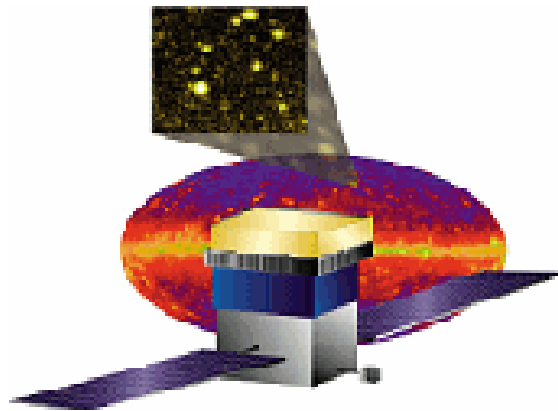


Monthly Progress Report

(Month Ending August 2004)

GLAST Large Area Telescope (LAT)



LAT-MR-04819-01

October 7, 2004

1.0 Introduction

This monthly progress report is submitted to the GLAST Project Office at the Goddard Space Flight Center and the Department of Energy SLAC Site Office. The report summarizes LAT project status as of the end of August, 2004.

2.0 Recent Progress and Status

4.1.4 Tracker

The tray panels for the first tower were completed and tested. Several employed tungsten tiles bead-blasted as a surface preparation prior to gluing. The ensuing thermal-vacuum testing revealed that this failed to prevent delamination of the bias circuit. An Anomaly Resolution Team (ART) met during the last week of the month, and a plan for resolution was drafted. The panels that passed the thermal-vacuum test proceeded to G&A for integration of electronics and detectors, where it was discovered that the encapsulation on the wire bonds between electronics and detectors on the heavy-tungsten trays pulled loose from the detectors in places and broke many of the wire bonds. No such problem occurred on the thin-tungsten trays. Encapsulation will not be applied to those wire bonds (as was the case in the engineering model). The completed trays were arranged in the stacked-tray test-bed in Pisa and operated as a cosmic-ray telescope. The system worked well, indicating that the electronics and software were ready for tower production. The cosmic-ray events were very clean, with noise levels negligible and well below the required maximum. The remaining mechanical ground support equipment (MGSE) and parts for the first tower assembly were completed. The top-tray corner brackets were completed, but required a small amount of rework before shipping. Production of multichip modules (MCMs) continued. Much effort went into understanding and resolving several production problems: short circuits that developed in several completed MCMs during burn-in, pitch-adaptor trace cracking, and workmanship problems with the conformal coating.

The new pitch adapter design was tested, resulting in some design modification. A new visual inspection was implemented to help weed out MCMs with too many cracked traces, and implementation of a comprehensive electronic test of those traces is underway. A shipment of 20 new wafers of GTFE ASICs was received, and was tested with excellent yield. The first tower sidewall layouts and coupon tests were completed, and the machining program was verified on dummy aluminum panels.

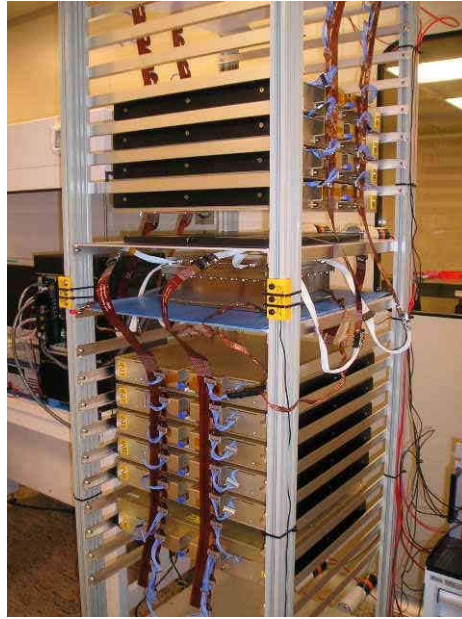


Figure 1: Tracker trays, in protective boxes, operating as a cosmic-ray telescope.

4.1.5 Calorimeter

Assembly of the first flight module is in progress; the analog front-end electronics (AFEE) cards have been installed. Over 1,750 crystal detector elements (CDEs) have been bonded. Approximately 1,600 of these have been acceptance-tested, and almost 1,400 have been delivered to NRL. Sixteen flight composite structures have now been manufactured and twelve received; tooling wear problems have been corrected and an alignment problem discovered in two structures is being corrected. Eight Pre-Electronics Modules (PEMs) have been assembled and tested with cosmic muons. To solve a capacitor leakage current problem, an alternate part has been ordered and replacement has been made on all assembled AFEE cards. Solder mask has been retouched on all the assembled AFEE boards, and the remaining boards are being remanufactured. Sixteen boards have completed burn-in and temperature acceptance testing; six have completed conformal coating, and four of these have been functionally tested. Two thermal-vacuum fixtures are being assembled, as well as the Calorimeter module shipping containers.

4.1.6 Anticoincidence Detector

All flight front-end electronics boards have been completed. A "mini-ACD" was delivered to Integration & Test. Four solution paths to the photomultiplier tube glass crack issue were tested, and a solution was selected. A noise issue on the high voltage bias supplies (HVBS) was discovered; resolution involves adding a capacitor to the HVBSs and re-assembling the electronics chassis on the qual/spare unit. Science simulation confirmed that the ACD efficiency requirement of 0.9997 is met. Performance testing of the ribbon detectors and the upper 45 tile detector assemblies with clear fiber cables was performed. Tile shell assembly instrumentation is nearly completed.



Figure 2: Mini-Anticoincidence Detector.

4.1.7 Electronics, Data Acquisition, and Flight Software

The majority of the electronics ground support equipment (EGSE) test stands were tested and shipped to subsystems (52 of a total 55). A detailed tower electronics module and tower power supply production schedule (TEM/TPS) was created. Approximately 80% of the TEM ASICs underwent testing and dynamic burn-in. No failures were reported. The GASU ASICs are being readied for flight production testing. A detailed production schedule for the GASU, GASU power supply, power distribution unit (PDU) and spacecraft interface unit (SIU) is being created. The procurement of the PDU flight board is underway. The enclosures for the PDU, GASU, and SIU are ready for flight fabrication. A suggestion to exchange poly-switches on the PDU with one-time, fast-blow FM12 fuses is being evaluated. The reported anti-fuse failure possibility for ACTEL FPGAs is being examined, including the test data by ACTEL/GSFC/Aerospace Company.

Preparations are underway for a peer review of Flight Software in September. An engineering release was made to Integration & Test, for the next LAT Test Executive (LATTE) release. An initial release of the instrument-to-spacecraft interface simulator (ISIS) was made for flight software testing. GBM messages were updated and most LAT in ISIS commands have been unit tested. The primary boot code is being evaluated to determine whether it can fit into a 64k image. If it does fit within 64k, with a reasonable spare margin, there is an option to go to a PROM implementation of the boot process in the future. A new driver for the LAT control board was released, and the code was ported to reflect this new driver. Unit testing of the LAT event manager is underway, as well as testing with the new LAT control board driver. Unit testing of housekeeping is underway, as well as integration testing with the new LAT control board driver. A power-up sequencing code for the GASU was written. Debugging of the front-end simulator continues.

4.1.8 Mechanical Systems

The flight grid was inspected, prior to plating. Alodine operations were completed, and brush nickel operations commenced. Finish machining of the second grid is underway. Process qualification tests for two of the three top flange heat pipe samples have now been conducted. The variable conductance heat pipe (VHCP) qualification has been completed, including burst, heat capacity, and shut-off testing. All flight VHCPs have been charged and leak tested. The cross-LAT heat pipe bonding trials were successfully completed.

4.1.9 Integration & Test (I&T)

Tracker integration training is in progress, with the Mechanical Systems subsystem. Integration of the facility substation/emergency generator transfer switch was completed. The Calorimeter engineering model was successfully integrated with the mini-Tracker. Assembly of the mini-ACD is underway. The four-by-four base structure was received. The grid lift fixtures were received. Version 4.3.1 of the LAT Test Executive (LATTE) was released, and is being debugged with the minitower. The offline production pipeline is being tested. The Van de Graaff generator target was changed. A LAT managers meeting was held, focusing on I&T needs from subsystems.



Figure 3: Tracker integration training.

3.0 Schedule Status

The critical path for the project is driven by the assembly of Tracker trays. There is no float to the “ready for CD-4 review” milestone (baseline has five weeks’ float). Management changes were made in June to address the Tracker schedule, and a road map for system test is being prepared by System Engineering.

The status of significant milestones is summarized in Attachments 1 and 2. Attachment 1 presents the status of the Level 1 and Level 2 milestones. Attachment 2 shows the status of the Level 3 milestones planned to occur during the six months preceding and following the current month. Unfavorable variance projections greater than one week to the future milestones are discussed below.

The completion of the flight grid (level 1 milestone 1M1P000060) is discussed below. The start of integration (level 2 milestone 1M1000740) and the delay in the pre-environmental test review (level 2 milestone 1M1000700) are due to the delay in Tracker tray assembly, and is the project critical path as addressed elsewhere in this section.

Following is discussion of the level 3 milestone variances, by responsible subsystem.

4.1.4 Tracker

The delivery of the full Tracker EM (milestone 1M1001430) was initially delayed by the issues discovered with the interface during the EM vibration test. A workaround plan is in place, enabling integration planning to continue by supplying other hardware and drawings in the interim. The EM tower will remain in Pisa for testing tower assembly and alignment procedures.

Variances to the following milestones are due to delays in the MCM and tray assembly processes, as well as the above-mentioned Tracker/grid interface redesign issues.

- Tracker Modules (1M1000200, 1M1000201, 1M1000220, 1M1000221, 1M1000250, 1M1000251, 1M1000260, 1M1000261, 1M1000270, 1M1000271, 1M1000280, 1M1000281, 1M1000290, 1M1000291, 1M1000300, 1M1000301, 1M1000310, and 1M1000311)

4.1.5 Calorimeter

Variances to the following milestones are due to delayed receipt of Calorimeter ASICs and other flight EEE parts. The schedule impact will be minimized by using parts before completion of screening and qualification. However, continuing problems with the delivery of tantalum capacitors are impacting the schedule. A sufficient number of alternate capacitors have been found to proceed with the first Calorimeter module electronic cards.

- Calorimeter Modules (1M1000210, 1M1500, 1M1000230, 1M1510, 1M1000400, 1M1520, 1M1000390, 1M1530, 1M1000380, 1M1540, 1M1000370, 1M1550, 1M1560, 1M1000360, 1M1000350, 1M1570, 1M1000340, and 1M1580)

- EM2 TEM/PS for FM9 through FM16 (return FMA through FM6) from I&T to Calorimeter (1M1001790 through 1M1001860)

4.1.6 Anticoincidence Detector

There are several factors slowing the development of the ACD Test Scripts (1M1001000). The G3 test stands have been delayed, the underlying LAT Test Executive software continues to evolve, and the translation of scientific requirements into test scripts has been more complex than planned. The online team delivered the required software to the ACD in July, and the test scripts are expected to be completed (though not in final form) by November.

Several technical issues have impacted the delivery date of the ACD (1M1000410). The most notable issues have been flaws in the photomultiplier tubes that cause the glass tube to be much weaker than expected, the late delivery of ASICs, and the delay of the G3 test stands. The ACD team continues to mitigate these technical issues to minimize the overall schedule impact.

4.1.7 Electronics

Variances to the following milestones are due to delays in drawing release driving procurement placement. The drawing release process has been improved, and additional staff has been hired. Changes in functional requirements with other subsystems, and the functional interface with the spacecraft, as well as flight performance requirements not being satisfied by engineering model testing have impacted the deliveries of these milestones, as well. Additional testing of the qualification and engineering model units has been required in response.

- Flight TEM Power Supply Assemblies to I&T (1M79002010 through 1M79002180)
- Flight TEM Assemblies to I&T (1M79001010 through 1M79001180)
- Flight Cable Assemblies to I&T (1M79003010 through 1M79003180)

Variances to the following electronics ground support equipment (EGSE) milestones are due to delayed receipt and quality problems with connectors. Effort has been diverted to the installation of Tower Electronics Modules (TEMs) on the Test Bed.

- Updated EGSE Systems (#9 & 10) to Tracker (1M74000090 and 1M740000100).
- EGSE TEM/TEM PS/CTS #2 for Bldg. 33 to I&T (1M7941420)
- EGSE TEM/TEM PS/CTS w/ GASU for Bldg. 33 to I&T (1M7941430)
- Final EGSE incl S/C Sim, FSW (1M7941440)

Variances to the following milestones are due to a delay in completion of the Tracker/Calorimeter tower electronics module (TEM) ASIC qualification and screening plan.

- EM2 TEM/PS/CTS for Flight Models 7 and 8 to Calorimeter (1M1001770, and 1M1001780)

Fabrication of the following items has been delayed in order to conduct additional system and unit tests, and complete drawing review:

- Flight SIU (1M7941080)
- Flight PDU Box (1M7942000)
- Flight Harness (1M7941110)
- Flight GASU Box (1M7941070)
- Flight Event Processor Units (1M7941090)

A Flight Software demonstration of the Spacecraft Inter-Task Communications was held in July, in place of the scheduled Thermal Control & Deadtime demonstration (1M79020). A preliminary demonstration of ISIS was held in August, in place of the scheduled Multitower Configuration and Filter demonstration (1M79030). A replan of the schedule of demonstrations is underway.

4.1.8 Mechanical Systems

The flight grid (1M1000240 and 1M1P000060) has been delayed due to the modifications made to the Tracker/grid interface, adding several weeks to the manufacturing effort. The schedule savings from adding a second shift to the grid machining has not compensated for the complexity of the machining operations. In addition, a machine failure resulted in a loss of eleven manufacturing days. Discrepancies were found during inspection, requiring resolution. A Materials Review Board was held and approval to proceed to the plating operations was given. The nickel plating operations are taking longer than planned and will impact the Grid delivery date.

The cross-LAT (X-LAT) thermal plate (1M941710) has been delayed due to issues with the electronics box to X-LAT plate interface, the ground cooling design implementation, and heat pipe bending. These have all been resolved; the source control drawing was released and the manufacturing readiness review was held. The vendor has received approval to proceed. This delay is not expected to impact the LAT schedule.

4.1.B Instrument Science Operations Center

The dates for the Mission Operations Review (1M1000112), and the Ground System Interface Test Start (1M7941270) have been adjusted to align with the project level ground data system (GDS) preparation on which these reviews are dependent. Given the current GLAST GDS schedule, there is no impact due to the date change and no need for mitigation.

4.0 Financial Status

Attachment 3 depicts the costs, commitments, and performance through the end of the current reporting period.

Attachments 4 and 5 summarize the actual costs through the current period, by WBS level 3 and institution, respectively. The hours worked/FTE lines include only DOE/NASA-funded labor.

A cost report from Stanford-HEPL was not received for the current month.

5.0 Performance Status (Comparison to Project Baseline)

Attachment 6 is a Cost Performance Report (CPR) for the end of the current reporting period, by WBS level 3. The CPR shows the time-phased budget to date (BCWS), the earned value (BCWP), and the actual costs through the end of the month (ACWP). Attachment 7 shows the same information for each participating DOE- and/or NASA-funded institution. The schedule variance is equal to the difference between the budget-to-date and the earned value and represents a measure of the ahead (positive) or behind (negative) schedule position. The cost variance is equal to the difference between the earned value and the actual costs.

Attachment 8 shows performance analysis (by WBS level 3), including trends in the schedule and cost variances from the previous period. Cumulative cost variances exceeding 10% of the BCWP and cumulative schedule variances exceeding 10% of BCWS (favorable and unfavorable) are discussed below.

4.1.7 Electronics

The unfavorable schedule variance is due to changes in functional requirements with other subsystems, and the functional interface with the spacecraft, as well as flight performance requirements not being satisfied by engineering model testing. Additional modification and testing of the engineering model units has been required in response. Documentation and drawings for flight fabrication took longer than originally estimated. Delays in starting the flight production of the TEM and TEM power supplies occurred. Review and release of documentation, as well as late delivery of electronics components from vendors, also contribute to the schedule variance.

4.1.C Education & Public Outreach

The favorable cost variance is due to delayed subcontractor invoice payments, and is not a concern at this time.

6.0 Change Control and Contingency Analysis

A summary of change requests approved during this period (Level 3 and above), including the impacts on the LAT fabrication phase contingency, is below.

Change Request No.	Description	Submitted By	Current Status	Contingency Impact ¹
LAT-XR-03507-01	LAT Environmental Specification Update	L. Lee/ J. Ku	Approved	N/A
LAT-XR-03793-01	I&T Engineering Manager	E. Bloom	Approved	\$269K
LAT-XR-03794-01	Continued IFCT Design	E. Bloom	Approved	\$62K
LAT-XR-03795-01	IFCT Supplies & Training	E. Bloom	Approved	\$42K
LAT-XR-03928-02	Stanford Benefits Rate Change	T. Boysen	Approved	\$81K
LAT-XR-03974-01	I&T Manpower	E. Bloom	Approved	\$579K
LAT-XR-04024-01	ACD 3.3 V and 28 V Current Monitoring	R. Bielawski	Approved	N/A
LAT-XR-04106-01	LAT Instrumentation Plan Update	L. Lee	Approved	N/A
LAT-XR-04139-01	Tracker GTFE	R. Johnson	Approved	\$59K
LAT-XR-04456-01	Tracker Prepreg	R. Johnson	Approved	\$243K
LAT-XR-04457-01	Tracker Data Entry at INFN	R. Johnson	Approved	\$24K
LAT-XR-04458-01	Tracker Flex Circuit Cables	R. Johnson	Approved	\$545K
LAT-XR-04460-01	RAD750 CPUs	J. Doubrava	Approved	\$354K
LAT-XR-04464-01	Manufacturing Engineering	D. Horn	Approved	\$444K
LAT-XR-04482-01	Calorimeter Parts Cost Reduction	N. Johnson	Approved	-\$81K
LAT-XR-04485-01	HEPL Labor Cost Reduction	C. Rhoads	Approved	-\$100K
LAT-XR-04490-01	Clarifying the Boundary between Instrument Fab. & Science Analysis	L. Klaisner	Approved	-\$998K
LAT-XR-04619-01	Mechanical Systems Cost Reductions	M. Campell	Approved	-\$101K

¹ A positive number indicates a draw on contingency.

LAT-XR-04620-01	Grid Cost Increases	M. Campell	Approved	\$166K
LAT-XR-04621-01	Additional IFCT Integration Equipment	E. Bloom	Approved	\$170K
LAT-XR-04633-01	Instrument Design Engineering & Project Controls Cost Increases	T. Boysen/ J. Doubrava	Approved	\$1,020K
LAT-XR-04635-01	TMCM Fabrication Increases	R. Johnson	Approved	\$150K
LAT-XR-04636-01	Mechanical Redesign Increase	R. Johnson	Approved	\$182K
LAT-XR-04637-01	Extend QA Support	D. Marsh	Approved	\$464K
LAT-XR-04638-01	LAT-to-ACD HVBS Supply Voltage	T. Johnson/ G. Unger	Approved	\$63K
LAT-XR-04639-01	PMT Glass Crack Anomaly	T. Johnson/ G. Unger	Approved	\$378K
LAT-XR-04640-01	TSA Design & TDA Hole Location Error	T. Johnson/ K. Segal	Approved	\$84K
LAT-XR-04641-01	ACD Electronics Parts Issues	T. Johnson/ G. Unger	Approved	\$62K

The fabrication phase cost baseline is \$132.2M. Funding applicable to that baseline is \$136.0M; the resulting contingency is \$3.8M.

7.0 Staffing

Attachments 9-10 demonstrate the staffing plan, and reports of actual manpower received. Note from Attachment 10 that not all participating organizations are providing manpower data.

The monthly planned FTEs reflect adjustments made so that the cumulative-to-date manpower plan corresponds to the approved changes in that month.

Neither Goddard nor Stanford-HEPL manpower was reported in the current month.

Attachment 1 Milestones, Levels 1-2

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY01	FY02	FY03	FY04	FY05	FY06
DOE/NASA Joint Oversight Group (Level 1)										
1M1P000000	DOE Critical Decision (CD) 0 Approval	06/25/01A	0	06/25/01A	▼					
1M1P000010	CD-1 Approval	07/23/02A	0	07/23/02A		▼				
1M1P000020	CD-2 Approval	11/08/02A	0	11/08/02A			▼			
1M1P000030	CD-3 Approval	09/03/03A	0	09/03/03A				▼		
1M1P000060	Flight GRID Complete	09/15/04*	-14	10/05/04					▼	
1M1P000040	CD-4 Approval	03/15/06*	0	03/15/06*						▼
DOE/NASA Federal Project Managers (Level 2)										
1M1BF00000	Launch Balloon Flight	08/01/01A	0	08/01/01A	▼					
1M1000100	Instrument Preliminary Design Review	01/08/02A	0	01/08/02A		▼				
1M1000110	I-CDR (Critical Design Review)	05/16/03A	0	05/16/03A			▼			
1M1000740	Start LAT Integration	08/24/04*	-82	12/21/04					▼	
1M1000700	Pre Environmental Testing Review	07/14/05*	-42	09/13/05						▼
1M1000120	PSR-(Instrument Pre-Ship Review)	12/01/05*	0	12/01/05*						▼
Run Date	10/04/04 07:59	GLAST LAT PROJECT Project Milestones (Level 1 and 2)			0923 LT_MS1-2	Sheet 1 of 1				
© Primavera Systems, Inc.										

Attachment 2
Level 3 Milestones (One-Year View)
Page 1 of 6

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY04				FY05										
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4							
Instrument Project Office (Level 3)																			
4.1.4 Tracker																			
1M1001430	Delv of TKR EM to SLAC I&T/MGSE	01/02/04	-178	09/15/04															
1M1000200	Tracker Modules A RFI	07/28/04	-101	12/21/04															
1M1000201	Tracker Modules B RFI	08/18/04	-91	01/05/05															
1M1000220	Tracker Modules 1 RFI	08/18/04	-97	01/13/05															
1M1000221	Tracker Modules 2 RFI	09/08/04	-87	01/20/05															
1M1000250	Flight Tracker Tower 3 RFI	09/08/04	-90	01/25/05															
1M1000251	Flight Tracker Tower 4 RFI	10/14/04	-66	01/27/05															
1M1000260	Flight Tracker Tower 5 RFI	10/14/04	-71	02/03/05															
1M1000261	Flight Tracker Tower 6 RFI	11/05/04	-55	02/03/05															
1M1000270	Flight Tracker Tower 7 RFI	11/05/04	-60	02/10/05															
1M1000271	Flight Tracker Tower 8 RFI	11/24/04	-54	02/22/05															
1M1000280	Flight Tracker Tower 9 RFI	11/24/04	-61	03/03/05															
1M1000281	Flight Tracker Tower 10 RFI	12/17/04	-51	03/10/05															
1M1000290	Flight Tracker Tower 11 RFI	12/17/04	-56	03/17/05															
1M1000291	Flight Tracker Tower 12 RFI	01/11/05	-61	04/08/05															
1M1000300	Flight Tracker Tower 13 RFI	01/11/05	-66	04/15/05															
1M1000301	Flight Tracker Tower 14 RFI	01/25/05	-62	04/22/05															
1M1000310	Flight Tracker Tower 15 RFI	01/25/05	-79	05/17/05															
1M1000311	Flight Tracker Tower 16 RFI	02/08/05	-72	05/20/05															
4.1.5 Calorimeter																			
1M1000210	Calorimeter Modules A RFI	07/09/04	-86	11/09/04															
1M1500	Calorimeter Modules B RFI	07/09/04	-95	11/22/04															
1M1000230	Calorimeter Modules 1 RFI	07/30/04	-84	11/30/04															
1M1510	Calorimeter Modules 2 RFI	08/02/04	-91	12/10/04															
1M1000400	Flight Calorimeter Tower 3 RFI	08/17/04	-84	12/16/04															
1M1520	Flight Calorimeter Tower 4 RFI	08/17/04	-87	12/21/04															
1M1000390	Flight Calorimeter Tower 5 RFI	09/15/04	-67	12/21/04															
1M1530	Flight Calorimeter Tower 6 RFI	09/15/04	-72	01/05/05															
1M1000380	Flight Calorimeter Tower 7 RFI	10/11/04	-54	01/05/05															
1M1540	Flight Calorimeter Tower 8 RFI	10/11/04	-71	01/31/05															
Run Date	10/04/04 07:58		GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)				0923 LTX1 - MS (L3) FLX1 - MS (L3)				Sheet 1 of 6								
© Primavera Systems, Inc.																			

Attachment 2
Level 3 Milestones (One-Year View)
Page 2 of 6

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY04				FY05					
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1M1000370	Flight Calorimeter Tower 9 RFI	11/02/04	-55	01/31/05										
1M1550	Flight Calorimeter Tower 10 RFI	11/02/04	-69	02/18/05										
1M1560	Flight Calorimeter Tower 12 RFI	11/15/04	-71	03/08/05										
1M1000360	Flight Calorimeter Tower 11 RFI	11/16/04	-59	02/18/05										
1M1000350	Flight Calorimeter Tower 13 RFI	12/02/04	-60	03/08/05										
1M1570	Flight Calorimeter Tower 14 RFI	12/02/04	-69	03/21/05										
1M1000340	Flight Calorimeter Tower 15 RFI (Spare)	01/06/05	-50	03/21/05										
1M1580	Flight Calorimeter Tower 16 RFI (Spare)	01/06/05	-56	03/29/05										
4.1.6 ACD														
1M1001000	ACD Test Scripts (from ACD to I&T)	07/01/04	-90	11/08/04										
1M1000410	ACD Flight Unit at SLAC, Tested/Inspected & RFI	11/03/04	-110	04/20/05										
1M1000990	ACD Calibration Test Unit at SLAC, Tested & RFI	01/18/05	0	01/18/05										
4.1.7 Electronics														
1M74000010	Updated EGSE System 1: Elec to TKR	12/08/03	-80	04/09/04A										
1M7941130	EGSE TEM/TEM PS/CTS w/ FE Elec #1-Elec to I&T	12/08/03	-158	07/30/04A										
1M76000020	G3 Test Stand (test 2 FREE Cards): Elec to ACD	12/15/03	-84	04/22/04A										
1M74000020	Updated EGSE System 2: Elec to TKR	12/22/03	-82	04/27/04A										
1M7941150	EGSE TEM/TEM PS/CTS w/ FE Elec #2-Elec to I&T	12/22/03	-158	08/13/04A										
1M74000030	Updated EGSE System 3: Elec to TKR	01/07/04	-104	06/04/04A										
1M7941160	EGSE TEM/TEM PS/CTS w/ FE Elec #3-Elec to I&T	01/07/04	-153	08/13/04A										
1M1000920	EM2 TEM: Elec to Tracker	01/12/04	-55	03/31/04A										
1M1001900	Test Stations (5) for AFEE: Elec to CAL	01/14/04	-100	06/07/04A										
1M74000040	EGSE System 4: Elec to TKR	01/14/04	-99	06/04/04A										
1M7941170	EGSE TEM/TEM PS/CTS/GASU FE Elec-Elec to I&T	01/14/04	-138	07/30/04A										
1M1001870	5 EM2 TEM/PS for AFEE brd ass & tst: Elec to CAL	01/15/04	-99	06/07/04A										
1M1001220	EM2 TEM/PS/CTS for FMA from Elec to CAL	01/22/04	-101	06/15/04A										
1M74000050	EGSE System 5: Elec to TKR	01/22/04	-94	06/04/04A										
1M7941180	EGSE Development Hrdw/FSW 1st Delivr-Elec to I&T	01/22/04	-154	08/30/04A										
1M1001260	EM2 TEM/PS/CTS for FMB from Elec to CAL	01/29/04	-128	07/30/04A										
1M74000060	EGSE System 6: Elec to TKR	01/29/04	-138	08/13/04A										
1M7941190	EGSE TEM/TEM PS/CTS #1 for Bldg 33-Elec to I&T	01/29/04	-104	06/25/04A										
1M1001600	EM2 TEM/PS/CTS for FM1 from Elec to CAL	02/05/04	-141	08/25/04A										
Run Date		10/04/04 07:58	GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)		0923 LTX1 - MS (L3) FLX1 - MS (L3)		Sheet 2 of 6							
© Primavera Systems, Inc.														

Attachment 2
Level 3 Milestones (One-Year View)
Page 3 of 6

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY04				FY05					
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1M7941420	EGSE TEM/TEM PS/CTS #2 for Bldg 33-Elec to I&T	02/05/04	-133	08/13/04A				▼						
1M7941430	EGSE TEM/TEM PS/CTS w/ GASU for B33-Elec to	02/05/04	-147	09/02/04*				▼						
1M1001650	EM2 TEM/PS/CTS for FM2 from Elec to CAL	02/12/04	-136	08/25/04A				▼						
1M74000070	EGSE System 7: Elec to TKR	02/12/04	-128	08/13/04A				▼						
1M74000080	EGSE System 8: Elec to TKR	02/12/04	-128	08/13/04A				▼						
1M74000090	EGSE System 9: Elec to TKR	02/20/04	-145	09/15/04*				▼						
1M74000100	EGSE System 10: Elec to TKR	02/20/04	-145	09/15/04*				▼						
1M76000030	G3 Test Stand (Flt-like I/F): Elec to ACD	02/20/04	-64	05/20/04A			▼							
1M1001660	EM2 TEM/PS/CTS for FM3 from Elec to CAL	02/27/04	-126	08/25/04A				▼						
1M1001680	EM2 TEM/PS/CTS for FM4 from Elec to CAL	02/27/04	-126	08/25/04A				▼						
1M1001720	EM2 TEM/PS/CTS for FM5 from Elec to CAL	02/27/04	-126	08/25/04A				▼						
1M1001760	EM2 TEM/PS/CTS for FM6 from Elec to CAL	03/05/04	-121	08/25/04A				▼						
1M1001770	EM2 TEM/PS/CTS for FM7 from Elec to CAL	03/05/04	-135	09/15/04*				▼						
1M1001780	EM2 TEM/PS/CTS for FM8 from Elec to CAL	03/05/04	-135	09/15/04*				▼						
1M79003010	Flight Cables Assy A: Elec to I&T	05/10/04	-132	11/15/04								▼		
1M79003020	Flight Cables Assy B: Elec to I&T	05/10/04	-132	11/15/04								▼		
1M79002010	Flight TEM PS Assy A: Elec to I&T	05/12/04	-121	11/02/04								▼		
1M79002020	Flight TEM PS Assy B: Elec to I&T	05/19/04	-121	11/09/04								▼		
1M79010	Demo: SI Functionality - Elec to MO	05/28/04*	0	05/28/04A				▼						
1M79001010	Flight TEM Assy A: Elec to I&T	06/07/04	-110	11/10/04								▼		
1M79003030	Flight Cables Assy 1: Elec to I&T	06/10/04	-110	11/15/04								▼		
1M79003040	Flight Cables Assy 2: Elec to I&T	06/10/04	-110	11/15/04								▼		
1M79003050	Flight Cables Assy 3: Elec to I&T	06/10/04	-110	11/15/04								▼		
1M79003060	Flight Cables Assy 4: Elec to I&T	06/10/04	-110	11/15/04								▼		
1M79001020	Flight TEM Assy B: Elec to I&T	06/14/04	-105	11/10/04								▼		
1M79003070	Flight Cables Assy 5: Elec to I&T	06/28/04	-98	11/15/04								▼		
1M79003080	Flight Cables Assy 6: Elec to I&T	06/28/04	-98	11/15/04								▼		
1M79003090	Flight Cables Assy 7: Elec to I&T	06/28/04	-98	11/15/04								▼		
1M79003100	Flight Cables Assy 8: Elec to I&T	06/28/04	-98	11/15/04								▼		
1M79003110	Flight Cables Assy 9: Elec to I&T	06/28/04	-98	11/15/04								▼		
1M79003120	Flight Cables Assy 10: Elec to I&T	06/28/04	-98	11/15/04								▼		
1M79002030	Flight TEM PS Assy 1: Elec to I&T	07/01/04	-121	12/23/04									▼	

Run Date 10/04/04 07:58

GLAST LAT PROJECT
Project Milestones (Level 3)
1 Year View (+/- 6mo)

0923
LTX1 - MS (L3)
FLX1 - MS (L3)

Sheet 3 of 6

© Primavera Systems, Inc.

Attachment 2
Level 3 Milestones (One-Year View)
Page 4 of 6

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY04				FY05					
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1M79002040	Flight TEM PS Assy 2: Elec to I&T	07/09/04	-121	01/07/05										
1M79003130	Flight Cables Assy 11: Elec to I&T	07/15/04	-90	11/19/04										
1M79003140	Flight Cables Assy 12: Elec to I&T	07/15/04	-90	11/19/04										
1M79003150	Flight Cables Assy 13: Elec to I&T	07/15/04	-90	11/19/04										
1M79003160	Flight Cables Assy 14: Elec to I&T	07/15/04	-90	11/19/04										
1M79003170	Flight Cables Assy 15: Elec to I&T	07/15/04	-90	11/19/04										
1M79003180	Flight Cables Assy 16: Elec to I&T	07/15/04	-90	11/19/04										
1M79002050	Flight TEM PS Assy 3: Elec to I&T	07/16/04	-121	01/14/05										
1M79002060	Flight TEM PS Assy 4: Elec to I&T	07/23/04	-121	01/24/05										
1M79020	Demo: Thermal Control & Dearthime - Elec to MO	07/26/04*	-28	09/02/04*										
1M79002070	Flight TEM PS Assy 5: Elec to I&T	07/30/04	-121	01/31/05										
1M79001030	Flight TEM Assy 1: Elec to I&T	08/03/04	-114	01/24/05										
1M79002080	Flight TEM PS Assy 6: Elec to I&T	08/06/04	-121	02/07/05										
1M79001040	Flight TEM Assy 2: Elec to I&T	08/10/04	-114	01/31/05										
1M79002090	Flight TEM PS Assy 7: Elec to I&T	08/13/04	-121	02/14/05										
1M79001050	Flight TEM Assy 3: Elec to I&T	08/17/04	-114	02/07/05										
1M79002100	Flight TEM PS Assy 8: Elec to I&T	08/20/04	-121	02/22/05										
1M79001060	Flight TEM Assy 4: Elec to I&T	08/24/04	-114	02/14/05										
1M79002110	Flight TEM PS Assy 9: Elec to I&T	08/25/04	-121	02/25/05										
1M79030	Demo: Multi-Tower Config & Filter - Elec to MO	08/27/04*	-4	09/02/04*										
1M79002120	Flight TEM PS Assy 10: Elec to I&T	08/30/04	-121	03/02/05										
1M79001070	Flight TEM Assy 5: Elec to I&T	08/31/04	-114	02/22/05										
1M79002130	Flight TEM PS Assy 11: Elec to I&T	09/02/04	-121	03/07/05										
1M79001080	Flight TEM Assy 6: Elec to I&T	09/08/04	-114	03/01/05										
1M79002140	Flight TEM PS Assy 12: Elec to I&T	09/08/04	-121	03/10/05										
1M79002150	Flight TEM PS Assy 13: Elec to I&T	09/13/04	-121	03/15/05										
1M79001090	Flight TEM Assy 7: Elec to I&T	09/15/04	-114	03/08/05										
1M79002160	Flight TEM PS Assy 14: Elec to I&T	09/16/04	-121	03/18/05										
1M79002170	Flight TEM PS Assy 15: Elec to I&T	09/21/04	-121	03/23/05										
1M79001100	Flight TEM Assy 8: Elec to I&T	09/22/04	-114	03/15/05										
1M79002180	Flight TEM PS Assy 16: Elec to I&T	09/24/04	-121	03/28/05										
1M79040	Demo: EPO Boot & Commanding - Elec to MO	09/24/04*	0	09/24/04										

Run Date 10/04/04 07:58
 © Primavera Systems, Inc.

GLAST LAT PROJECT
Project Milestones (Level 3)
1 Year View (+/- 6mo)

0923
 LTX1 - MS (L3)
 FLX1 - MS (L3)
 Sheet 4 of 6

Attachment 2
Level 3 Milestones (One-Year View)
Page 5 of 6

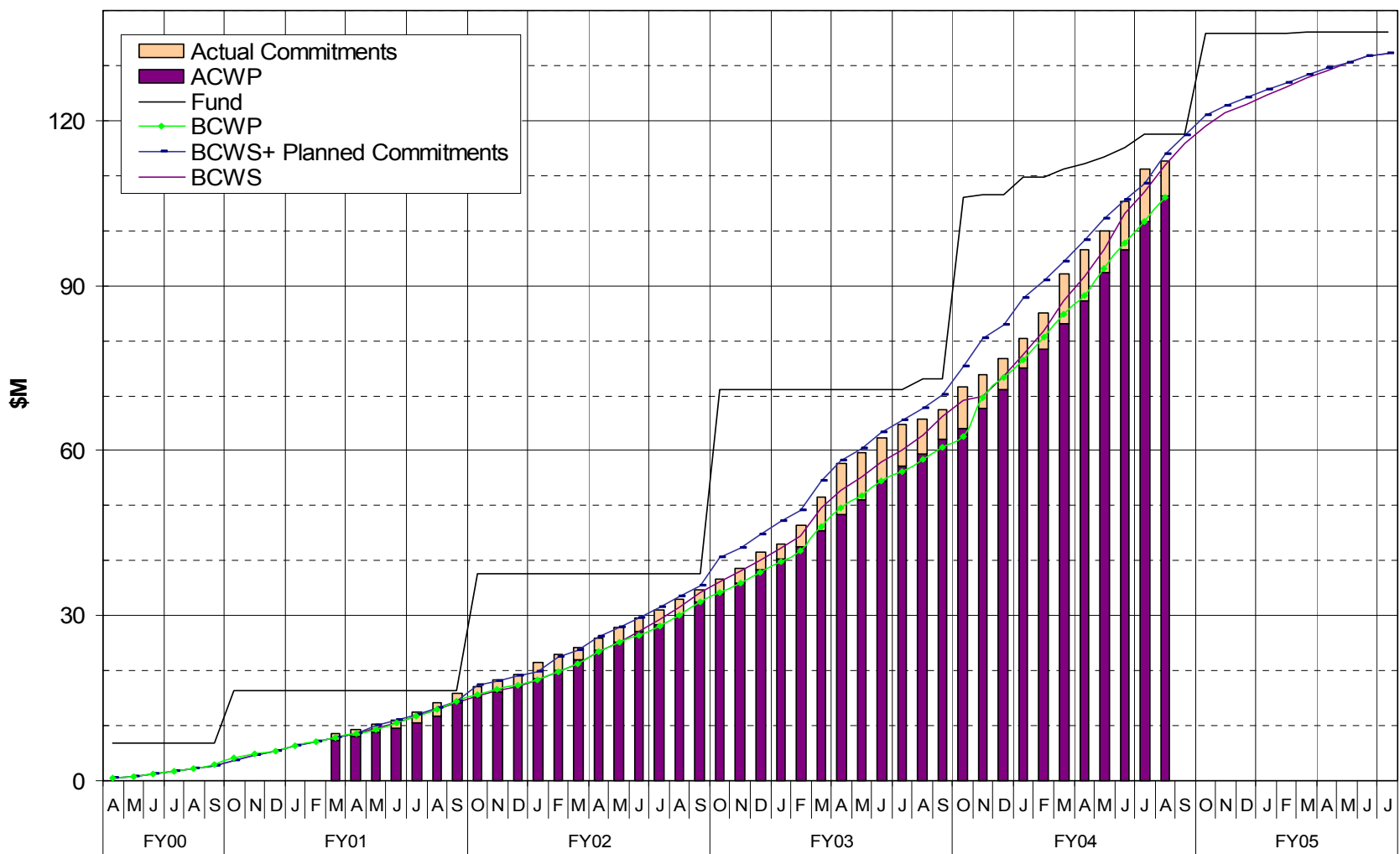
Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY04				FY05					
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1M79001110	Flight TEM Assy 9: Elec to I&T	09/29/04	-114	03/22/05										
1M79001120	Flight TEM Assy 10: Elec to I&T	10/06/04	-114	03/29/05										
1M79001130	Flight TEM Assy 11: Elec to I&T	10/13/04	-114	04/05/05										
1M7941080	Flight SIU-Elec to I&T	10/13/04	-131	04/28/05										
1M7942000	Flight PDU Box-Elec to I&T	10/13/04	-119	04/12/05										
1M79001140	Flight TEM Assy 12: Elec to I&T	10/20/04	-114	04/12/05										
1M7941110	Flight Harness-Elec to I&T	10/20/04	-63	01/28/05										
1M79001150	Flight TEM Assy 13: Elec to I&T	10/27/04	-114	04/19/05										
1M79050	Demo: Inst. Calibration - Elec to MO	10/29/04*	0	10/29/04										
1M7941070	Flight GASU Box-Elec to I&T	11/01/04*	-112	04/20/05										
1M7941090	Flight Event Processor Units-Elec to I&T	11/01/04	-118	04/28/05										
1M79001160	Flight TEM Assy 14: Elec to I&T	11/03/04	-114	04/26/05										
1M79001170	Flight TEM Assy 15: Elec to I&T	11/10/04	-114	05/03/05										
1M79001180	Flight TEM Assy 16: Elec to I&T	11/17/04	-114	05/10/05										
1M79060	Demo: Full 1553 & Full Towers Cmnds - Elec to MO	12/03/04*	0	12/03/04										
1M7941440	Final EGSE incl S/C Sim, FSW-Elec to I&T	12/13/04	-68	03/29/05										
1M79070	Demo: FU Build - Elec to MO	12/17/04*	0	12/17/04										
4.1.8 Mechanical														
1M1001380	Delivery of EM (1X4) Grid to I&T/MSGE	12/19/03	-64	03/31/04A										
1M1000240	Flight Grid RFI-Mech to I&T	07/22/04	-69	10/28/04										
1M941710	X-LAT Thermal Plate RFI from Mech to I&T	08/12/04	-82	12/09/04										
4.1.9 I&T														
1M1001790	EM2 TEM/PS for FM9 (return FMA) from I&T to CAL	07/23/04	-86	11/23/04										
1M1001800	EM2 TEM/PS for FM10 (return FMB) from I&T to CAL	07/23/04	-95	12/08/04										
1M1001810	EM2 TEM/PS for FM11 (return FM1) from I&T to CAL	08/13/04	-84	12/14/04										
1M1001820	EM2 TEM/PS for FM12 (return FM2) from I&T to CAL	08/16/04	-91	01/03/05										
1M1001830	EM2 TEM/PS for FM13 (return FM3) from I&T to CAL	08/31/04	-84	01/07/05										
1M1001840	EM2 TEM/PS for FM14 (return FM4) from I&T to CAL	08/31/04	-87	01/12/05										
1M1001850	EM2 TEM/PS for FM15 (return FM5) from I&T to CAL	09/29/04	-67	01/12/05										
1M1001860	EM2 TEM/PS for FM16 (return FM6) from I&T to CAL	09/29/04	-72	01/20/05										
4.1.B ISOC														
1M005480	ISOC CDR	03/12/04	-101	08/04/04A										
Run Date	10/04/04 07:58	GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			0923 LTX1 - MS (L3) FLX1 - MS (L3)	Sheet 5 of 6								
© Primavera Systems, Inc.														

Attachment 2
Level 3 Milestones (One-Year View)
Page 6 of 6

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY04				FY05				
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1M1000112	Mission Operations Review (L-21mo.)	11/10/04	-78	03/14/05						♦	▽		
1M7941270	Ground System Interface Test start	11/10/04	-78	03/14/05						♦	▽		
Run Date	10/04/04 07:58	GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			0923 LTX1 - MS (L3) FLX1 - MS (L3)	Sheet 6 of 6							
© Primavera Systems, Inc.													

Attachment 3

Budget vs Actuals vs Performance
DOE + NASA Project Expenditures
4.1 LAT



**Attachment 4
LAT Costs, through August 2004, by WBS**

Monthly Contractor Financial Management Report								Report for Month Ending: 8/31/2004		
To: Kevin Grady, GLAST Project Manager (NASA) Ev Valle, LAT Project Manager (DOE)				From: Tanya Boysen, LAT Project Controls Manager				Budget Value		
								Cost: 0	Fee: 0	
LAT3 GLAST LAT Project		Type:						Fund Limitation: 0		
Reporting Category	Cost Incurred				Estimated Cost			4/3/2000	Billing	
	During Month		Cum. to Date		Detail		Balance of Budget	Estimated Final Cost		Unfilled Orders Outstanding
	Actual	Planned	Actual	Planned	SEP04	OCT04		Project Estimate	Budget Value	
4.1.1 INSTRUMENT MANAGEMENT	319	772	13,480	13,510	386	363	2,682	16,911	16,911	
4.1.2 SYSTEM ENGINEERING	371	192	5,190	5,475	185	149	1,524	7,047	7,047	
4.1.4 TRACKER	480	624	13,808	14,761	513	674	1,578	16,573	16,573	
4.1.5 CALORIMETER	540	646	17,338	19,213	616	581	3,486	22,022	22,022	
4.1.6 ANTICOINCIDENCE DETECTOR	350	531	14,305	14,568	471	118	701	15,595	15,595	
4.1.7 ELECTRONICS	1,530	1,092	19,296	20,048	461	269	2,030	22,055	22,055	
4.1.8 MECHANICAL SYSTEMS	574	722	10,869	11,440	648	409	2,253	14,179	14,179	
4.1.9 INTEGRATION & TEST	279	129	4,643	4,977	419	283	2,419	7,764	7,764	
4.1.A PERFORMANCE AND SAFETY ASSURANCE	144	123	2,088	2,206	118	142	587	2,935	2,935	
4.1.B LAT INSTRUMENT OPERATIONS CENTER	11	4	293	292	3	4	29	328	328	
4.1.C EDUCATION AND PUBLIC OUTREACH	45	74	1,542	1,913	71	51	784	2,448	2,448	
4.1.D SCIENCE ANALYSIS SOFTWARE	66	18	2,098	2,261	48	78	795	3,020	3,020	
4.1.E SUBORBITAL FLIGHT TEST	0	0	1,325	1,325	0	0	0	1,325	1,325	
Gen. and Admin.	0	0	0	0	0	0	0	0	0	
Total	4,708	4,926	106,275	111,988	3,940	3,120	18,867	132,202	132,202	

Attachment 5
LAT Costs, through August 2004, by Organization and Cost Code

Monthly Contractor Financial Management Report								Report for Month Ending: 8/31/2004	
To: Kevin Grady, GLAST Project Manager (NASA) Ev Valle, LAT Project Manager (DOE)				From: Tanya Boysen, LAT Project Controls Manager				Budget Value	
								Cost: 0	Fee: 0
LAT3	Type:						Fund Limitation:		
GLAST LAT Project							0		
Reporting Category	Cost Incurred				Estimated Cost			4/3/2000	Billing
	During Month		Cum. to Date		Detail		Balance of Budget	Estimated Final Cost	Unfilled Orders Outstanding
	Actual	Planned	Actual	Planned	SEP04	OCT04			
DG *** GSFC	373	488	15,550	16,136	508	155	1,328	17,541	17,541
DH *** HEPL	0	204	5,261	6,059	227	136	1,917	7,542	7,542
DL *** SLAC	3,610	3,271	60,588	62,372	2,402	2,052	9,942	74,984	74,984
DN *** NRL	619	845	20,863	22,965	691	680	4,446	26,679	26,679
DO *** Financial Plan Transfer/Sub Ou	0	0	59	54	0	0	-5	54	54
DS *** SSU	35	71	1,528	1,876	68	50	754	2,401	2,401
DT *** Texas A&M	0	0	15	16	0	0	0	16	16
DU *** UCSC	48	38	2,237	2,341	36	38	415	2,726	2,726
DW *** UW	23	9	174	169	9	9	68	260	260
Total	4,708	4,926	106,275	111,988	3,940	3,120	18,867	132,202	132,202

Reporting Category	Cost Incurred/Hours Worked				Estimated Cost/Hours to Complete			Estimated Final Cost/Hours		Unfilled Orders Outstanding
	During Month		Cum. to Date		Detail		Balance of Budget	Project Estimate	Budget Value	
	Actual	Planned	Actual	Planned	SEP04	OCT04				
RL LABOR	1,818	1,880	52,312	53,724	1,779	1,458	9,615	65,164	65,164	
<i>FTE (DOE/NASA)</i>	<i>121.8</i>	<i>160.4</i>	<i>4,807.6</i>	<i>4,576.6</i>	<i>166.0</i>	<i>114.0</i>	<i>437.7</i>	<i>5,525.3</i>	<i>5,525.3</i>	
<i>HOURS (DOE/NASA)</i>	<i>21,433</i>	<i>28,220</i>	<i>801,708</i>	<i>760,329</i>	<i>27,894</i>	<i>19,089</i>	<i>66,656.1</i>	<i>915,347</i>	<i>915,347</i>	
RT TRAVEL	38	-114	1,354	1,874	62	68	998	2,481	2,481	
RM MATERIAL & SERVICES	2,852	3,156	50,252	53,907	2,096	1,590	8,020	61,958	61,958	
RX MPS & LAB TAX	0	4	2,357	2,482	3	4	235	2,599	2,599	
Total (not incl FTE/Hours)	4,708	4,926	106,275	111,988	3,940	3,120	18,867	132,202	132,202	

Attachment 6
LAT Performance, through August 2004, by WBS

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:				Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 7/31/2004 8/31/2004				
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %	Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling			
1	0		0		0	0	0		0	0			
CAPW[3]	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost Work	Variance		Budgeted Cost		Actual Cost Work	Variance		Budgeted	Latest Revised Estimate	Variance
	Work Scheduled	Work Performed	Performed	Schedule	Cost	Work Scheduled	Work Performed	Performed	Schedule	Cost			
Item	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
4.1.1 INSTRUMENT MANAGEMENT	772	771	319	0	452	13,510	13,510	13,480	0	29	16,911	16,911	0
4.1.2 SYSTEM ENGINEERING	192	192	371	0	-179	5,475	5,475	5,190	0	285	7,047	7,047	0
4.1.4 TRACKER	624	543	480	-81	63	14,761	14,045	13,808	-716	237	16,573	16,573	0
4.1.5 CALORIMETER	646	424	540	-222	-116	19,213	17,451	17,338	-1,762	113	22,022	22,022	0
4.1.6 ANTICOINCIDENCE DETECTOR	531	679	350	148	330	14,568	14,170	14,305	-398	-135	15,595	15,595	0
4.1.7 ELECTRONICS	1,092	803	1,530	-289	-727	20,048	17,936	19,296	-2,112	-1,360	22,055	22,055	0
4.1.8 MECHANICAL SYSTEMS	722	618	574	-104	44	11,440	10,936	10,869	-504	67	14,179	14,179	0
4.1.9 INTEGRATION & TEST	129	102	279	-26	-177	4,977	4,598	4,643	-379	-45	7,764	7,764	0
4.1.A PERFORMANCE AND SAFETY AS	123	123	144	0	-21	2,206	2,206	2,088	0	118	2,935	2,935	0
4.1.B LAT INSTRUMENT OPERATIONS O	4	4	11	0	-8	292	292	293	0	0	328	328	0
4.1.C EDUCATION AND PUBLIC OUTRE	74	69	45	-5	25	1,913	1,889	1,542	-24	346	2,448	2,448	0
4.1.D SCIENCE ANALYSIS SOFTWARE	18	18	66	0	-48	2,261	2,261	2,098	0	162	3,020	3,020	0
4.1.E SUBORBITAL FLIGHT TEST	0	0	0	0	0	1,325	1,325	1,325	0	0	1,325	1,325	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget											0	0	0
Sub Total	4,926	4,346	4,708	-579	-362	111,988	106,092	106,275	-5,895	-183	132,202	132,202	0
Contingency											3,823	3,823	0
Total	4,926	4,346	4,708	-579	-362	111,988	106,092	106,275	-5,895	-183	136,025	136,025	0

Attachment 7
LAT Performance, through August 2004, by Organization

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:						Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 7/31/2004 8/31/2004		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %	Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling			
1	0		0		0	0	0	0	0	0			
OBS[1]	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost Work	Variance		Budgeted Cost		Actual Cost Work	Variance		Budgeted	Latest Revised Estimate	Variance
	Work Scheduled	Work Performed		Schedule	Cost	Work Scheduled	Work Performed		Schedule	Cost			
Item	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
DG *** GSFC	488	636	373	148	264	16,136	15,738	15,550	-398	188	17,541	17,541	0
DH *** HEPL	204	204	0	0	204	6,059	6,052	5,261	-6	791	7,542	7,542	0
DL *** SLAC	3,271	2,805	3,610	-466	-806	62,372	58,795	60,588	-3,577	-1,793	74,984	74,984	0
DN *** NRL	845	589	619	-257	-30	22,965	21,084	20,863	-1,881	222	26,679	26,679	0
DO *** Financial Plan	0	0	0	0	0	54	54	59	0	-5	54	54	0
DS *** SSU	71	66	35	-5	31	1,876	1,852	1,528	-24	323	2,401	2,401	0
DT *** Texas A&M	0	0	0	0	0	16	16	15	0	0	16	16	0
DU *** UCSC	38	38	48	0	-10	2,341	2,332	2,237	-9	95	2,726	2,726	0
DW *** UW	9	9	23	0	-14	169	169	174	0	-4	260	260	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget											0	0	0
Sub Total	4,926	4,346	4,708	-579	-362	111,988	106,092	106,275	-5,895	-183	132,202	132,202	0
Contingency											3,823	3,823	0
Total	4,926	4,346	4,708	-579	-362	111,988	106,092	106,275	-5,895	-183	136,025	136,025	0

Attachment 8 LAT Performance Analysis, August 2004

	WBS	Description	BAC	BCWS	BCWP	ACWP	SV \$	CV \$	%BCWS	%BCWP	%ACWP	SPI	CPI	SPI	CPI	Cpi_Fcst	CpiSpi_Fcst
1	4.1	LAT	132,202	111,988	106,092	106,275	-5,895	-183	84.71	80.25	80.39	↔	↓	0.947	0.998	132,430	133,883
2	4.1.1	Instr Mgmt	16,911	13,510	13,510	13,480	0	29	79.89	79.89	79.71	↔	↑	1.000	1.002	16,874	16,874
3	4.1.2	System Engr	7,047	5,475	5,475	5,190	0	285	77.68	77.68	73.64	↔	↓	1.000	1.055	6,680	6,680
4	4.1.4	Tracker	16,573	14,761	14,045	13,808	-716	237	89.06	84.74	83.31	↔	↑	0.951	1.017	16,294	16,421
5	4.1.5	Calorimeter	22,022	19,213	17,451	17,338	-1,762	113	87.25	79.25	78.73	↓	↓	0.908	1.007	21,879	22,338
6	4.1.6	ACD	15,595	14,568	14,170	14,305	-398	-135	93.41	90.86	91.73	↑	↑	0.973	0.991	15,744	15,785
7	4.1.7	Electronics	22,055	20,048	17,936	19,295	-2,112	-1,360	90.90	81.32	87.49	↔	↓	0.895	0.930	23,727	24,249
8	4.1.8	Mechanical	14,179	11,440	10,936	10,869	-504	67	80.68	77.13	76.66	↓	↑	0.956	1.006	14,092	14,241
9	4.1.9	I&T	7,764	4,977	4,598	4,643	-379	-45	64.10	59.22	59.80	↔	↓	0.924	0.990	7,840	8,104
10	4.1.A	PSA	2,935	2,206	2,206	2,088	0	118	75.17	75.17	71.15	↔	↓	1.000	1.056	2,778	2,778
11	4.1.B	ISOC	328	292	292	293	0	0	89.11	89.11	89.14	↔	↓	1.000	1.000	328	328
12	4.1.C	EPO	2,448	1,913	1,889	1,542	-24	346	78.13	77.14	62.99	↓	↔	0.987	1.225	1,999	2,005
13	4.1.D	SAS	3,019	2,261	2,261	2,098	0	162	74.86	74.86	69.49	↔	↓	1.000	1.077	2,803	2,803
14	4.1.E	Balloon Flight	1,325	1,325	1,325	1,325	0	0	100.00	100.00	99.98	↔	↔	1.000	1.000	1,325	1,325

LEGEND

BAC: Budget At Complete
 BCWS: Budgeted Cost of Work Scheduled (to date)
 BCWP: Budgeted Cost of Work Performed (to date)
 ACWP: Actual Cost of Work Performed (to date)

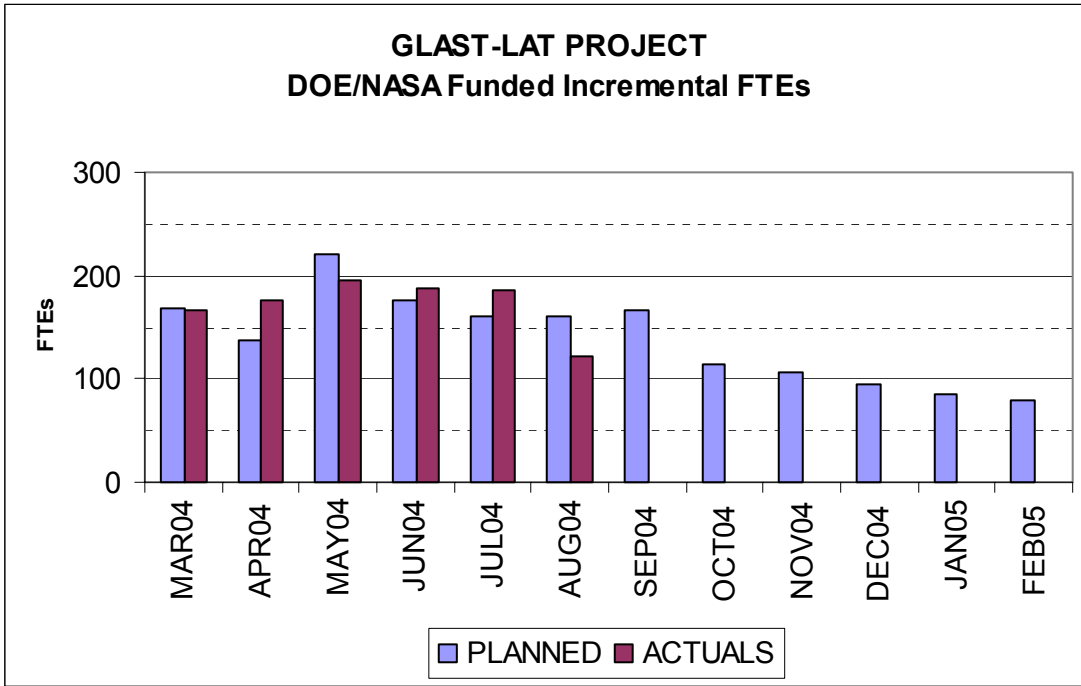
SV \$: Schedule Variance = BCWP - BCWS
 CV \$: Cost Variance = BCWP - ACWP
 SPI: Schedule Performance Index = BCWP/BCWS
 CPI: Cost Performance Index = BCWP/ACWP

% BCWS: Percent Scheduled = BCWS/BAC
 % BCWP: Percent Complete = BCWP/BAC
 % ACWP: Percent Spent = ACWP/BAC

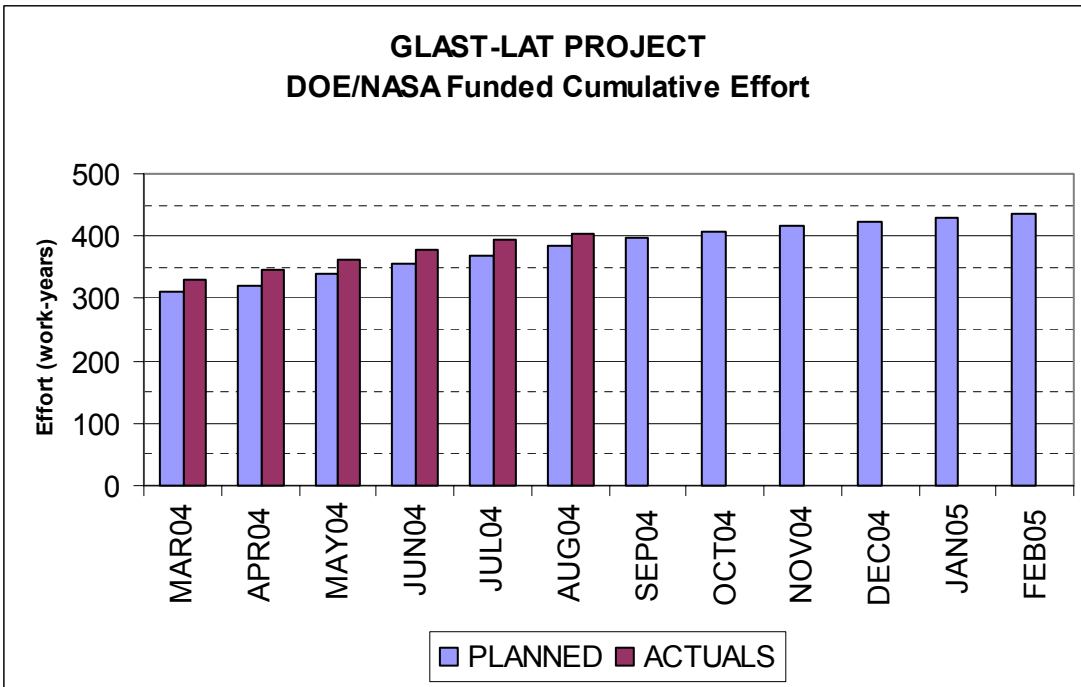
Cpi_Fcst: CPI (to date) EAC Forecast = BAC / CPI
 CpiSpi_Fcst: Combination CPI and SPI EAC Forecast = ACWP + (BAC - BCWP) / (CPI * SPI)

■	Worse than .85	■	Between .95 and 1.10
■	Between .85 and .95	■	Better than 1.10
SPI and CPI Change Thresholds			

**Attachment 9
LAT Manpower (DOE/NASA-Funded)**



Note: Goddard and HEPL manpower was not reported in the month of August, 2004.



Attachment 10
LAT Manpower Data, through August 2004, by Organization

Program: LAT3		Description: GLAST LAT Project			Approval: Program Manager											
Run Date: 9/30/2004		Status Date: 8/31/2004			Functional Manager				Cost Account Manager							
		PRIOR	MAR04	APR04	MAY04	JUN04	JUL04	AUG04	Cum-to- Date	SEP04	OCT04	NOV04	DEC04	JAN05	FEB05	
OBS																
DG *** GSFC																
FTE	PLANNED	775.4	61.0	58.3	28.6	38.3	31.6	54.1	1047.2	55.3	13.3	17.8	13.0	7.7	7.7	
	ACTUALS	914.0	48.7	45.4	61.1	47.3	46.2	0.0	1162.7	0.0	0.0	0.0	0.0	0.0	0.0	
DH *** HEPL																
FTE	PLANNED	255.9	3.2	2.4	3.4	4.5	4.9	-0.9	273.4	2.0	3.8	3.8	3.7	3.8	3.8	
	ACTUALS	252.3	4.0	2.7	3.6	3.9	1.5	0.0	268.0	0.0	0.0	0.0	0.0	0.0	0.0	
DL *** SLAC																
FTE	PLANNED	1868.3	79.7	78.1	158.4	98.2	89.4	89.7	2461.8	89.9	80.2	77.3	77.5	69.7	65.0	
	ACTUALS	1752.6	84.7	91.0	95.2	101.4	105.0	105.6	2335.5	0.0	0.0	0.0	0.0	0.0	0.0	
DN *** NRL																
FTE	PLANNED	852.6	36.9	17.1	49.4	52.2	44.2	41.4	1093.8	31.9	29.4	21.0	17.6	15.9	12.8	
	ACTUALS	867.1	35.0	35.4	42.6	39.8	36.4	31.8	1088.0	0.0	0.0	0.0	0.0	0.0	0.0	
DS *** SSU																
FTE	PLANNED	86.9	3.2	3.2	3.2	3.2	3.2	3.2	105.8	3.2	2.0	2.0	1.9	1.9	1.9	
	ACTUALS	102.0	3.0	6.0	3.4	2.7	3.4	4.6	125.1	0.0	0.0	0.0	0.0	0.0	0.0	
DU *** UCSC																
FTE	PLANNED	239.9	4.7	4.4	4.4	4.4	4.4	4.4	266.6	4.4	4.4	4.4	4.4	4.4	4.4	
	ACTUALS	290.7	3.3	6.7	1.0	5.5	5.0	5.0	317.3	0.0	0.0	0.0	0.0	0.0	0.0	
DW *** UW																
FTE	PLANNED	38.9	0.4	0.4	0.4	0.4	0.4	0.4	41.3	0.4	0.4	0.4	0.4	0.4	0.4	
	ACTUALS	12.2	0.9	1.0	1.1	1.0	1.1	1.0	18.3	0.0	0.0	0.0	0.0	0.0	0.0	
FF *** France																
FTE	PLANNED	1092.6	15.2	15.2	15.2	15.2	15.2	15.2	1183.5	15.2	14.2	13.9	10.8	6.4	6.7	
	ACTUALS								0.0							
FI *** Italy																
FTE	PLANNED	389.8	9.4	15.6	15.2	14.9	12.8	14.6	472.2	15.2	9.1	9.1	7.1	1.5	1.5	
	ACTUALS	354.0	10.9	10.9	10.9	10.9	10.9	21.2	429.5	0.0	0.0	0.0	0.0	0.0	0.0	
FJ *** Japan																
FTE	PLANNED	98.4	0.9	0.5	0.5	0.5	0.5	0.5	101.5	0.5	0.5	0.5	0.5	0.5	0.5	
	ACTUALS	79.0	1.8	1.8	1.8	1.8	1.8	3.4	91.1	0.0	0.0	0.0	0.0	0.0	0.0	
FK *** Sweden																
FTE	PLANNED	120.5	3.6	3.6	3.6	3.6	3.6	3.6	142.0	3.6	3.6	3.6	2.7	3.4	3.6	
	ACTUALS								0.0							
Grand Totals:																
	PLANNED	5819.3	218.1	198.6	282.1	235.1	210.0	226.0	7189.1	221.4	160.8	153.8	139.5	115.5	108.2	
	ACTUALS	4623.9	192.2	200.8	220.5	214.2	211.1	172.6	5835.3	0.0	0.0	0.0	0.0	0.0	0.0	
4.1 GLAST LAT																
Contributed	PLANNED	2265.8	49.8	60.8	61.1	59.7	49.7	65.6	2612.4	55.3	47.2	47.9	45.1	30.6	28.8	
	ACTUALS	850.1	26.4	24.8	24.5	25.8	25.3	50.8	1027.7	0.0	0.0	0.0	0.0	0.0	0.0	
Funded	PLANNED	3553.5	168.3	137.8	221.0	175.4	160.3	160.4	4576.6	166.0	113.6	106.0	94.4	84.8	79.4	
	ACTUALS	3773.8	165.8	176.0	196.1	188.4	185.8	121.8	4807.6	0.0	0.0	0.0	0.0	0.0	0.0	
Grand Totals:																
	PLANNED	5819.3	218.1	198.6	282.1	235.1	210.0	226.0	7189.1	221.4	160.8	153.8	139.5	115.5	108.2	
	ACTUALS	4623.9	192.2	200.8	220.6	214.2	211.1	172.6	5835.3	0.0	0.0	0.0	0.0	0.0	0.0	