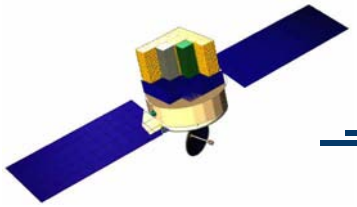


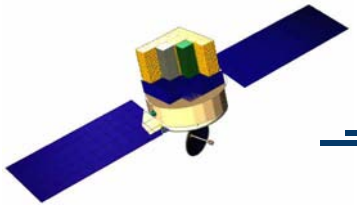
GLAST

System Requirements and Science-related Issues

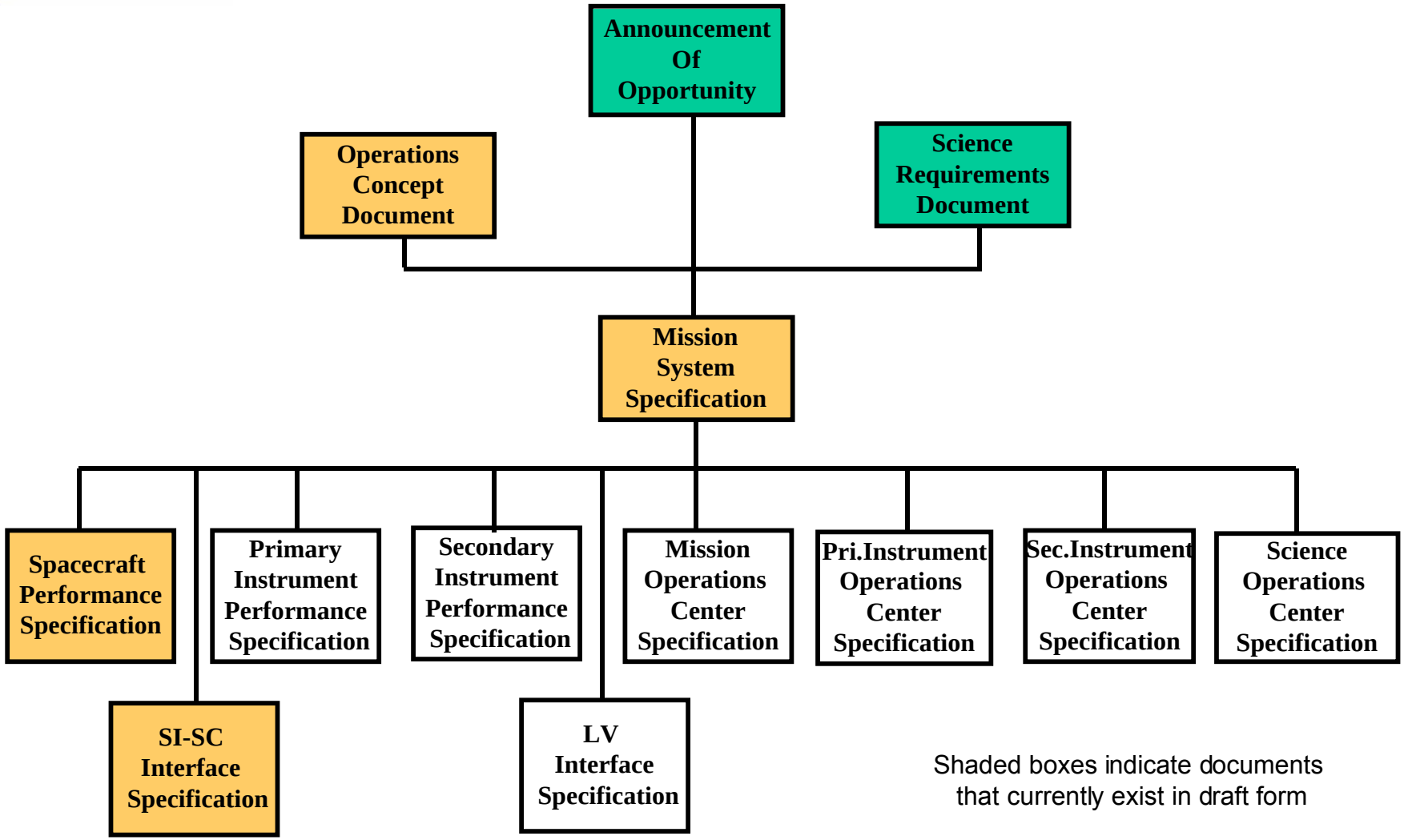
GLAST SWG Meeting

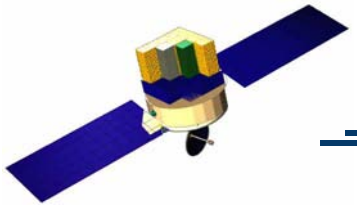
May 25-26, 2000

Scott Lambros
GLAST Project Formulation Manager
scott.lambros@gsfc.nasa.gov



Specification Tree

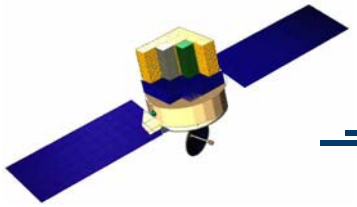




Configuration Management

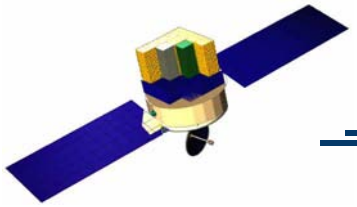
- Documents will be configuration controlled with a formal Review Board.
  - For most documents, formal control starts after SRR.
  - Project configuration Control Manager to start soon.

- DOORS Software System in place for requirements tracing.



Issue Resolution

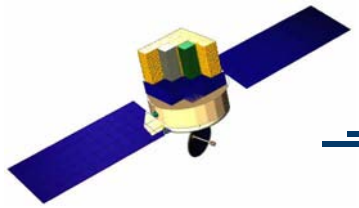
- Issues can be submitted to be put on an Issues List.
- Science Issues worked with the Project Scientist (representing the SWG).
- Resolution documented in Requirements Documents, or on Issues List.



System Requirements from MSS

General

Launch Date:	2005.
Mission Life:	> 5 yrs, < 25 yrs.
Orbit Altitude:	550 km, initial, uncontrolled.
Orbit Inclination:	28.5 degree (TBR).
Orbit Eccentricity:	<0.001 (TBR).
EOL Disposal:	Uncontrolled reentry (TBR).
Data Loss:	< 2%.
Data Quality:	< 10^{-10} undetected bit errors.
Coordinate System:	J2000 for pointing commanding and reporting.
Communications:	CCSDS packets, AOS protocols, GoS-2 (TBR).
Science Data Packet Construction:	Packet per event, ancillary data merged at the source.
Observing Modes:	Sky Survey, Pointed Observations.
Alerts:	GRB and AGN alerts to GCN, ToO from SOC via GCN and Internet.
Autonomy:	Unattended operation for up to 72 hrs (TBR).
Sky Coverage:	100% in TBD orbits in Sky Survey Mode.
Observing Efficiency:	> TBD % in Sky Survey Mode, > TBD % in Pointed Observation Mode.
System Availability:	> 98 % (TBR) Ground System Centers.



System Requirements from MSS

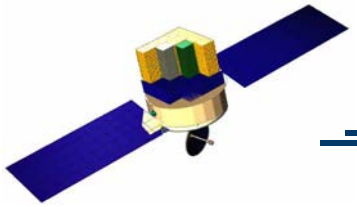
(Continued)

Launch Vehicle

Baseline Launch Vehicle:	Delta II 7920 with 3m fairing diameter.
Reliability:	> 97 %.

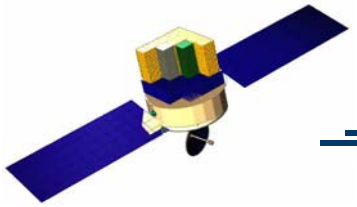
Observatory

Instrument Complement:	1 primary science instrument, 1 secondary science instrument.
Launch Mass:	4505 kg, maximum.
Spacecraft Power at end of life:	1.2 kW, minimum orbit average.
Spacecraft Data Storage:	40 Gb (36 hours science data @ 300 kbps average).
Spacecraft Command Storage:	256 kB (TBR).
Spacecraft Pointing Accuracy:	< 40 arcmin , 1 s, radial.
Spacecraft Pointing Knowledge:	< 10 arcsec, 1 s, radial.
Spacecraft Repointing:	Autonomous response to GRB, Alternate target for occulted pointed observation, Autonomous sequences of pointed observations, Enabled/disabled by command.
Orbit Position Accuracy:	< 1 km.
Absolute Time Accuracy:	< 10 microsec, 1 s.
Safe Mode:	Sun referenced, power and thermal safe indefinitely.
Mission Reliability:	> 80 % (TBR) at 5 yrs.



Current Issues for Discussion/Resolution

- System response time for burst alerts: assuming 3-5 seconds.
- Assuming a requirement for 100% sky coverage.
  - What is the timeframe to complete 100% sky coverage?
  - How uniform should the coverage be?
- Assuming GBM will create a burst alert and spacecraft will be repointed if burst meets pre-set criteria.
- General question of communication paths and reaction activities to on-board detections and quick ground notification through TDRSS:
  - Assuming LAT will perform high-energy GRB detection;
    - Will repointing/pointing hold be done?
  - For GBM-detected bursts, will LAT send a second alert message with more precise localization?
  - Assuming LAT will perform AGN flare detection and alert messages for time scales $\leq$ 1-2 days (TBR);
    - Will repointing/pointing hold be done?



Current Issues for Discussion/Resolution
(continued)

- Assuming alert message includes coordinates (RA and DEC) and time;
  - Also include a light curve or other information?
  - How big is the message?
- Do instruments notify each other on-board?