt of capacitors from GSFC
 - Receipt of remanufactured Novacap capacitors on time
 - ACTEL FPGA reliability/performance issue in work
 - Successful PWB coupon testing
 - Manufacturing flow and span times still need to be confirmed with assembly house to validate production schedule. Current schedule uses span times based on previous CCA assembly experience and test span times provided by DAQ personnel
- **Schedule risk mitigation efforts in process**
 - 3x weekly production meetings to assign and status action item matrix
 - 1x weekly meeting with assembly house to prepare for production and work documentation/process issues prior to receipt of kits

* Production is managed and slide supplied by Brigitte Estey, SLAC



ASIC

- **TEM ASIC's test & dynamic burn-in**
 - **Tested/burned-in/tested 304 GTCC's and 152 GCCC's. No failure after burn-in**
 - **One more batch in burn-in (80/40)**
 - **Need 192 GTCC & 96 GCCC for 22 TEM's plus 52 for qual**
 - **Test stand will then be sent to GSFC to be used for Qual testing**
- **GLTC ASIC's (for GASU)**
 - **Testers including software almost ready for flight testing**
 - **Documents need to be released**

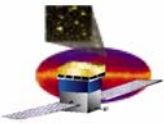


GASU & GASU-PS & PDU & SIU

- **Brigitte is working on getting very detailed production schedule entered (like for TEM/TPS)**
- **Lat months schedule showed that enclosure/boards/components are all in by Oct 1. That is delayed by 4 weeks.**
- **Driver is getting all fabrication documentation approved and contract put in place**
- **PDU flight board fabrication requisition was written**
- **PDU/GASU/SIU enclosures ready for flight fabrication, awaiting drawing sign-off**

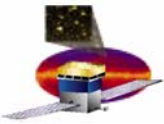
- **PDU tests on test-bed with SAI PRU went extremely well**

- **Issues**
 - **Getting internal harness components ordered**
 - **Which ACTEL fab-line to use**
 - **Apparent suggestion by GPO to exchange poly-switches on PDU with one-time, fast-blow FM12 fuses.**
 - **LAT will present justification next week to keep poly-switches**



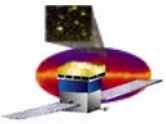
EEPROM Issue

- **SIB board: File-based system versus mem-map based system**
 - **FSW CCB was held and decided that the file-system stays**
 - There are two copies in each SIB
 - Even if there is problem, in control section only, we might to have upload the code again
 - Always the option to replace with mem-map-based system on-orbit if there is a real problem
 - No change in hardware
- **RAD750 SU-ROM**
 - Gave go-ahead for BAE to order PROM's (end of Dec delivery)
 - Deferred decision whether to change EEPROM to PROM based on
 - More analysis what the expected failure rate is really going to be (is it really a problem at all) and compare to impact on reliability if boards are reworked
 - Discuss what BAE suggests to test after rework versus original tests
 - Get 100% confidence that our boot-code fits within 64K
 - Make decision with time margin before PROM's come in
 - Large inconvenience if PROM is to be used
 - Revisit Oct 1



ACTEL FPGA

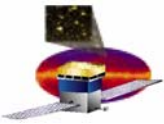
- **Investigation still on-going on MEC production line FPGA's**
 - **ACTEL is working on new algorithm to possibly fix I/K anti-fuse issues (F/X were fixed with previous algorithm mod), more news mid September**
 - **Not true that this is only present for I/O under-shoots exceeding 0.5V (see P7 Aero-space project)**
 - **ACTEL put order in for MEC line devices for us, but delivery is 16 weeks**
 - **At that time we can decide to return the MEC or not**
 - **Qual and A/B TEM's are being produced with MEC line**
 - **ACTEL's were programmed with existing new algorithm at ACTEL**
 - **TEM measured under-shoots are up to 1V**



Testbed

- **Used by**
 - **FSW**
 - **OSU for FES software development/commissioning**
 - **DAQ hardware group**
 - **Test group**

 - **Scheduled daily by Gregg**



Schedule/Budget

- Total budget: \$21,685
- Work Scheduled up to date: \$18,956
- Work Performed: \$17,133
- Actuals: \$17,766
- Schedule Variance \$-1,823k (-10.6%)
 - Qual/Flight work should have been started, reflects current status
- Cost Variance: \$-633k (-3.7%)
 - EGSE is over budget (26-00068)