

Monthly Progress Report
(Month Ending January 2003)

GLAST Large Area Telescope (LAT)

LAT-MR-01532-01

March 5, 2003

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 January, 2003.

2.0 Recent Progress and Status

4.1.4 Tracker

Multichip module assembly for the engineering model is underway; all functional boards were completed, tested and most have been delivered to Italy. Production of the first 300 flight ladders is complete through wire bonding and electronics testing, with continued excellent test results. Testing of the new encapsulation material is complete; 40 flight ladders have been encapsulated and are under test. Procurement of 1,331 silicon strip detectors was begun by SLAC. Updated flexure design loads and test inputs were received, and showed that the bottom tray will in fact have a positive margin. Engineering model assembly in Italy continues; all panels built, mounting of tungsten and Kapton underway, vibration tests were done on four panels with good results. The electrical ground support equipment was received in Italy, and is functional there with a Teledyne multichip module.

4.1.5 Calorimeter

Acceptance testing was completed on 113 crystal detector elements (CDEs), and they are now available for engineering model assembly. The French and NRL CDEs were found to have identical performance. Bond strengths were tested on six CDEs with expected results showing approximately eight times the required shear strength. Four CDEs have completed 100 thermal cycles, with no significant change in light yield. The ShinEtsu silicone elastomer (optical window encapsulant) passed outgassing tests with planned bakeout and is approved for flight use. The redesigned engineering model baseplate was manufactured and shipped to NRL for installation. The analog front-end electronics printed wire assemblies are being assembled by hand to meet the schedule. Extra boards will be automatically assembled with a flight-qualified vendor. Modifications to the readout controller design have been completed and tested; these changes provide better clocking margins, and were part of the version 5 ASIC submission in January.

4.1.6 Anticoincidence Detector

The ACD peer review was successfully completed. There were 19 action items that will all be addressed within the next month. The version 5 front-end and version 2 readout controller ASICs were submitted. We expect that both of these ASICs will be our flight versions. Three front-end electronics boards were received. Two of the 18 channels on the front-end electronics boards have been populated and tested with good results. Hole locations are being corrected on the scintillating fiber ribbon fixture. The fourth set of 30 phototubes were received. Commercial off-the-shelf phototubes were received and the testing/screening process has begun. The engineering unit high voltage bias supply

(HVBS) is being fabricated, and the HVBS to readout controller interface tests are in the planning stage and will be performed when the HVBS is completed.

4.1.7 Electronics

Discussion continued with Spectrum-Astro to define interfaces for such items as control and data handling, power feeds, and monitoring. The PCI mezzanine card version of the LAT communication board was fabricated. The Statement of Work for the Tower Engineering Model power supply was completed. The Flight Software plan, schedule, and milestones are being updated.

4.1.8 Mechanical Systems

The flight extrusions for the downspout and cross-LAT heat pipes have been ordered. A design study on the electronics box to cross-LAT thermal joint options was completed; thermal straps are being investigated. Prototype testing was performed on the three-way heat pipe joint; the results meet requirements. The preliminary cross-LAT plate specification and Statement of Work has been issued for subcontract negotiations.

4.1.9 Integration & Test

The LAT Integration Facility (SLAC Building 33) is ready for engineering model (EM) activities. The SVAC (Science, Verification, and Calibration) Tracker EM database is complete. The Van de Graaff simulator is functional, but needs radiation approval and a heat-sunk target; more current was output than expected. The electronic logbook (which stores information about functional test and calibration data files, is the repository for shift worker comments, and is used to support the data analysis) was completed.

3.0 Schedule Status

The status of significant milestones identified in the Project Management Plan (LAT-MD-00054-08) for the LAT project 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.

Three of the below milestones are related to the completion of the engineering model (EM). The Calorimeter Engineering Model milestone (1M59000000) is the critical path item for the EM effort as a whole. The LAT Project Manager, the Integration & Test subsystem manager, and the Calorimeter, Tracker, and Mechanical Systems subsystem managers have implemented workaround plans to accommodate these delays, without unfavorably impacting the flight unit schedules.

Engineering Model (1x4) Grid (1M1001380)

Baseline/Target Finish: 12/02/02 Projected Finish: 02/03/03 Variance: -37 days
Lack of sufficient manpower has resulted in the delay of this milestone. While the staffing levels have been increased, the completion of this milestone will still be delayed.

The procurement has been made for the 1x4 EM grid, machining has begun, and receipt is expected in early April. After inspection and testing, the grid will be ready for integration with the EM in early May. This delay can be accommodated in the I&T schedule with no further impact.

Tracker Engineering Model (1M1001430)

Baseline/Target Finish: 12/09/02 Projected Finish: 02/03/03 Variance: -32 days

This milestone has been delayed by the ASIC design issues, startup issues with the tray fabrication, and the ladder production being slower than planned. The expected completion date of this milestone is in March. This delay can be accommodated in the I&T schedule with no further impact.

GEM H/W Driver, Final Version, Elex to I&T/Online (1M1001390)

Baseline/Target Finish: 01/07/03 Projected Finish: 04/16/03 Variance: -69 days

The subsystem managers for Electronics and Integration & Test have agreed on a completion date for this milestone in April. This will not adversely affect any other activities or level 3 milestones.

Calorimeter Engineering Model (1M59000000)

Baseline/Target Finish: 04/25/03 Projected Finish: 06/16/03 Variance: -35 days

Problems in the development of the crystal detector element manufacturing process (now resolved) unfavorably impacted this delivery. (Update: A change request was approved in February to implement the workaround plan in the baseline schedule.)

4.0 Financial Status

Attachment 3 depicts the costs and commitments through the end of the current reporting period. Commitments for level-of-effort subcontracts have been phased in response to the continuing resolution situation. This is being managed so that there is no cost impact, and the level of effort is not affected.

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.

4.1.5 Calorimeter

Problems, now resolved, in the development of the crystal detector element manufacturing process have unfavorably impacted the delivery of the engineering model. A recovery plan is in progress. Delays in the AFEE flight part procurements (to ensure design maturity) and development and delays in the ground support equipment are not currently critical, but the unfavorable trend is a concern and a recovery plan is in progress.

4.1.6 Anticoincidence Detector

The tile shell assembly design has taken longer than planned due to inadequate manpower. Manpower was diverted from the MGSE design work to support this effort. A recovery plan has been developed which preserves the MGSE delivery date, does not impact significant milestones, and removes the unfavorable schedule variance by the end of the fiscal year. A plan has been developed and is being implemented to minimize the impact of delays in the analog ASICs, by moving the ASIC design work to SLAC. The unfavorable schedule variance is expected to be removed before the end of the fiscal year.

The unfavorable cost variance is due to higher labor costs than planned for the tile shell assembly work, as well as the base electronics assembly (BEA). Cost savings in other areas are anticipated to decrease the tile shell assembly variance. A change request is being prepared to address the BEA variance; this includes work occurring at SLAC not currently in the ACD baseline.

4.1.8 Mechanical Systems

The unfavorable schedule variance is due to filling key engineering and design positions slower than planned. Four people were hired in January and the engineering of the cross-LAT plate will be transferred to Lockheed Martin. This level of effort is believed to be adequate to stop the slip and then bring this system back to the baseline schedule by the end of the fiscal year.

During January, \$170K of subcontractor costs were incorrectly charged to 4.1.1 Management, resulting in an overstated favorable cost variance for 4.1.8 Mechanical Systems and an overstated unfavorable cost variance for 4.1.1 Management. This is expected to be corrected in the March accounting period.

4.1.A Performance & Safety Assurance

The favorable cost variance is due to the delay in the hire of a part-time parts engineer at NRL (now on board), specific mission-assurance-related activities being covered by other LAT subsystems, and less travel taken than planned.

4.1.B Instrument Operations Center

The schedule variance results from a delay in hiring additional planned resources. The LAT management is working with SLAC management to address the long-term management and staffing issues for the subsystem.

A change in the subsystem management has resulted in a temporary favorable cost variance. The budget will be adjusted once longer-term plans have been made for management of this subsystem.

4.1.C Education & Public Outreach

Recent funding delays have resulted in procurement and invoice delays. The funding situation is rectified, so the invoice delays are expected to be resolved.

4.1.D Science Analysis Software

Hiring delays at Stanford/HEPL and GSFC have resulted in a temporary favorable cost variance. A candidate has been hired at HEPL in February, and a search is underway at GSFC.

6.0 Change Control and Contingency Analysis

One change request was submitted to and approved by the LAT Configuration Control Board during January. A summary, including the impacts on the LAT fabrication phase cost, is below.

Change Request No.	Description	Submitted By	CCB Meeting	Current Status
LAT-XR-01319-01	Procurement of Silicon Strip Detectors	T. Borden	1/22/03	Approved \$387K*

The fabrication phase cost baseline is now \$101.4M. Funding applicable to that baseline is \$121.7M; resulting contingency remains at \$20.3M.

* Cost increase of \$387K is directly offset by corresponding funding increase from Japan.

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.

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											
1M1P000000	DOE Critical Decision (CD) 0 Approval	06/25/01A	0	06/25/01A	▼						
1M1P000010	CD-1 Approval	07/01/02*	-15	07/23/02A		▼					
1M1P000020	CD-2 Approval	12/13/02*	27	11/04/02A			▼				
1M1P000030	CD-3 Approval	07/15/03*	0	07/15/03*				▼			
1M1P000060	Flight GRID Complete	09/15/04*	0	09/15/04*					▼		
1M1P000040	CD-4 Approval	03/15/06*	0	03/15/06*						▼	
DOE/NASA Federal Project Managers (Level											
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)	04/30/03*	0	04/30/03*			▼				
1M1000730	TKR, CAL FM A, B Available for Calibration Unit	02/17/04*	0	02/17/04*				▼			
1M1000740	Start LAT Integration	06/15/04*	0	06/15/04*					▼		
1M1000700	Pre Environmental Testing Review	02/15/05*	0	02/15/05*						▼	
1M1000120	PSR-(Instrument Pre-Ship Review)	07/07/05*	0	07/07/05*						▼	
1M1000140	LAT Ready for Integration (RFI) to Spacecraft	09/22/05*	0	09/22/05*						▼	
Run Date					02/25/03 10:20		GLAST LAT PROJECT			0214	
© Primavera Systems, Inc.							Project Milestones (Level 1 and 2)			LT_MS1-2	
										Sheet 1 of 1	

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

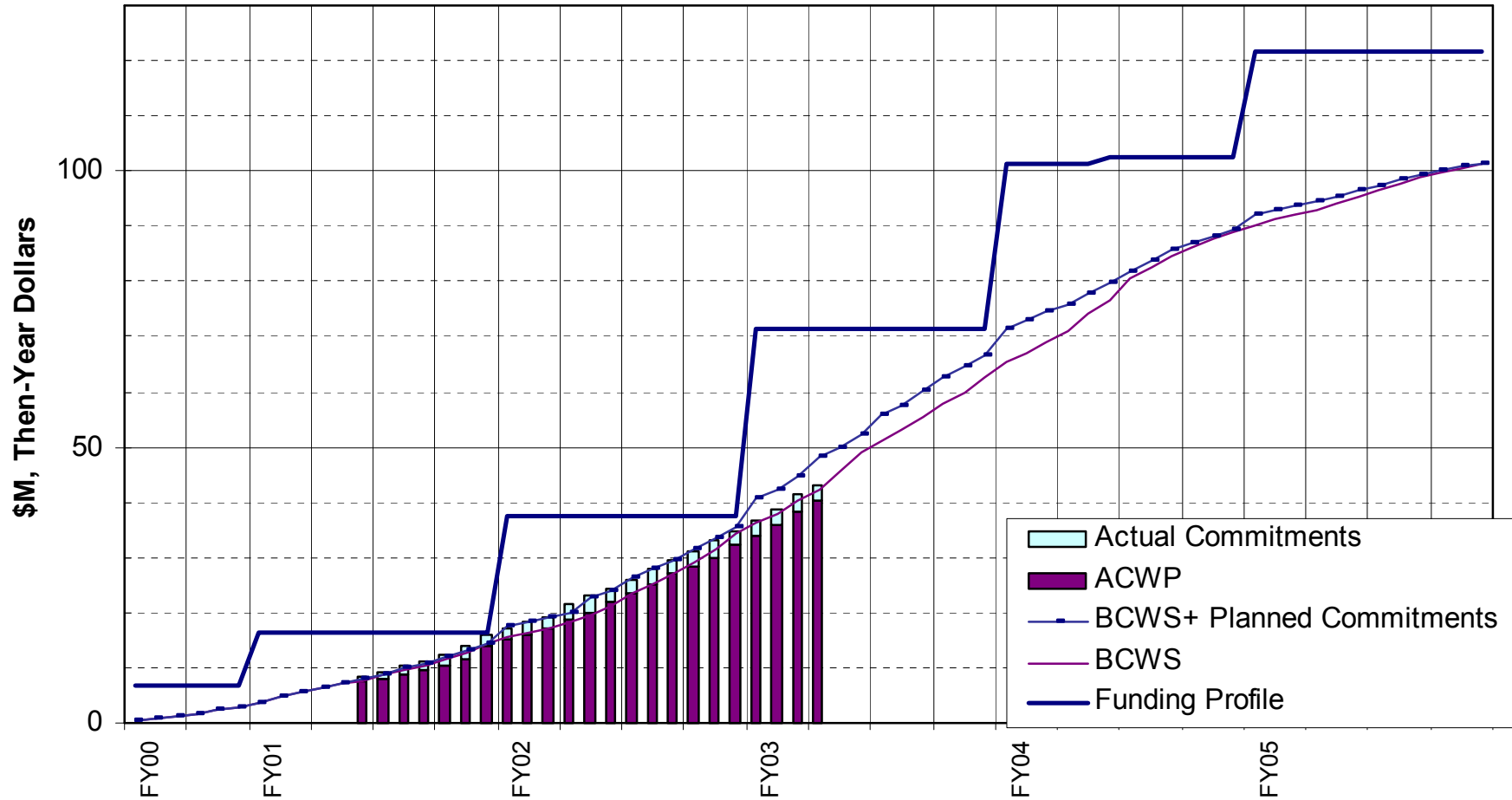
Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND	Fiscal Year		
							FY02	FY03	FY04
Instrument Project Office (Level 3)									
1M1001120	Tracker Dead/Noisy Strips (SAS to I & T)	06/21/02*	-79	10/14/02A	D	9			
1M1001110	Calorimeter Calibration Prototype Coding SAS-I&T	07/08/02	-69	10/14/02A	D	9			
1M1000550	(9) MCM's from Tracker to Elec	09/20/02	-29	10/31/02A	4	7			
1M1001420	AEM H/W driver final ver-ELX to I&T/Online	09/20/02	-40	11/15/02A	7	9			
1M7941310	ACD Electronics Module - EM1 (Elec to ACD)	09/20/02	-40	11/15/02A	7	6			
1M7941330	Test/Screening Board w/ASIC for EM1 -ACD to Elec	09/20/02	12	09/04/02A	6	7			
1M1001340	GEM H/W driver, init ver-ELX to I&T/Online	11/12/02	37	09/20/02A	7	9			
1M1001410	TEM H/W driver, final ver-ELX to I&T/Online	11/19/02	36	09/30/02A	7	9			
1M1001380	Delivery of EM (1X4) Grid to I&T/MSGE	12/02/02*	-37	02/03/03*	8	9			
1M1001280	As-Built dwgs for EM TKR-TKR to I&T	12/05/02	-1	12/06/02A	4	9			
1M1001510	EM1 EGSE WS-S/W R2 I&T to ACD	12/05/02	-6	12/13/02A	9	6			
1M1001511	EM1 EGSE WS-S/W R2 I&T to CAL	12/05/02	-6	12/13/02A	9	5			
1M1001512	EM1 EGSE WS-S/W R2 I&T to ELX	12/05/02	-6	12/13/02A	9	7			
1M1001513	EM1 EGSE WS-S/W R2 I&T to IOC	12/05/02	-6	12/13/02A	9	B			
1M1001514	EM1 EGSE WS-S/W R2 I&T to TKR	12/05/02	-6	12/13/02A	9	4			
1M1001430	Delv of TKR EM to SLAC I&T/MGSE	12/09/02*	-32	02/03/03*	4	9			
1M1001360	FSW system spec-ELX/FSW to I&T/Online	12/20/02	4	12/16/02A	7	9			
1M1001460	IPS description-ELX to I&T/Online	12/23/02	5	12/16/02A	7	9			
1M1001210	AEM H/W driver, init ver-ELX to I&T/Online	01/02/03*	25	11/15/02A	7	9			
Run Date	02/25/03 10:21	GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			0214 LT - MS (L3)	Sheet 1 of 2			
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**Attachment 2, Continued (Page 2 of 2)
Level 3 Milestones (One-Year View)**

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND	Fiscal Year				
							FY02	FY03	FY04		
Instrument Project Office (Level 3)											
1M1001310	AEM data taking desc-ELX to I&T/Online	01/02/03*	25	11/15/02A	7	9		▼			
1M1000980	Doc defining Backsplash Test Model (ACD to I&T)	01/03/03*	0	01/03/03A	6	9		▼			
1M1001390	GEM h/w driver, final ver-ELX to I&T/Online	01/07/03	-69	04/16/03	7	9		▼			
1M1001130	Tracker Tower & Tray Alignment (SAS to I&T)	01/22/03*	11	01/06/03A	D	9		▼			
1M57000020	CAL AFFE Engr Model-CAL to Elec	02/03/03*	0	02/03/03*	5	7		▼			
1M7941350	High Voltage Power Supply (Bd & Prts)-ACD to Elec	02/03/03*	0	02/03/03*	6	7		▼			
1M7941380	EGSE Workstation / Software #3 (I&T to ACD)	03/03/03*	216	04/15/02A	9	6	▼	▼			
1M7941320	(2) ACD Electronics Modules - EM2 (Elec to ACD)	04/24/03	59	01/30/03A	7	6		▼			
1M59000000	EM from CAL to I&T	04/25/03	-35	06/16/03	5	9		▼			
1M1001490	SIS description-ELX to I&T	04/30/03*	0	04/30/03*	7	9		▼			
1M1001500	Online EM2 release #1 to FSW	04/30/03	0	04/30/03	9	7		▼			
1M19500500	CU IPS - ELX to I&T/Online*	04/30/03*	0	04/30/03*	7	9		▼			
1M7941340	(11) FREE Bds & ASICS, (1) Fully Tested Bd - EM2	05/07/03*	0	05/07/03*	6	7		▼			
1M7941150	EGSE EM2 Release-Elec to I&T	06/12/03*	0	06/12/03*	7	9		▼			
1M1001570	CU Monte Carlo sim from SAS to I&T/SVAC	06/13/03*	156	10/22/02A	D	9	▼	▼			
1M1001520	EM CAL Returned to NRL (arrives on dock)	06/23/03	-3	06/26/03	9	5		▼			
1M1001550	Online EM2 release #2 to ELX	06/26/03	0	06/26/03	9	7		▼			
1M1000910	(36) MCM's for EM2 from Tracker to Elec	07/18/03	-5	07/25/03	4	7		▼			
Run Date: 02/25/03 10:21							GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			0214 LT - MS (L3)	Sheet 2 of 2
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Attachment 3

Budget vs Actuals vs Funding DOE + NASA Project Expenditures



**Attachment 4
LAT Costs, through January 2003, by WBS**

Monthly Contractor Financial Management Report								Report for Month Ending: 1/31/03		
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			4/3/00	Billing
									Estimated Final Cost	
		During Month		Cum. to Date		Detail		Balance of Budget	Project Estimate	Budget Value
Actual	Planned	Actual	Planned	FEB03	MAR03					
4.1.1 INSTRUMENT MANAGEMENT	404	193	6,284	5,886	175	193	4,950	11,602	11,602	
4.1.2 SYSTEM ENGINEERING	115	98	2,685	2,494	89	85	1,788	4,647	4,647	
4.1.4 TRACKER	345	178	5,913	5,799	1,126	1,147	2,118	10,303	10,303	
4.1.5 CALORIMETER	272	384	6,703	7,790	505	406	9,961	17,575	17,575	
4.1.6 ANTICOINCIDENCE DETECTOR	374	299	5,985	5,597	317	683	3,786	10,772	10,772	
4.1.7 ELECTRONICS	201	374	4,238	4,206	281	298	10,920	15,737	15,737	
4.1.8 MECHANICAL SYSTEMS	32	327	3,155	4,284	319	327	7,992	11,794	11,794	
4.1.9 INTEGRATION & TEST	104	136	1,336	1,461	117	123	5,097	6,673	6,673	
4.1.A PERFORMANCE AND SAFETY ASSURANCE	38	55	770	1,102	49	55	1,300	2,174	2,174	
4.1.B LAT INSTRUMENT OPERATIONS CENTER	-14	30	262	483	28	32	2,229	2,552	2,552	
4.1.C EDUCATION AND PUBLIC OUTREACH	17	49	687	773	36	32	1,928	2,684	2,684	
4.1.D SCIENCE ANALYSIS SOFTWARE	51	74	980	1,086	84	88	2,460	3,611	3,611	
4.1.E SUBORBITAL FLIGHT TEST	0	0	1,325	1,321	0	0	-4	1,321	1,321	
Gen. and Admin.	0	0	0	0	0	0	0	0	0	
Total	1,939	2,197	40,323	42,282	3,126	3,468	54,527	101,444	101,444	

Attachment 5
LAT Costs, through January 2003, by Organization and Cost Code

Monthly Contractor Financial Management Report								Report for Month Ending: 1/31/03		
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			4/3/00	Billing	
	During Month		Cum. to Date		Detail		Balance of Budget	Estimated Final Cost		Unfilled Orders Outstanding
	Actual	Planned	Actual	Planned	FEB03	MAR03		Project Estimate	Budget Value	
DG *** GSFC	281	345	7,004	7,072	358	729	5,642	13,733	13,733	
DH *** HEPL	49	97	2,974	3,323	86	89	4,444	7,593	7,593	
DL *** SLAC	1,228	1,143	19,781	19,419	1,952	2,004	26,868	50,605	50,605	
DN *** NRL	305	504	8,428	10,063	642	548	14,214	23,831	23,831	
DO *** Financial Plan Transfer/Sub Ou	0	0	32	32	0	0	0	32	32	
DS *** SSU	17	48	687	773	36	32	1,853	2,609	2,609	
DT *** Texas A&M	0	0	15	16	0	0	0	16	16	
DU *** UCSC	48	52	1,391	1,576	44	58	1,248	2,741	2,741	
DW *** UW	10	8	10	8	8	8	257	283	283	
Total	1,939	2,197	40,323	42,282	3,126	3,468	54,527	101,444	101,444	

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	FEB03	MAR03				
RL LABOR	1,061	1,166	24,059	24,912	1,037	1,111	29,301	55,509	55,509	
<i>FTE (DOE/NASA)</i>	101.7	102.4	2,069.8	2,211.4	99.0	97.0	2,564.5	4,830.3	4,830.3	
<i>HOURS (DOE/NASA)</i>	17,161	17,210	347,268	363,278	15,115	16,343	418,822	797,548	797,548	
RT TRAVEL	20	59	652	1,162	53	66	2,496	3,267	3,267	
RM MATERIAL & SERVICES	791	823	14,000	14,506	1,939	2,178	20,769	38,886	38,886	
RX MPS & LAB TAX	67	150	1,612	1,702	96	113	1,962	3,783	3,783	
Total (not incl FTE/Hours)	1,939	2,197	40,323	42,282	3,126	3,468	54,527	101,444	101,444	

**Attachment 6
LAT Performance, through January 2003, by WBS**

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:						Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 12/31/02 1/31/03		
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	193	193	404	0	-211	5,886	5,886	6,284	0	-399	11,602	11,602	0
4.1.2 SYSTEM ENGINEERING	98	96	115	-2	-19	2,494	2,492	2,685	-2	-193	4,647	4,647	0
4.1.4 TRACKER	178	182	345	4	-163	5,799	5,644	5,913	-155	-269	10,303	10,303	0
4.1.5 CALORIMETER	384	305	272	-79	33	7,790	6,997	6,703	-792	295	17,575	17,575	0
4.1.6 ANTICOINCIDENCE DETECTOR	299	166	374	-133	-208	5,597	5,051	5,985	-546	-934	10,772	10,772	0
4.1.7 ELECTRONICS	374	403	201	29	202	4,206	4,148	4,238	-58	-90	15,737	15,737	0
4.1.8 MECHANICAL SYSTEMS	327	248	32	-79	216	4,284	3,539	3,155	-746	384	11,794	11,794	0
4.1.9 INTEGRATION & TEST	136	143	104	6	39	1,461	1,411	1,336	-50	75	6,673	6,673	0
4.1.A PERFORMANCE AND SAFETY ASSURA	55	55	38	0	17	1,102	1,102	770	0	332	2,174	2,174	0
4.1.B LAT INSTRUMENT OPERATIONS CENT	30	18	-14	-13	31	483	426	262	-57	163	2,552	2,552	0
4.1.C EDUCATION AND PUBLIC OUTREACH	49	66	17	18	50	773	779	687	6	92	2,684	2,684	0
4.1.D SCIENCE ANALYSIS SOFTWARE	74	91	51	18	40	1,086	1,097	980	11	118	3,611	3,611	0
4.1.E SUBORBITAL FLIGHT TEST	0	0	0	0	0	1,321	1,321	1,325	0	-4	1,321	1,321	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget											0	0	0
Sub Total	2,197	1,965	1,939	-232	27	42,282	39,892	40,323	-2,389	-431	101,444	101,444	0
Contingency											20,269	20,269	
Total	2,197	1,965	1,939	-232	27	42,282	39,892	40,323	-2,389	-431	121,713	121,713	

Attachment 7
LAT Performance, through January 2003, by Organization

Cost Performance Report - Organization													
Contractor: Location:					Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 12/31/02 1/31/03			
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	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)
DG *** GSFC	345	211	281	-133	-70	7,072	6,526	7,004	-546	-478	13,733	13,733	0
DH *** HEPL	97	120	49	23	70	3,323	3,252	2,974	-71	278	7,593	7,593	0
DL *** SLAC	1,143	1,052	1,228	-90	-176	19,419	18,470	19,781	-950	-1,311	50,605	50,605	0
DN *** NRL	504	454	305	-51	148	10,063	9,242	8,428	-821	815	23,831	23,831	0
DO *** Financial Plan	0	0	0	0	0	32	32	32	0	0	32	32	0
DS *** SSU	48	64	17	16	47	773	777	687	4	90	2,609	2,609	0
DT *** Texas A&M	0	0	0	0	0	16	16	15	0	0	16	16	0
DU *** UCSC	52	56	48	4	8	1,576	1,569	1,391	-6	178	2,741	2,741	0
DW *** UW	8	8	10	0	-1	8	8	10	0	-1	283	283	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget											0	0	0
Sub Total	2,197	1,965	1,939	-232	27	42,282	39,892	40,323	-2,389	-431	101,444	101,444	0
Contingency											20,269	20,269	
Total	2,197	1,965	1,939	-232	27	42,282	39,892	40,323	-2,389	-431	121,713	121,713	

**Attachment 8
LAT Performance Analysis, January 2003**

	WBS	BAC	BCWS	BCWP	ACWP	SV \$	CV \$	% BCWS	% BCWP	% ACWP	SV Trend	CV Trend	SPI	CPI	Cpi_Fcst	CpiSpi_Fcst
1	4.1	101,444	42,282	39,892	40,323	-2,389	-431	41.68	39.32	39.75	↔	↑	0.943	0.989	102,540	106,266
2	4.1.1	11,602	5,886	5,886	6,284	0	-399	50.73	50.73	54.17	↔	↓	1.000	0.937	12,388	12,388
3	4.1.2	4,647	2,494	2,492	2,685	-2	-193	53.68	53.63	57.78	↔	↔	0.999	0.928	5,006	5,008
4	4.1.4	10,303	5,799	5,644	5,913	-155	-269	56.28	54.78	57.39	↔	↓	0.973	0.955	10,794	10,928
5	4.1.5	17,575	7,790	6,997	6,703	-792	295	44.32	39.82	38.14	↔	↔	0.898	1.044	16,834	17,982
6	4.1.6	10,772	5,597	5,051	5,985	-546	-934	51.96	46.89	55.57	↓	↓	0.902	0.844	12,764	13,497
7	4.1.7	15,737	4,206	4,148	4,238	-58	-90	26.73	26.36	26.93	↑	↑	0.986	0.979	16,079	16,244
8	4.1.8	11,794	4,284	3,539	3,155	-746	384	36.33	30.01	26.75	↔	↑	0.826	1.122	10,515	12,066
9	4.1.9	6,673	1,461	1,411	1,336	-50	75	21.90	21.14	20.02	↑	↑	0.966	1.056	6,319	6,497
10	4.1.A	2,174	1,102	1,102	770	0	332	50.67	50.67	35.41	↔	↔	1.000	1.431	1,520	1,520
11	4.1.B	2,552	483	426	262	-57	163	18.92	16.68	10.28	↓	↑	0.881	1.621	1,574	1,751
12	4.1.C	2,684	773	779	687	6	92	28.81	29.04	25.61	↑	↑	1.008	1.134	2,367	2,354
13	4.1.D	3,611	1,086	1,097	980	11	118	30.07	30.38	27.13	↑	↑	1.010	1.120	3,224	3,202
14	4.1.E	1,321	1,321	1,321	1,325	0	-4	100.00	100.00	100.29	↔	↔	1.000	0.997	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

SV Trend: Schedule Variance Trend = SV\$ / BCWS

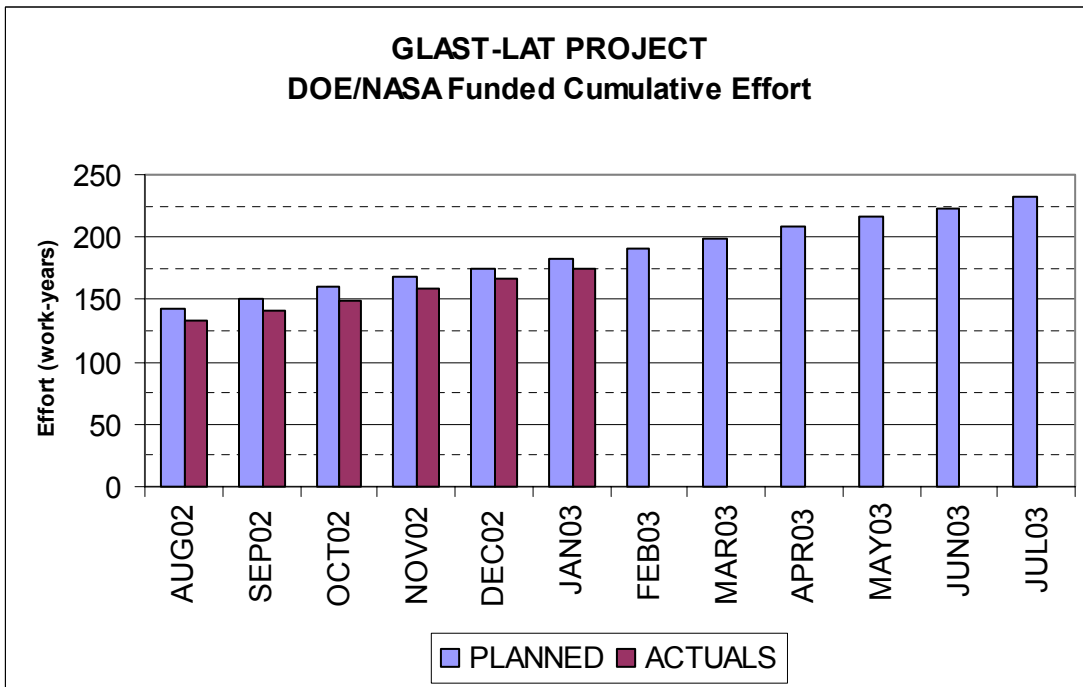
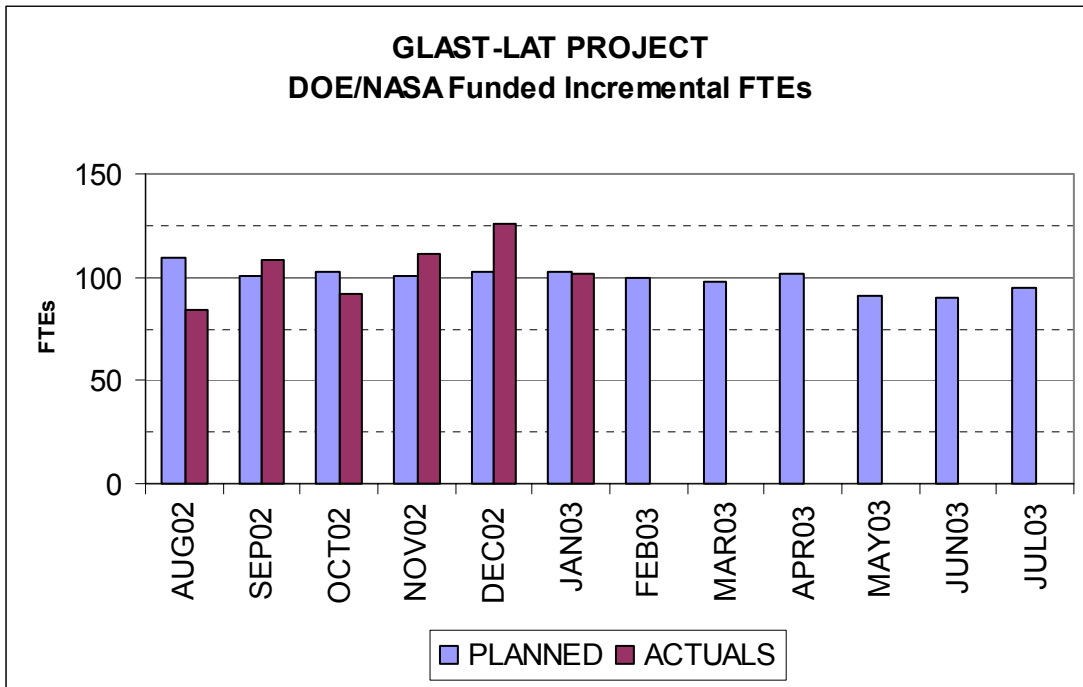
CV Trend: Cost Variance Trend = CV\$ / BCWP

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

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

■	Worse than -15%	■	Between -5% and 10%
■	Between -15% and -5%	■	Better than 10%
Change Threshold 10%			

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



Attachment 10
LAT Manpower Data, through January 2003, by Organization

Program: LAT3		Description: GLAST LAT Project		Approval: Program Manager			Approval: Functional Manager			Approval: Cost Account Manager						
Run Date: 2/28/03		Status Date: 1/31/03														
			PRIOR	AUG02	SEP02	OCT02	NOV02	DEC02	JAN03	Cum-to- Date	FEB03	MAR03	APR03	MAY03	JUN03	JUL03
OBS																
DG *** GSFC																
FTE	PLANNED	332.5	25.1	38.8	26.4	26.1	22.1	22.7	493.7	21.4	21.2	24.3	20.0	19.7	14.9	
	ACTUALS	261.1	27.6	28.1	26.4	28.7	36.8	29.4	438.1	0.0	0.0	0.0	0.0	0.0	0.0	
DH *** HEPL																
FTE	PLANNED	193.5	7.3	6.9	7.2	8.0	8.1	7.3	238.3	7.2	6.7	7.5	7.7	6.4	7.2	
	ACTUALS	176.4	0.0	3.2	4.1	4.3	5.9	2.1	195.9	0.0	0.0	0.0	0.0	0.0	0.0	
DL *** SLAC																
FTE	PLANNED	699.7	60.0	61.4	42.4	47.2	53.7	57.5	1022.0	57.5	58.0	59.9	56.8	55.0	53.1	
	ACTUALS	597.0	85.9	53.7	44.8	52.0	55.1	57.2	945.5	0.0	0.0	0.0	0.0	0.0	0.0	
DN *** NRL																
FTE	PLANNED	348.5	23.7	28.9	30.4	23.8	24.7	22.7	502.5	23.4	22.1	22.1	17.8	21.4	27.4	
	ACTUALS	362.5	17.0	31.1	21.9	25.3	26.4	16.8	501.0	0.0	0.0	0.0	0.0	0.0	0.0	
DS *** SSU																
FTE	PLANNED	41.5	1.5	1.5	1.7	1.7	1.6	1.9	51.4	2.0	2.0	1.9	1.9	1.9	6.3	
	ACTUALS	43.8	3.1	0.4	0.0	5.5	3.0	1.7	57.6	0.0	0.0	0.0	0.0	0.0	0.0	
DU *** UCSC																
FTE	PLANNED	147.1	4.8	4.8	5.1	5.1	4.7	4.8	176.5	5.4	6.4	5.7	4.8	4.7	4.5	
	ACTUALS	171.5	6.2	4.4	5.5	6.6	8.9	4.8	208.0	0.0	0.0	0.0	0.0	0.0	0.0	
DW *** UW																
FTE	PLANNED	28.8	0.9	0.9	0.9	0.9	0.9	0.4	33.7	0.4	0.4	0.4	0.4	0.4	0.4	
	ACTUALS	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	
FF *** France																
FTE	PLANNED	586.3	37.3	36.0	35.5	35.1	26.7	30.0	786.9	31.3	31.3	31.3	31.2	31.0	31.0	
	ACTUALS								0.0							
FI *** Italy																
FTE	PLANNED	203.3	14.0	12.9	16.5	16.9	18.4	16.9	298.8	16.6	13.7	18.9	19.2	13.0	11.1	
	ACTUALS	147.9	10.9	10.9	10.9	10.9	10.9	10.8	213.0	0.0	0.0	0.0	0.0	0.0	0.0	
FJ *** Japan																
FTE	PLANNED	61.5	2.8	2.8	2.8	2.8	2.8	2.8	78.1	2.8	2.8	2.8	2.8	1.1	1.0	
	ACTUALS	45.7	1.8	1.8	1.8	1.8	1.8	1.8	56.2	0.0	0.0	0.0	0.0	0.0	0.0	
FK *** Sweden																
FTE	PLANNED	32.0	4.6	4.6	4.6	4.6	3.4	4.9	58.7	5.1	5.1	5.1	5.1	5.1	5.1	
	ACTUALS								0.0							
Grand Totals:																
	PLANNED	2674.5	182.2	199.4	173.3	172.2	167.1	171.9	3740.6	173.0	169.6	179.9	167.7	159.7	162.0	
	ACTUALS	1806.0	152.4	133.5	115.3	135.0	148.6	125.6	2616.3	0.0	0.0	0.0	0.0	0.0	0.0	
4.1 GLAST LAT																
Contributed																
	PLANNED	1081.4	73.0	98.4	71.0	71.7	64.3	69.4	1529.2	73.6	72.3	77.9	76.5	69.8	67.6	
	ACTUALS	359.5	68.2	25.5	23.1	23.6	22.7	23.9	546.4	0.0	0.0	0.0	0.0	0.0	0.0	
Funded																
	PLANNED	1593.1	109.1	101.0	102.4	100.5	102.9	102.4	2211.4	99.4	97.3	102.0	91.2	89.9	94.4	
	ACTUALS	1446.5	84.2	108.0	92.2	111.4	125.9	101.7	2069.9	0.0	0.0	0.0	0.0	0.0	0.0	
Grand Totals:																
	PLANNED	2674.5	182.2	199.4	173.3	172.2	167.1	171.9	3740.6	173.0	169.6	179.9	167.7	159.7	162.0	
	ACTUALS	1806.0	152.4	133.5	115.3	135.0	148.6	125.6	2616.3	0.0	0.0	0.0	0.0	0.0	0.0	