

GLAST Calorimeter

*Monthly Cost /
Schedule / Mission
January 2005*

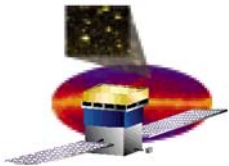
Monthly Cost/Schedule/Mission Review

GLAST LAT Calorimeter January 27, 2005

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Naval Research Lab
Washington DC





GLAST Calorimeter

Outline

*Monthly Cost /
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January 2005*

□ Technical Status:

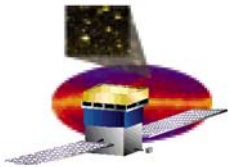
- Last Month's Accomplishments
- Near-term Milestones & Status towards them for next 3 months (from F2F)
- Drawing Release Plan & Status required to achieve production milestones
- Summary of issues & concerns
- Status of Subsystem's Documentation & qualification program

□ Cost & Schedule

- Variances
- Actions required to retain zero schedule variance

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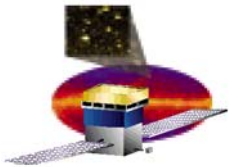
Significant Accomplishments Pre Electronic Modules

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- ❑ **CsI Crystals - Complete**
- ❑ **CDE Assembly Process**
 - All CDEs have been bonded.
 - Rebonding of process control samples is on-going for spare CDEs.
 - Curing, wrapping and acceptance testing will complete in mid Feb.
 - Swales Aerospace has provided high quality CDEs on schedule and well under budget. Great job!
- ❑ **All flight composite structures have been manufactured.**
 - Excellent job completed by Oscar and his group at LLR Ecole Polytechnique.
- ❑ **All PEM mechanical structures (base plate, top frame, composite) have been assembled and inspected.**
- ❑ **14 PEMs are complete and tested with muons**
 - CDE insertion is complete on PEM 115. Starting muon testing.

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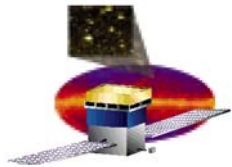
Significant Accomplishments

Analog Front End Electronics

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- **ASICs - Qual testing of GCFE and GCRC at GSFC completed**
 - Final summary report on qualification testing at GSFC has been released.
- **All flight AFEE boards (110) have been manufactured**
 - 64 boards have completed burn in, three temperature testing and conformal coating.
 - Boards for FM 117 and FM 118 began burn in this week.
 - Four additional flight AFEE boards have been tested and will be shipped to SLAC to support T&DF test program.
 - FM 113 boards have completed conformal coating and will be available for PEM installation.





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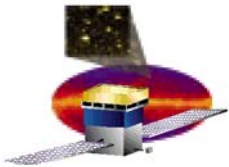
Significant Accomplishments Assembly & Test

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- ❑ **FM 101 – FM 105 delivered and accepted by LAT I&T**
 - **NRL still needs to provide DVDs of end item data packages – in progress.**
- ❑ **FM 106 – FM 107 ready to ship, completing ATDP documentation for pre-ship review.**
- ❑ **FM 108 – FM 111 waiting for TVAC**
- ❑ **FM 112 completed CAL build, starting pre-environmental testing.**
- ❑ **FM 113 – FM 114 finished PEM muon testing.**
- ❑ **FM 115 PEM muon testing underway.**

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Assembly and Test

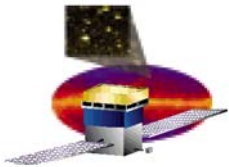
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Module S/N	AFEE Installation	TEM/TPS Safe-to-Mate	TEM/TPS Installation	Conformal Coat	Initial CPT	EM/EMC	Vibration	TVAC	Mass Properties	Final CPT Calibration	Data Review	Ship	Post Ship Test
101	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
102	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
103	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
104	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
105	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
106	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗		
107	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗		
108	⊗	⊗	⊗	⊗	⊗	⊗	⊗						
109	⊗	⊗	⊗	⊗	⊗		⊗						
110	⊗	⊗	⊗	⊗	⊗		⊗						
111	⊗	⊗	⊗	⊗	⊗		⊗						
112	⊗	⊗	⊗	⊗									
113													
114													
115													
116													
117													
118													

Completion

- ⊗ This month
- ⊗ Previously
- Started





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CAL Module Deliveries

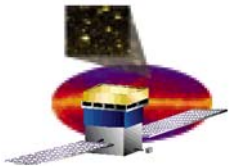
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December '04	FM 101
January '05	FM 102 - 105
February '05	FM 106 - 107
March '05	FM 108 - 110
April '05	FM 111 - 114
May '05	FM 115 - 116

- Unconstrained by availability of TEM/TPS for module assembly and test**
- Includes one month shut down of NRL TVAC facility**

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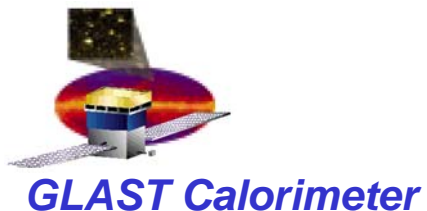




Issues and Concerns

- **NRL Thermal Vac Chamber refurbishment in January**
 - TVAC refurbishment began Jan 18th.
 - Expect next CAL TVAC to begin around Feb 22nd.
 - New plan TVACs three modules at a time – improves schedule, saves money.
- **Availability of additional EM2 TEMs and/or removal of mounted EM2 TEMs from delivered CAL modules.**
 - CAL has 14 TEMs and 11 TPS.
 - Three EM2 TPS were removed from delivered FM101 – 103 to support module testing thru FM 114
 - For FM 115 – 118 we need to recover both TEM and TPS from delivered modules FM105 - 108
 - **Need for first of these TEM & TPS is about Feb 11th This date may require removal of EM2 hardware before flight version is available.**





Drawing Release Summary

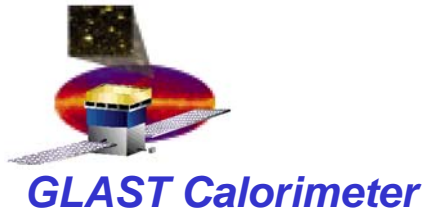
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No Change From Last Month

Flight Hardware Drawings

Element	Total Dwgs	Completed Dwgs	Comments
Module Assy	11	11	AFEE Cable support & shield – 3 parts.
PEM Assy	6	6	
Structure	12	12	Includes CAL-TEM stand off
CDE	5	5	
AFEE	8	8	
TOTAL	42	42	100% Complete





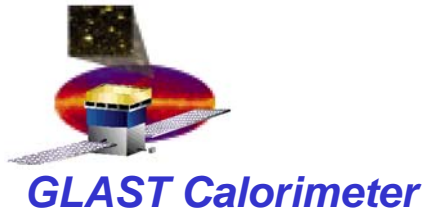
Documentation and Qualification Program

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No Change From Last Month

- ❑ CDE manufacture and test procedures – 100% complete
- ❑ Composite Structure manufacture and test procedures – 100% complete
- ❑ PEM Assembly and Test – 100% complete
- ❑ EEE qualification and screening procedures – 100% complete
- ❑ AFEE PCB manufacture and assembly – 100% complete
- ❑ Module Assembly and Qualification/Acceptance – 100% complete
 - Redlines / improvements from lessons learned are on-going.
- ❑ Completing Acceptance Test Data Packages (ATDP)



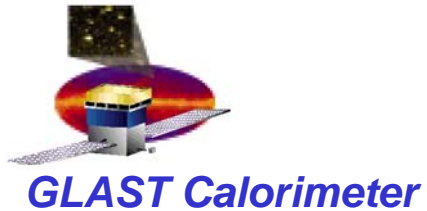


PMCS – December '04 Cost Variances

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- **Cost Variance: + \$251 cum (-\$13 for Dec)**
 - **+144: Mgmt, Eng, R&QA, (+11 for Dec)**
 - **+655: CDE Manuf.**
 - PDA manufacturing - materials cost underrun.
 - CDE manufacturing - labor underrun (+541)
 - **-17: PEM**
 - **- 542: AFEE (-9 for Dec)**
 - Much higher labor costs balanced by savings in GSE materials
 - Fabrication problems, parts problems, you name it.
 - **-106: Module Ass'y & Test (- 91 for Dec)**
 - EM CAL overrun (-53)
 - Software (-30)
 - Module Test (+125)
 - Facilities (-114)





PMCS – December '04 Schedule Variances

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- **Schedule Variance: - \$1285 cum (+321 for Dec)**
 - **- 155: PEM (+92 for Dec)**
 - Delay in delivery of 1st composite structures.
 - **- 47: AFEE (+47 for Dec)**
 - Delay in delivery of ASICs causing delay in screening and qualification work
 - Problems in manufacture of AFEE PCB.
 - **-977: Module Assy & Test (+141 for Dec)**
 - Delay in electronics delivery for module A&T finally arrived at baseline environmental test costs.

