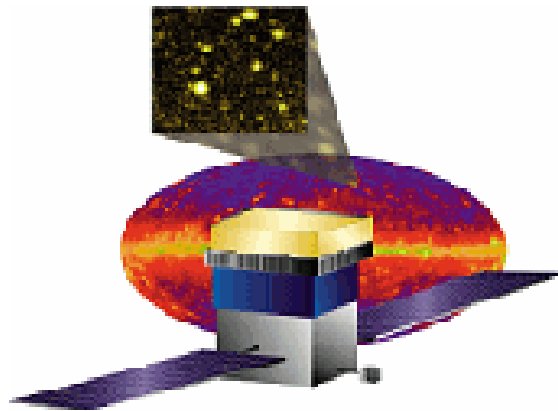


Monthly Progress Report

(Month Ending September 2004)

GLAST Large Area Telescope (LAT)



LAT-MR-05045-01

November 10, 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 September, 2004.

2.0 Recent Progress and Status

4.1.4 Tracker

Nineteen trays were fabricated, 36 layers with multichip modules (MCMs), and 27 layers with silicon. Tray panel fabrication will resume in early October. Bare panel production has continued. Twenty bare panels (full tower) will be ready for kapton bonding in early October. The root cause of the 0% yield of heavy trays in thermal cycling after wire bond encapsulation (silicon to MCM) due to breaking of many wire bonds is not fully understood. Encapsulation will be eliminated from the MCM-silicon joint and design changes are in process.

In parallel with the execution of the recovery plan, the team moved forward with assembly of 19 trays into 'Tower 0'. Operators were trained and assembly procedures, including alignment, were validated. Operation of the full tower with 23 active layers was successful. The interference between connectors on MCMs and sidewalls on many trays was identified.

A total of 342 MCM units were received. Over 200 are through burn in and are in final test. A potential reliability issue regarding Novocap capacitors was raised regarding high leakage current. It was decided to use existing capacitors on existing boards with replacements being kitted for production. Problems with pitch adaptors arose during the month. There was a 13.5% drop-out at mandatory inspection points as well as brittle nickel plating that cracked easily in the bend region, sometimes also cracking copper. Two new pitch adaptor concepts and a new electrical test fixture are in fabrication to eliminate the problem. Issues have been identified with peeling, contamination and bubbles in the conformal coating. Detailed specifications for inspection and rework are under review. Six MCM boards have developed low resistance between two layers (120V and 0V planes) of the multilayer board during burn-in. The test is in process to determine the root cause and an accelerated life test is in progress to evaluate risk.

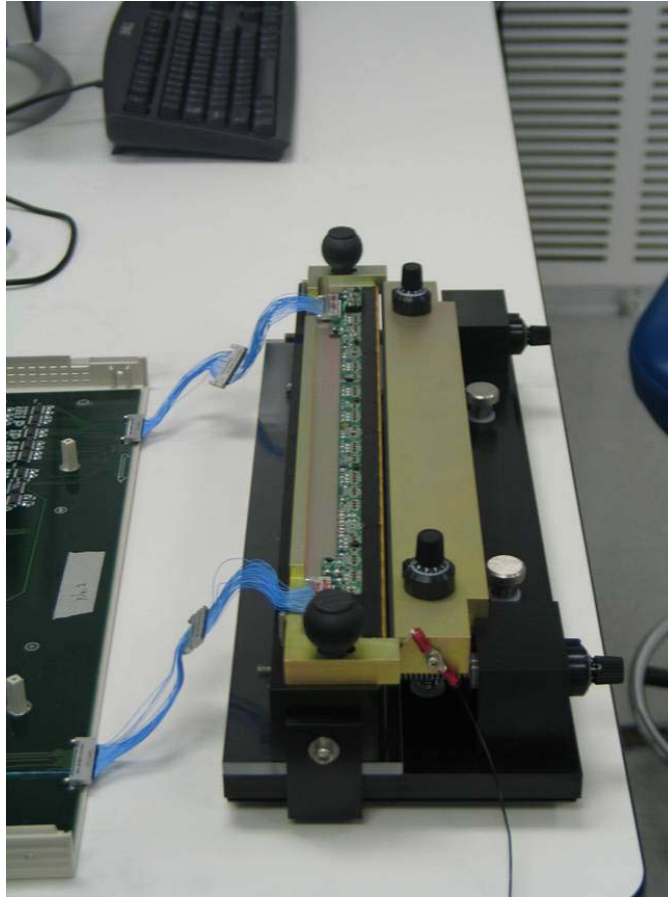


Figure 1: Equipment set-up of pitch adaptor setting.

4.1.5 Calorimeter

The cesium iodide crystals are essentially complete. To date, Kalmar has delivered 1755 tested crystals to NRL. The team is waiting for 78 additional crystals from Amcryst-H. Twelve of the 78 crystals are required to complete the 18th module. The positive-intrinsic-negative photodiode assembly manufacture is complete. All possible crystal detector elements (1755) have been built and tested at Swales. Nineteen flight structures have been manufactured, with seventeen having completed strength verification testing. One has been rejected due to a test anomaly. Two structures are slightly out of tolerance but are being held at NRL for potential flight use, requiring slight modifications to the baseplate. NRL has received fourteen flight structures. Ecole Polytechnique plans to fabricate three more structures (up to 24), providing replacements for the two which are slightly out of tolerance. Eight pre-electronic modules (PEMs) have been completely assembled and tested with cosmic muons. All 110 flight analog front-end electronics (AFEE) boards have been manufactured. Remanufactured AFEE boards have been received, inspected and shipped to the assembly vendor. Twenty four AFEE boards have completed burn in, temperature cycling and conformal coating. The first flight calorimeter module has been completely assembled and performance tested. Protoflight electromagnetic interference and comparability (EMI/EMC) test and vibration test sequences have been completed. No problems have been found with the calorimeter

module. The second flight module has been assembled and preliminary tests with the tower electronics module/TEM power supplies (TEM/TPS) are underway prior to staking and conformal coating of the diode wires.



Figure 2: The backlog of PEMs is slowly being reduced. The first four Calorimeter modules are completely assembled and are in test.

4.1.6 Anticoincidence Detector

Assembly and functional testing of two single row electronic chassis, minus the photomultiplier tubes (PMTs), was completed. Corrective action to resolve fiber ribbon anomalies, including length discrepancies, vents, and fiber bushing orientation, was completed. Fiber ribbons were installed on the flight structure and the installation of tile detector assemblies was begun.

Qualification of the new spring-mounted PMT enclosure was started. Thermal cycling, vibration, and two thermal vacuum cycles on ten spring mounted PMTs was completed. Significant progress was made on writing the test scripts required for EMI testing. An issue was found with the electrical ground support equipment (EGSE) crashing. The development with I&T and the Electronics groups for EGSE/G3 is ongoing. New hardware and software for the EGSE will be required.

4.1.7 Electronics, Data Acquisition, and Flight Software

The Tracker EGSE test stands were completed. Three more Calorimeter flight module TEM/TPSs, including conformal coating/stacking were produced. GASUs were delivered to I&T. Only the power distribution unit (PDU) remains to be provided (in test). Novocaps, another capacitor which was surge-tested, and parts from lead-forming were received for TEM/TPS production. The parts kit shipped to General Technology is being audited. Schedule risk mitigation efforts are in process. All Tracker cable controller 1 and Calorimeter cable controller 1 TEM ASICs were screened with a 95% yield on the function/performance test. There were no failures after burn in. During radiation testing, seven burned-in samples were total ionizing dose tested, up to 10 krad, with no failures.

One non-burned in sample was tested with no failures. The original plan was for eight burned-in chips and a nonconformance report will be written.

Procurement has begun for the GASU, GASU power supply, PDU, and the Spacecraft Interface Unit. The heater control box drawings have been submitted for release, the harness drawings were submitted for review/release, and the statement of work for the harness is in progress.

The Flight Unit Peer Review was conducted and successfully completed with six requests for action generated. The science data interface for the instrument-to-spacecraft interface simulator is working and the development build is undergoing extensive testing. In the primary and secondary boot, event processing unit boot coding is underway. Coding continues for the intertask communication system. A new LAT communications board driver (LCBD) is successfully running all test cases. The driver design is stable and implementation is virtually complete. New tests were added to exercise the new LCBD. Unit testing was conducted with the new LCBD, is complete, and the package has been released. Front end simulator code has been added to support the new ACD data files. Debugging activities continue.

4.1.8 Mechanical Systems

The nickel plating on the flight grid is complete and all required detail parts are available for final operations. The finish machining is 80% complete on the second grid. Lockheed Martin has delivered the top flange and downspout heat pipes. The grid thermal control system instrumentation quantities and locations have been finalized. The grid box tilt table for assembly work has been received. The grid-top flange heat pipe bond process qualification is 80% complete. The grid box assembly static load test planning for the second grid has begun.

4.1.9 Integration & Test (I&T)

Of the 62 total I&T documents and procedures, 30 are currently in the review/approval cycle. The Tracker integration procedure is being developed with Mechanical Systems. The engineering model (EM)-ACD assembly was received, checked out, and integrated with the mini-tower (no EM Calorimeter). The 1x4 lift fixture, 4x4 lift fixture, and Calorimeter mass simulators were delivered. The personnel access platform integration was supported at the subcontractor facility. Currently 267 mechanical ground support equipment drawings are complete or in final release, with 20 remaining for the integration phase at SLAC. Version 4.4.1 of the LAT Test Executive was released. Testing of the science verification, analysis, and calibration (SVAC) pipeline is in progress. Data analysis tools are being debugged in preparation EM2 data taking. The SVAC trending database is complete. Conditioning continued of the Van de Graaff (VdG) to get higher terminal voltage. High multiplicity events were investigated when taking VdG photon data with the tracker mini-tower, which have been shown to be X-ray bursting in VdG at about 1 Hz.



Figure 3: Installation of the Calorimeter EM hardware into the grid mockup.

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). Options are being explored with the international partners to accelerate the Tracker production schedule.

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), the delay in the pre-environmental test review (level 2 milestone 1M1000700), and the instrument pre-ship review (level 2 milestone 1M1000120), 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)

(As of publication of this report, the delivery of the full tracker EM was completed.)

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. New test stand hardware and software deliveries are expected in early November. The test scripts are expected to be completed (though not in final form) by late 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 EGSE milestones are due to delayed receipt and quality problems with connectors. Effort has been diverted to the installation of TEMs on the Test Bed.

- Updated EGSE Systems (#9 & 10) to Tracker (1M74000090 and 1M740000100).
- 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 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)

The demonstration of the ISIS flight qualification test (1M79110) was delayed by unplanned difficulties in getting the science data interface configured and tested properly.

(As of publication of this report, the following milestones were completed: EGSE Systems 9 & 10, EM2 TEM/PS/CTS for FM7 & FM8, the EGSE TEM/TEM PS/CTS w/ GASU, and the LAT Communication Board Driver demonstration)

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 took three weeks longer than planned and delayed the flight grid delivery.

(As of publication of this report, the milestone for the receipt of the flight grid, 1M1P000060, has been completed.)

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 started work. 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.

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.

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
LAT-XR-04779-01	Flight Software Demo Milestones	G. Haller	Approved	N/A

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 month of August, 2004. The September, 2004, incremental FTE report includes a correction, so that the cumulative-to-date actual manpower is correct.

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*	-27	10/22/04					▼															
1M1P000040	CD-4 Approval	03/15/06*	0	03/15/06*						▼														
DOE/NASA Federal Project Managers (Level 1																								
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*	-71	12/06/04					▼															
1M1000700	Pre Environmental Testing Review	07/14/05*	-53	09/28/05						▼														
1M1000120	PSR-(Instrument Pre-Ship Review)	12/01/05*	-26	01/17/06						▼														
Run Date					10/25/04 16:46					GLAST LAT PROJECT Project Milestones (Level 1 and 2)					1020 LT_MS1-2					Sheet 1 of 1				
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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	-200	10/15/04														
1M1000200	Tracker Modules A RFI	07/28/04	-90	12/06/04														
1M1000201	Tracker Modules B RFI	08/18/04	-90	01/04/05														
1M1000220	Tracker Modules 1 RFI	08/18/04	-112	02/04/05														
1M1000221	Tracker Modules 2 RFI	09/08/04	-98	02/04/05														
1M1000250	Flight Tracker Tower 3 RFI	09/08/04	-98	02/04/05														
1M1000251	Flight Tracker Tower 4 RFI	10/14/04	-91	03/04/05														
1M1000260	Flight Tracker Tower 5 RFI	10/14/04	-91	03/04/05														
1M1000261	Flight Tracker Tower 6 RFI	11/05/04	-75	03/04/05														
1M1000270	Flight Tracker Tower 7 RFI	11/05/04	-98	04/06/05														
1M1000271	Flight Tracker Tower 8 RFI	11/24/04	-85	04/06/05														
1M1000280	Flight Tracker Tower 9 RFI	11/24/04	-85	04/06/05														
1M1000281	Flight Tracker Tower 10 RFI	12/17/04	-92	05/06/05														
1M1000290	Flight Tracker Tower 11 RFI	12/17/04	-92	05/06/05														
1M1000291	Flight Tracker Tower 12 RFI	01/11/05	-81	05/06/05														
1M1000300	Flight Tracker Tower 13 RFI	01/11/05	-102	06/07/05														
1M1000301	Flight Tracker Tower 14 RFI	01/25/05	-93	06/07/05														
1M1000310	Flight Tracker Tower 15 RFI	01/25/05	-113	07/06/05														
1M1000311	Flight Tracker Tower 16 RFI	02/08/05	-103	07/06/05														
4.1.5 Calorimeter																		
1M1000210	Calorimeter Modules A RFI	07/09/04	-87	11/10/04														
1M1500	Calorimeter Modules B RFI	07/09/04	-99	11/30/04														
1M1000230	Calorimeter Modules 1 RFI	07/30/04	-88	12/06/04														
1M1510	Calorimeter Modules 2 RFI	08/02/04	-93	12/14/04														
1M1000400	Flight Calorimeter Tower 3 RFI	08/17/04	-87	12/21/04														
1M1520	Flight Calorimeter Tower 4 RFI	08/17/04	-90	01/03/05														
1M1000390	Flight Calorimeter Tower 5 RFI	09/15/04	-70	01/03/05														
1M1530	Flight Calorimeter Tower 6 RFI	09/15/04	-80	01/18/05														
1M1000380	Flight Calorimeter Tower 7 RFI	10/11/04	-62	01/18/05														
1M1540	Flight Calorimeter Tower 8 RFI	10/11/04	-90	02/28/05														
Run Date	11/09/04 16:24		GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			1020 LTX1 - MS (L3) FLX1- MS (L3)			Sheet 1 of 6									
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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	-74	02/28/05										
1M1550	Flight Calorimeter Tower 10 RFI	11/02/04	-104	04/11/05										
1M1560	Flight Calorimeter Tower 12 RFI	11/15/04	-104	04/22/05										
1M1000360	Flight Calorimeter Tower 11 RFI	11/16/04	-94	04/11/05										
1M1000350	Flight Calorimeter Tower 13 RFI	12/02/04	-93	04/22/05										
1M1570	Flight Calorimeter Tower 14 RFI	12/02/04	-103	05/06/05										
1M1000340	Flight Calorimeter Tower 15 RFI (Spare)	01/06/05	-84	05/06/05										
1M1580	Flight Calorimeter Tower 16 RFI (Spare)	01/06/05	-90	05/16/05										
4.1.6 ACD														
1M1001000	ACD Test Scripts (from ACD to I&T)	07/01/04	-82	10/27/04										
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										
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										
1M7941420	EGSE TEM/TEM PS/CTS #2 for Bldg 33-Elec to I&T	02/05/04	-133	08/13/04A										

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

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FLX1- MS (L3)

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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		
1M7941430	EGSE TEM/TEM PS/CTS w/ GASU for B33-Elec to	02/05/04	-197	11/12/04*										
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	-162	10/08/04*										
1M74000100	EGSE System 10: Elec to TKR	02/20/04	-162	10/08/04*										
1M76000030	G3 Test Stand (Fit-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	-156	10/14/04*										
1M1001780	EM2 TEM/PS/CTS for FM8 from Elec to CAL	03/05/04	-156	10/14/04*										
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	-144	12/07/04										
1M79002020	Flight TEM PS Assy B: Elec to I&T	05/19/04	-139	12/07/04										
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	-127	12/07/04										
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	-122	12/07/04										
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	-140	01/28/05										
1M79002040	Flight TEM PS Assy 2: Elec to I&T	07/09/04	-140	02/04/05										

Run Date 11/09/04 16:24

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

1020
LTX1 - MS (L3)
FLX1- MS (L3)

Sheet 3 of 6

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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
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	-139	02/10/05						▼		
1M79002060	Flight TEM PS Assy 4: Elec to I&T	07/23/04	-138	02/16/05						▼		
1M79002070	Flight TEM PS Assy 5: Elec to I&T	07/30/04	-137	02/23/05						▼		
1M79020	Demo: Inter-task Communications	07/30/04	0	07/30/04A					▼			
1M79001030	Flight TEM Assy 1: Elec to I&T	08/03/04	-118	01/28/05						▼		
1M79002080	Flight TEM PS Assy 6: Elec to I&T	08/06/04	-136	03/01/05						▼		
1M79001040	Flight TEM Assy 2: Elec to I&T	08/10/04	-118	02/04/05						▼		
1M79002090	Flight TEM PS Assy 7: Elec to I&T	08/13/04	-136	03/08/05						▼		
1M79001050	Flight TEM Assy 3: Elec to I&T	08/17/04	-117	02/10/05						▼		
1M79002100	Flight TEM PS Assy 8: Elec to I&T	08/20/04	-136	03/15/05						▼		
1M79001060	Flight TEM Assy 4: Elec to I&T	08/24/04	-116	02/16/05						▼		
1M79002110	Flight TEM PS Assy 9: Elec to I&T	08/25/04	-138	03/22/05						▼		
1M79002120	Flight TEM PS Assy 10: Elec to I&T	08/30/04	-140	03/29/05						▼		
1M79001070	Flight TEM Assy 5: Elec to I&T	08/31/04	-115	02/23/05						▼		
1M79030	Demo: Preliminary ISIS	09/01/04	-2	09/03/04A					▼			
1M79002130	Flight TEM PS Assy 11: Elec to I&T	09/02/04	-142	04/05/05						▼		
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	-144	04/12/05						▼		
1M79002150	Flight TEM PS Assy 13: Elec to I&T	09/13/04	-146	04/19/05						▼		
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	-148	04/26/05						▼		
1M79002170	Flight TEM PS Assy 15: Elec to I&T	09/21/04	-150	05/03/05						▼		
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	-152	05/10/05						▼		
1M79001110	Flight TEM Assy 9: Elec to I&T	09/29/04	-114	03/22/05						▼		
1M79080	Demo: LAT Communication Board Driver	10/01/04	0	10/01/04					▼			

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

1020
 LTX1 - MS (L3)
 FLX1 - MS (L3)

Sheet 4 of 6

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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		
1M79090	Demo: Command and Telemetry	10/01/04	0	10/01/04										
1M79100	Demo: 1553 Service	10/01/04	0	10/01/04										
1M79001120	Flight TEM Assy 10: Elec to I&T	10/06/04	-114	03/29/05										
1M79110	Demo: ISIS FQT	10/08/04	-21	11/08/04										
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	-130	04/27/05										
1M7942000	Flight PDU Box-Elec to I&T	10/13/04	-128	04/25/05										
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	-77	02/17/05										
1M79001150	Flight TEM Assy 13: Elec to I&T	10/27/04	-114	04/19/05										
1M79120	Demo: Primary Boot	10/29/04	0	10/29/04										
1M79130	Demo: Secondary Boot	10/29/04	0	10/29/04										
1M79140	Demo: LCB Service	10/29/04	0	10/29/04										
1M79150	Demo: Power/Initialize GASU	10/29/04	0	10/29/04										
1M7941070	Flight GASU Box-Elec to I&T	11/01/04*	-121	05/03/05										
1M7941090	Flight Event Processor Units-Elec to I&T	11/01/04	-117	04/27/05										
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										
1M79160	Demo: File and Memory Management	12/03/04	0	12/03/04										
1M79170	Demo: Spacecraft Interfaces	12/03/04	0	12/03/04										
1M79180	Demo: Inter-task Communications	12/03/04	0	12/03/04										
1M7941440	Final EGSE incl S/C Sim, FSW-Elec to I&T	12/13/04	-89	04/27/05										
1M79190	Demo: Command and Telemetry Data Dictionary	01/07/05	0	01/07/05										
1M79200	Demo: Thermal Control	01/07/05	0	01/07/05										
1M79210	Demo: Watchdog	01/07/05	0	01/07/05										
1M79220	Demo: Charge Injection Calibration	01/07/05	0	01/07/05										
1M79230	Demo: Housekeeping	01/28/05	0	01/28/05										
1M79240	Demo: Event Integrity and Delivery	01/28/05	0	01/28/05										
1M79250	Demo: Event Filtering	01/28/05	0	01/28/05										
1M79260	Demo: GRB Detection and Response	01/28/05	0	01/28/05										
1M79270	Demo: Mode Control	02/25/05	0	02/25/05										

Run Date 11/09/04 16:24

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

1020
LTX1 - MS (L3)
FLX1 - MS (L3)

Sheet 5 of 6

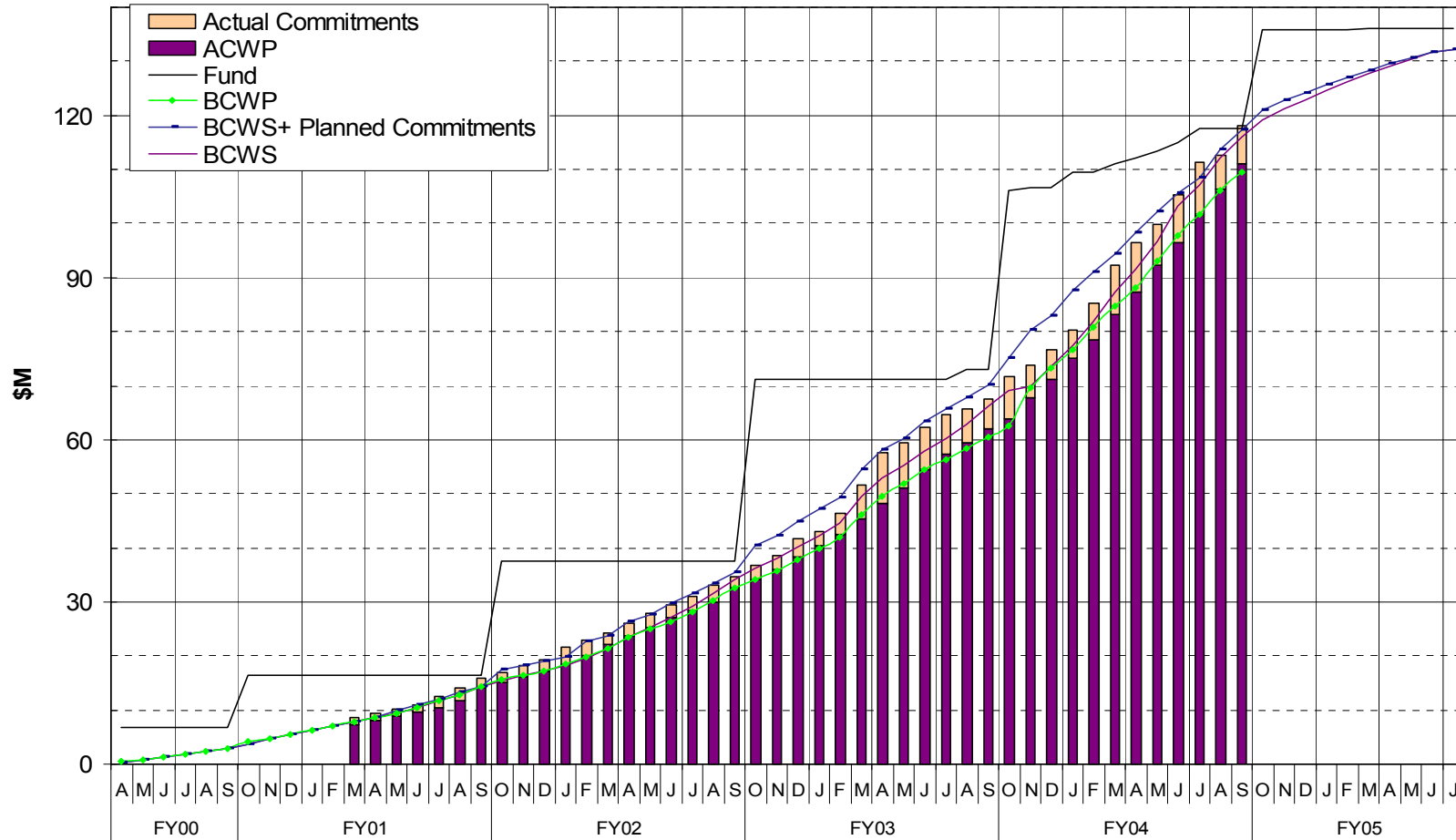
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**Attachment 2
Level 3 Milestones (One-Year View)
Page 6 of 6**

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY04				FY05			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1M79280	Demo: Diagnostics	02/25/05	0	02/25/05								
4.1.8 Mechanical												
1M1000240	Flight Grid RFI-Mech to I&T	07/22/04	-84	11/18/04				•	▽			
1M941710	X-LAT Thermal Plate RFI from Mech to I&T	08/12/04	-119	02/09/05				•		▽		
1M941720	Radiators ready for I&T (from Mech to I&T)	03/17/05	-25	04/21/05							•	▽
4.1.9 I&T												
1M1001790	EM2 TEM/PS for FM9 (return FMA) from I&T to CAL	07/23/04	-104	12/21/04				•		▽		
1M1001800	EM2 TEM/PS for FM10 (return FMB)from I&T to CAL	07/23/04	-104	12/21/04				•		▽		
1M1001810	EM2 TEM/PS for FM11 (return FM1) from I&T to CAL	08/13/04	-120	02/11/05				•		▽		
1M1001820	EM2 TEM/PS for FM12 (return FM2) from I&T to CAL	08/16/04	-124	02/18/05				•		▽		
1M1001830	EM2 TEM/PS for FM13 (return FM3) from I&T to CAL	08/31/04	-117	02/25/05				•		▽		
1M1001840	EM2 TEM/PS for FM14 (return FM4) from I&T to CAL	08/31/04	-121	03/03/05				•		▽		
1M1001850	EM2 TEM/PS for FM15 (return FM5) from I&T to CAL	09/29/04	-105	03/09/05				•		▽		
1M1001860	EM2 TEM/PS for FM16 (return FM6) from I&T to CAL	09/29/04	-109	03/15/05				•		▽		
4.1.B ISOC												
1M005480	ISOC CDR	03/12/04	-101	08/04/04A		•		▼				
1M1000112	Mission Operations Review (L-21mo.)	11/10/04	-99	04/12/05				•			▽	
1M7941270	Ground System Interface Test start	11/10/04	-99	04/12/05				•			▽	
Run Date	11/09/04 16:24		GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)		1020 LTX1 - MS (L3) FLX1- MS (L3)		Sheet 6 of 6					
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Attachment 3

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



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

Monthly Contractor Financial Management Report									Report for Month Ending: 9/30/2004		
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	OCT04	NOV04		Project Estimate	Budget Value		
4.1.1 INSTRUMENT MANAGEMENT	439	386	13,920	13,896	363	346	2,282	16,911	16,911		
4.1.2 SYSTEM ENGINEERING	223	185	5,413	5,659	152	152	1,331	7,047	7,047		
4.1.4 TRACKER	1,347	513	15,155	15,274	674	219	525	16,573	16,573		
4.1.5 CALORIMETER	567	616	17,905	19,829	581	349	3,186	22,022	22,022		
4.1.6 ANTICOINCIDENCE DETECTOR	202	471	14,508	15,040	118	80	890	15,595	15,595		
4.1.7 ELECTRONICS	536	461	19,832	20,509	269	229	1,725	22,055	22,055		
4.1.8 MECHANICAL SYSTEMS	765	648	11,634	12,088	409	406	1,729	14,179	14,179		
4.1.9 INTEGRATION & TEST	335	419	4,978	5,397	283	264	2,239	7,764	7,764		
4.1.A PERFORMANCE AND SAFETY ASSURANCE	142	118	2,231	2,324	142	135	427	2,935	2,935		
4.1.B LAT INSTRUMENT OPERATIONS CENTER	3	3	296	296	4	3	25	328	328		
4.1.C EDUCATION AND PUBLIC OUTREACH	64	71	1,606	1,984	51	44	748	2,448	2,448		
4.1.D SCIENCE ANALYSIS SOFTWARE	61	48	2,159	2,309	78	74	708	3,019	3,019		
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	4,686	3,941	110,961	115,928	3,123	2,302	15,816	132,202	132,202		

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

Monthly Contractor Financial Management Report								Report for Month Ending: 9/30/2004	
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	OCT04	NOV04			
DG *** GSFC	255	508	15,805	16,644	155	115	1,465	17,541	17,541
DH *** HEPL	463	227	5,724	6,286	139	135	1,543	7,542	7,542
DL *** SLAC	3,116	2,402	63,704	64,774	2,052	1,510	7,718	74,984	74,984
DN *** NRL	753	691	21,615	23,655	680	455	3,929	26,679	26,679
DO *** Financial Plan Transfer/Sub Ou	0	0	59	54	0	0	-5	54	54
DS *** SSU	64	68	1,592	1,944	50	43	716	2,401	2,401
DT *** Texas A&M	0	0	15	16	0	0	0	16	16
DU *** UCSC	35	36	2,271	2,378	38	36	381	2,726	2,726
DW *** UW	1	9	175	178	9	8	68	260	260
Total	4,686	3,941	110,961	115,928	3,123	2,302	15,816	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	OCT04	NOV04				
RL LABOR	1,977	1,779	54,289	55,503	1,458	1,257	8,159	65,164	65,164	
<i>FTE (DOE/NASA)</i>	234.9	170.5	5,042.5	4,742.9	114.0	106.0	263.0	5,525.5	5,525.5	
<i>HOURS (DOE/NASA)</i>	39,473	28,642	841,181	788,223	19,089	16,956	38,121.0	915,347	915,347	
RT TRAVEL	45	62	1,398	1,936	68	64	951	2,481	2,481	
RM MATERIAL & SERVICES	2,664	2,096	52,916	56,004	1,593	978	6,471	61,958	61,958	
RX MPS & LAB TAX	0	3	2,357	2,486	4	4	234	2,599	2,599	
Total (not incl FTE/Hours)	4,686	3,941	110,961	115,928	3,123	2,302	15,816	132,202	132,202	

Attachment 6
LAT Performance, through September 2004, by WBS

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:				Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 8/31/2004 9/30/2004				
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		Schedule	Cost	Work Scheduled	Work Performed		Schedule	Cost			
Item	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
4.1.1 INSTRUMENT MANAGEMENT	386	386	439	0	-53	13,896	13,896	13,920	0	-24	16,911	16,911	0
4.1.2 SYSTEM ENGINEERING	185	185	223	0	-38	5,659	5,659	5,413	0	247	7,047	7,047	0
4.1.4 TRACKER	513	654	1,347	141	-693	15,274	14,699	15,155	-575	-456	16,573	16,573	0
4.1.5 CALORIMETER	616	482	567	-134	-85	19,829	17,933	17,905	-1,896	28	22,022	22,022	0
4.1.6 ANTICOINCIDENCE DETECTOR	471	295	202	-176	93	15,040	14,465	14,508	-574	-42	15,595	15,595	0
4.1.7 ELECTRONICS	461	186	536	-276	-351	20,509	18,121	19,832	-2,388	-1,710	22,055	22,055	0
4.1.8 MECHANICAL SYSTEMS	648	579	765	-69	-186	12,088	11,515	11,634	-573	-119	14,179	14,179	0
4.1.9 INTEGRATION & TEST	419	304	335	-115	-31	5,397	4,902	4,978	-494	-76	7,764	7,764	0
4.1.A PERFORMANCE AND SAFETY AS	118	118	142	0	-25	2,324	2,324	2,231	0	93	2,935	2,935	0
4.1.B LAT INSTRUMENT OPERATIONS	3	3	3	0	0	296	296	296	0	0	328	328	0
4.1.C EDUCATION AND PUBLIC OUTRE	71	95	64	24	31	1,984	1,984	1,606	0	378	2,448	2,448	0
4.1.D SCIENCE ANALYSIS SOFTWARE	48	48	61	0	-13	2,309	2,309	2,159	0	149	3,019	3,019	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	3,941	3,337	4,686	-604	-1,350	115,928	109,429	110,961	-6,500	-1,532	132,202	132,202	0
Contingency											3,783	3,783	0
Total	3,941	3,337	4,686	-604	-1,350	115,928	109,429	110,961	-6,500	-1,532	135,985	135,985	0

Attachment 7
LAT Performance, through September 2004, by Organization

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:				Contract Type/No:				Project Name/No: GLAST LAT Project		Report Period: 8/31/2004 9/30/2004			
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		
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	508	332	255	-176	77	16,644	16,069	15,805	-574	264	17,541	17,541	0
DH *** HEPL	227	227	463	0	-236	6,286	6,280	5,724	-6	555	7,542	7,542	0
DL *** SLAC	2,402	2,087	3,116	-315	-1,029	64,774	60,882	63,704	-3,892	-2,822	74,984	74,984	0
DN *** NRL	691	553	753	-137	-199	23,655	21,638	21,615	-2,018	23	26,679	26,679	0
DO *** Financial Plan	0	0	0	0	0	54	54	59	0	-5	54	54	0
DS *** SSU	68	92	64	24	29	1,944	1,944	1,592	0	352	2,401	2,401	0
DT *** Texas A&M	0	0	0	0	0	16	16	15	0	0	16	16	0
DU *** UCSC	36	36	35	0	2	2,378	2,368	2,271	-9	97	2,726	2,726	0
DW *** UW	9	9	1	0	8	178	178	175	0	3	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	3,941	3,337	4,686	-604	-1,350	115,928	109,429	110,961	-6,500	-1,532	132,202	132,202	0
Contingency											3,783	3,783	0
Total	3,941	3,337	4,686	-604	-1,350	115,928	109,429	110,961	-6,500	-1,532	135,985	135,985	0

**Attachment 8
LAT Performance Analysis, September 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	115,928	109,429	110,961	-6,500	-1,532	87.69	82.77	83.93	↔	↓	0.944	0.986	134,053	135,425
2	4.1.1	Instr Mgmt	16,911	13,896	13,896	13,920	0	-24	82.17	82.17	82.31	↑	↓	1.000	0.998	16,940	16,940
3	4.1.2	System Engr	7,047	5,659	5,659	5,413	0	247	80.31	80.31	76.81	↔	↓	1.000	1.046	6,740	6,740
4	4.1.4	Tracker	16,573	15,274	14,699	15,155	-575	-456	92.16	88.69	91.44	↑	↓	0.962	0.970	17,088	17,164
5	4.1.5	Calorimeter	22,022	19,829	17,933	17,905	-1,896	28	90.04	81.43	81.31	↔	↓	0.904	1.002	21,987	22,419
6	4.1.6	ACD	15,595	15,040	14,465	14,508	-574	-42	96.44	92.75	93.02	↓	↑	0.962	0.997	15,641	15,686
7	4.1.7	Electronics	22,055	20,509	18,121	19,832	-2,388	-1,710	92.99	82.16	89.92	↓	↓	0.884	0.914	24,136	24,704
8	4.1.8	Mechanical	14,179	12,088	11,515	11,634	-573	-119	85.26	81.22	82.05	↔	↓	0.953	0.990	14,325	14,459
9	4.1.9	I&T	7,764	5,397	4,902	4,978	-494	-76	69.51	63.14	64.12	↓	↓	0.908	0.985	7,884	8,177
10	4.1.A	PSA	2,935	2,324	2,324	2,231	0	93	79.17	79.17	76.01	↔	↓	1.000	1.042	2,818	2,818
11	4.1.B	ISOC	328	296	296	296	0	0	90.14	90.14	90.12	↔	↑	1.000	1.000	328	328
12	4.1.C	EPO	2,448	1,984	1,984	1,606	0	378	81.02	81.02	65.59	↑	↔	1.000	1.235	1,982	1,982
13	4.1.D	SAS	3,019	2,309	2,309	2,159	0	150	76.47	76.47	71.51	↔	↓	1.000	1.069	2,824	2,824
14	4.1.E	Balloon Flight	1,325	1,325	1,325	1,325	0	0	100.00	100.00	100.00	↔	↓	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

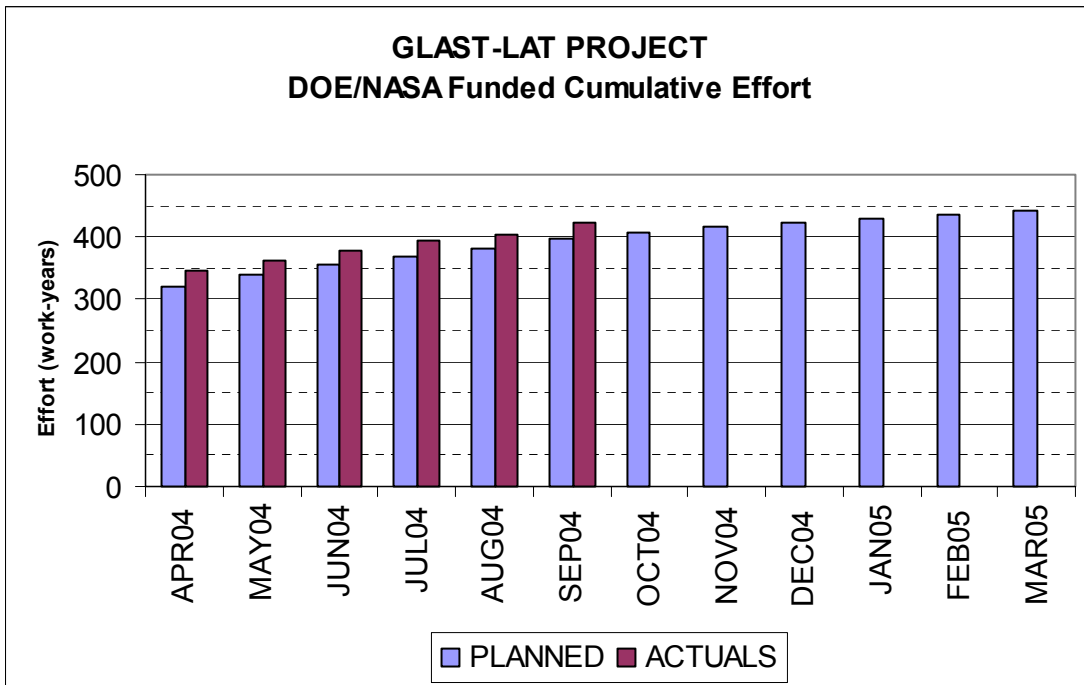
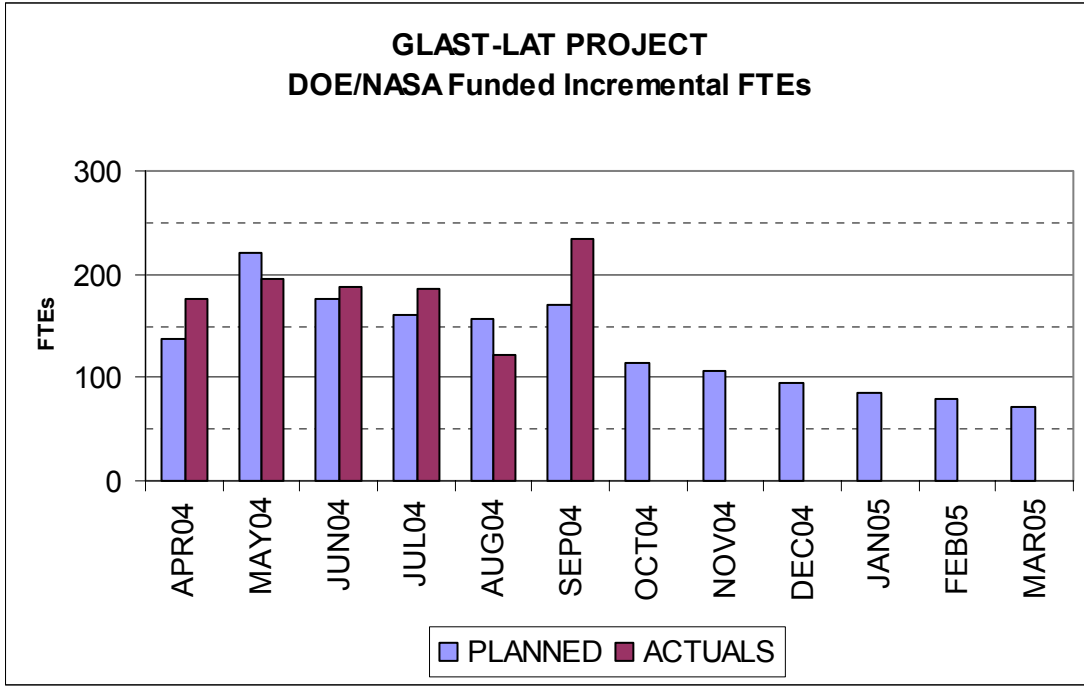
% ACWP: Percent Spent = ACWP/BAC

Cpi_Fcst: CPI (to date) EAC Forecast = BAC / CPI

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

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

Note: Neither Goddard nor Stanford-HEPL manpower was reported in the month of August, 2004. The September, 2004, incremental FTE report includes a correction, so that the cumulative-to-date actual manpower is correct.



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

Program: LAT3		Description: GLAST LAT Project		Approval: Program Manager												
Run Date: 10/25/2004		Status Date: 9/30/2004		Functional Manager			Cost Account Manager									
			PRIOR	APR04	MAY04	JUN04	JUL04	AUG04	SEP04	Cum-to- Date	OCT04	NOV04	DEC04	JAN05	FEB05	MAR05
OBS																
DG *** GSFC																
FTE	PLANNED	836.4	58.3	28.6	38.3	31.6	54.1	55.3	1102.5	13.3	17.8	13.0	7.7	7.7	7.7	
	ACTUALS	962.6	45.4	61.1	47.3	46.2	0.0	69.7	1232.4	0.0	0.0	0.0	0.0	0.0	0.0	
DH *** HEPL																
FTE	PLANNED	259.2	2.4	3.4	4.5	4.9	-0.9	2.0	275.3	3.8	3.8	3.7	3.8	3.8	3.8	
	ACTUALS	256.3	2.7	3.6	3.9	1.5	0.0	5.9	273.8	0.0	0.0	0.0	0.0	0.0	0.0	
DL *** SLAC																
FTE	PLANNED	1948.0	78.1	158.4	98.2	89.4	85.4	94.3	2551.9	80.2	77.3	77.5	69.7	65.0	61.4	
	ACTUALS	1837.4	91.0	95.2	101.4	105.0	105.6	124.1	2459.6	0.0	0.0	0.0	0.0	0.0	0.0	
DN *** NRL																
FTE	PLANNED	889.6	17.1	49.4	52.2	44.2	41.4	31.9	1125.7	29.4	21.0	17.6	15.9	12.8	10.7	
	ACTUALS	902.0	35.4	42.6	39.8	36.4	31.8	41.1	1129.1	0.0	0.0	0.0	0.0	0.0	0.0	
DS *** SSU																
FTE	PLANNED	90.1	3.2	3.2	3.2	3.2	3.2	3.2	109.0	2.0	2.0	1.9	1.9	1.9	1.9	
	ACTUALS	105.0	6.0	3.4	2.7	3.4	4.6	4.9	130.0	0.0	0.0	0.0	0.0	0.0	0.0	
DU *** UCSC																
FTE	PLANNED	244.6	4.4	4.4	4.4	4.4	4.4	4.4	271.1	4.4	4.4	4.4	4.4	4.4	4.4	
	ACTUALS	294.0	6.7	1.0	5.5	5.0	5.0	4.7	321.9	0.0	0.0	0.0	0.0	0.0	0.0	
DW *** UW																
FTE	PLANNED	39.3	0.4	0.4	0.4	0.4	0.4	0.4	41.7	0.4	0.4	0.4	0.4	0.4	0.4	
	ACTUALS	13.1	1.0	1.1	1.0	1.1	1.0	1.1	19.3	0.0	0.0	0.0	0.0	0.0	0.0	
FF *** France																
FTE	PLANNED	1107.8	15.2	15.2	15.2	15.2	15.2	15.2	1198.7	14.2	13.9	10.8	6.4	6.7	6.7	
	ACTUALS								0.0							
FI *** Italy																
FTE	PLANNED	399.2	15.6	15.2	14.9	12.8	14.6	15.2	487.4	9.1	9.1	7.1	1.5	1.5	1.5	
	ACTUALS	364.9	10.9	10.9	10.9	10.9	21.2	0.0	429.5	0.0	0.0	0.0	0.0	0.0	0.0	
FJ *** Japan																
FTE	PLANNED	99.2	0.5	0.5	0.5	0.5	0.5	0.5	101.9	0.5	0.5	0.5	0.5	0.5	0.5	
	ACTUALS	80.7	1.8	1.8	1.8	1.8	3.4	0.0	91.1	0.0	0.0	0.0	0.0	0.0	0.0	
FK *** Sweden																
FTE	PLANNED	124.1	3.6	3.6	3.6	3.6	3.6	3.6	145.5	3.6	3.6	2.7	3.4	3.6	3.6	
	ACTUALS								0.0							
Grand Totals:																
	PLANNED	6037.4	198.6	282.1	235.1	210.0	221.7	225.8	7410.7	160.8	153.8	139.5	115.5	108.2	102.5	
	ACTUALS	4816.1	200.8	220.5	214.2	211.1	172.6	251.4	6086.7	0.0	0.0	0.0	0.0	0.0	0.0	
4.1 GLAST LAT																
Contributed	PLANNED	2315.6	60.8	61.1	59.7	49.7	65.6	55.3	2667.8	47.2	47.9	45.1	30.6	28.8	30.5	
	ACTUALS	876.5	24.8	24.5	25.8	25.3	50.8	16.5	1044.2	0.0	0.0	0.0	0.0	0.0	0.0	
Funded	PLANNED	3721.8	137.8	221.0	175.4	160.3	156.1	170.5	4742.9	113.6	106.0	94.4	84.8	79.4	72.0	
	ACTUALS	3939.6	176.0	196.1	188.4	185.8	121.8	234.9	5042.5	0.0	0.0	0.0	0.0	0.0	0.0	
Grand Totals:																
	PLANNED	6037.4	198.6	282.1	235.1	210.0	221.7	225.8	7410.7	160.8	153.8	139.5	115.5	108.2	102.5	
	ACTUALS	4816.1	200.8	220.6	214.2	211.1	172.6	251.4	6086.7	0.0	0.0	0.0	0.0	0.0	0.0	