GLAST Mission Status

October 1, 2004

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GLAST Project Manager

Recent Accomplishments

- **Spacecraft:**
  - ***Spacecraft detailed design completed***
    - ***Completed extensive subsystem peer review process.***
    - ***Completed successful spacecraft CDR in May 2004.***
  - ***Tested Ku-band transmitter engineering model at Goddard.***
  - ***Presently in the process of integrating flight components and fabricating primary structure. Qualification of structure occurs in November. I&T starts in January.***
- **LAT:**
  - ***Initiated build of flight subsystems. First flight calorimeter nearing delivery. ACD in integration.***
  - ***Grid also nearing delivery.***
- **GBM:**
  - ***Completed successful instrument CDR in June.***
  - ***Initiated flight detector and electronics fabrication.***

Recent Accomplishments

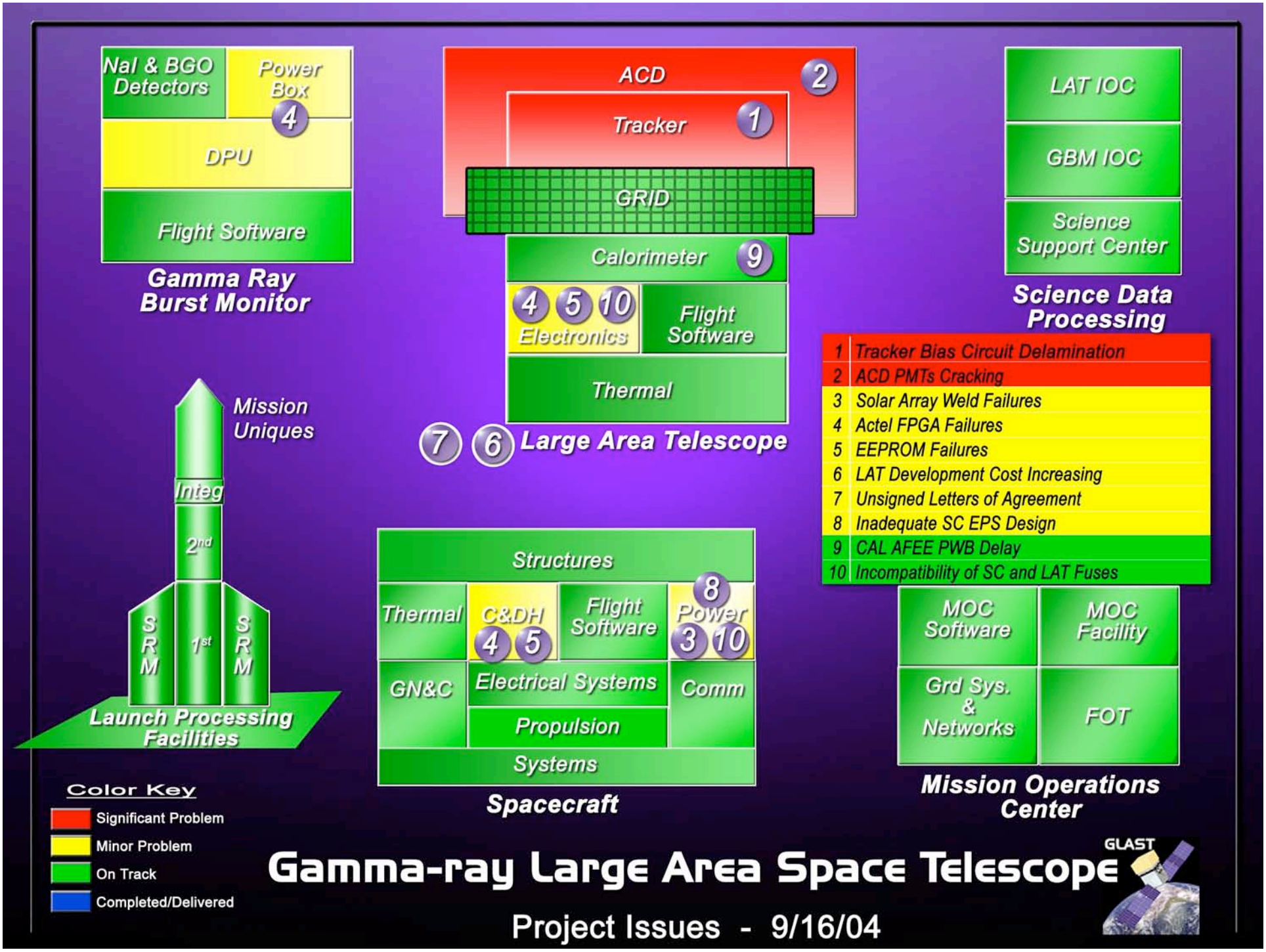
- **Mission Systems:**
  - ***Completed two key post-CDR trades.***
    - ***S-band architecture simplification and power-on at launch. Mission robustness study is ongoing.***
  - ***Significant effort in process to close approximately over 800 independent review actions.***
  - ***Updated orbital debris predictions (DCA=24m^2).***
  - ***Continue to maintain positive margin against mission performance metrics. Attitude knowledge performance predictions continue to be refined.***
    - ***Current worse case performance predictions range between 11 and 17 arc sec over four cases which bound the 5 year mission and spacecraft hardware failures.***
    - ***Developed integrated structural/thermal model at GSFC to assess the ETE LAT tracker on-orbit attitude knowledge performance. Anticipate improved predicts as orbital and seasonal cases are analyzed.***

Recent Accomplishments

- **Ground Systems:**
  - ***Completed successful series of ground system element CDRs.***
  - ***Completed Ground System SDR for entire GLAST ground system.***
  - ***Awarded Mission Operations Center (MOC) development contract.***
- **Launch Vehicle:**
  - ***Developed launch vehicle interface requirements document and held successful Mission Integration Working Group meeting (MIWG).***
- **Mission Critical Design Review (MCDR):**
  - ***Critical design review for the entire GLAST mission.***
  - ***Very positive feedback from review team. Review team findings on next slide.***

GLAST MCDR Review Team Findings

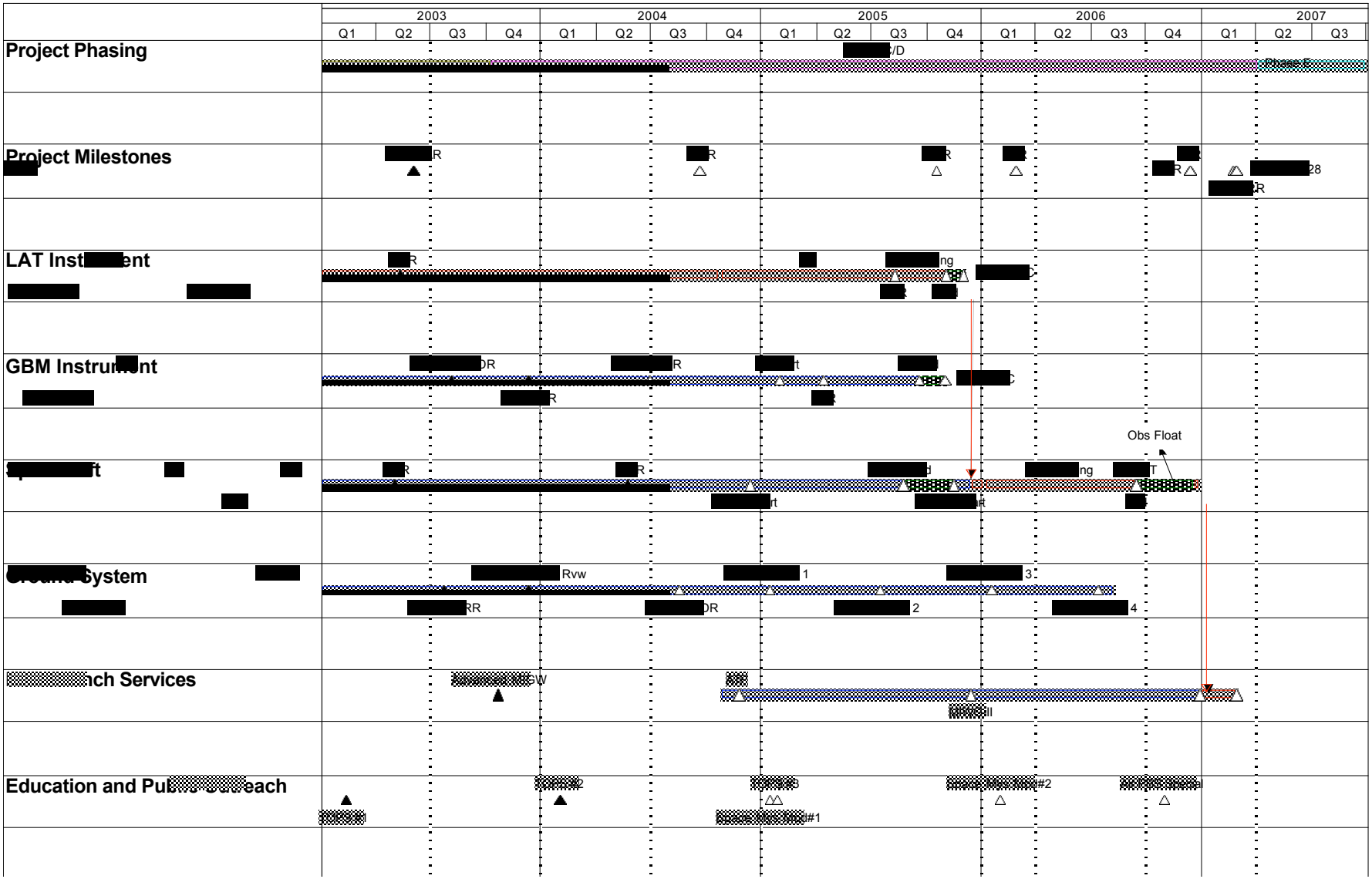
- **All elements of the design are compliant with functional and performance requirements.**
  - ***Requirement for pointing knowledge (10 arc-sec) is not currently met, although a conservative approach was used. Mitigation plans are being implemented.***
- **The verification approach is viable and will confirm compliance with all requirements.**
- **Risks have been appropriately identified and mitigated or are on track for timely mitigation.**
- **The design is sufficiently mature to proceed with full-scale fabrication.**
  - ***Exceptions include the Tungsten foil bonding issue, the successful testing of the PMTs, and the Emcore Solar Array diode weld problem. Based on efforts on-going, these aren't considered as liens to continuing fabrication.***
- **The management processes used by the project team are sufficient to develop and operate the mission.**
- **The schedules indicate that the mission will be ready to launch and operate on time and the control processes are adequate to ensure remaining within allocated resources.**
  - ***Concerns over late delivery of LAT instrument and the impact to schedule and resources.***


NaI & BGO Detectors
Power Box
4
DPU
Flight Software
Gamma Ray Burst Monitor
ACD
2
Tracker
1
GRID
Calorimeter
9
4
5
10
Electronics
Flight Software
Thermal
7
6
Large Area Telescope
LAT IOC
GBM IOC
Science Support Center
Science Data Processing
1 Tracker Bias Circuit Delamination
2 ACD PMTs Cracking
3 Solar Array Weld Failures
4 Actel FPGA Failures
5 EEPROM Failures
6 LAT Development Cost Increasing
7 Unsigned Letters of Agreement
8 Inadequate SC EPS Design
9 CAL AFEE PWB Delay
10 Incompatibility of SC and LAT Fuses
Mission Uniques
Integ
2nd
SRM
1st
SRM
Launch Processing Facilities
Structures
Thermal
C&DH
4
5
Flight Software
8
Power
3
10
GN&C
Electrical Systems
Comm
Propulsion
Systems
Spacecraft
MOC Software
MOC Facility
Grd Sys. & Networks
FOT
Mission Operations Center
Color Key
Significant Problem
Minor Problem
On Track
Completed/Delivered
Gamma-ray Large Area Space Telescope
GLAST
Project Issues - 9/16/04

GLAST Top Ten Issues

#	*Issue*	*Impact*	*Owner*
1	Tracker Bias Circuits Debonding	Delays assembly of 1st flight tracker	B. Graf
2	ACD PMTs Cracking in Engineering Testing	Flight electronics on hold; potential delay in ACD delivery	B. Graf
3	Solar Array Weld Failures	Delay to flight array fabrication	J. Bretthauer
4	Actel FPGA Failures	Potential on-orbit early failure of flight electronics	A. Vernacchio
5	EEPROM Failures	Delay to fabrication of LAT electronics	E. Andrews
6	LAT Development Cost Increasing	Reserves will not be available to address emerging fabrication issues	K. Grady
7	Unsigned LOAs	International contributions delayed	A. Vernacchio
8	SC EPS Design Issues	Overvoltage failure mode	J. Bretthauer
9	Calorimeter AFEE PWB Delay	Flight boards rejected, schedule delay	B. Graf
10	Incompatibility of SC & LAT Fusing and Internal LAT Subsystem Fusing	Redesign of instrument fusing and/or selection of different devices	J. Leibee

Project Master Schedule



The Road Ahead

- **Instruments**
  - ***Complete fabrication of LAT and GBM subsystems.***
  - ***Initiate integration of LAT towers.***
- **Spacecraft**
  - ***Assemble and qualify spacecraft primary structure.***
  - ***Continue fabrication and test of flight components.***
  - ***Initiate spacecraft bus integration activities.***
- **Mission**
  - ***Continue refinement of tracker ETE pointing knowledge performance using cycle 3 STOP analysis.***
  - ***Perform interface testing between spacecraft, LAT and GBM engineering models.***
  - ***Develop detailed procedures for initial spacecraft ETE test.***
- **Develop initial releases of ground system elements.**
- **Provide authority to proceed for manufacturing of launch vehicle.**