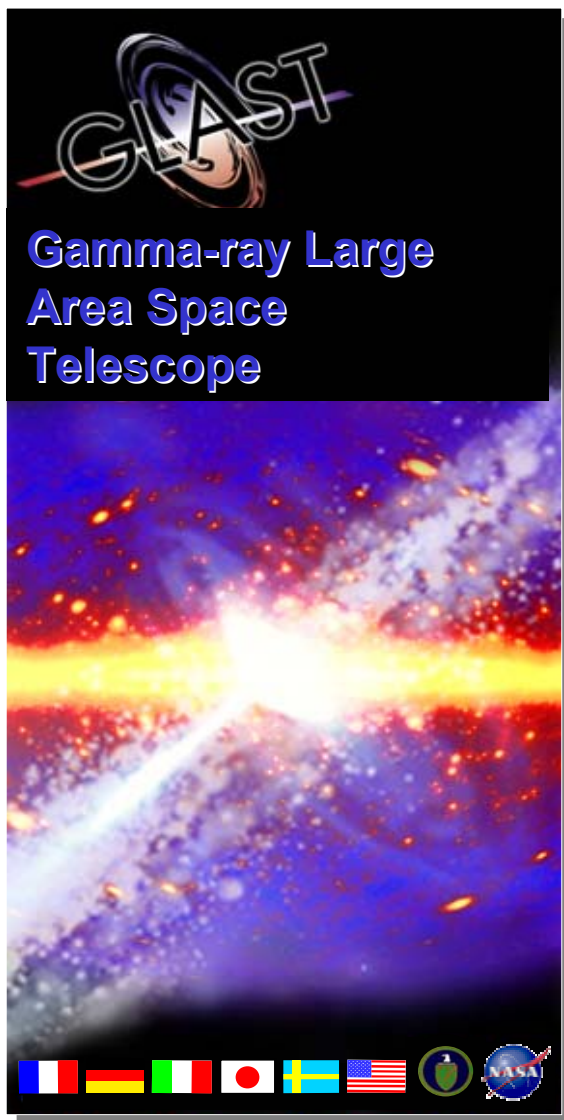


DRAFT Rev 1

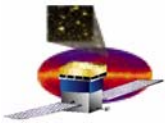


GLAST Large Area Telescope:

Electronics, Data Acquisition & Flight Software Overview W.B.S 4.1.7

Gunther Haller
Stanford Linear Accelerator Center
Manager, Electronics, DAQ & FSW
LAT Chief Electronics Engineer

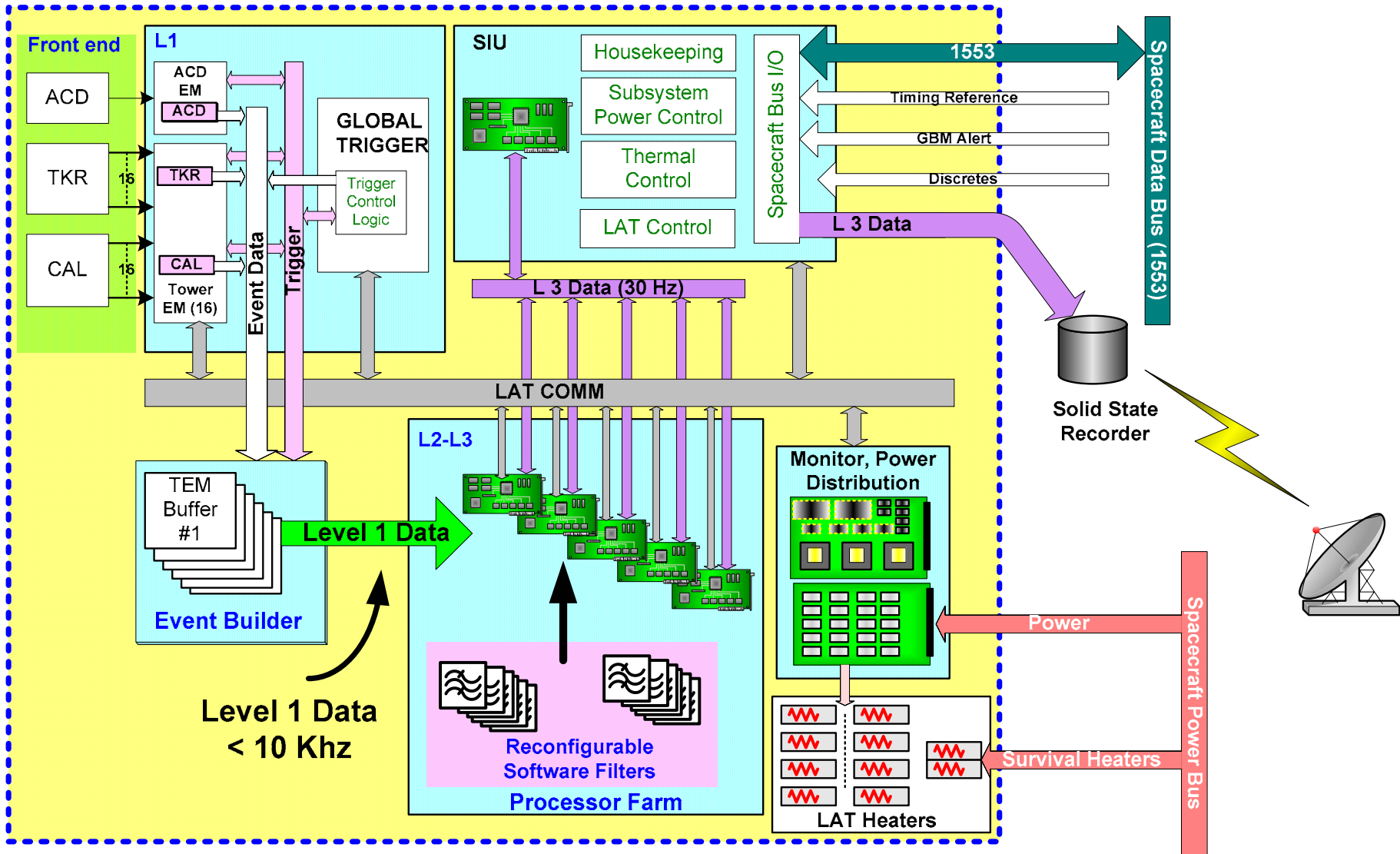
haller@slac.stanford.edu

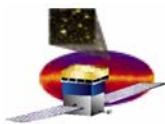


Outline

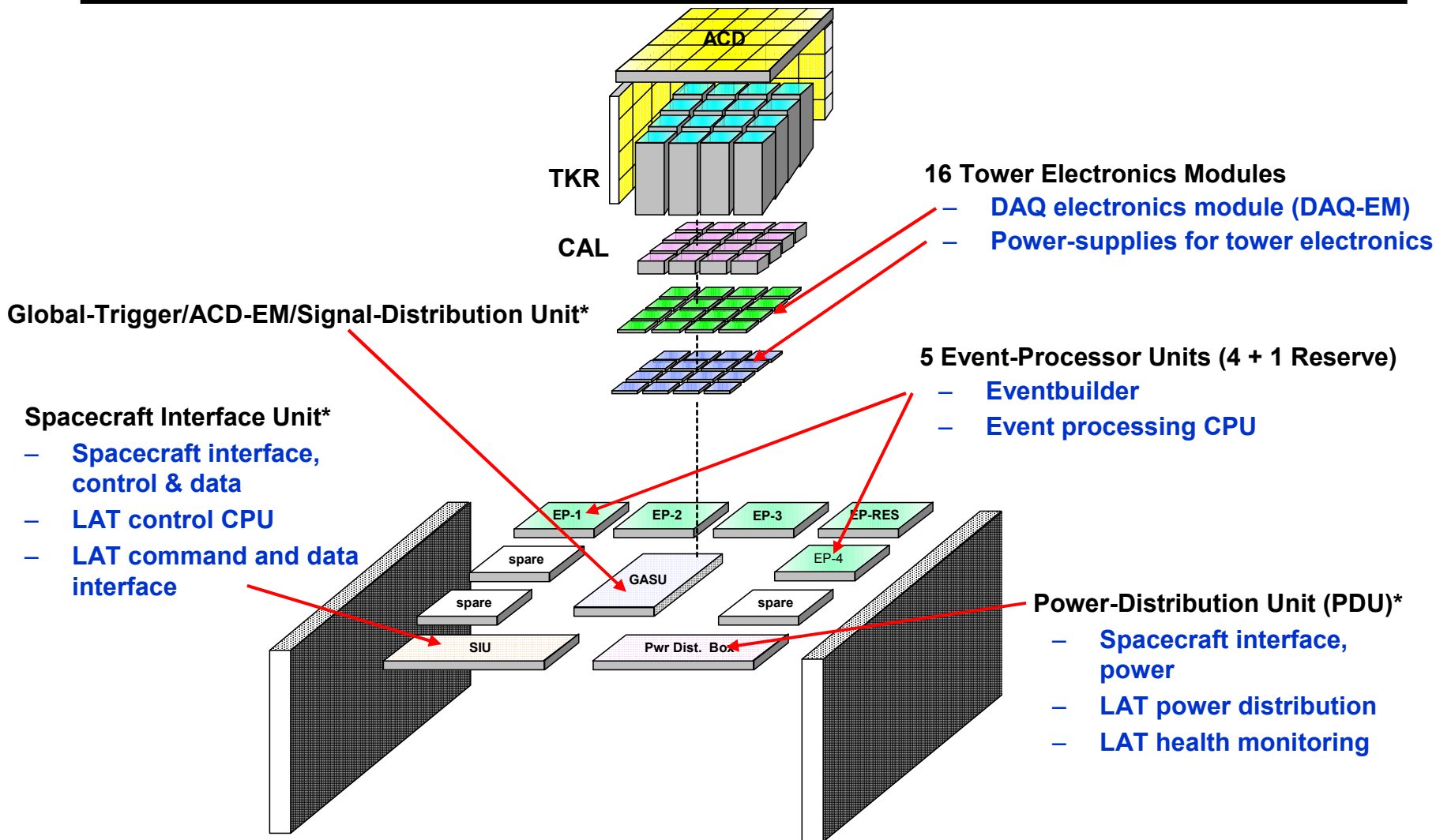
- **Overview**
- **Requirements**
- **Status**
- **Past Review Recommendations**
- **WBS Interfaces**
- **Organization**
- **Summary Schedule**
- **Schedule Milestones**
- **Cost Plan**

Subsystem Overview

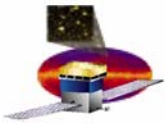




Subsystem Overview (con't)

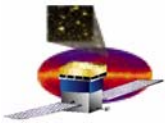


* Primary & Secondary Units shown in one chassis



Requirements Documents

- **Level III Requirements**
 - **LAT-SS-019 Level III Trigger & Dataflow Requirements**
 - **LAT-SS-136 Level III Power System Requirements**
- **Level IV Requirements**
 - **LAT-SS-284 Level IV Trigger Requirements**
 - **LAT-SS-285 Level IV Dataflow Requirements**
 - **LAT-SS-399 Level IV Flight Software Requirements**
 - **LAT-SS-183 Level IV Power Supply Requirements**
- **Other Requirements documents**
 - **433-IRD Spacecraft Interface Requirements**
 - **LAT-SS-00010 LAT Instrument Performance Specifications**



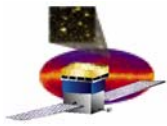
Electronics, DAQ & FSW Status

- Balloon-flight effort ended
- Requirement documents created
- Electronics system design completed
 - Final partitioning of functions into locations at bottom of LAT
 - Interface to all other sub-systems defined
- Data formats within LAT (most important on Tower Electronics Module) defined
- Buffer depths on TEM simulated
- Tower Electronics DAQ Module prototype fabricated and in test
- Conceptual Design of most units documented
- Ground-Support Equipment card designed, fabricated, and in use
- System test with EGSE test-stand, TEM, and Calorimeter Front-end electronics under way.
- Processor choice baselined
- Wooden 1:1 model of LAT with electronics boxes built
- FEMA created

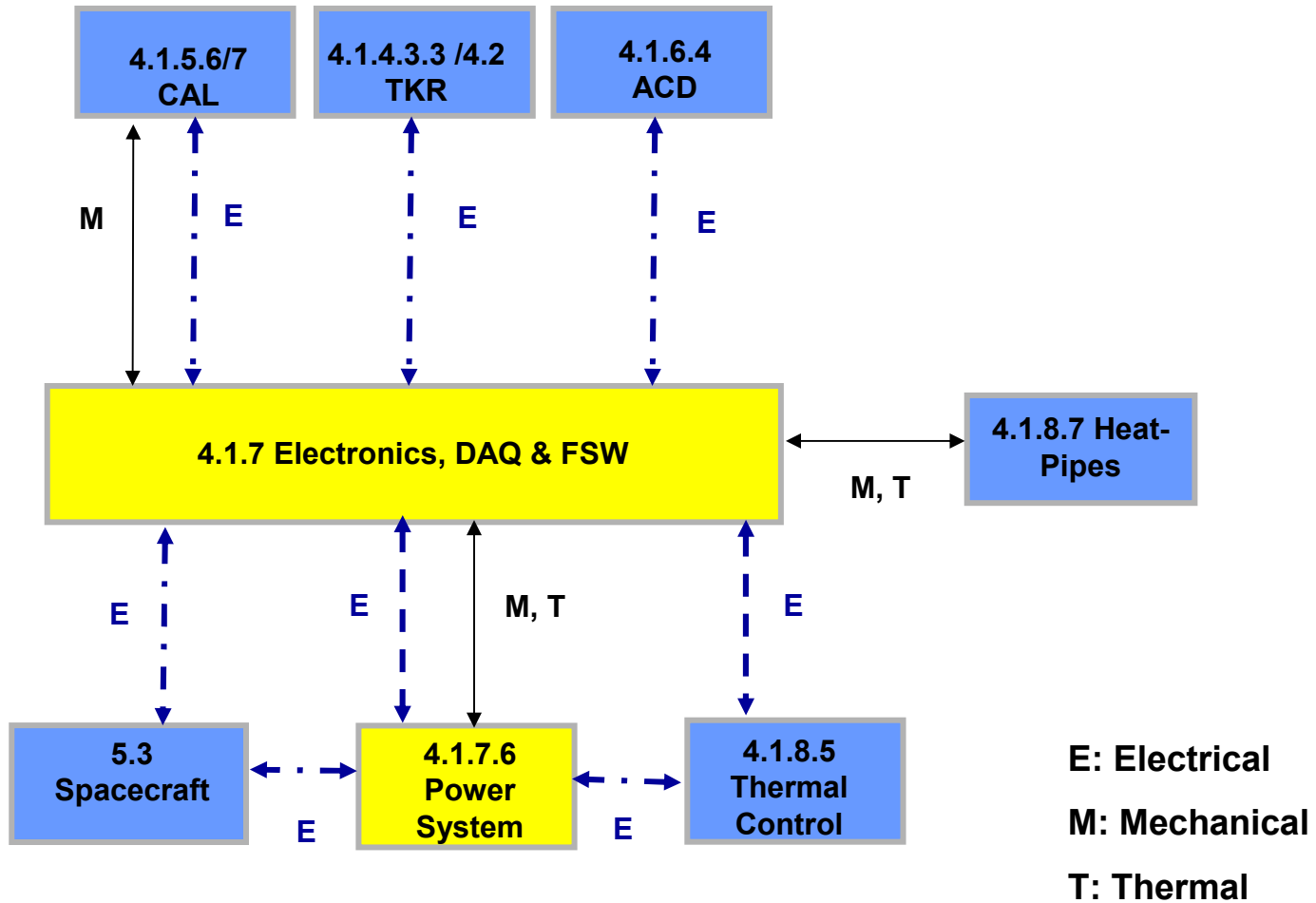


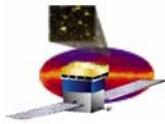
Electronics, DAQ & FSW Status (con't)

- **Balloon Flight**
 - Validated many elements of Flight Software Management Plan
 - Code development life cycle
 - Code building/distribution
 - Inline documentation generation
- **Dataflow Analysis**
 - Performed discrete event simulation
 - Designed/documented compact/efficient event format
 - More compact (nearly a factor of two smaller)
 - More “navigable” (easier for filter to read/process/span)
- **Filter Analysis**
 - Generated MC events
 - Processed events using trial algorithms (continuing effort)
 - Characterizing timing performance
 - Characterizing efficiency/purity
- **Hardware and software development on schedule**

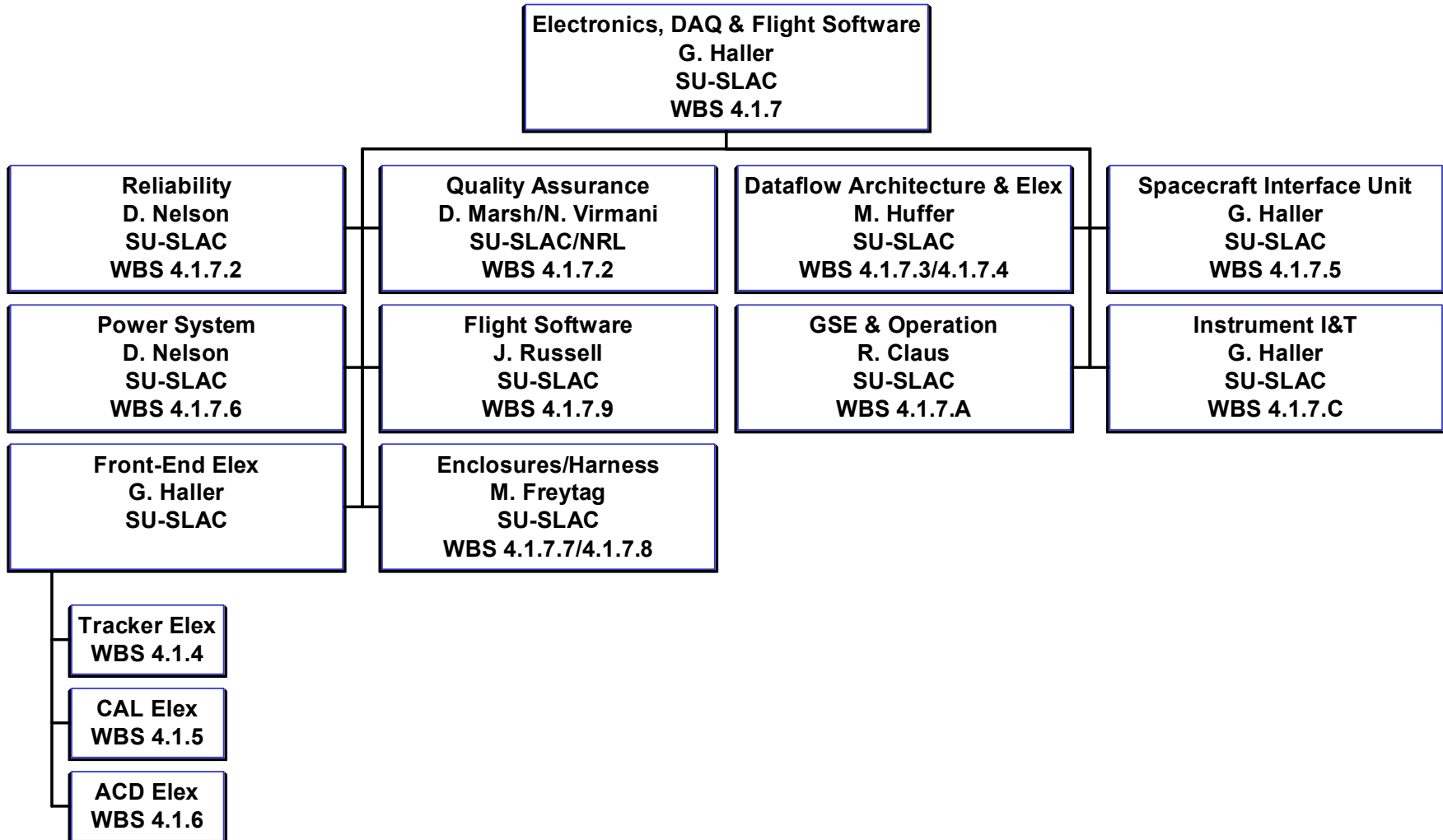


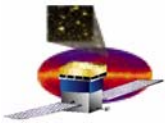
Subsystem WBS Interfaces





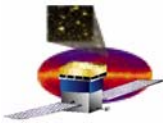
Electronics Organization Charts



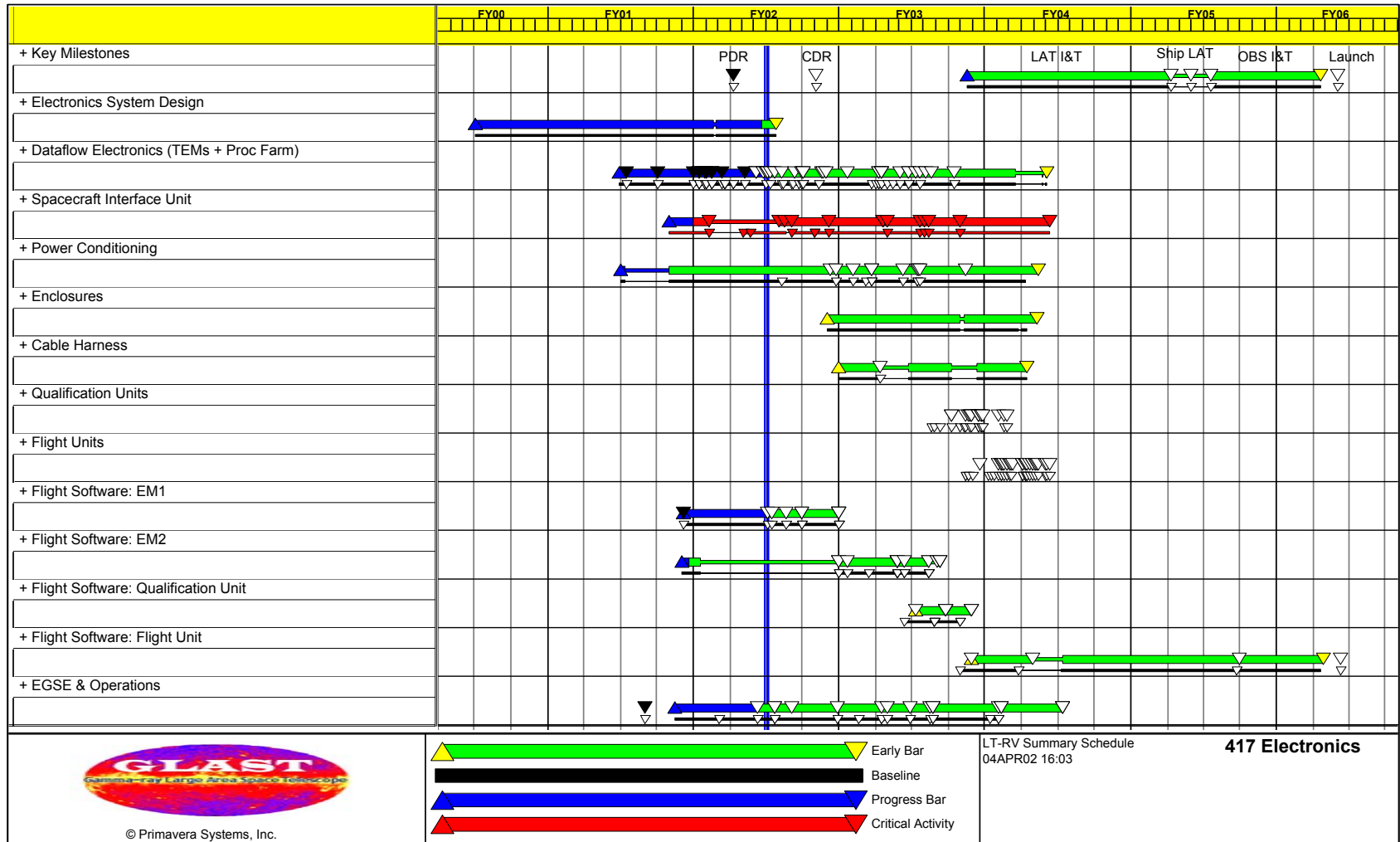


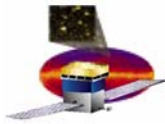
Key Level III Milestones

Electronics & DAQ Subsystem Requirements Review	04/25/01
Electronics & DAQ Pre-PDR	08/16/01
Tracker Elex - TEM System Test	02/07/02
Calorimeter Elex - TEM System Test	04/12/02
EGSE EM1 Release Available	04/22/02
ACD Elex - TEM System Test	07/01/02
Engineering Model 2 TEM to I&T	03/04/03
Engineering Model 2 System Test (HW & SW)	03/20/03
First Flight TEM to I&T	10/29/03
Full 16-Tower EM2 Test	11/15/03
Flight GASU/EPU/SIU/PDU/Harness to I&T	04/26/04

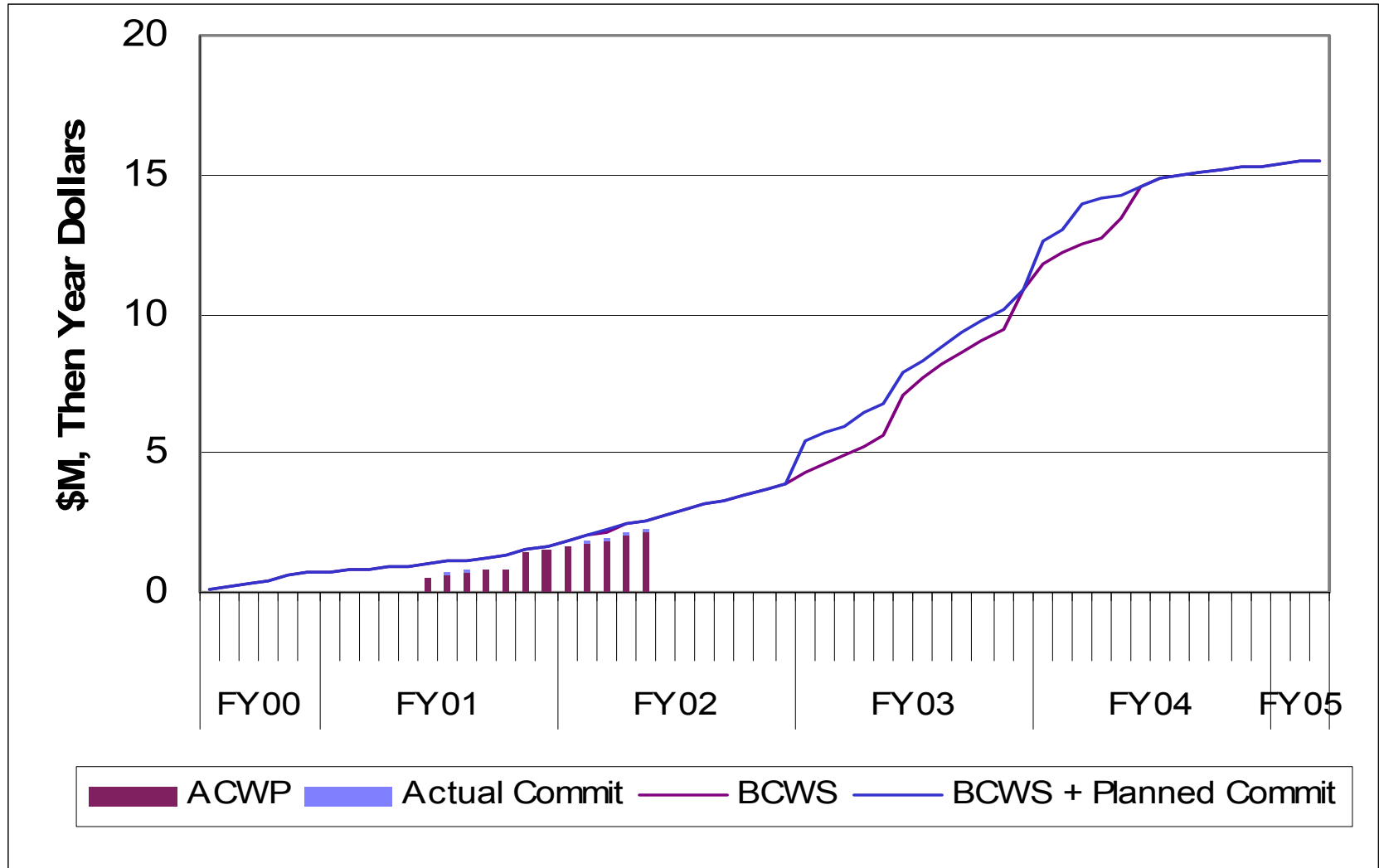


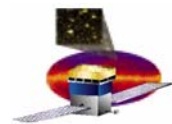
Summary Schedule



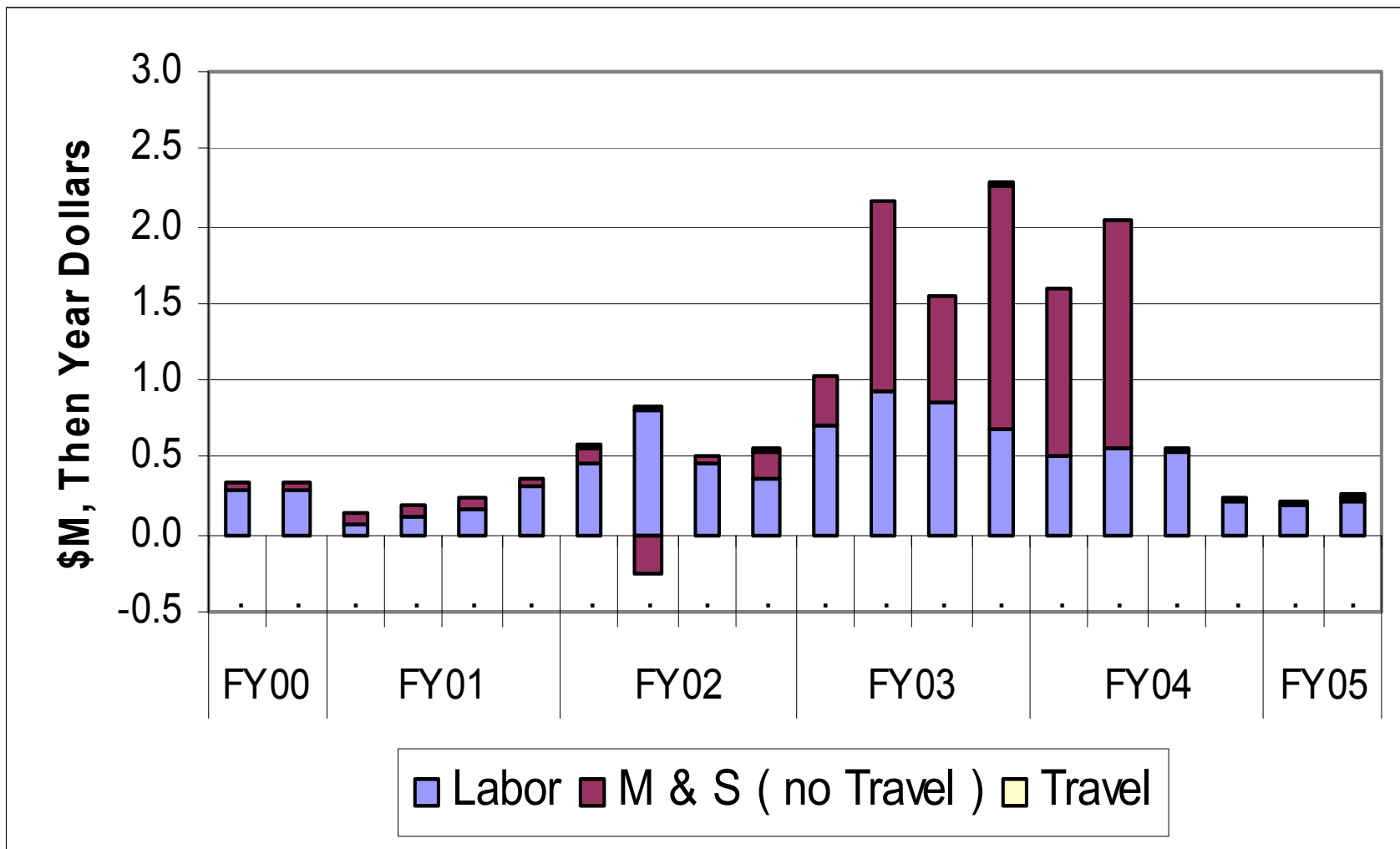


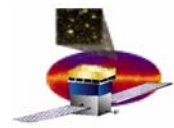
Electronics Cost & Commitments



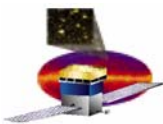


Electronics Cost Type





backup



Key Level IV Milestones

Flight Software EM1, Complete Architecture	04/15/02
Global Trigger EM1 Available	05/15/02
Event Builder EM1 Available	06/15/02
Front-End Simulator Available	10/10/02
Spacecraft Interface Card Available	12/13/02
Global Trigger EM2 Available	01/31/03
Event Builder EM2 Available	03/20/03
Housekeeping Card EM2 Available	05/02/03
Multi-CPU Toolbox Flight-Software Complete	05/13/03