

Monthly Progress Report
(Month Ending September 2002)

GLAST Large Area Telescope (LAT)

LAT-MR-01041-01

November 18, 2002

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, 2002.

2.0 Recent Progress and Status

Representatives of the LAT project attended the kickoff meeting with the GLAST spacecraft vendor, Spectrum Astro, September 25-26.

The subsystem ASICs (application specific integrated circuits) submitted for a dedicated run were received and tested. The ACD front-end ASIC was not successful; the remainder tested successfully. If there is time for another submission, we may choose to make some improvements to those ASICs which were successful.

Tracker: A production readiness review for the silicon strip detector ladders was held. Final approval is dependent on the completion of tests on the new encapsulation material. ASIC testing was carried out, with two full multi-chip modules (MCMs) and several mini-MCMs built and tested. Approximately 50% of the Engineering Model (EM) tray panels have been fabricated. Bottom-tray redesign efforts, using invar, have commenced. A backup plan is being studied, which uses the existing carbon design with titanium reinforcement.

Calorimeter: A technical interchange meeting was held with our French collaborators to demonstrate the crystal detector element (CDE) bonding process and tools developed at NRL. Kalmar University (Sweden) has received all crystals required for the first engineering model (EM), and the chamfer process is underway. Tooling production for CDE bonding for the engineering model has been completed. The ground support equipment for the insertion of the CDE's into the EM structure has been completed, and the EM structure has been inspected. Seven front-end ASICs and four readout controller ASICs are being tested on the pre-EM analog front-end electronics X-board.

ACD: The final design report on the Micrometeoroid Shield was completed. The design meets all current LAT and GLAST Mission requirements; however it wouldn't meet the requirements if the recently updated orbital debris model was used for the predictions. Thermal testing of the tile detector assembly and wave shifting fiber/clear fiber connector was completed. A performance increase was noted with decreasing temperature.

Electronics: The Calorimeter front-end ASIC (with remote on/off overload recovery option) and the Global Trigger ASIC have been submitted for fabrication. The ACD front-end analog ASIC was modified and submitted for fabrication. The Tower Engineering Model power supply board for the first EM has been fabricated. Three new engineers are on board.

Mechanical Systems: A contractor was hired to work on engineering model testing. Lockheed-Martin has added several new team members to support the detailed design development. The search is on for a mechanical engineer, to maintain Mechanical Systems manpower levels (impacted by the formation of Instrument Design Engineering). Work has started on the Engineering Model 1 x 4 grid design. This unit will incorporate most of the features of the Flight 4 x 4 grid.

Integration & Test: Preliminary signal-to-noise background studies with engineering model geometry using GLEAM (GLAST Event Analysis Machine – the package for setting up the development version of the simulation) was accomplished. Contributed support for fire suppression system improvements in the clean room was received. Engineering Model work is progressing with an in-house software while the Electrical Ground Support Equipment test executive trade study is being performed. The Calorimeter alignment tool and grid bay mockup is almost complete.

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.

As reported last month, the attention of the Electronics team was diverted to support the front-end ASIC work. The schedule for all but two of the affected Level 3 milestones has been restored. The Electronics and ACD subsystem managers are updating the delivery dates for the ACD Electronics Module (1M7941310) and the final version of the AEM (ACD Electronics Module) hardware driver (1M1001420).

The flight software system specification milestone (1M1001360) shows a 32-day delay; a workaround plan is under development and the schedule is expected to be restored by the next reporting period.

The Tracker dead/noisy strips (1M1001120), the Calorimeter calibration prototype coding (1M1001110), and the multichip modules from Tracker to Electronics (1M1000550) were completed in October.

The as-built drawings for the Tracker Engineering Model (1M1001280) are expected to be completed in mid-December; a workaround plan is in progress and the schedule is expected to be restored by the next reporting period.

4.0 Financial Status

Attachment 3 depicts the costs and commitments 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.

While the cumulative cost and schedule variances for 4.1.4 Tracker do not exceed the reporting threshold, the current period's unfavorable variances are a concern. They stem from extra time spent understanding and correcting the electronics design errors in the ASICs and the printed wiring boards. The subsystem management is evaluating the possibility of absorbing these variances within the current subsystem baseline cost and schedule.

The unfavorable schedule variance in 4.1.5 Calorimeter is due to several items: a late start on the PEM assembly, delays in the AFEE flight part procurements and development, and delays in the ground support equipment. These variances are not currently considered critical.

The unfavorable schedule variance in 4.1.6 ACD is due to delays in several areas. The delivery of mechanical hardware required to perform tile detector assembly (TDA) testing is late. Assistance is being received from the GSFC mechanical systems group to mitigate delays in finalizing tile shell assembly design. The base electronics assembly (BEA) packaging design board layouts are complete and being sent out for fabrication. There are delays in the photomultiplier tube resistor network assembly and testing; the details are being worked out. A plan is being developed to minimize the impact of delays in the analog ASICs. The unfavorable schedule variance in the current period is due to costs for lab and MPS taxes not occurring when planned; the cumulative variances for lab and MPS taxes are below reporting threshold.

The unfavorable cost variance in 4.1.7 Electronics is caused by 4.1.6 ACD and 4.1.5 Calorimeter electronics work being charged to 4.1.7; change requests are in development to create new work packages at SLAC for that work.

The favorable cost variance in 4.1.8 Mechanical Systems is caused by subcontractor invoicing delays. An accrual was made in September to minimize this impact (hence the unfavorable cost variance in the current period). The unfavorable schedule variance is centered in three areas: mechanical systems development, thermal control system work, and the grid engineering model (EM). The delays in mechanical systems development are caused by hiring delays; a technician was added in September to work full-time on the engineering model program, and a possible realignment of tasks towards the subsystem and instrument CDRs is being evaluated. The delay in the thermal control system development will be mitigated by the formation of the Instrument Design Engineering group, which will drive issues across subsystem boundaries. The unfavorable schedule variance in the grid EM program is due to delays in the 1x4 grid, cantilever beam, Cal-Grid interface test, and thermal contact and EM heat pipe tests. A new engineer will start work in November and another analyst is being sought; tests will be conducted in parallel to recover schedule.

The task loading of the mechanical ground support equipment area of 4.1.9 Integration & Test is being adjusted to reflect the updated completion dates in the six-month schedule extension. This largely accounts for the negative schedule variance in 4.1.9 Integration & Test, which will be corrected once the replan has been approved and implemented (currently projected for the November status report).

The favorable cost variance in 4.1.A Performance & Safety Assurance 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.

A change in the 4.1.B IOC subsystem management has resulted in a temporary favorable cost variance. This will be addressed once a permanent replacement subsystem manager has been appointed.

The favorable cost variance in 4.1.C Education & Public Outreach is attributed to a temporary delay in the printing of the TOPS material, and funding delays.

6.0 Change Control and Contingency Analysis

Eight change requests were submitted to and approved by the LAT Configuration Control Board during September.

Change Request No.	Description	Submitted By	CCB Meeting	Current Status
LAT-XR-00770-01	Redundant HVBS's for ACD Electronics	G. Shiblee	9/18/02	Approved \$60K
LAT-XR-00883-01	Tracker Design Consultation	T. Borden	9/18/02	Approved \$40K
LAT-XR-00911-01	L1 Milestone Changes	W. Althouse	9/18/02	Approved \$0K
LAT-XR-00952-01	I&T Technical Support	B. Grist	9/18/02	Approved \$19K
LAT-XR-01000-01	ACD FY01 Carryover Costs	T. Johnson	9/18/02	Approved \$275K
LAT-XR-01001-01	ACD MPS Tax Rephasing	T. Johnson	9/30/02	Approved \$50K
LAT-XR-01009-01	ACD FY02 Scheduling Support	T. Johnson	9/30/02	Approved \$82K
LAT-XR-0934-01	Calorimeter CDE Development Modifications	N. Johnson	9/30/02	Approved \$227K

The fabrication phase cost baseline is now \$100.7M. Funding applicable to that baseline is \$121.2M; resulting contingency is \$20.5M.

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 1)										
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*	0	12/13/02*			▼			
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 2)										
1M1BF00000	Launch Balloon Flight	08/01/01A	0	08/01/01A	▼					
1M1000100	Instrument Preliminary Design Review	01/08/02A	0	01/08/02A		▼				
1M1000110	I-CDR (Critical Design Review)	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	10/24/02 12:27	GLAST LAT PROJECT Project Milestones (Level 1 and 2)			LAT3 LT_MS1-2	Sheet 1 of 1				
© Primavera Systems, Inc.										

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

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND	FY02		FY03	
Instrument Project Office (Level 3)										
1M7941300	(1) Prototype Electronics Module (Elec to ACD)	04/08/02A	0	04/08/02A	7	6	▼			
1M1001200	AEM reg descrip-ELX to I&T/Online	04/12/02A	0	04/12/02A	7	9	▼			
1M7941362	EGSE Workstation / Software #1 (I&T to TKR)	04/12/02A	0	04/12/02A	9	4	▼			
1M7941363	EGSE Workstation / Software #1 (I&T to ELX)	04/12/02A	0	04/12/02A	9	7	▼			
1M7941361	EGSE Workstation / Software #1 (I&T to CAL)	04/15/02A	0	04/15/02A	9	5	▼			
1M7941380	EGSE Workstation / Software #3 (I&T to ACD)	03/03/03*	216	04/15/02A	9	6	▼			
1M7941360	EGSE Workstation / Software #1 (I&T to ACD)	04/16/02A	0	04/16/02A	9	6	▼			
1M7941370	EGSE Workstation / Software #2 (I&T to ACD)	04/16/02A	0	04/16/02A	9	6	▼			
1M7941140	EGSE EM1 H/W Release-Elec to I&T	04/22/02A	0	04/22/02A	7	9	▼			
1M1001300	Def of Data format from ELX/FSW to I&T/Online	05/01/02A	0	05/01/02A	7	9	▼			
1M1001320	GEM register description-ELX to I&T/Online	05/02/02A	0	05/02/02A	7	9	▼			
1M1001330	GEM data taking desc-ELX to I&T/Online	05/02/02A	0	05/02/02A	7	9	▼			
1M57000030	1st Major Release of Sim/Recon (SAS to I & T)	06/12/02	0	06/12/02A	D	9	▼			
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	▼			
1M1001120	Tracker Dead/Noisy Strips (SAS to I & T)	06/21/02*	-69	09/30/02*	D	9	▼			
1M1001410	TEM H/W driver, final ver-ELX to I&T/Online	11/19/02	36	09/30/02	7	9	▼			
Run Date	10/24/02 10:19	GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			LAT3 LT - MS (L3)		Sheet 1 of 3			
© Primavera Systems, Inc.										

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

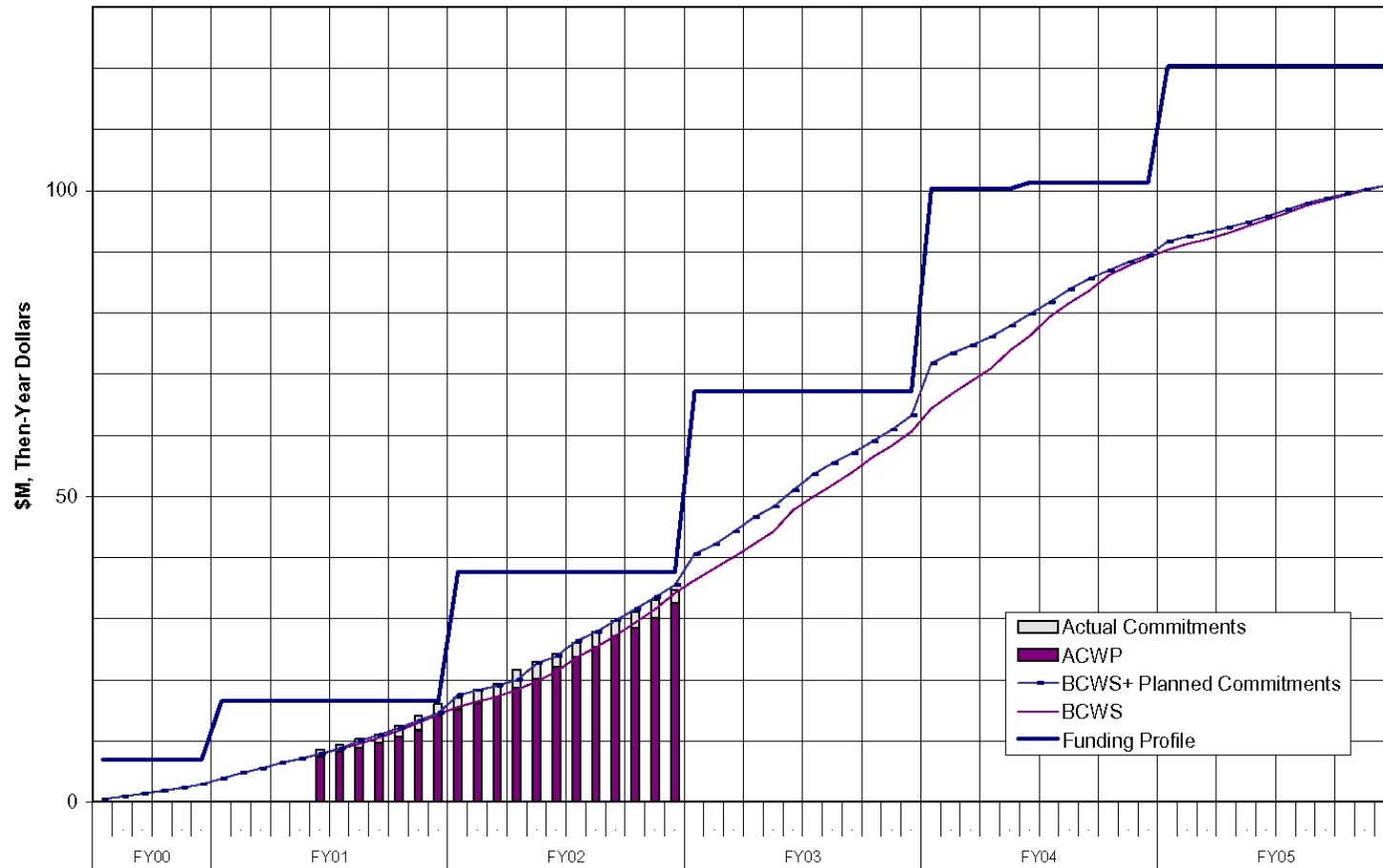
Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND	FY02		FY03		
Instrument Project Office (Level 3)											
1M1001110	Calorimeter Calibration Prototype Coding SAS-I&T	07/08/02	-69	10/14/02	D	9					
1M1000550	(9) MCM's from Tracker to Elec	09/20/02	-40	11/15/02	4	7					
1M7941350	High Voltage Power Supply (Bd & Prts)-ACD toElec	11/15/02*	0	11/15/02*	6	7					
1M1001510	EM1 EGSE WS-S/W R2 I&T to ACD	12/05/02	6	11/27/02	9	6					
1M1001511	EM1 EGSE WS-S/W R2 I&T to CAL	12/05/02	6	11/27/02	9	5					
1M1001512	EM1 EGSE WS-S/W R2 I&T to ELX	12/05/02	6	11/27/02	9	7					
1M1001513	EM1 EGSE WS-S/W R2 I&T to IOC	12/05/02	6	11/27/02	9	B					
1M1001514	EM1 EGSE WS-S/W R2 I&T to TKR	12/05/02	6	11/27/02	9	4					
1M1001380	Delivery of EM (1X4) Grid to I&T/MSGE	12/02/02*	0	12/02/02*	8	9					
1M1001430	Delv of TKR EM to SLAC I&T/MGSE	12/09/02*	0	12/09/02*	4	9					
1M1001210	AEM H/W driver, init ver-ELX to I&T/Online	01/02/03*	0	01/02/03*	7	9					
1M1001310	AEM data taking desc-ELX to I&T/Online	01/02/03*	0	01/02/03*	7	9					
1M1000980	Doc defining Backsplash Test Model (ACD to I&T)	01/03/03*	0	01/03/03*	6	9					
1M1001390	GEM h/w driver, final ver-ELX to I&T/Online	01/07/03	-4	01/13/03	7	9					
1M1001130	Tracker Tower & Tray Alignment (SAS to I&T)	01/22/03*	0	01/22/03*	D	9					
1M57000020	CAL AFFE Engr Model-CAL to Elec	02/03/03*	0	02/03/03*	5	7					
1M7941310	ACD Electronics Module - EM1 (Elec to ACD)	09/20/02	-89	02/06/03	7	6					
Run Date	10/24/02 10:19	GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			LAT3 LT - MS (L3)	Sheet 2 of 3					
© Primavera Systems, Inc.											

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

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND	FY02		FY03			
Instrument Project Office (Level 3)												
1M1001280	As-Built dwgs for EM TKR-TKR to I&T	12/05/02	-40	02/11/03	4	9				▽		
1M1001360	FSW system spec-ELX/FSW to I&T/Online	12/20/02	-32	02/14/03	7	9				▽		
1M1001460	IPS description-ELX to I&T/Online	12/23/02	-42	03/04/03	7	9				▽		
1M1001420	AEM H/W driver final ver-ELX to I&T/Online	09/20/02	-110	03/10/03	7	9				▽		
1M7941340	(11) FREE Bds & ASICS, (1) Fully Tested Bd - EM2	03/10/03*	0	03/10/03*	6	7				▽		
Run Date							10/24/02 10:19	GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)			LAT3 LT - MS (L3)	Sheet 3 of 3
© Primavera Systems, Inc.												

Attachment 3

Budget vs Actuals vs Funding
DOE + NASA Project Expenditures



Attachment 4
LAT Costs, through September 2002, by WBS

Monthly Contractor Financial Management Report								Report for Month Ending: 9/30/02		
To: Liz Citrin, 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			4/3/00	Billing	
	During Month		Cum. to Date		Detail		Balance of Budget	Estimated Final Cost		Unfilled Orders Outstanding
	Actual	Planned	Actual	Planned	OCT02	NOV02		Project Estimate	Budget Value	
4.1.1 INSTRUMENT MANAGEMENT	281	220	5,191	5,161	210	175	6,026	11,602	11,602	
4.1.2 SYSTEM ENGINEERING	69	110	2,105	2,119	110	91	2,340	4,647	4,647	
4.1.4 TRACKER	172	170	5,040	5,081	112	130	4,635	9,917	9,917	
4.1.5 CALORIMETER	360	400	5,440	5,841	571	694	10,870	17,574	17,574	
4.1.6 ANTICOINCIDENCE DETECTOR	312	977	4,223	4,423	245	192	6,086	10,746	10,746	
4.1.7 ELECTRONICS	389	151	3,637	3,346	168	134	11,798	15,738	15,738	
4.1.8 MECHANICAL SYSTEMS	683	380	2,403	3,172	324	299	8,824	11,850	11,850	
4.1.9 INTEGRATION & TEST	115	108	929	965	133	82	5,528	6,673	6,673	
4.1.A PERFORMANCE AND SAFETY ASSURANCE	38	53	599	896	60	49	1,466	2,174	2,174	
4.1.B LAT INSTRUMENT OPERATIONS CENTER	0	10	262	368	33	28	2,228	2,552	2,552	
4.1.C EDUCATION AND PUBLIC OUTREACH	42	26	530	628	39	29	2,000	2,598	2,598	
4.1.D SCIENCE ANALYSIS SOFTWARE	48	42	784	794	63	52	2,429	3,328	3,328	
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	2,508	2,648	32,469	34,115	2,068	1,955	64,228	100,719	100,719	

Attachment 5
LAT Costs, through September 2002, by Organization and Cost Code

Monthly Contractor Financial Management Report								Report for Month Ending: 9/30/02		
To: Liz Citrin, 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	OCT02	NOV02		Project Estimate	Budget Value	
DG *** GSFC	340	1,010	5,399	5,727	295	233	7,781	13,708	13,708	
DH *** HEPL	41	101	2,736	2,942	106	95	4,656	7,593	7,593	
DL *** SLAC	1,550	954	15,553	15,723	901	783	33,045	50,283	50,283	
DN *** NRL	487	492	7,036	7,686	678	771	15,370	23,855	23,855	
DS *** SSU	42	26	530	628	39	29	1,950	2,548	2,548	
DT *** Texas A&M	15	0	15	16	0	0	0	16	16	
DU *** UCSC	33	65	1,199	1,393	50	42	1,425	2,716	2,716	
Total	2,508	2,648	32,469	34,115	2,069	1,953	64,229	100,719	100,719	

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	OCT02	NOV02				
RL LABOR	1,466	1,415	19,770	20,582	1,276	1,006	33,007	55,059	55,059	
<i>FTE (DOE/NASA)</i>	<i>108.0</i>	<i>101.0</i>	<i>1,638.7</i>	<i>1,803.3</i>	<i>107.0</i>	<i>102.0</i>	<i>2,973.8</i>	<i>4,821.5</i>	<i>4,821.5</i>	
<i>HOURS (DOE/NASA)</i>	<i>17,276</i>	<i>16,164</i>	<i>280,107</i>	<i>298,791</i>	<i>19,669</i>	<i>15,543</i>	<i>481,042</i>	<i>796,361</i>	<i>796,361</i>	
RT TRAVEL	51	48	590	939	68	52	2,512	3,222	3,222	
RM MATERIAL & SERVICES	921	756	10,925	11,264	710	849	26,171	38,656	38,656	
RX MPS & LAB TAX	70	429	1,183	1,331	15	46	2,538	3,783	3,783	
Total (not incl FTE/Hours)	2,508	2,648	32,469	34,115	2,069	1,953	64,229	100,719	100,719	

**Attachment 6
LAT Performance, through September 2002, by WBS**

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:					Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 8/31/02 9/30/02			
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 Performed	Variance		Budgeted Cost		Actual Cost Work Performed	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)
4.1.1 INSTRUMENT MANAGEMENT	220	220	281	0	-61	5,161	5,161	5,191	0	-31	11,602	11,602	0
4.1.2 SYSTEM ENGINEERING	110	106	69	-4	38	2,119	2,058	2,105	-62	-47	4,647	4,647	0
4.1.4 TRACKER	170	85	172	-85	-87	5,081	4,887	5,040	-194	-153	9,917	9,917	0
4.1.5 CALORIMETER	400	482	360	82	122	5,841	5,587	5,440	-254	148	17,574	17,574	0
4.1.6 ANTICOINCIDENCE DETECTOR	977	698	312	-279	386	4,423	3,990	4,223	-434	-233	10,746	10,746	0
4.1.7 ELECTRONICS	151	146	389	-5	-242	3,346	3,280	3,637	-66	-357	15,738	15,738	0
4.1.8 MECHANICAL SYSTEMS	380	284	683	-96	-399	3,172	2,713	2,403	-459	310	11,850	11,850	0
4.1.9 INTEGRATION & TEST	108	127	115	19	13	965	860	929	-105	-70	6,673	6,673	0
4.1.A PERFORMANCE AND SAFETY ASSURA	53	53	38	0	15	896	896	599	0	297	2,174	2,174	0
4.1.B LAT INSTRUMENT OPERATIONS CENT	10	8	0	-2	8	368	346	262	-22	84	2,552	2,552	0
4.1.C EDUCATION AND PUBLIC OUTREACH	26	61	42	34	19	628	628	530	0	98	2,598	2,598	0
4.1.D SCIENCE ANALYSIS SOFTWARE	42	70	48	27	21	794	769	784	-25	-14	3,328	3,328	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	2,648	2,340	2,508	-308	-168	34,115	32,495	32,469	-1,620	26	100,719	100,719	0
Contingency											20,521	20,521	
Total	2,648	2,340	2,508	-308	-168	34,115	32,495	32,469	-1,620	26	121,240	121,240	

Attachment 7
LAT Performance, through September 2002, by Organization

Cost Performance Report - Organization													
Contractor: Location:				Contract Type/No:				Project Name/No: GLAST LAT Project		Report Period: 8/31/02 9/30/02			
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 Item	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			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
DG *** GSFC	1,010	730	340	-280	390	5,727	5,291	5,399	-436	-108	13,708	13,708	0
DH *** HEPL	101	133	41	32	93	2,942	2,897	2,736	-45	161	7,593	7,593	0
DL *** SLAC	954	772	1,550	-182	-778	15,723	14,873	15,553	-850	-680	50,283	50,283	0
DN *** NRL	492	591	487	99	103	7,686	7,404	7,036	-283	368	23,855	23,855	0
DS *** SSU	26	61	42	34	19	628	628	530	0	98	2,548	2,548	0
DT *** Texas A&M	0	0	15	0	-15	16	16	15	0	0	16	16	0
DU *** UCSC	65	53	33	-12	20	1,393	1,386	1,199	-7	187	2,716	2,716	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget											0	0	0
Sub Total	2,648	2,340	2,508	-308	-168	34,115	32,495	32,469	-1,620	26	100,719	100,719	0
Contingency											20,521	20,521	
Total	2,648	2,340	2,508	-308	-168	34,115	32,495	32,469	-1,620	26	121,240	121,240	

Attachment 8 LAT Performance Analysis, September 2002

	WBS	BAC	BCWS	BCWP	ACWP	SV \$	CV \$	% BCWS	% BCWP	% ACWP	SV Trend	CV Trend	SPI	CPI	Cpi_Fcst	CpiSpi_Fcst
2	4.1	100,719	34,115	32,495	32,469	-1,620	26	33.87	32.26	32.24	↓	↓	0.953	1.001	100,638	104,037
3	4.1.1	11,602	5,161	5,161	5,191	0	-31	44.48	44.48	44.74	↔	↓	1.000	0.994	11,671	11,671
4	4.1.2	4,647	2,119	2,058	2,105	-62	-47	45.61	44.28	45.30	↔	↑	0.971	0.977	4,754	4,833
5	4.1.4	9,917	5,081	4,887	5,040	-194	-153	51.24	49.28	50.82	↓	↓	0.962	0.970	10,226	10,432
6	4.1.5	17,575	5,841	5,587	5,440	-254	148	33.23	31.79	30.95	↑	↑	0.957	1.027	17,110	17,640
7	4.1.6	10,746	4,423	3,990	4,223	-434	-233	41.16	37.13	39.30	↓	↑	0.902	0.945	11,375	12,152
8	4.1.7	15,738	3,346	3,280	3,637	-66	-357	21.26	20.84	23.11	↔	↓	0.980	0.902	17,450	17,728
9	4.1.8	11,850	3,172	2,713	2,403	-459	310	26.77	22.89	20.28	↓	↓	0.855	1.129	10,497	11,868
10	4.1.9	6,673	965	860	929	-105	-70	14.46	12.88	13.93	↑	↑	0.891	0.925	7,215	7,986
11	4.1.A	2,174	896	896	599	0	297	41.21	41.21	27.57	↔	↔	1.000	1.495	1,455	1,455
12	4.1.B	2,552	368	346	262	-22	84	14.44	13.56	10.29	↔	↔	0.939	1.319	1,935	2,044
13	4.1.C	2,598	628	628	530	0	98	24.17	24.17	20.39	↑	↑	1.000	1.185	2,192	2,192
14	4.1.D	3,328	794	769	784	-25	-14	23.85	23.11	23.55	↑	↑	0.969	0.982	3,390	3,474
15	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
16	[FMB]	100,719	34,115	32,495	32,469	-1,620	26	33.87	32.26	32.24	↓	↓	0.953	1.001	100,638	104,037

LEGEND

BAC: Budget At Complete

BCWS: Budgeted Cost of Work Scheduled (to date)

BCWP: Budgeted Cost of Work Performed (to date)

ACWP: Actual Cost of Work Performed (to date)

SV \$: Schedule Variance = BCWP - BCWS

CV \$: Cost Variance = BCWP - ACWP

SPI: Schedule Performance Index = BCWP/BCWS

CPI: Cost Performance Index = BCWP/ACWP

% BCWS: Percent Scheduled = BCWS/BAC

% BCWP: Percent Complete = BCWP/BAC

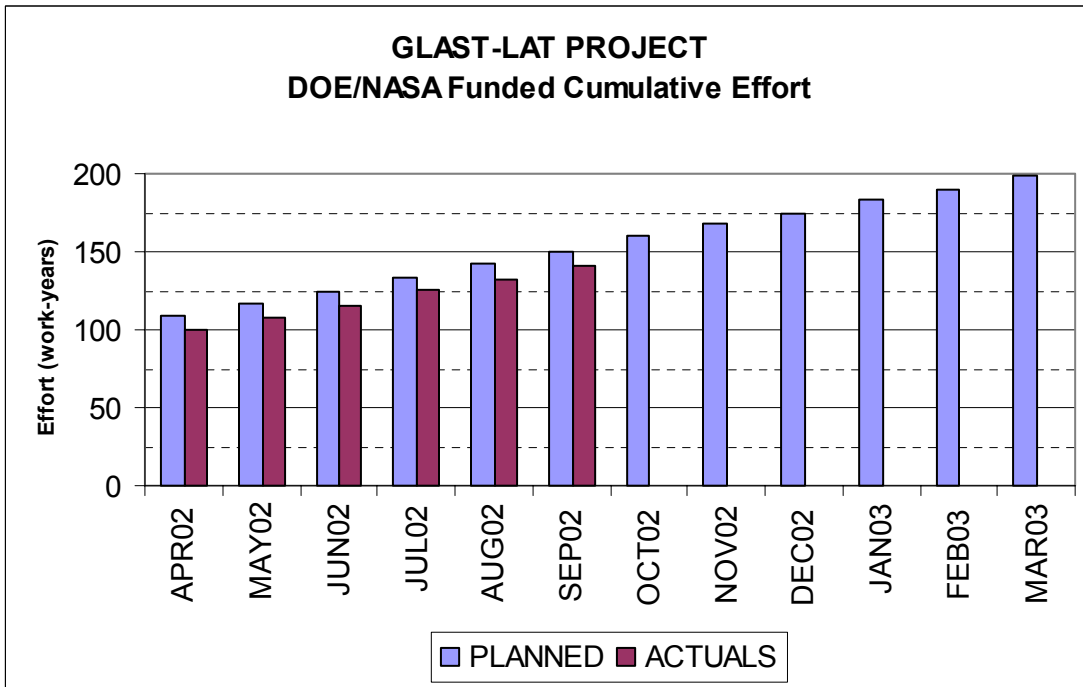
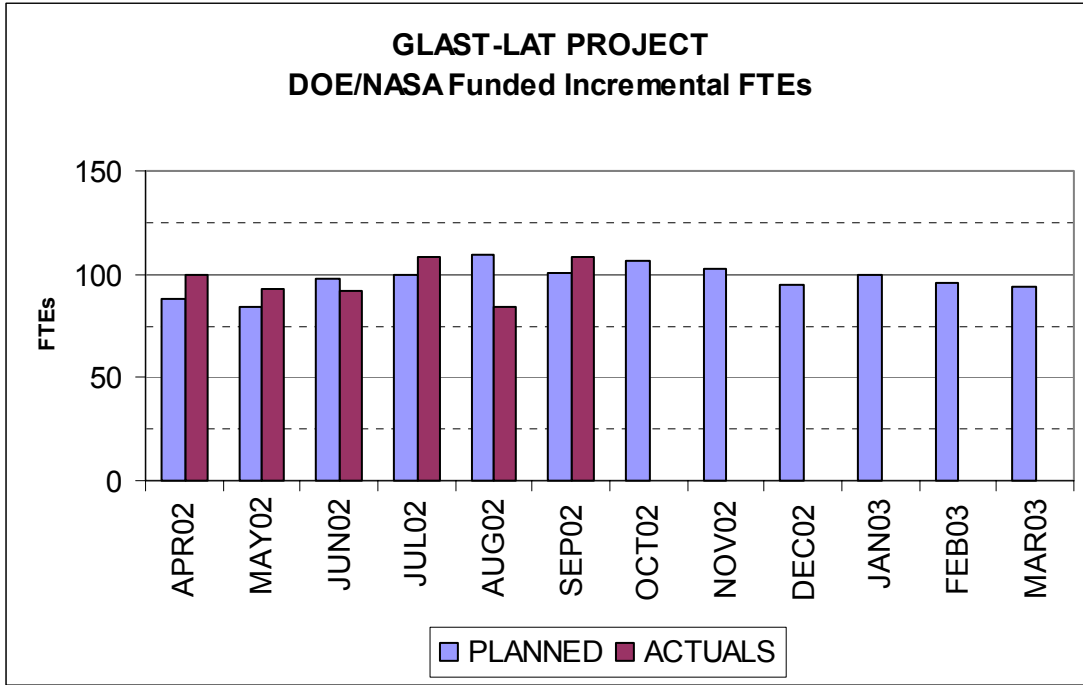
% ACWP: Percent Spent = ACWP/BAC

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

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

	Worse than -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 September 2002, by Organization

Program: LAT3		Description: GLAST LAT Project		Approval: Program Manager												
Run Date: 10/24/02		Status Date: 9/30/02		Functional Manager			Cost Account Manager									
			PRIOR	APR02	MAY02	JUN02	JUL02	AUG02	SEP02	Cum-to- Date	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03
OBS																
DG *** GSFC																
FTE	PLANNED	235.7	23.1	24.6	24.2	24.9	25.1	38.8	396.4	26.4	26.1	22.3	23.5	22.4	21.5	
	ACTUALS	150.0	29.1	25.9	13.7	42.5	27.6	28.1	316.8	0.0	0.0	0.0	0.0	0.0	0.0	
DH *** HEPL																
FTE	PLANNED	163.2	6.3	7.7	7.8	8.5	7.3	6.9	207.6	7.2	8.0	8.1	7.3	7.2	6.7	
	ACTUALS	150.7	5.3	6.0	8.9	5.5	0.0	3.2	179.6	0.0	0.0	0.0	0.0	0.0	0.0	
DL *** SLAC																
FTE	PLANNED	507.6	43.3	43.0	54.7	51.1	60.0	61.4	821.2	47.0	49.0	49.4	53.7	53.4	55.1	
	ACTUALS	433.2	48.9	37.8	39.4	37.6	85.9	53.7	736.5	0.0	0.0	0.0	0.0	0.0	0.0	
DN *** NRL																
FTE	PLANNED	269.3	21.7	15.2	20.7	21.6	23.7	28.9	401.0	30.4	23.8	20.5	23.0	23.5	22.2	
	ACTUALS	256.4	31.5	23.5	30.1	21.1	17.0	31.1	410.6	0.0	0.0	0.0	0.0	0.0	0.0	
DS *** SSU																
FTE	PLANNED	32.7	1.5	1.5	1.5	4.2	1.5	1.5	44.6	1.7	1.7	1.6	1.6	1.6	1.6	
	ACTUALS	33.1	1.5	2.4	4.0	2.8	3.1	0.4	47.4	0.0	0.0	0.0	0.0	0.0	0.0	
DU *** UCSC																
FTE	PLANNED	126.6	4.8	6.0	4.8	4.8	4.8	4.8	156.7	5.1	5.1	4.7	4.8	5.4	6.4	
	ACTUALS	149.8	4.6	4.9	5.9	6.3	6.2	4.4	182.2	0.0	0.0	0.0	0.0	0.0	0.0	
DW *** UW																
FTE	PLANNED	24.9	0.9	0.9	1.1	1.0	0.9	0.9	30.6	0.9	0.9	0.9	0.9	0.9	0.9	
	ACTUALS								0.0							
FF *** France																
FTE	PLANNED	441.7	35.9	35.8	35.9	37.1	37.3	36.0	659.6	35.5	35.1	26.7	30.0	31.3	31.3	
	ACTUALS								0.0							
FI *** Italy																
FTE	PLANNED	145.6	13.7	14.2	14.6	15.1	14.0	12.9	230.2	16.5	16.9	18.4	16.9	16.6	13.7	
	ACTUALS	104.6	10.9	11.9	9.8	10.9	10.9	10.9	169.6	0.0	0.0	0.0	0.0	0.0	0.0	
FJ *** Japan																
FTE	PLANNED	50.4	2.8	2.8	2.8	2.8	2.8	2.8	67.0	2.8	2.8	2.8	2.8	2.8	2.8	
	ACTUALS	38.7	1.8	1.8	1.8	1.8	1.8	1.8	49.2	0.0	0.0	0.0	0.0	0.0	0.0	
FK *** Sweden																
FTE	PLANNED	13.6	4.6	4.6	4.6	4.6	4.6	4.6	41.2	4.6	4.6	3.4	4.9	5.1	5.1	
	ACTUALS								0.0							
Grand Totals:																
	PLANNED	2011.4	158.7	156.1	172.6	175.7	182.2	199.4	3056.1	177.9	173.9	158.9	169.4	170.2	167.3	
	ACTUALS	1316.6	133.4	114.1	113.5	128.4	152.4	133.5	2091.9	0.0	0.0	0.0	0.0	0.0	0.0	
4.1 GLAST LAT																
Contributed	PLANNED	788.1	70.4	71.9	74.6	76.5	73.0	98.4	1252.9	71.0	71.7	64.3	70.2	74.4	73.1	
	ACTUALS	262.5	33.9	21.4	21.4	20.2	68.2	25.5	453.2	0.0	0.0	0.0	0.0	0.0	0.0	
Funded	PLANNED	1223.3	88.3	84.3	98.0	99.3	109.1	101.0	1803.3	106.9	102.3	94.7	99.2	95.8	94.2	
	ACTUALS	1054.1	99.5	92.7	92.1	108.2	84.2	108.0	1638.7	0.0	0.0	0.0	0.0	0.0	0.0	
Grand Totals:																
	PLANNED	2011.4	158.7	156.1	172.6	175.7	182.2	199.4	3056.1	177.9	173.9	158.9	169.4	170.2	167.3	
	ACTUALS	1316.6	133.4	114.1	113.5	128.4	152.4	133.5	2091.9	0.0	0.0	0.0	0.0	0.0	0.0	