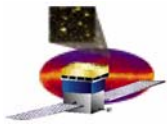


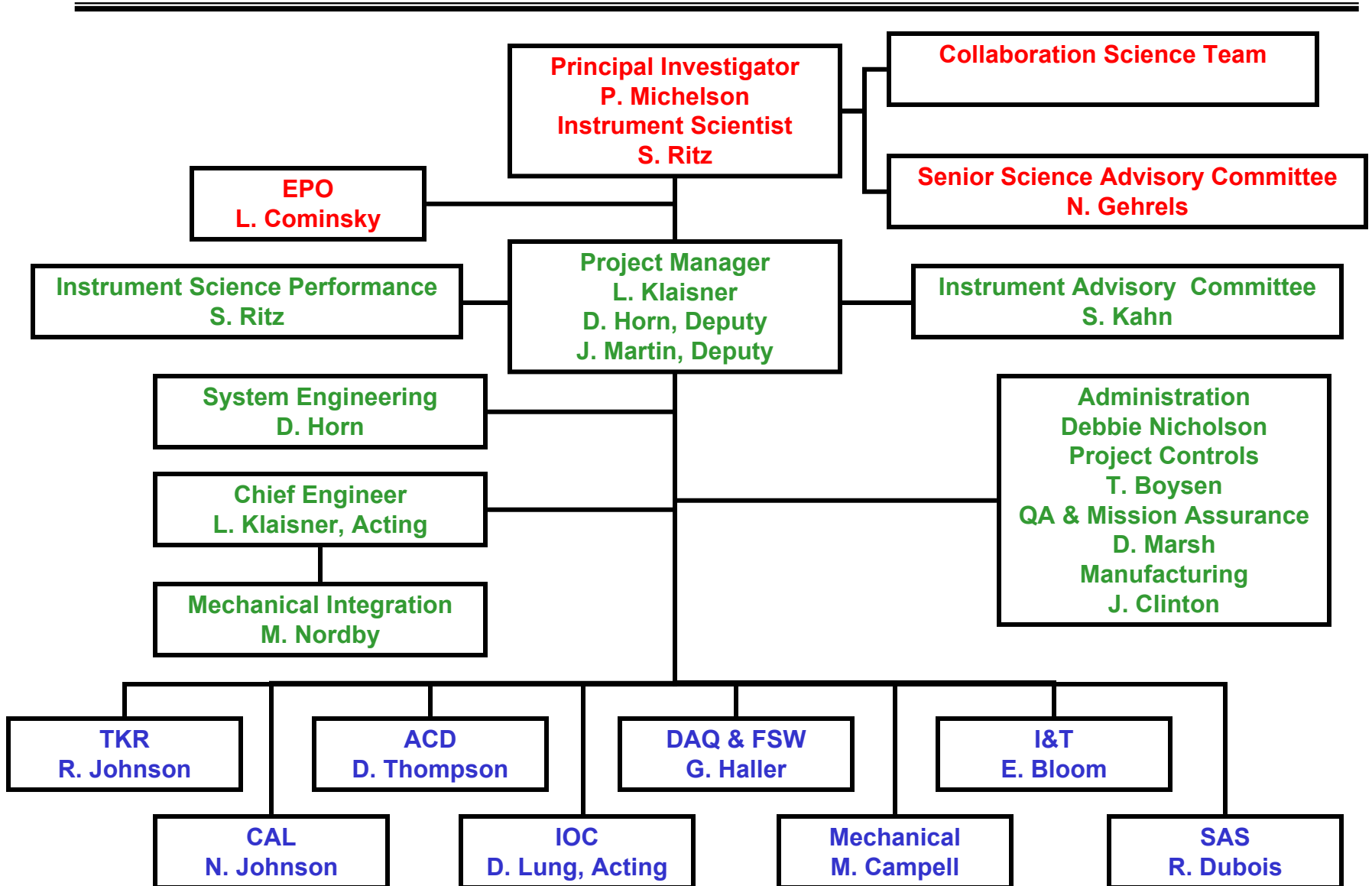
GLAST Mission Large Area Telescope Project

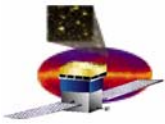
GSFC Monthly Review -- July July 30, 2003

Lowell A. Klaisner, Project Manager
Stanford Linear Accelerator Center
klaisner@slac.stanford.edu



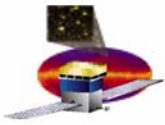
LAT Organization Chart





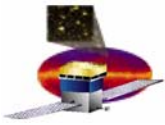
Rebaseline

- **Rebaseline Proposal**
 - **LAT Funding increased by \$17.2 million**
 - **Fabrication Phase (LAT construction project) increased by \$11.7 million**
 - **Commissioning Phase increased by \$5.5 million**
 - **Presented to the JOG**
 - **Approved in principle**
 - **Funding problem in FY 04**
 - **NASA adding \$3 million**
 - **DOE no funds available**
 - **\$5 million bridge loan is available from Stanford University**
 - **Present to a DOE Lehman Mini-review July 31, 2003**
 - **DOE ESAAB scheduled for August 1, 2003**



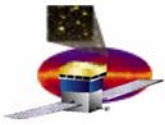
Fabrication Phase

- The Fabrication Phase of the LAT project is defined as all work on the LAT during the DOE Capital Equipment Project.
- The end of the DOE Capital Equipment Project occurs at the successful completion of the Critical Decision 4 review.
 - The proposed criterion for CD-4 is the successful completion of the Pre-Environmental Test Review.
- Work in the Fabrication Phase is funded by:
 - The DOE Capital Equipment Project (MIE)
 - DOE Commissioning and Operating funds
 - NASA GLAST Mission funds
 - Foreign Contributions
 - Participation of the LAT Collaborating institutions



Commissioning Phase

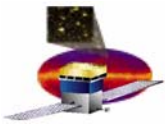
- The LAT project enters the Commissioning Phase after the completion of the Fabrication Phase
- The work for the LAT project in this phase is:
 - Responsibility for the LAT environmental test
 - Pre-Shipment Review
 - After successful completion of this review the responsibility for the LAT instrument is accepted by the NASA GLAST Project Manger
 - Support of Observatory Integration
 - Support through launch and initial calibration on-orbit
- Funding for this phase comes from:
 - DOE Operating funds
 - NASA GLAST Mission funds
 - Participation by the LAT Collaborating institutions



Proposed additions to budgets

By element in the LAT project	FY03	FY04	FY05	FY06	Total
Fabricate CDEs using US funds	\$1.6	\$2.6			\$4.2
Tracker	\$0.5	\$1.0			\$1.5
ACD		\$0.9			\$0.9
Electronics Manufacturing costs		\$0.8			\$0.8
Mechanical Design / Fab		\$2.0			\$2.0
Schedule Delay		\$1.0	\$1.7	\$2.7	\$5.4
Increase to Contingency		\$0.7	\$1.7		\$2.4
Total	\$2.1	\$9.0	\$3.4	\$2.7	\$17.2

All values in millions of dollars



Delta Costs and Funding

Commissioning / Operating	FY03	FY04	FY05	FY06	Total
Costs added to Commissioning / Operating					
LAT environmental test			\$1.0	\$2.7	\$3.7
Instrument Operations Center	\$0.2	\$1.0	\$0.6		\$1.8
Total	\$0.2	\$1.0	\$1.6	\$2.7	\$5.5
Funding added to Commissioning / Operating					
NASA GLAST Mission Funds			\$0.5	\$1.4	\$1.9
DOE Operating Funds	\$0.2	\$1.0	\$1.1	\$1.4	\$3.6
Total	\$0.2	\$1.0	\$1.6	\$2.7	\$5.5
Fabrication Phase					
Net costs added to Fabrication Phase					
Total Costs Added to Fabrication Phase	\$2.1	\$9.0	\$3.4	\$2.7	\$17.2
Costs identified as Operating/Comm.	\$0.2	\$1.0	\$1.6	\$2.7	\$5.5
Difference	\$1.9	\$8.0	\$1.8	\$0.0	\$11.7
Funding added to Fabrication Phase					
NASA Glast Mission Funds	\$1.8	\$3.0	\$1.9		\$6.7
DOE Capital Equipment Project (MIE)	\$0.1	\$0.0	\$4.9		\$5.0
Stanford University bridge loan		\$5.0	-\$5.0		\$0.0
Total	\$1.9	\$8.0	\$1.8	\$0.0	\$11.7
Total					
Source of funds					
NASA	\$1.8	\$3.0	\$2.4	\$1.4	\$8.6
DOE	\$0.3	\$1.0	\$6.0	\$1.4	\$8.6
Stanford University bridge loan		\$5.0	-\$5.0		\$0.0
Total	\$2.1	\$9.0	\$3.4	\$2.7	\$17.2



Total Fabrication Phase Cost and Funding

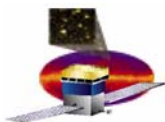
	Previous	FY03	FY04	FY05	Total
Baseline Fab Phase Cost	\$35.4	\$35.1	\$24.6	\$12.8	\$107.9
Baseline Fab Phase Funding	\$37.6	\$33.5	\$31.0	\$19.6	\$121.7
Baseline Fab Contingency		\$0.6	\$6.4	\$6.8	\$13.8
Contingency as % of this years cost			26.0%	53.1%	
New Fab Phase Cost	\$35.4	\$34.8	\$31.9	\$12.9	\$115.0
New Fab Phase Funding	\$37.6	\$35.4	\$39.0	\$21.4	\$133.4
New Fab Contingency		\$0.6	\$7.1	\$8.5	\$16.2
Contingency as % of this years cost			22.3%	66.0%	

Baseline cost at risk*	\$54.3
Contingency as percent fo cost at risk	25%
with funded schedule float**	33%

New cost at risk*	\$63.7
Contingency as percent fo cost at risk	25%
with funded schedule float**	32%

*Cost at Risk = Estimated cost to compete minus EPO costs

** The schedule has 14 weeks of schedule contingency funded at \$3.9 million total when included the contingency becomes \$17.7 million and \$20.1 million respectively



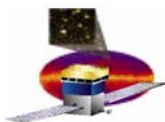
Contingency Analysis

(Escalated K\$)	Project Estimate						
	WBS Item	To Date	To Go	Total Cost	Contingency		Total Cost
		Cost*	Cost		%	\$	Plus Cont.
4.1.1 Instrument Management	\$ 8,197	\$ 7,049	\$ 15,246	13%	\$ 911	\$ 16,157	
4.1.2 Systems Engineering	\$ 3,599	\$ 2,993	\$ 6,592	12%	\$ 366	\$ 6,958	
4.1.4 Tracker	\$ 8,381	\$ 4,091	\$ 12,472	37%	\$ 1,514	\$ 13,986	
4.1.5 Calorimeter	\$ 8,965	\$ 13,593	\$ 22,558	22%	\$ 3,019	\$ 25,576	
4.1.6 ACD	\$ 7,090	\$ 6,104	\$ 13,194	30%	\$ 1,806	\$ 15,000	
4.1.7 Electronics	\$ 5,967	\$ 11,932	\$ 17,899	33%	\$ 1,663	\$ 21,832	
4.1.8 Mechanical Systems	\$ 4,961	\$ 7,495	\$ 12,456	30%	\$ 2,249	\$ 14,705	
4.1.9 Instrument Integration & Test	\$ 1,972	\$ 4,836	\$ 6,808	34%	\$ 1,663	\$ 8,471	
4.1.A Performance & Safety Assurance	\$ 1,149	\$ 437	\$ 1,586	15%	\$ 66	\$ 1,652	
4.1.B Instrument Operations Center	\$ 549	\$ 485	\$ 1,034	10%	\$ 48	\$ 1,082	
4.1.C Education & Public Outreach	\$ 934	\$ 1,656	\$ 2,590	0%	\$ -	\$ 2,590	
4.1.D Science Analysis Software	\$ 1,478	\$ 2,009	\$ 3,487	22%	\$ 451	\$ 3,938	
4.1.E Suborbital Flight Test**	\$ 1,321	\$ 0	\$ 1,321	0%	\$ -	\$ 1,321	
Subtotal***	\$ 54,563	\$ 62,681	\$ 117,243	26%	\$ 16,023	\$ 133,267	
Unallocated Contingency					\$ 133	\$ 133	
Total Project Estimate	\$ 54,563	\$ 62,681	\$ 117,243	26%	\$ 16,157	\$ 133,400	

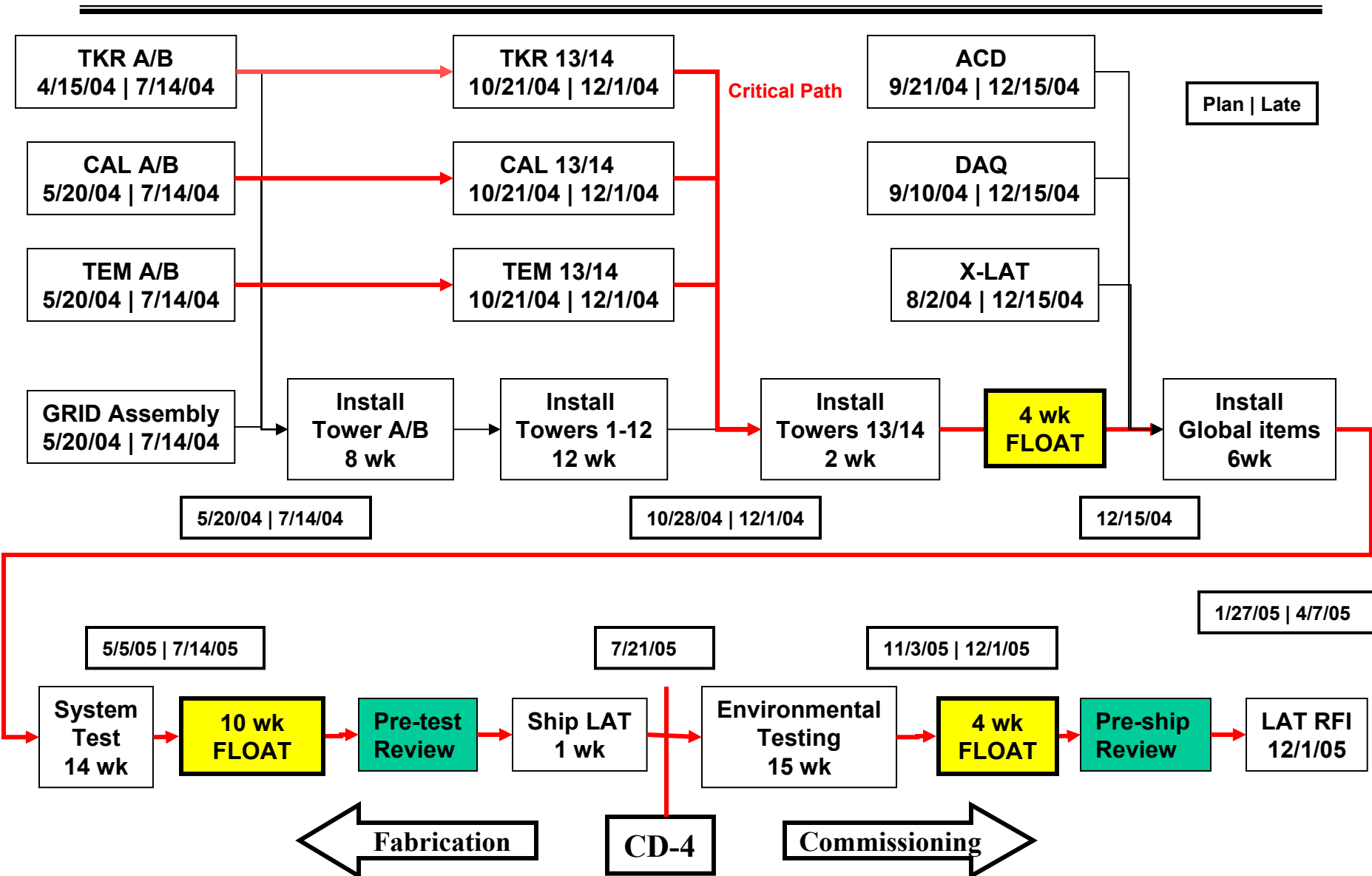
*"To date cost" refers to cost through June 30, 2003. "To go cost" refers to cost after June 30, 2003.

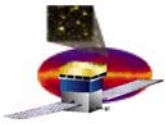
**4.1.E Suborbital Flight Test is completed.

***Total contingency for project calculated against remaining costs at risk. Costs not at risk are costs to date and E/PO.



LAT Working Schedule



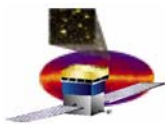


Level 1 and 2 Milestones

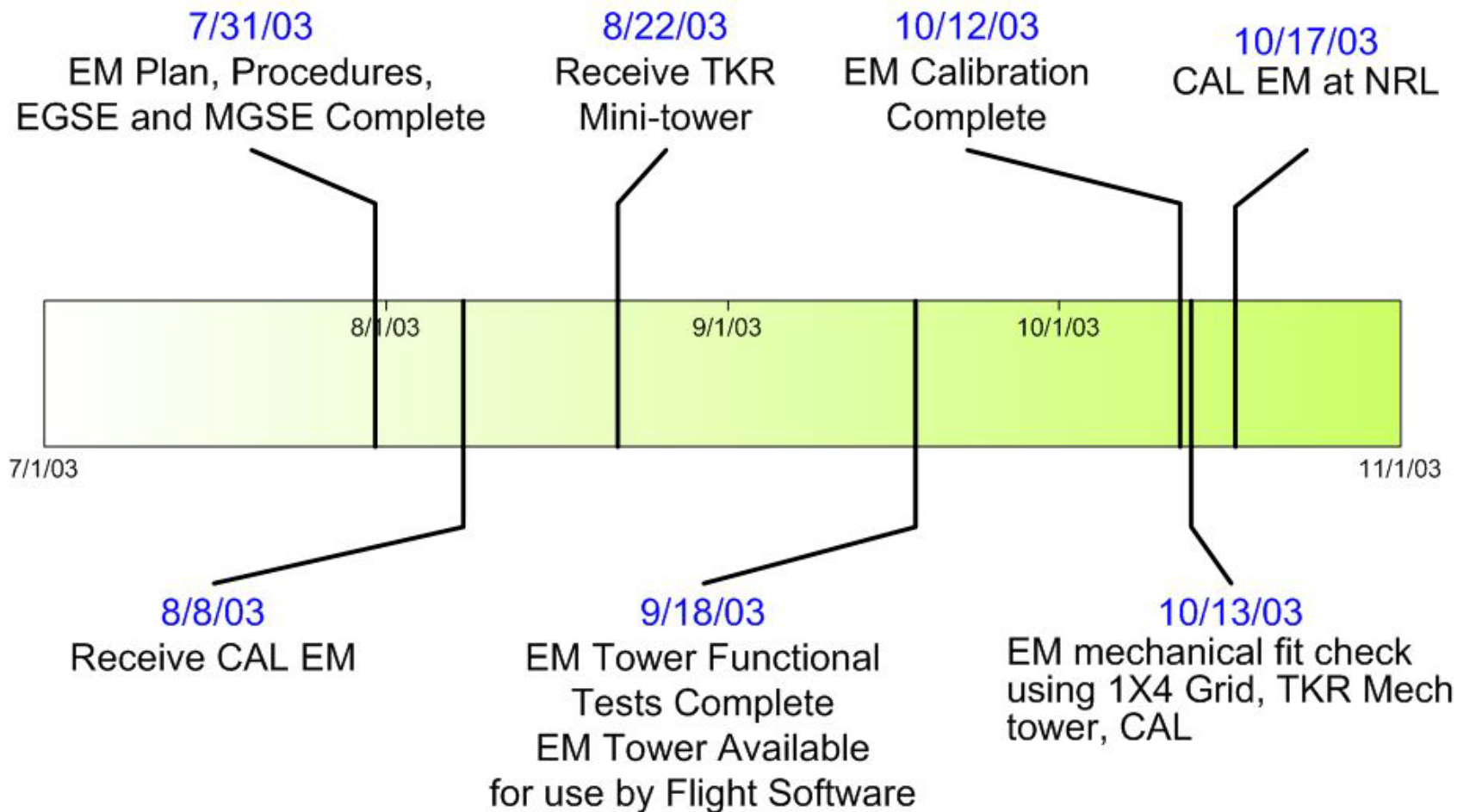
	Existing	Proposed
Level 1 Milestones -- DOE/NASA Joint Oversight Group		
DOE Critical Decision (CD) 0 Approval	June 25, 2001	June 25, 2001 Actual
CD-1 Approval	July 1, 2002	July 23, 2002 Actual
CD-2 Approval	December 13, 2002	November 8, 2002 Actual
CD-3 Approval	July 15, 2003	August 31, 2003
Flight Grid Complete	September 15, 2004	September 15, 2004
CD-4 Approval	March 15, 2006	March 15, 2006
Level 2 Milestones -- Federal Project Managers		
Launch Balloon Flight	August 1, 2001	August 1, 2001 Actual
Instrument Preliminary Design Review	January 8, 2002	January 8, 2002 Actual
Instrument Critical Design Review	April 30, 2003	May 16, 2003 Actual
TKR, CAL FMA,B Available for Calibration Unit	February 17, 2004	See note:
Start LAT Integration	June 15, 2004	August 24, 2004
Pre Environmental Review	February 15, 2005	July 21, 2005
Instrument Pre-Ship Review (PSR)	July 7, 2005	December 1, 2005

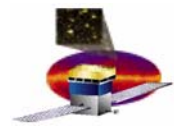
Note: The calibration test has been moved until after LAT integration. Units FM A and B of the Tracker and Calorimeter will be installed in the

**Proposed changes
in Blue**



LAT Engineering Model Testing Timeline





Engineering Models

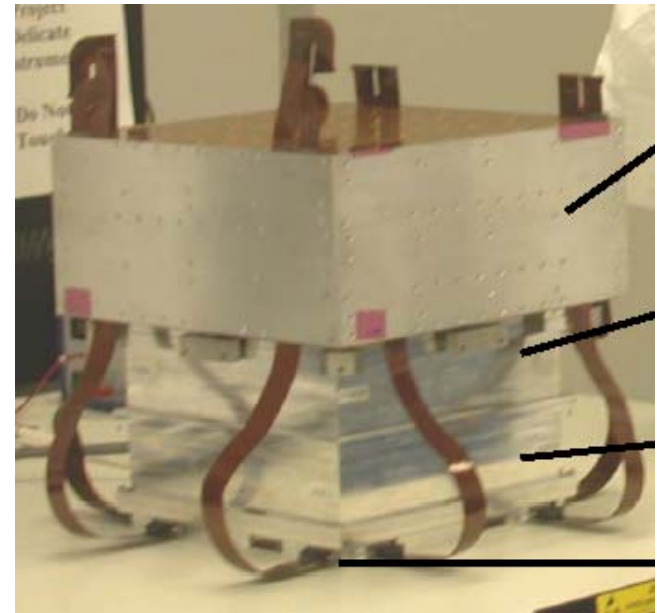
1 X 4 Grid

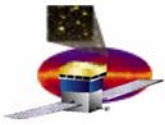


Calorimeter EM



Tracker Minitower





Next 3 months

- **Close key design issues**
 - **CAL-GRID Interface**
 - **X-LAT plate to electronics boxes thermal interface**
 - **Plating of contact surfaces for EMI**
 - **Mounting of the MCMs for Tracker**
 - **Plan to reduce the risk of scrapping Silicon ladders**
- **Complete rebaseline funding**
- **Update PMCS to current plans**
 - **Simplify PMCS**
 - **3 month goals tied to PMCS**
- **Add key personnel**
 - **Chief Engineer**
 - **EMI/EMC expertise**
- **First meeting of the Instrument Advisory Committee**
- **Consolidate management meetings**
- **Have more fun**