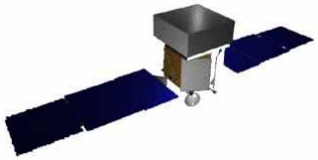
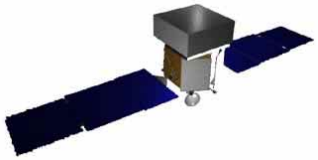




# GLAST Ground Systems and Operations

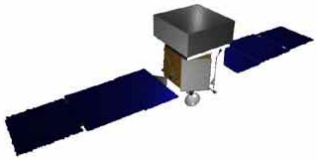
May 26, 2000

Steve Tompkins



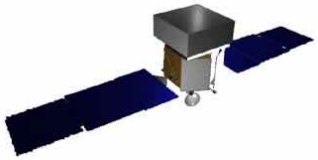
# Agenda

- Functional Allocation Team results
- Operations Considerations
- Science Issues



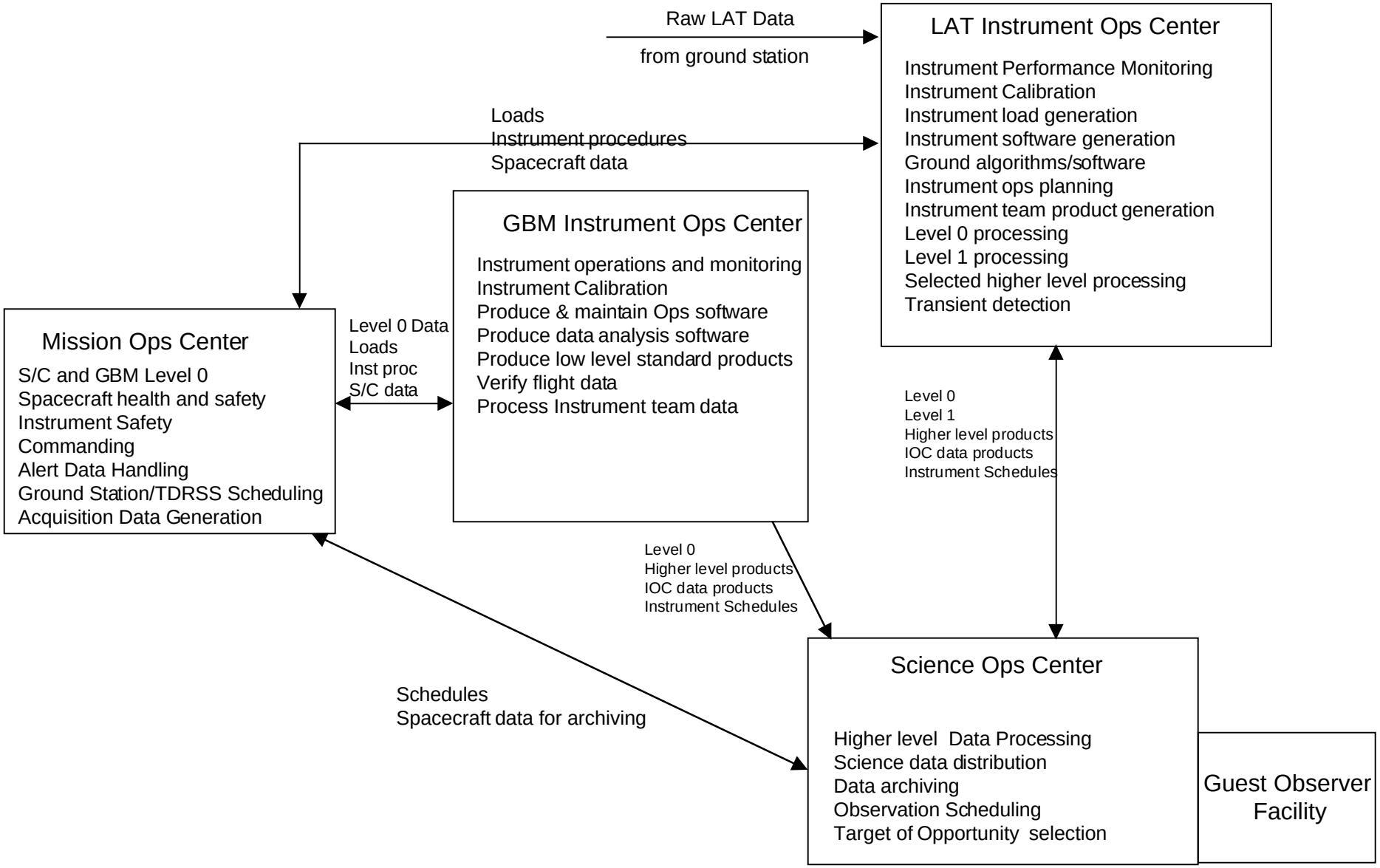
# Ground System Functional Allocation Team

- Established in March to adjust baseline architecture to accommodate instrument proposals
- Included representatives from both instrument teams, mission operations, and science operations
- Agreed on the high level architecture
  - Moved level zero processing (removal of artifacts of the space/ground communications link) of the LAT data from the MOC to the LAT IOC
  - More standard products produced in IOC than assumed in the baseline

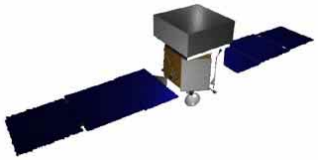


# Ground System Functional Allocation Team

- Further work
  - Clarify data policy
  - Science Ops Center definition limited until SOC is selected
  - Define common nomenclature, identify data products

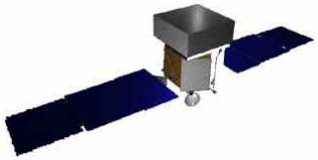



Baseline Ground System Architecture

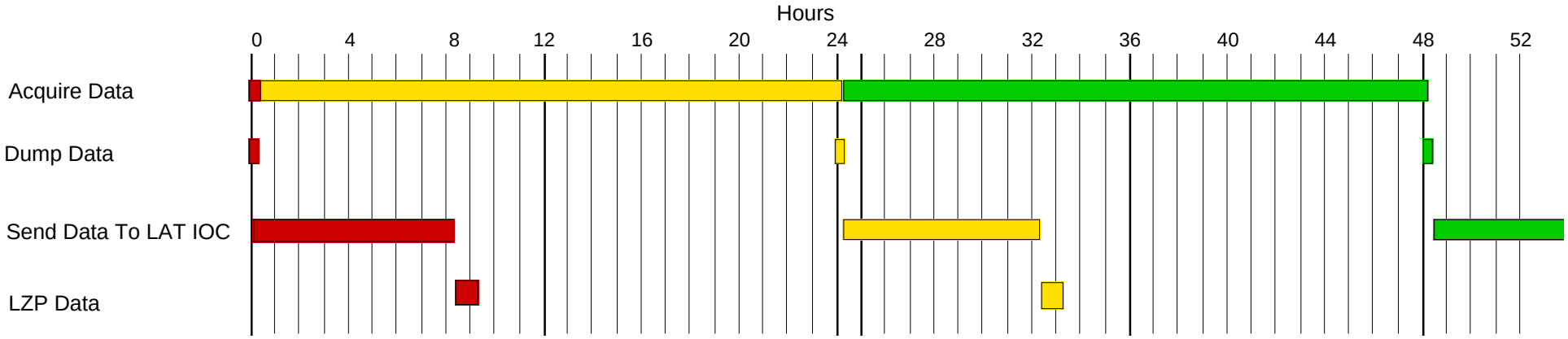


# Operations Implications

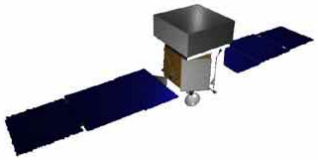
- Alert Communications Link
  - Low bandwidth
  - One-way
  - Available 100% of the time
  - Duty cycle limitations to be defined
- Data Delivery Time
  - Once per day downlink of bulk science data
  - Data will be typically 1-2 days old when it is available to IOC users



# LAT Data Latency

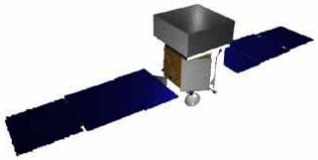



- Time from Observation until delivery to user at LAT IOC
- GBM delivery will be shorter due to less data volume
- One downlink per day, within several hour window
- Communications link with ground station shared with other users
- Level Zero processing time
- Worst case could add ~ 20 hours



# Operations Implications

- TDRSS lifetime
  - Alert service dependent on the six first-generation TDRSs launched between 1983 and 1995
  - Need 3 TDRSs for 100% coverage, 2 for 95% coverage
  - TDRSS folks are confident that the spacecraft will be capable of supporting the alert service through 2015
- Other than alerts generated onboard, GLAST operations are not expected to be dynamic
  - Observations schedules for year 2 and beyond defined well in advance
  - Infrequent targets of opportunity (~monthly)
  - Ops staffing expected to be prime shift only



# Science Related Ops Concept Issues

- Timely identification of transients
  - Expect LAT to perform onboard orbit to orbit and multi-orbit comparisons and generate an alert message if a transient is detected
  - Alert will be distributed via GCN
    - Possibly to a different set of subscribers than bursts
- Data Completeness of 98%
  - Loss of up to 2% of the data due to scheduling, data communications, or other operations problems
- Sophistication of the autonomous slew decision
  - Include time until occultation or SAA excursion?
  - Burst characteristics
  - Position of burst in field of view