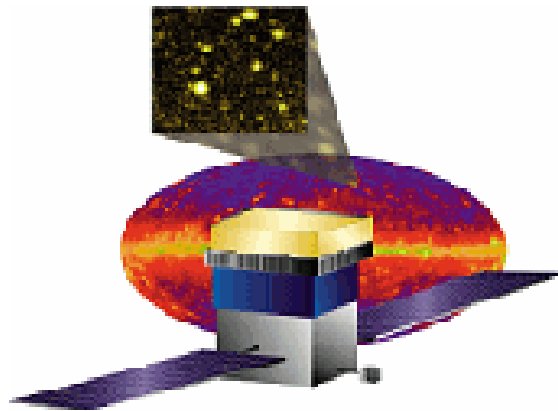


Monthly Progress Report

(Month Ending August 2005)

GLAST Large Area Telescope (LAT)



LAT-MR-07332-01

October 4, 2005

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, 2005.

2.0 Recent Progress and Status

4.1.4 Tracker

All flight tray panels and sidewalls are completed. Multichip module (MCM) production is also complete. All sixteen flight towers have been assembled; however, some cables are still missing. The ninth and tenth towers each had one tray with high noise on one side when at elevated temperature. These trays were two of the first trays built and differ from following trays in that the wire bonds from MCM to silicon strip detectors and bias circuit are encapsulated with silicone. The bad tray in the ninth tower was replaced, and the tower has completed a second round of environmental testing. The bad tray in the tenth tower will be replaced in early September, and the tower will repeat environmental testing after installation of the remaining flight cables. All flight cables are expected to be available in early September. Environmental testing will be completed in September, and the last flight tower should ship from Italy by September 30. The 17th tower will also be assembled and tested by the end of September and should be a true flight spare. Assembly of the 18th tower will be done afterwards, and it will include some non-flight-quality parts.

4.1.6 Anticoincidence Detector

Thermal vacuum and mass property testing of the ACD was completed. The pre-ship review was conducted, and the ACD was shipped to SLAC.



Figure 1: The ACD on its shipping dolly being brought into the LAT Integration and Test Facility.

4.1.7 Electronics, Data Acquisition, and Flight Software

Fifteen tower electronics modules (TEMs) and tower power supplies (TPSs) have now been delivered to Integration & Test. Five are ready for review. The last unit is undergoing thermal vacuum testing.

The power distribution unit (PDU) flight unit is tested and ready for review. The spare unit is ready for safe-to-mate and performance testing.

The GASU flight unit is in conformal coating.

Connectors (cCPI) were assembled on the flight backplanes for the spacecraft interface unit (SIU) and event processing unit (EPU). A short was discovered; the non-conformance reporting process resulted in a "use-as-is" determination since those two pins are not used. Seven backplanes are assembled; three of these are in final assembly and conformal coating.

A flight RAD750 processor was integrated into a SIU (spacecraft interface unit) crate; performance tests were successful. One modules each for the spacecraft interface board and LAT communications board assemblies were received.

Spare LAT harness cables are being reworked. Boards have been assembled for the heater control box. Parts for the harness interconnect box have been kitted.

Thermal vacuum testing of the radiators at Lockheed has been completed. The electronics ground support equipment should return to SLAC shortly.

Configuration parameters were incorporated into all relevant flight software packages. Filter infrastructure was built for the Calorimeter pedestal, gains and geometry files. The preliminary event output format definitions were completed; high-energy Gamma are about 500-600 compressed bytes. Code to write data to the solid state recorder was delivered. Testing of the instrument manager modes was completed. A number of bug fixes were made involving the charge injection calibration compaction routines, front-end simulator, ring buffers, and thermal code.

4.1.8 Mechanical Systems

The grid box assembly for the static load test is nearly complete and all test hardware has been received. The test interface plate assembly has been delayed due to conflicts with ACD receiving, but is back underway. The shipping container for the second grid is expected to be available in early September. A minor rework of the cross-LAT (X-LAT) plate strongback support equipment is being made. The radiator panels are undergoing thermal vacuum testing. Acoustic testing has been completed, with good results.



Figure 2: Radiator in thermal vacuum test preparations.

4.1.9 Integration & Test (I&T)

Two additional towers were installed on the flight grid, and the eight-tower tests were performed. The ACD was received and tested; scripts were integrated with the I&T script base. The second grid was assembled and prepared for the static load test. Version 4.10.1 of the LAT Test Executive (LATTE) was released for tower/ACD testing. Parallelized tests scripts were created, to reduce multiple-tower test durations. Work on the LAT Instrument Checkout System (LICOS) is underway. A mobile rack for online software has been set up; system configuration is being finalized. The fifth Science, Verification, Analysis and Calibration workshop was held. The first results from initial Monte Carlo simulations of the ACD/tower integration were produced. A comprehensive review of Tracker data taken (up to eight towers) was conducted. Two additional workshops are planned to guide the science team through integration. A design review for the transport container is being planned for early September. A final design review of the environmental test stand was conducted, and procurement is underway.



Figure 3: The ACD delivery and receiving team.

4.1.B Instrument Science Operations Center

Preliminary test objectives and procedures were determined for the third and fourth ground readiness tests (GRTs), and the two test dates were swapped to give more time for the larger of the two tests. The next GRT is scheduled for October, and will include a regression test for ISOC. The following GRT will occur in December; it will incorporate new data products from the mission operations center into the ISOC database, trending data and display/plot, logging, and science data processing. Software releases are planned approximately four weeks prior to each GRT. A Ground System Discrepancy Review Board was formed, to review results from ground testing. ISOC code modules are being integrated into the LICOS framework, for support of integration & test. A technical interchange meeting on LAT configuration control was held. Plans for the operations facility were reviewed.

3.0 Schedule Status

The critical path for the project is the fabrication of components of the Spacecraft Interface Unit and Event Processing Unit. There is currently three days' schedule float to the shipment of the LAT instrument. A workaround plan is in place to start the checkout of flight configuration in October.

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. The pre-environmental test review and pre-ship review milestones (1M1000700 and 1M1000120) have been delayed as a result of this critical path.

Attachment 2 shows the status of the remaining Level 3 milestones. The following level 3 milestones were completed during this reporting period:

Milestone Number	Description	Date Completed
1M1000261	Flight Tracker Tower 6	8/1/05
1M1000410	ACD Flight Unit	8/23/05
1M79001110	Flight TEM Assy 9	8/5/05
1M79002110	Flight TEM PS Assy 9	8/5/05
1M79001120	Flight TEM Assy 10	8/5/05
1M79002120	Flight TEM PS Assy 10	8/5/05
1M79001130	Flight TEM Assy 11	8/5/05
1M79002130	Flight TEM PS Assy 11	8/5/05
1M79001140	Flight TEM Assy 12	8/26/05
1M79002140	Flight TEM PS Assy 12	8/26/05
1M79001150	Flight TEM Assy 13	8/26/05
1M79002150	Flight TEM PS Assy 13	8/26/05
1M79520	FSW Test Peer Review Complete	8/15/05
1M99030	Start 8 Tower Comprehensive Performance Test	8/5/05

Unfavorable variance projections greater than one week are discussed below, listed by responsible subsystem.

4.1.4 Tracker

The remaining Tracker towers have been delayed due to cable delivery delays. The primary cable vendor is producing a 10% yield. The second cable vendor also experienced some manufacturing problems, delaying the first deliveries from July into August. These delays are being mitigated by assembling and testing towers without cables, adding the cables when available. In August, the second vendor began delivering cables in sufficient quantities that all flight cables are available by the time the environmental testing finishes in September.

4.1.7 Electronics

The following milestones have been delayed at the assembly vendor. The main issue was the quality of the solder assembly of the cPCI connectors onto the cPCI boards. The LAT project continued to work with the vendor to improve the situation. The issues have been resolved and the modules are all being assembled.

- * Flight PDU Box (1M17942000)
- * Flight GASU Box (1M7941070)
- * LCB Flight Units (1M7R050)
- * Flight Event Processor Units (1M7941090)
- * Flight EPU/SIUs (1M7R040, 1M7R010, 1M7R020, 1M7R030, 1M7941080)

As of publication of this report, 19 TEM/TPS modules have completed testing and documentation and passed review. The harness (1M7941110) has been delayed due to cable parts shortages. Delays in flight software, and the addition of a Virtual Spacecraft Simulator to make LAT control/readout simpler for installation and test have led to the delay of the milestone for final electronics ground support equipment (1M7941440).

The flight software demonstrations were replaced as measures of progress by the running of real test scripts that will be used for the flight software formal qualification testing (FQT). The FQT Readiness Review (1M79550) occurred in September. Effort required to complete the Science Test Data Output milestone (1M79510) was underestimated, complicated by the absence of a key resource. This impacts the subsequent flight software milestones.

4.1.8 Mechanical Systems

Radiator delivery (milestone 1M941720) has slipped due to the extra time required to install instrumentation harnesses onto the radiators. Some of the thermostats de-bonded during these harness operations (cause is still under investigation). These harnesses have now been installed. The radiator thermal vacuum test set-up and test instrumentation took longer than planned, delaying the start of the test.

4.1.9 Integration & Test

Variances to the “Ready to Ship” and subsequent milestones are driven by the critical path for the project, as described above.

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.

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.C Education & Public Outreach

The favorable cost variance is due to outstanding commitments which have not yet been costed. This is not a concern at this time.

6.0 Change Control and Contingency Analysis

A summary of change requests approved and implemented during this period (Level 3 and above), including the impacts on the FY05 LAT cost contingency, is below.

Change Request No.	Description	Submitted By	FY05 Contingency Impact ¹
LAT-XR-02904-01	Light-Tight Requirement	L. Lee	N/A
LAT-XR-06855-01	Changes to LAT Systems Assembly Drawings	M. Nordby	N/A
LAT-XR-07035-01	Changes to the LAT Integration Sequence	M. Nordby	N/A
LAT-XR-07088-01	System Engineering Consolidation	D. Horn	\$36K
LAT-XR-07089-01	ACD Cost Variance	T. Johnson	\$361K
LAT-XR-07090-01	Aeroflex Change Order	G. Haller	\$42K
LAT-XR-07091-01	Add'l UTM Receiver Chips	G. Haller	\$35K
LAT-XR-07092-01	T-V Chamber Operation Labor	G. Haller	\$118K ²
LAT-XR-07093-01	Environmental Test Cabling	G. Haller	\$130K
LAT-XR-07094-01	Extend Flight Software Schedule	D. Horn	\$360K
LAT-XR-07095-01	DAQ Schedule Delay	G. Haller	\$124K ²

¹ A positive number indicates a draw on contingency.

² Additional budget approved for FY06 will be reported when FY06 baseline budget approved.

Change Request No.	Description	Submitted By	FY05 Contingency Impact
LAT-XR-07102-01	Tracker Cable Production Improvement	R. Johnson	\$120K
LAT-XR-07116-01	Tracker MCM Production	R. Johnson	\$150K
LAT-XR-07117-01	Nanoconnectors for Tracker Flex Cables	R. Johnson	\$25K
LAT-XR-07118-01	Add'l Tracker Bias Circuits	R. Johnson	\$18K
LAT-XR-07119-01	Tracker ASIC Grinding & Dicing	R. Johnson	\$33K
LAT-XR-07178-01	ACD Receiving Test Definition	P. Hascall	N/A

The cost baseline through FY05 is \$155,577K Funding applicable to that baseline is \$157,307K; the resulting contingency through FY05 is \$1,045K.

7.0 Staffing

Attachment 9 demonstrates the staffing plan funded by DOE/NASA, and reports of actual manpower received. This report includes contracted labor which is bookkept as M&S.

Actual incremental ACD FTEs for the month exceeded plan due to weekend work to complete the ACD. In addition, the Goddard labor charging system accounted for approximately six to seven weeks' work in the August close.

Hardware delays have prevented the planned rampdown of Performance & Safety Assurance staff from occurring at this time.

The Calorimeter subsystem will be closed out in September, and the remaining work will be distributed to other subsystems. In advance of this, the actual costs for August have been charged to the other subsystems.

Attachment 2 Future Level 3 Milestones Page 1 of 2

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY05				FY06					
					Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Instrument Project Office (Level 3)														
4.1.1 Instrument Management														
1M1001920	Pre-Environmental Test Review	12/20/05	-17	01/23/06										▽
4.1.4 Tracker														
1M1000270	Flight Tracker Tower 7 RFI	06/27/05	-57	09/16/05										▽
1M1000271	Flight Tracker Tower 8 RFI	07/06/05	-65	10/06/05										▽
1M1000280	Flight Tracker Tower 9 RFI	07/15/05	-44	09/16/05										▽
1M1000281	Flight Tracker Tower 10 RFI	07/26/05	-42	09/23/05										▽
1M1000290	Flight Tracker Tower 11 RFI	08/04/05	-41	10/03/05										▽
1M1000291	Flight Tracker Tower 12 RFI	08/15/05	-34	10/03/05										▽
1M1000300	Flight Tracker Tower 13 RFI	08/24/05	-29	10/05/05										▽
1M1000301	Flight Tracker Tower 14 RFI	09/02/05	-14	09/23/05										▽
1M1000310	Flight Tracker Tower 15 RFI	09/13/05	-23	10/14/05										▽
1M1000311	Flight Tracker Tower 16 RFI	09/22/05	-18	10/18/05										▽
4.1.7 Electronics														
1M7941440	Final EGSE incl S/C Sim, FSW-Elec to I&T	04/01/05	-128	10/03/05										▽
1M7942000	Flight PDU Box-Elec to I&T	07/01/05	-85	11/01/05										▽
1M7941110	Flight Harness-Elec to I&T	07/05/05	-45	09/07/05										▽
1M7941070	Flight GASU Box-Elec to I&T	07/19/05	-81	11/10/05										▽
1M7R050	LCB Flight Units - Elec to Elec	07/20/05	-68	10/25/05										▽
1M79001160	Flight TEM Assy 14: Elec to I&T	07/26/05	-37	09/16/05										▽
1M79002160	Flight TEM PS Assy 14: Elec to I&T	07/26/05	-37	09/16/05										▽
1M79001170	Flight TEM Assy 15: Elec to I&T	08/02/05	-32	09/16/05										▽
1M79002170	Flight TEM PS Assy 15: Elec to I&T	08/02/05	-32	09/16/05										▽
1M79510	Science Test Data Output	08/08/05	-22	09/08/05										▽
1M79001180	Flight TEM Assy 16: Elec to I&T	08/09/05	-32	09/23/05										▽
1M79002180	Flight TEM PS Assy 16: Elec to I&T	08/09/05	-32	09/23/05										▽
1M7941090	Flight Event Processor Units-Elec to I&T	08/19/05	-70	11/30/05										▽
1M7R040	1st Flight EPU/SIU-Elec to I&T	08/19/05	-70	11/30/05										▽
1M7R010	2nd Flight EPU/SIU-Elec to I&T	08/24/05	-72	12/07/05										▽
1M7R020	3rd Flight EPU/SIU-Elec to I&T	08/26/05	-75	12/14/05										▽
1M79530	Release FSW for FQT	08/29/05	-15	09/20/05										▽
1M79540	FQT Scripts Complete	08/30/05	-11	09/15/05										▽
1M7R030	4th Flight EPU/SIU-Elec to I&T	08/30/05	-78	12/21/05										▽
Run Date	09/28/05 14:15	GLAST LAT PROJECT Project Milestones (Level 3) Planned Milestones			0916 LTX2 - MS3 (planned) FLX1- MS (L3)					Sheet 1 of 2				
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Attachment 2
Future Level 3 Milestones
Page 2 of 2

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	FY05				FY06						
					Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1M79550	FQT Readiness Review	09/01/05	-15	09/23/05											
1M7941080	5th Flight EPU/SIU-Elec to I&T	09/02/05	-113	12/26/05											
1M79560	FQT Complete	09/15/05	-11	09/30/05											
1M79610	FSW RFI to I&T	10/03/05	0	10/03/05											
1M79620	Delta Test Readiness Review	11/18/05	0	11/18/05											
4.1.8 Mechanical															
1M941720	Radiators ready for I&T (from Mech to I&T)	07/22/05	-41	09/20/05											
4.1.9 I&T															
1M99040	Start 16 Tower Comprehensive Performance Test	09/07/05	-23	10/10/05											
1M1000130	LAT Ready to Ship to NRL for Env Test	12/20/05	-17	01/23/06											
1M19010	Ship LAT to NRL for Env Test	12/26/05	-30	01/27/06											
1M19020	LAT EMI/EMC Test	02/01/06	-43	03/16/06											
1M19030	LAT Sine Vibe	02/14/06	-9	02/23/06											
1M19040	LAT Acoustic Test	02/26/06	-29	03/27/06											
1M19050	LAT TVAC	04/15/06	-31	05/16/06											
1M19060	LAT Weight & CG	04/17/06	-38	05/25/06											
1M19070	Ship LAT to Spectrum Astro	04/23/06	-34	05/27/06											
4.1.B ISOC															
1M1000112	Mission Operations Review	01/17/06*	0	01/17/06*											

Run Date 09/28/05 14:15

GLAST LAT PROJECT
Project Milestones (Level 3)
Planned Milestones

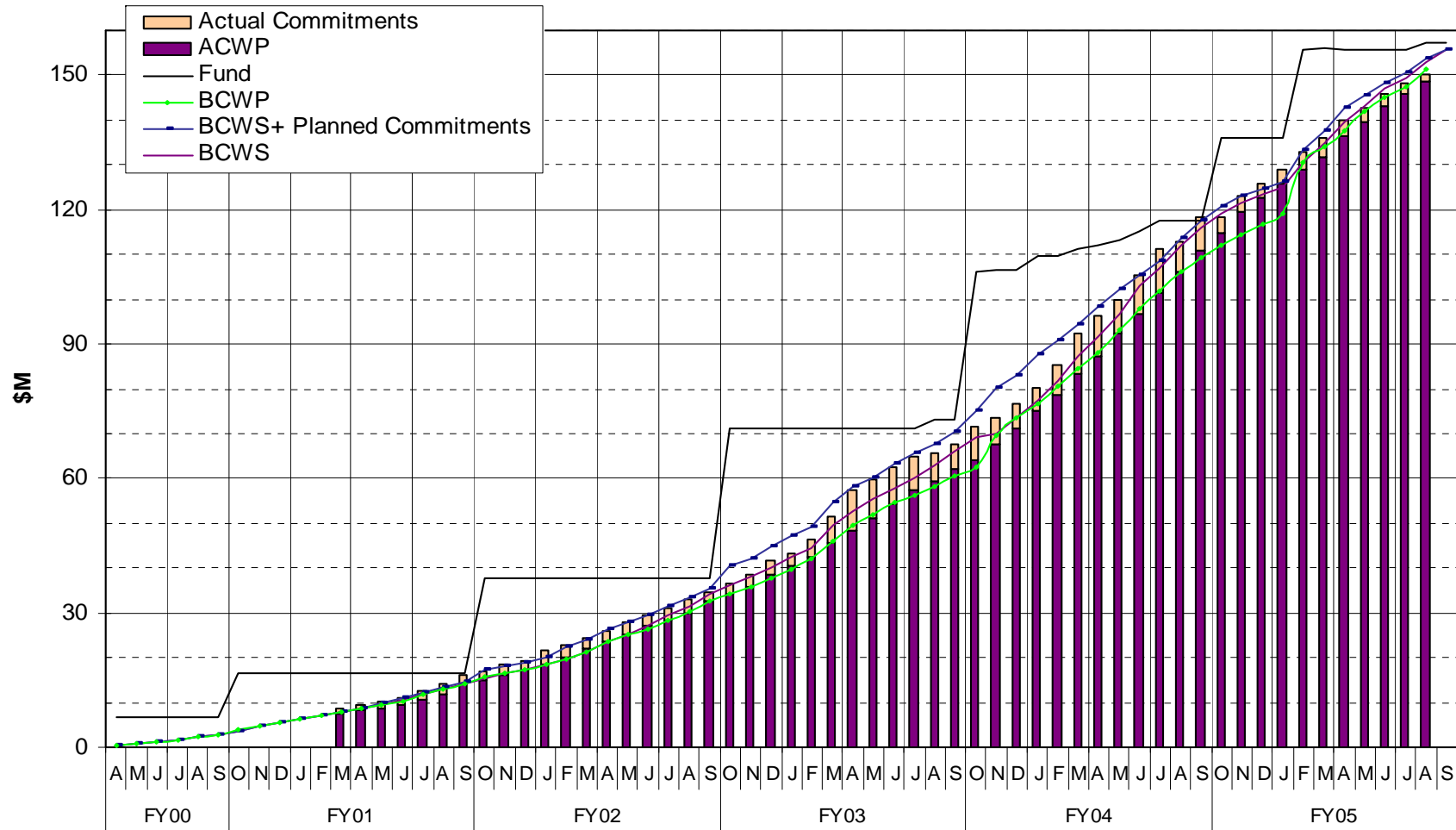
0916
LTX2 - MS3 (planned)
FLX1- MS (L3)

Sheet 2 of 2

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Attachment 3

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



**Attachment 4
LAT Costs, through August 2005, by WBS**

Monthly Contractor Financial Management Report								Report for Month Ending: 8/31/2005		
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 Contract	Estimated Final Cost		Unfiled Orders Outstanding	
	Actual	Planned	Actual	Planned			AT COMPL	Contractor Estimate		Contract Value
4.1.1 INSTRUMENT MANAGEMENT	261	98	17,236	17,304	206	0	68	17,511	17,511	30
4.1.2 SYSTEM ENGINEERING	244	291	7,619	7,655	295	0	35	7,950	7,950	0
4.1.4 TRACKER	573	581	20,863	21,860	188	0	997	22,048	22,048	335
4.1.5 CALORIMETER	0	201	21,554	22,424	171	0	869	22,594	22,594	14
4.1.6 ANTICOINCIDENCE DETECTOR	265	411	17,933	18,228	100	0	295	18,329	18,329	138
4.1.7 ELECTRONICS	338	992	27,925	29,287	417	0	1,361	29,703	29,703	705
4.1.8 MECHANICAL SYSTEMS	347	500	16,504	16,650	215	0	146	16,866	16,866	85
4.1.9 INTEGRATION & TEST	275	291	8,228	8,702	749	0	475	9,451	9,451	19
4.1.A PERFORMANCE AND SAFETY ASSURANCE	78	93	3,880	3,761	85	0	-119	3,846	3,846	0
4.1.B LAT INSTRUMENT SCIENCE OPERATIONS	2	5	314	332	2	0	17	334	334	0
4.1.C EDUCATION AND PUBLIC OUTREACH	46	77	2,263	2,614	70	0	350	2,684	2,684	202
4.1.D SCIENCE ANALYSIS SOFTWARE	72	80	2,764	2,862	75	0	97	2,936	2,936	117
4.1.E SUBORBITAL FLIGHT TEST	0	0	1,325	1,325	0	0	0	1,325	1,325	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0
Total	2,501	3,618	148,410	153,003	2,574	0	4,594	155,577	155,577	1,644

Attachment 5
LAT Costs, through August 2005, by Organization and Cost Code

Monthly Contractor Financial Management Report								Report for Month Ending: 8/31/2005	
To: Kevin Grady, GLAST Project Manager (NASA) Ev Valle, LAT Project Manager (DOE)				From: Tanya Boysen, LAT Project Controls Manager				Budget Value	
								Cost:	Fee:
								0	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 Contract	Estimated Final Cost		Unfilled Orders Outstanding
	Actual	Planned	Actual	Planned			30SEP2005	Contractor Estimate	
DG *** GSFC	335	450	19,615	20,080	137	0	464	20,216	20,216
DH *** HEPL	272	268	8,085	8,438	236	0	353	8,674	8,674
DL *** SLAC	1,568	2,453	89,096	91,637	1,821	0	2,541	93,458	93,458
DN *** NRL	259	360	26,678	27,523	301	0	845	27,825	27,825
DO *** Financial Plan Transfer/Sub Ou	0	0	59	59	0	0	0	59	59
DS *** SSU	45	76	2,239	2,584	69	0	345	2,654	2,654
DT *** Texas A&M	0	0	15	15	0	0	0	15	15
DU *** UCSC	13	1	2,373	2,395	1	0	23	2,396	2,396
DW *** UW	10	10	247	270	9	0	23	279	279
Gen. and Admin.	0	0	0	0	0	0	0	0	0
Total	2,501	3,618	148,410	153,003	2,574	0	4,594	155,577	155,577

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 Contract	Contractor Estimate	Contract Value		
	Actual	Planned	Actual	Planned					30SEP2005	
RL LABOR	1,275	1,739	70,647	71,414	1,083	0	767	72,497	72,497	
RT TRAVEL	20	44	1,756	2,435	79	0	679	2,514	2,514	
RM MATERIAL & SERVICES	1,207	1,833	73,621	76,605	1,355	0	2,983	77,959	77,959	
RX MPS & LAB TAX	0	3	2,386	2,549	58	0	164	2,607	2,607	
Gen. and Admin.	0	0	0	0	0	0	0	0	0	
Total	2,501	3,618	148,410	153,003	2,574	0	4,594	155,577	155,577	

**Attachment 6
LAT Performance, through August 2005, by WBS**

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:						Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 7/31/2005 8/31/2005		
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	Variance		Budgeted Cost		Actual Cost	Variance		Budgeted	Latest Revised Estimate	Variance
	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost			
Item	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
4.1.1 INSTRUMENT MANAGEMENT	98	98	261	0	-164	17,304	17,304	17,236	0	68	17,511	17,511	0
4.1.2 SYSTEM ENGINEERING	291	291	244	0	47	7,655	7,655	7,619	0	36	7,950	7,950	0
4.1.4 TRACKER	581	853	573	272	280	21,860	21,523	20,863	-337	660	22,048	22,048	0
4.1.5 CALORIMETER	201	200	0	-1	200	22,424	22,321	21,554	-102	767	22,594	22,594	0
4.1.6 ANTICOINCIDENCE DETECTOR	411	460	265	49	195	18,228	18,226	17,933	-2	294	18,329	18,329	0
4.1.7 ELECTRONICS	992	1,061	338	69	723	29,287	28,437	27,925	-850	511	29,703	29,703	0
4.1.8 MECHANICAL SYSTEMS	500	261	347	-239	-86	16,650	16,355	16,504	-295	-149	16,866	16,866	0
4.1.9 INTEGRATION & TEST	291	326	275	35	51	8,702	8,597	8,228	-105	370	9,451	9,451	0
4.1.A PERFORMANCE AND SAFETY AS	93	93	78	0	15	3,761	3,761	3,880	0	-119	3,846	3,846	0
4.1.B LAT INSTRUMENT OPERATIONS C	5	5	2	0	2	332	332	314	0	17	334	334	0
4.1.C EDUCATION AND PUBLIC OUTRE	77	77	46	0	31	2,614	2,614	2,263	0	350	2,684	2,684	0
4.1.D SCIENCE ANALYSIS SOFTWARE	80	80	72	0	8	2,862	2,862	2,764	0	97	2,936	2,936	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	3,618	3,804	2,501	186	1,303	153,003	151,312	148,410	-1,691	2,902	155,577	155,577	0
Contingency											1,730	1,730	0
Total	3,618	3,804	2,501	186	1,303	153,003	151,312	148,410	-1,691	2,902	157,307	157,307	0

Attachment 8 LAT Performance Analysis, August 2005

	WBS	BAC	BCWS	BCWP	ACWP	SV \$	CV \$	% BCWS	% BCWP	% ACWP	SPI Trend	CPI Trend	SPI	CPI	CPI Fcst	CpiSpi Fcst
1	4.1	155,577	153,003	151,312	148,409	-1,692	2,902	98.35	97.26	95.39	↑	↑	0.989	1.020	152,593	152,640
2	4.1.1	17,511	17,304	17,304	17,236	0	68	98.82	98.82	98.43	↔	↓	1.000	1.004	17,442	17,442
3	4.1.2	7,950	7,655	7,655	7,619	0	36	96.29	96.29	95.84	↔	↑	1.000	1.005	7,913	7,913
4	4.1.4	22,048	21,860	21,523	20,863	-337	660	99.15	97.62	94.62	↑	↑	0.985	1.032	21,372	21,380
5	4.1.5	22,594	22,424	22,321	21,554	-102	767	99.24	98.79	95.40	↔	↑	0.995	1.036	21,818	21,819
6	4.1.6	18,329	18,228	18,227	17,933	-2	294	99.45	99.44	97.84	↑	↑	1.000	1.016	18,034	18,034
7	4.1.7	29,703	29,287	28,437	27,925	-850	511	98.60	95.74	94.01	↑	↑	0.971	1.018	29,169	29,207
8	4.1.8	16,866	16,650	16,355	16,504	-295	-149	98.72	96.97	97.86	↓	↓	0.982	0.991	17,020	17,029
9	4.1.9	9,451	8,702	8,597	8,228	-105	370	92.07	90.96	87.05	↑	↑	0.988	1.045	9,045	9,055
10	4.1.A	3,846	3,761	3,761	3,880	0	-119	97.79	97.79	100.89	↔	↑	1.000	0.969	3,968	3,968
11	4.1.B	334	332	332	314	0	17	99.27	99.27	94.03	↔	↑	1.000	1.056	317	317
12	4.1.C	2,684	2,614	2,614	2,263	0	350	97.39	97.39	84.34	↔	↔	1.000	1.155	2,324	2,324
13	4.1.D	2,936	2,862	2,862	2,764	0	98	97.46	97.46	94.14	↔	↔	1.000	1.035	2,836	2,836
14	4.1.E	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: Budgetd 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

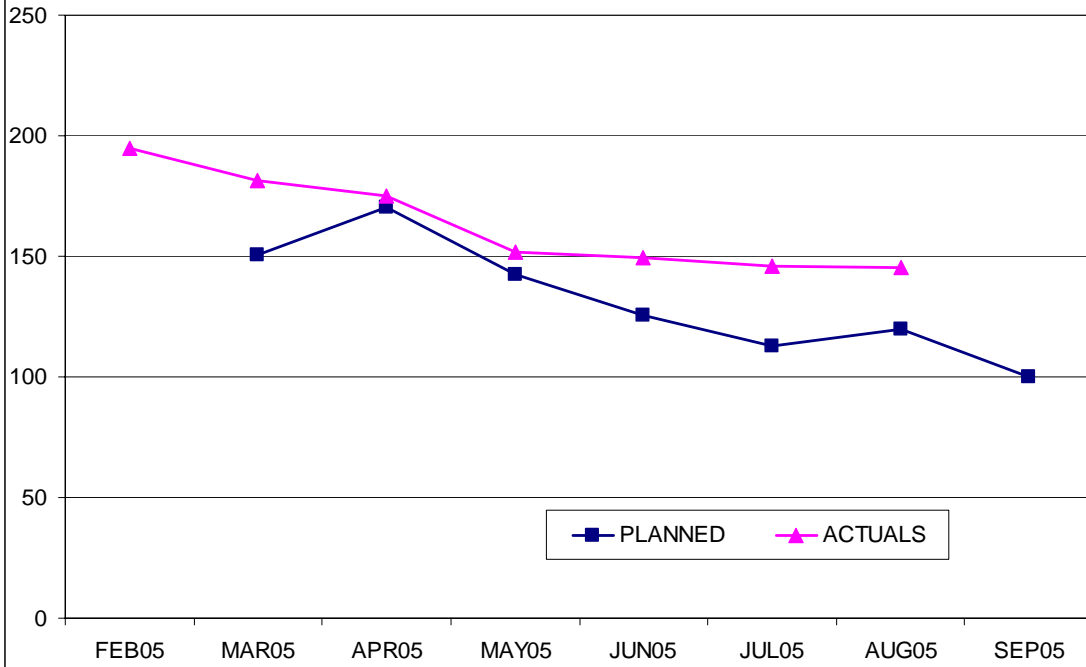
Cpi_Fcst: CPI (to date) EAC Forecast = BAC / CPI

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

4.1 LAT Project DOE/NASA-Funded FTEs (includes contractors reported as M&S)



FTEs BY SUBSYSTEM		FEB05	MAR05	APR05	MAY05	JUN05	JUL05	AUG05	SEP05
4.1.1 INSTRUMENT MANAGEMENT	PLANNED		19.2	19.2	19.2	18.7	19.4	11.2	10.9
	ACTUALS	19.7	23.4	19.2	18.4	16.8	23.2	17.9	0.0
4.1.2 SYSTEM ENGINEERING	PLANNED		10.2	10.3	10.3	10.3	10.3	15.1	13.2
	ACTUALS	10.5	10.1	9.8	8.8	9.6	9.7	17.5	0.0
4.1.4 TRACKER	PLANNED		16.8	16.6	12.7	10.7	9.9	9.2	9.2
	ACTUALS	17.0	15.4	15.9	13.9	15.1	15.9	12.6	0.0
4.1.5 CALORIMETER	PLANNED		18.7	19.6	13.4	9.9	7.6	8.1	7.4
	ACTUALS	23.8	19.8	21.6	11.5	15.1	5.2	0.0	0.0
4.1.6 ANTICOINCIDENCE DETECTOR	PLANNED		16.4	39.0	26.4	22.1	11.6	13.0	3.6
	ACTUALS	36.2	33.1	29.8	37.1	28.2	27.3	35.7	0.0
4.1.7 ELECTRONICS	PLANNED		28.8	22.1	22.8	18.3	15.4	26.8	21.1
	ACTUALS	36.7	35.2	32.5	27.8	24.5	27.5	25.6	0.0
4.1.8 MECHANICAL SYSTEMS	PLANNED		6.0	6.4	1.7	4.1	7.2	5.9	4.3
	ACTUALS	3.7	3.2	3.9	3.6	4.2	3.4	2.5	0.0
4.1.9 INTEGRATION & TEST	PLANNED		15.3	17.2	16.2	16.3	16.4	16.5	15.9
	ACTUALS	20.5	23.0	19.1	13.9	12.4	14.5	14.8	0.0
4.1.A PERFORMANCE AND SAFETY ASSURANCE	PLANNED		12.5	12.3	9.9	5.9	4.9	4.9	4.9
	ACTUALS	12.6	12.4	12.1	11.5	11.3	11.1	9.1	0.0
4.1.B LAT INSTRUMENT SCIENCE OPERATIONS CENTER	PLANNED		0.2	0.2	0.2	0.2	0.2	0.2	0.0
	ACTUALS	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
4.1.C EDUCATION AND PUBLIC OUTREACH	PLANNED		1.5	2.0	4.3	4.1	4.5	3.9	4.3
	ACTUALS	10.1	3.3	7.1	2.3	7.9	2.9	4.4	0.0
4.1.D SCIENCE ANALYSIS SOFTWARE	PLANNED		5.3	5.3	5.1	4.9	5.3	5.2	5.2
	ACTUALS	3.8	2.6	3.7	3.1	4.4	5.1	5.0	0.0
Grand Totals:	PLANNED		150.8	170.3	142.3	125.5	112.7	120.0	100.1
	ACTUALS	194.5	181.6	174.8	152.0	149.6	145.8	145.2	