

**GLAST Calorimeter**

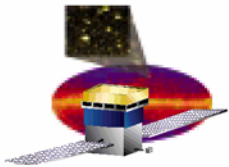
*Monthly Cost /  
Schedule / Mission  
December 2004*

# **Monthly Cost/Schedule/Mission Review**

## **GLAST LAT Calorimeter January 5, 2005**

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**GLAST Calorimeter**

# Outline

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Schedule / Mission  
December 2004*

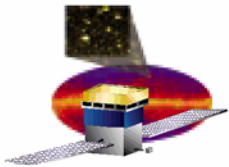
## □ Technical Status:

- 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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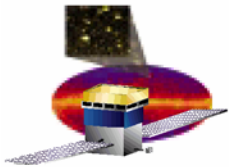
# Significant Accomplishments

## 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 January.
  - Swales Aerospace has provided high quality CDEs on schedule and well under budget. Great job!
- ❑ **All flight composite structures have been delivered to NRL**
  - Excellent job completed by Oscar and his group at LLR Ecole Polytechnique.
- ❑ **13 PEMs have been assembled and tested**
  - CDE insertion on PEM 114 has begun.





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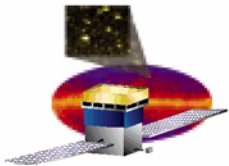
# Significant Accomplishments

## Analog Front End Electronics

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- **ASICs - Qual testing of GCFE and GCRC at GSFC completed**
  - **NRL is writing final summary report on qualification testing at GSFC Parts Branch.**
- **All flight AFEE boards (110) have been manufactured and assembled.**
  - **64 of these have been thru burn in and three temperature testing.**
  - **56 have been conformal coated.**
  - **Inspections show that cleaning of the boards continues to be a problem. Several boards have been scrapped.**
  - **Completion of burn in and conformal coating of remaining boards expected early in February.**





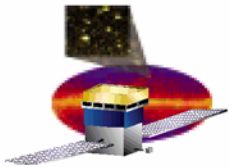
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# Significant Accomplishments Assembly & Test

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- ❑ **FM101 delivered**
  - Still working CAL LATTE script issues relating to configuration management and operation in I&T environment. These should be closed by 1/5/05
- ❑ **FM102 - FM105 ready to ship**
  - Schedule Preship review this week
  - Holding shipment until completion of LATTE issues to everyone's satisfaction.
- ❑ **FM106 – FM107 in final calibration**
- ❑ **FM108 – FM109 waiting for TVAC**
- ❑ **FM110 in initial performance testing**





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# Assembly and Test

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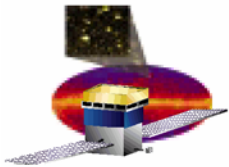
Module S/N	AFEE Installation	TEM/TPS Safe-to-	TEM/TPS Installation	Conformal Coat	Initial CPT	EM/EMC	Vibration	TVAC	Mass Properties	Final CPT Calibration	Data Review	Ship	Post Ship Test
101	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
102	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
103	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
104	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
105	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
106	✓	✓	✓	✓	✓	✓	✓	✓	✓	□			
107	✓	✓	✓	✓	✓	✓	✓	✓	✓	□			
108	✓	✓	✓	✓	✓	✓	✓						
109	✓	✓	✓	✓	✓	✓	✓						
110	✓	✓	✓	✓	✓								
111	□												
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## Completion

- ✓ This month
- ✓ Previously
- Started

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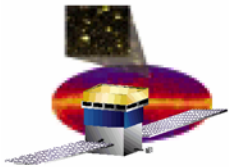
# CAL Module Deliveries

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<b>December '04</b>	<b>FMA</b>
<b>January '04</b>	<b>FMB – FM5</b>
<b>February '04</b>	<b>...</b>
<b>March '04</b>	<b>FM6 – FM9</b>
<b>April '04</b>	<b>FM10 – FM15</b>
<b>May '04</b>	<b>FM16</b>

- Unconstrained by availability of TEM/TPS for module assembly and test**
- Includes one month (Jan '05) shut down of NRL TVAC facility**



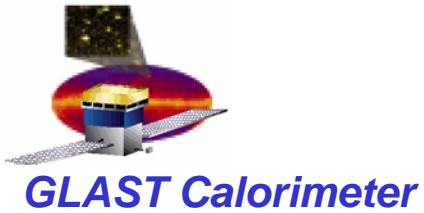


## Issues and Concerns

- **NRL Thermal Vac Chamber refurbishment in January**
  - TVAC of FM 106, 107 ended Dec 10<sup>th</sup>. Did not TVAC during Dec holidays.
  - TVAC scheduled to go down Jan 17<sup>th</sup> – Feb 17<sup>th</sup> .
  - FM108 and 109 are ready to TVAC and may start 1/6/05 if other program continues to have problems. Else TVAC of at least 3 modules will start 2/17/05.
- **Availability of additional EM2 TEMs and/or removal of mounted EM2 TEMs from delivered CAL modules.**
  - CAL has/will have 14 TEMs and 11 TPS.
  - The 11<sup>th</sup> TEM and TPS will be installed on FM 111 this week.
  - I need CAL 101 TPS returned to NRL ~14 Jan '05 for FM 112
  - I need CAL 102 TPS returned to NRL ~21 Jan, and so on.
  - **I need CAL 101 TEM returned to NRL ~ 4 Feb along with TPS from CAL 104 for installation on CAL 115.**
    - This TEM removal is before availability of flight TEM, I believe







# Drawing Release Summary

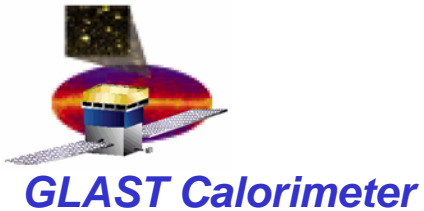
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**No Change From Last Month**

## 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	
<b>TOTAL</b>	<b>42</b>	<b>42</b>	<b>100% Complete</b>





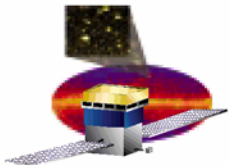
# Documentation and Qualification Program

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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)





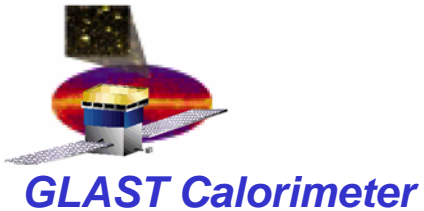
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## PMCS - November '04 Cost Variances

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- **Cost Variance: + \$269 cum ( \$103 for Nov)**
  - **+135: Mgmt, Eng, R&QA, (+29 for Nov)**
  - **+638: CDE Manuf.**
    - PDA manufacturing - materials cost underrun.
    - CDE manufacturing - labor underrun (+541)
  - **-50: PEM**
  - **-533: AFEE (-68 for Nov)**
    - Much higher labor costs balanced by savings in GSE materials
    - Fabrication problems, parts problems, you name it.
  - **-15: Module Ass'y & Test (+148 for Nov)**
    - EM CAL overrun (-53)
    - Software (-27)
    - Test (+173)
    - Facilities (-108)





## PMCS – November '04 Schedule Variances

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- **Schedule Variance: - \$1606 cum (+227 for Nov)**
  - **- 57: CDE Manuf.**
    - Stopped bonding CDE for about 1 month due to lack of end caps to complete CDEs. Material storage problem. (No issue: CDE manufacturing is weeks off of the CAL critical path)
  - **- 247: PEM**
    - Delay in delivery of 1<sup>st</sup> composite structures.
  - **- 94: AFEE (+14 for Nov)**
    - Delay in delivery of ASICs causing delay in screening and qualification work
    - Problems in manufacture of AFEE PCB.
  - **-1118: Module Assy & Test (+201 for Nov)**
    - Delay in electronics delivery for module A&T finally arrived at baseline environmental test costs.

