

# **Monthly Progress Report**

**(Month Ending July 2002)**

## **GLAST Large Area Telescope (LAT)**

LAT-MR-00892-01

September 9, 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 July, 2002.

## 2.0 Recent Progress and Status

A review of the LAT project management control system was conducted July 9-11. This is a requirement for DOE CD-2 ("Approve Performance Baseline") approval. The review committee was satisfied with the system, and provided several useful recommendations.

The joint DOE/NASA Delta Review of the Technical, Cost, Schedule and Management of the LAT project was conducted July 30 - August 1. The project was recommended for baseline. The top three action items are:

- Approve Critical Decision 2 (Responsibility: DOE)
- Conduct a Mini-Review (Responsibility: DOE)
- Conduct a NASA Critical Design Review and DOE CD-3 Review (Responsibility: DOE, NASA, LAT)

A DOE External Independent Review (a requirement for DOE CD-2 approval) was conducted in coordination with the Delta Review. The project successfully passed this review.

DOE CD-1 approval ("Approve Preliminary Baseline Range") was received July 23.

**Tracker:** A plan to redesign the corner flexure mount was submitted to the anomaly review committee for resolution of the vibration test structural failure; it was approved, pending cost and schedule details. The ASIC probe station development is complete.

**Calorimeter:** The pre-electronics module and crystal detector element (CDE) tolerance buildup review was completed and component dimension adjustments were directed. Structure cell size for engineering model (EM) will be increased by electroplating the mandrels. Insertion test of new CDE into VM2 structure cell was verified. Dimension modification on all EM CsI crystals was initiated, and the first 16 were delivered to CEA/Saclay. Twisted pair wiring was selected as the connection between the photodiode and the analog front-end electronics board. Test boards were received for engineering model ASIC parts testing.

**ACD:** The phototube procurement was placed. A successful beam test at CERN was conducted, to confirm previous measurements and calculations of backscatter into the ACD. The clear fibers that had shown the larger-than-expected light loss appear to have

had only one layer of cladding. A new shipment of multi-clad fibers has been received, and it is hoped that they will improve ACD light collection. The ASIC test boards have been developed and are ready for fabrication (test planning in progress). The phototube housing design was completed and parts were submitted for fabrication. Progress has been made in identifying and resolving the void problems with the Tile Shell Assembly composite laminates. New material has been ordered, but it may potentially delay manufacturing of the tile detector test panels and the development flexures.

**Electronics:** The schematic/HDL (hardware description language) and layout for the two Tower Electronics Module ASICs were completed. The next step is the full verification and simulation. Progress was made in the global trigger programming model, resulting in a better knowledge of the ASIC. Seventeen TEMs for subsystem and data acquisition test stands have been fabricated.

**Integration & Test:** A survey of the NRL Environmental Test Facility was conducted, including test chamber measurements, determination of plans and shaker limits, and determination of cable feedthrough standards. A plan for test stand software functionality is underway. Work associated with the radiator mockup was completed. Fabrication of the prototype Calorimeter alignment mechanism has commenced.

### **3.0 Schedule Status**

The status of significant (Levels 1 and 2) milestones identified in the Project Management Plan (LAT-MD-00054-06, currently in review) for the LAT project is summarized in Attachment 1. Level 3 milestone status is included as Attachment 2. Variances to milestones expected to occur in this period are explained below:

- Level 1: No variance.
- Level 2: No variance.
- Level 3: 1M1001110 Calorimeter Calibration Prototype Coding (SAS to I&T) - this item is not needed by I&T until October, 2002.

### **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.

4.1.4 Tracker has recovered to within reporting thresholds from their cumulative cost variance reported last period.

The unfavorable schedule variance in 4.1.5 Calorimeter is due to several items: the CDE bonding study development process taking longer than planned, a late start on the PEM assembly, a change in procedure for the AFEE engineering model board layout, and delays in the Calorimeter Module ground support equipment. The CDE bonding study manufacturing process has been shortened to recover time lost in the development process; the other variances are not currently considered critical.

The unfavorable cost variance in 4.1.6 ACD is due increased manpower requirements in project scheduling, analog ASIC support, and electronics packaging redesign; Goddard MPS and lab tax costs arrived earlier than planned. It was also discovered that some outstanding commitments at the end of FY01 had not been included in the plan (this is being further investigated). There has been a delay in electronics packaging; it is expected to be completed in August.

The favorable cost variance in 4.1.8 Mechanical Systems is largely due to subcontractor invoicing delays. The unfavorable schedule variance is centered in two areas: drawings of the Grid Box were postponed until later in the engineering model development, and testing delays associated with the Grid Box occurred. A designer was engaged in August to address the Grid Box drawings; planned manpower is being sought to address the other delays.

The unfavorable cost variance in 4.1.9 Integration & Test shows a slight upturn this period, but is still a concern. Insufficient credit was taken to account for actual work performed. The mechanical ground support equipment task loading will be adjusted to reflect the updated completion dates in the six-month schedule extension. There is insufficient resource in the SVAC (Science, Verification, Analysis, and Calibration) activities to account for the actual cost; this will be resolved with a change request to level resources between FY02 and FY03.

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 invoice delays.

The unfavorable cost variance in 4.1.D Science Analysis Software is due to an error in planning the six-month schedule extension. Some NRL labor costs in FY02 were moved to the outyears; this will be corrected via change request and is expected to have no impact on overall cost.

## 6.0 Change Control and Contingency Analysis

Two change requests were approved by the LAT Configuration Control Board during July. These were reflected in the internal baseline for the May, 2002 reporting period, which was recommended for approval at the July 30-August 1, 2002 DOE/NASA Review.

Change Request No.	Description	Submitted By	CCB Meeting	Current Status
LAT-XR-00825-01	Schedule Extension and Fabrication Phase Definition	W. Althouse	7/10/02	Approved
LAT-XR-00821-01	Procurement of Dual PIN Photodiodes	N. Johnson	7/10/02	Approved \$400K

The fabrication phase cost baseline is \$100.0M. Funding applicable to that baseline is \$121.2M; resulting contingency is \$21.2M.

## 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 Description	Target Finish Date	Variance	Finish Date							
				FY01	FY02	FY03	FY04	FY05	FY06	
<b>DOE Headquarters (Level 1)</b>										
CD-0 Approval	06/25/01A	0	06/25/01A	▼						
CD-1 Approval	07/01/02*	-15	07/23/02A		▼					
CD-2 Approval	12/13/02*	0	12/13/02*			▼				
CD-3 Approval	07/15/03*	0	07/15/03*				▼			
TEM Power Supply Eng. Model 2 Complete	03/15/04*	0	03/15/04*					▼		
Flight GRID Complete	09/15/04*	0	09/15/04*						▼	
LAT Integrated on Thermal-Vacuum Mount	07/15/05*	0	07/15/05*							▼
LAT Shipment for Observatory Integration	10/17/05*	0	10/17/05*							▼
CD-4 Approval	12/15/05*	0	12/15/05*							▼
<b>DOE/NASA Project Managers (Level 1)</b>										
Launch Balloon Flight	08/01/01A	0	08/01/01A	▼						
Instrument Preliminary Design Review	01/08/02A	0	01/08/02A		▼					
I-CDR (Critical Design Review)	04/30/03*	0	04/30/03*			▼				
TKR, CAL FM A, B Available for Calibration Unit	02/17/04*	0	02/17/04*				▼			
Start LAT Integration	06/15/04*	0	06/15/04*					▼		
Pre Environmental Testing Review	02/15/05*	0	02/15/05*						▼	
PSR-(Instrument Pre-Ship Review)	07/07/05*	0	07/07/05*							▼
LAT Ready for Integration ( RFI ) to Spacecraft	09/22/05*	0	09/22/05*							▼
Run Date	08/30/02 13:50	<b>GLAST LAT PROJECT Project Milestones (Level 1-2)</b>		LAT3 z1 - MS (L1-2)/FL - MS (L1-2)						Sheet 1
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**Attachment 2 (Page 1 of 3)**  
**Level 3 Milestones (One-Year View)**

Activity Description	Target Finish Date	Variance	Finish Date	ND	AV	FY02				FY03				
						Q1	Q2	Q3	Q4	Q1	Q2	Q3		
<b>Instrument Project Office (Level 3)</b>														
TEM H/W driver, init ver-ELX to I&T/Online	02/22/02A	0	02/22/02A	9	7		▼							
MGSE Requirements for ACD (from I&T to ACD)	03/22/02A	0	03/22/02A	6	9		▼							
SLAC Facilities Specification (from I&T to ACD)	03/22/02A	0	03/22/02A	6	9		▼							
Online System Spec from I&T to IOC	03/29/02A	0	03/29/02A	B	9		▼							
TEM Data Taking Desc-ELX to I&T/Online	04/01/02A	0	04/01/02A	9	7		▼							
(1) Prototype Electronics Module (Elec to ACD)	04/08/02A	0	04/08/02A	6	7		▼							
AEM reg descrip-ELX to I&T/Online	04/12/02A	0	04/12/02A	9	7		▼							
EGSE Workstation / Software #1 (I&T to TKR)	04/12/02A	0	04/12/02A	4	9		▼							
EGSE Workstation / Software #1 (I&T to ELX)	04/12/02A	0	04/12/02A	7	9		▼							
EGSE Workstation / Software #1 (I&T to CAL)	04/15/02A	0	04/15/02A	5	9		▼							
EGSE Workstation / Software #1 (I&T to ACD)	04/16/02A	0	04/16/02A	6	9		▼							
EGSE Workstation / Software #2 (I&T to ACD)	04/16/02A	0	04/16/02A	6	9		▼							
EGSE EM1 H/W Release-Elec to I&T	04/22/02A	0	04/22/02A	9	7		▼							
Def of Data format from ELX/FSW to I&T/Online	05/01/02A	0	05/01/02A	9	7		▼							
GEM register description-ELX to I&T/Online	05/02/02A	0	05/02/02A	9	7		▼							
GEM data taking desc-ELX to I&T/Online	05/02/02A	0	05/02/02A	9	7		▼							
1st Major Release of Sim/Recon (SAS to I & T)	06/12/02	0	06/12/02A	9	D		▼							
Run Date	08/30/02 13:52	<b>GLAST LAT PROJECT</b>			LAT3		Sheet 1 of 3							
Data Date	08/01/02	<b>Project Milestones (Level 3)</b>			LT - MS (L3)									
		<b>1 Year View (+/- 6mo)</b>			FL - MS (L3)									
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**Attachment 2, Continued (Page 2 of 3)  
Level 3 Milestones (One-Year View)**

Activity Description	Target Finish Date	Variance	Finish Date	ND	AV	FY02				FY03					
						Q1	Q2	Q3	Q4	Q1	Q2	Q3			
<b>Instrument Project Office (Level 3)</b>															
Tracker Dead/Noisy Strips (SAS to I & T)	06/21/02*	-27	07/31/02*	9	D				▼						
Calorimeter Calibration Prototype Coding SAS-I&T	07/08/02	-23	08/08/02	9	D				▼						
Science Analysis Software CDR	09/04/02*	0	09/04/02*	2	D				▼						
(9) MCM's from Tracker to Elec	09/20/02	0	09/20/02	7	4				▼						
AEM H/W driver final ver-ELX to I&T/Online	09/20/02	-26	10/28/02	9	7				▼						
ACD Electronics Module - EM1 (Elec to ACD)	09/20/02	-26	10/28/02	6	7				▼						
Test/Screening Board w/ASIC for EM1 -ACD to Elec	09/20/02	-26	10/28/02	7	6				▼						
Anticoincidence Detector CDR	09/30/02	-21	10/29/02	2	6				▼						
GEM H/W driver, init ver-ELX to I&T/Online	11/12/02	0	11/12/02	9	7				▼						
High Voltage Power Supply (Bd & Prts)-ACD toElec	11/15/02*	0	11/15/02*	7	6				▼						
TEM H/W driver, final ver-ELX to I&T/Online	11/19/02	0	11/19/02	9	7				▼						
Delivery of EM (2X2) Grid to I&T/MSGE	12/02/02*	0	12/02/02*	9	8				▼						
As-Built dwgs for EM TKR-TKR to I&T	12/05/02	0	12/05/02	9	4				▼						
EM1 EGSE WS-S/W R2 I&T to ACD	12/05/02	0	12/05/02	6	9				▼						
EM1 EGSE WS-S/W R2 I&T to CAL	12/05/02	0	12/05/02	5	9				▼						
EM1 EGSE WS-S/W R2 I&T to ELX	12/05/02	0	12/05/02	7	9				▼						
EM1 EGSE WS-S/W R2 I&T to IOC	12/05/02	0	12/05/02	B	9				▼						
Run Date Data Date	08/30/02 13:52 08/01/02	<b>GLAST LAT PROJECT Project Milestones (Level 3) 1 Year View (+/- 6mo)</b>			LAT3 LT - MS (L3) FL - MS (L3)	Sheet 2 of 3									
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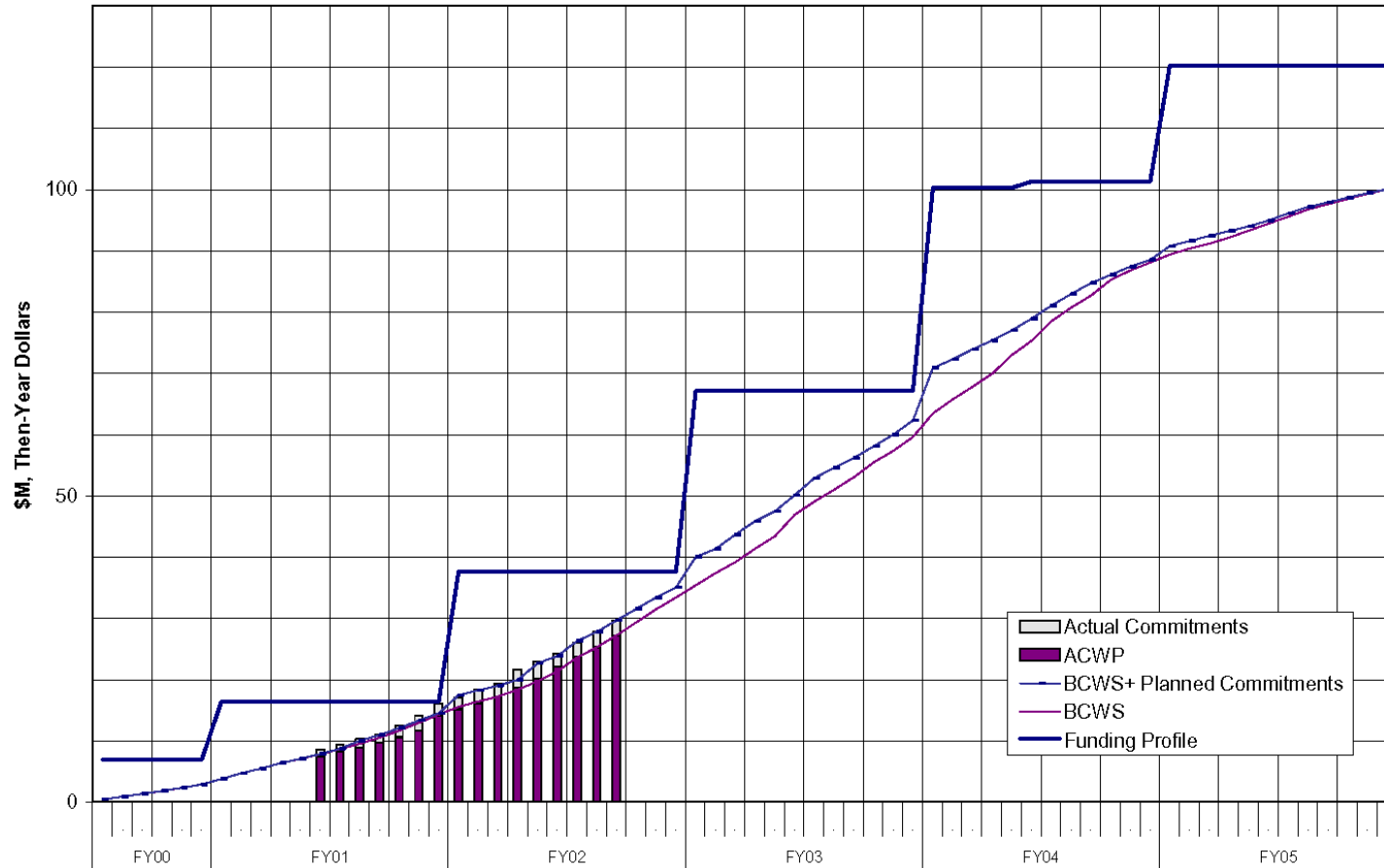


**Attachment 2, Continued (Page 3 of 3)  
Level 3 Milestones (One-Year View)**

Activity Description	Target Finish Date	Variance	Finish Date	ND	AV	FY02				FY03				
						Q1	Q2	Q3	Q4	Q1	Q2	Q3		
<b>Instrument Project Office (Level 3)</b>														
EM1 EGSE WS-S/W R2 I&T to TKR	12/05/02	0	12/05/02	4	9									▽
Delv of TKR EM to SLAC I&T/MGSE	12/09/02*	0	12/09/02*	9	4									▽
FSW system spec-ELX/FSW to I&T/Online	12/20/02	0	12/20/02	9	7									▽
IPS description-ELX to I&T/Online	12/23/02	0	12/23/02	9	7									▽
AEM H/W driver, init ver-ELX to I&T/Online	01/02/03*	0	01/02/03*	9	7									▽
AEM data taking desc-ELX to I&T/Online	01/02/03*	0	01/02/03*	9	7									▽
Sub System Qual Readiness Review-ACD	01/02/03*	0	01/02/03*	2	6									▽
Doc defining Backsplash Test Model (ACD to I&T)	01/03/03*	0	01/03/03*	9	6									▽
GEM h/w driver, final ver-ELX to I&T/Online	01/07/03	0	01/07/03	9	7									▽
Tracker CDR	01/14/03	0	01/14/03	2	4									▽
Sub System Production Readiness Review-TRKR	01/14/03	0	01/14/03	2	4									▽
Tracker Tower & Tray Alignment (SAS to I&T)	01/22/03*	0	01/22/03*	9	D									▽
Run Date 08/30/02 13:52						<b>GLAST LAT PROJECT</b>						Sheet 3 of 3		
Data Date 08/01/02						<b>Project Milestones (Level 3)</b>						LAT3		
© Primavera Systems, Inc.						<b>1 Year View (+/- 6mo)</b>						LT - MS (L3) FL - MS (L3)		

### Attachment 3

Budget vs Actuals vs Funding  
DOE + NASA Project Expenditures



**Attachment 4  
LAT Costs, through July 2002, by WBS**

Monthly Contractor Financial Management Report 31-Jul-02								Report for Month Ending: 7/31/02		
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 GLAST LAT Project		Type:						Fund Limitation: 0		
Reporting Category	Cost Incurred				Estimated Cost			4/3/00	Billing	
	During Month		Cum. to Date		Detail		Balance of Budget	Estimated Final Cost		Unfiled Orders Outstanding
	Actual	Planned	Actual	Planned	AUG02	SEP02		Project Estimate	Budget Value	
4.1.1 INSTRUMENT MANAGEMENT	257	242	4,680	4,698	242	220	6,460	11,602	11,602	
4.1.2 SYSTEM ENGINEERING	30	119	1,830	1,891	118	110	2,589	4,647	4,647	
4.1.4 TRACKER	118	246	4,777	4,753	107	223	4,770	9,877	9,877	
4.1.5 CALORIMETER	281	368	4,871	5,087	354	331	11,792	17,348	17,348	
4.1.6 ANTICOINCIDENCE DETECTOR	306	261	3,606	3,093	354	268	6,052	10,280	10,280	
4.1.7 ELECTRONICS	127	116	3,025	3,056	139	151	12,422	15,738	15,738	
4.1.8 MECHANICAL SYSTEMS	90	404	1,667	2,348	444	380	9,359	11,850	11,850	
4.1.9 INTEGRATION & TEST	88	168	699	661	196	102	5,657	6,654	6,654	
4.1.A PERFORMANCE AND SAFETY ASSURANCE	20	62	526	781	62	57	1,535	2,180	2,180	
4.1.B LAT INSTRUMENT OPERATIONS CENTER	2	38	262	341	18	10	2,261	2,552	2,552	
4.1.C EDUCATION AND PUBLIC OUTREACH	32	85	459	573	29	26	2,084	2,598	2,598	
4.1.D SCIENCE ANALYSIS SOFTWARE	45	61	713	701	51	42	2,522	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	
<b>Total</b>	<b>1,397</b>	<b>2,171</b>	<b>28,439</b>	<b>29,303</b>	<b>2,114</b>	<b>1,920</b>	<b>67,501</b>	<b>99,973</b>	<b>99,973</b>	

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

Monthly Contractor Financial Management Report 31-Jul-02								Report for Month Ending: 7/31/02		
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 GLAST LAT Project		Type:						Fund Limitation: 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	AUG02	SEP02		Project Estimate	Budget Value	
DG *** GSFC	347	297	4,701	4,327	390	301	7,850	13,242	13,242	
DH *** HEPL	68	145	2,692	2,723	118	101	4,682	7,593	7,593	
DL *** SLAC	576	1,116	13,195	13,640	1,079	1,003	34,953	50,229	50,229	
DN *** NRL	333	477	6,265	6,745	450	423	16,491	23,629	23,629	
DS *** SSU	32	85	459	573	29	26	2,034	2,548	2,548	
DT *** Texas A&M	0	0	0	16	0	0	16	16	16	
DU *** UCSC	42	50	1,127	1,280	48	65	1,477	2,716	2,716	
<b>Total</b>	<b>1,397</b>	<b>2,171</b>	<b>28,439</b>	<b>29,303</b>	<b>2,114</b>	<b>1,920</b>	<b>67,501</b>	<b>99,973</b>	<b>99,973</b>	

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	AUG02	SEP02				
RL LABOR	929	1,097	17,573	17,987	1,181	1,059	34,797	54,610	54,610	
<i>FTE (DOE/NASA)</i>	98.2	98.0	1,472.4	1,493.9	99.0	109.0	3,149.7	4,830.1	4,830.1	
<i>HOURS (DOE/NASA)</i>	15,709	15,677	251,033	245,958	17,469	19,208	509,846	797,556	797,556	
RT TRAVEL	24	68	516	835	56	51	2,604	3,227	3,227	
RM MATERIAL & SERVICES	320	920	9,381	9,725	732	733	27,558	38,404	38,404	
RX MPS & LAB TAX	124	85	970	757	145	77	2,542	3,733	3,733	
<b>Total (not incl FTE/Hours)</b>	<b>1,397</b>	<b>2,171</b>	<b>28,439</b>	<b>29,303</b>	<b>2,114</b>	<b>1,920</b>	<b>67,501</b>	<b>99,973</b>	<b>99,973</b>	

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

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:						Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 6/30/02                      7/31/02		
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	0			
CAPW[3]													
Item	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			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
4.1.1 INSTRUMENT MANAGEMENT	242	242	257	0	-15	4,698	4,698	4,680	0	18	11,602	11,602	0
4.1.2 SYSTEM ENGINEERING	119	95	30	-24	65	1,891	1,856	1,830	-35	27	4,647	4,647	0
4.1.4 TRACKER	246	249	118	3	131	4,753	4,631	4,777	-122	-145	9,877	9,877	0
4.1.5 CALORIMETER	368	371	281	3	90	5,087	4,754	4,871	-333	-117	17,348	17,348	0
4.1.6 ANTICOINCIDENCE DETECTOR	261	194	306	-66	-112	3,093	2,893	3,606	-200	-713	10,280	10,280	0
4.1.7 ELECTRONICS	116	80	127	-36	-47	3,056	3,020	3,025	-35	-5	15,738	15,738	0
4.1.8 MECHANICAL SYSTEMS	404	324	90	-81	233	2,348	2,138	1,667	-209	471	11,850	11,850	0
4.1.9 INTEGRATION & TEST	168	110	88	-58	22	661	544	699	-117	-155	6,654	6,654	0
4.1.A PERFORMANCE AND SAFETY ASSURA	62	62	20	0	42	781	781	526	0	255	2,180	2,180	0
4.1.B LAT INSTRUMENT OPERATIONS CENTI	38	40	2	2	39	341	323	262	-18	61	2,552	2,552	0
4.1.C EDUCATION AND PUBLIC OUTREACH	85	80	32	-6	47	573	548	459	-24	90	2,598	2,598	0
4.1.D SCIENCE ANALYSIS SOFTWARE	61	28	45	-33	-17	701	666	713	-35	-47	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	2,171	1,875	1,397	-296	478	29,303	28,175	28,439	-1,129	-264	99,973	99,973	0
Contingency											21,267		
Total	2,171	1,875	1,397	-296	478	29,303	28,175	28,439	-1,129	-264	121,240		

**Attachment 7  
LAT Performance, through July 2002, by Organization**

Cost Performance Report - Organization													
Contractor: Location:				Contract Type/No:				Project Name/No: GLAST LAT Project		Report Period: 6/30/02                      7/31/02			
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	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	297	230	347	-67	-117	4,327	4,126	4,701	-201	-575	13,242	13,242	0
DH *** HEPL	145	106	68	-39	39	2,723	2,664	2,692	-59	-28	7,593	7,593	0
DL *** SLAC	1,116	955	576	-161	379	13,640	13,187	13,195	-452	-7	50,229	50,229	0
DN *** NRL	477	459	333	-18	126	6,745	6,384	6,265	-361	119	23,629	23,629	0
DS *** SSU	85	80	32	-6	47	573	548	459	-24	90	2,548	2,548	0
DT *** Texas A&M	0	0	0	0	0	16	16	0	0	16	16	16	0
DU *** UCSC	50	44	42	-6	3	1,280	1,249	1,127	-32	122	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	2,171	1,875	1,397	-296	478	29,303	28,175	28,439	-1,129	-264	99,973	99,973	0
Contingency											21,267		
Total	2,171	1,875	1,397	-296	478	29,303	28,175	28,439	-1,129	-264	121,240		

## Attachment 8 LAT Performance Analysis, July 2002

	WBS	BAC	BCWS	BCWP	ACWP	SV \$	CV \$	% BCWS	% BCWP	% ACWP	SV Trend	CV Trend	SPI	CPI	Cpi_Fcst	CpiSpi_Fcst
1	4	99,974	29,303	28,175	28,439	-1,129	-264	29.31	28.18	28.45	↓	↑	0.961	0.991	100,910	103,813
2	4.1	99,974	29,303	28,175	28,439	-1,129	-264	29.31	28.18	28.45	↓	↑	0.961	0.991	100,910	103,813
3	4.1.1	11,602	4,698	4,698	4,680	0	18	40.50	40.50	40.34	↔	↓	1.000	1.004	11,557	11,557
4	4.1.2	4,647	1,891	1,856	1,830	-35	27	40.70	39.95	39.38	↓	↑	0.982	1.015	4,580	4,631
5	4.1.4	9,877	4,753	4,631	4,777	-122	-145	48.13	46.89	48.37	↔	↑	0.974	0.970	10,187	10,329
6	4.1.5	17,348	5,087	4,754	4,871	-333	-117	29.32	27.40	28.08	↔	↑	0.935	0.976	17,774	18,678
7	4.1.6	10,280	3,093	2,893	3,606	-200	-713	30.09	28.14	35.07	↓	↓	0.935	0.802	12,812	13,449
8	4.1.7	15,738	3,056	3,020	3,025	-35	-5	19.42	19.19	19.22	↓	↓	0.988	0.998	15,762	15,912
9	4.1.8	11,850	2,348	2,138	1,667	-209	471	19.81	18.05	14.07	↓	↑	0.911	1.283	9,239	9,981
10	4.1.9	6,654	661	544	699	-117	-155	9.93	8.17	10.50	↓	↑	0.823	0.778	8,551	10,242
11	4.1.A	2,180	781	781	526	0	255	35.83	35.83	24.14	↔	↑	1.000	1.484	1,469	1,469
12	4.1.B	2,552	341	323	262	-18	61	13.35	12.66	10.29	↑	↑	0.948	1.231	2,073	2,172
13	4.1.C	2,598	573	548	459	-24	90	22.04	21.10	17.66	↓	↑	0.957	1.195	2,174	2,250
14	4.1.D	3,328	701	666	713	-35	-47	21.05	20.01	21.42	↓	↓	0.950	0.934	3,563	3,712
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	[PMB]	99,974	29,303	28,175	28,439	-1,129	-264	29.31	28.18	28.45	↓	↑	0.961	0.991	100,910	103,813

### 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

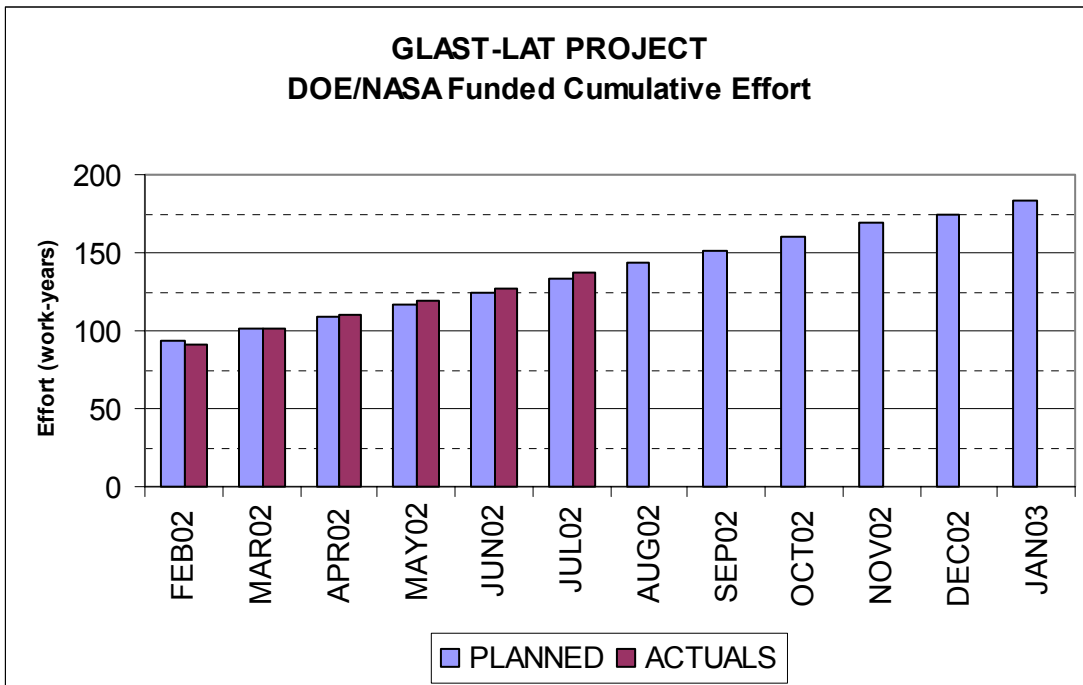
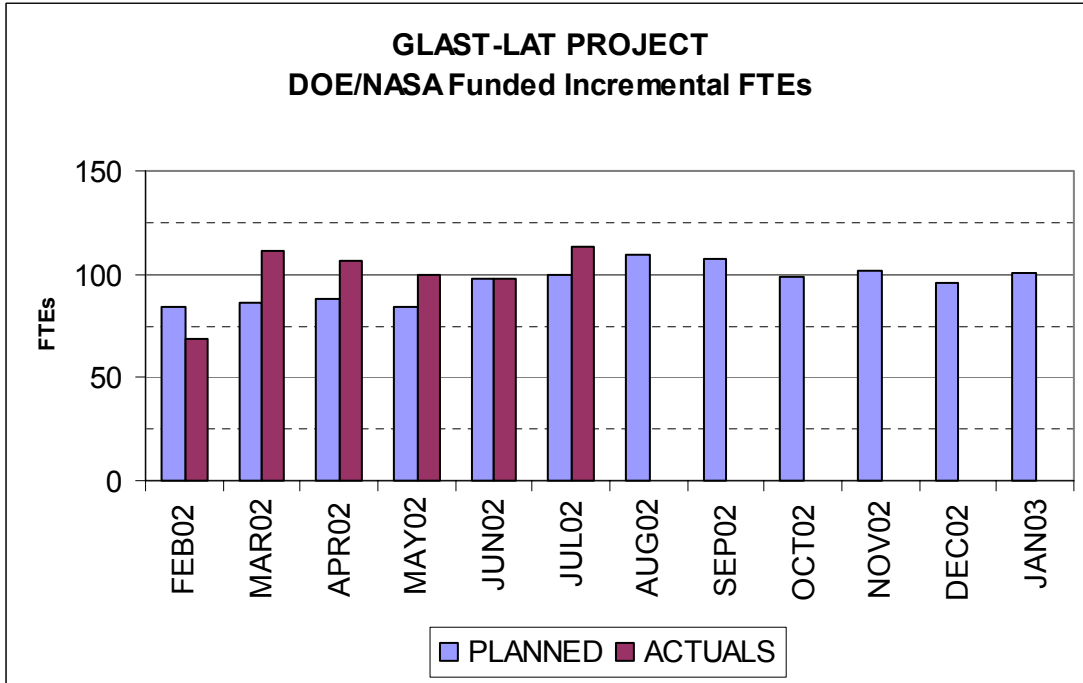
% ACWP: Percent Spent = ACWP/BAC

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 July 2002, by Organization**

Program: LAT3		Description: GLAST LAT Project		Approval: Program Manager Functional Manager Cost Account Manager												
Run Date: 8/30/02		Status Date: 7/31/02														
			PRIOR	FEB02	MAR02	APR02	MAY02	JUN02	JUL02	Cum-to- Date	AUG02	SEP02	OCT02	NOV02	DEC02	JAN03
OBS																
DG *** GSFC																
FTE	PLANNED	188.5	24.6	22.6	23.1	24.6	24.2	24.9	<b>332.5</b>	25.1	25.4	26.4	26.1	22.3	23.5	
	ACTUALS	88.1	8.6	53.3	29.1	25.9	13.7	42.5	<b>261.1</b>	0.0	0.0	0.0	0.0	0.0	0.0	
DH *** HEPL																
FTE	PLANNED	149.5	6.9	6.7	6.3	7.7	7.8	8.5	<b>193.4</b>	7.3	6.9	7.2	8.0	8.1	7.3	
	ACTUALS	136.1	7.4	7.2	5.3	6.0	8.9	5.5	<b>176.4</b>	0.0	0.0	0.0	0.0	0.0	0.0	
DL *** SLAC																
FTE	PLANNED	418.5	42.1	47.0	43.3	43.0	54.7	51.1	<b>699.7</b>	60.0	55.0	46.5	49.8	50.2	53.9	
	ACTUALS	370.9	28.8	33.5	48.9	37.8	39.4	37.6	<b>597.0</b>	0.0	0.0	0.0	0.0	0.0	0.0	
DN *** NRL																
FTE	PLANNED	233.7	14.3	21.3	21.7	15.2	20.7	21.6	<b>348.5</b>	23.7	24.5	22.1	22.5	20.4	22.9	
	ACTUALS	230.4	16.4	9.5	31.5	23.5	30.1	21.1	<b>362.5</b>	0.0	0.0	0.0	0.0	0.0	0.0	
DS *** SSU																
FTE	PLANNED	29.9	1.4	1.4	1.5	1.5	1.5	4.2	<b>41.5</b>	1.5	1.5	1.7	1.7	1.6	1.6	
	ACTUALS	30.5	0.9	1.6	1.5	2.4	4.0	2.8	<b>43.8</b>	0.0	0.0	0.0	0.0	0.0	0.0	
DU *** UCSC																
FTE	PLANNED	117.0	4.8	4.8	4.8	6.0	4.8	4.8	<b>147.1</b>	4.8	4.8	5.1	5.1	4.7	4.8	
	ACTUALS	137.7	6.4	5.8	4.6	4.9	5.9	6.3	<b>171.5</b>	0.0	0.0	0.0	0.0	0.0	0.0	
DW *** UW																
FTE	PLANNED	23.1	0.9	0.9	0.9	0.9	1.1	1.0	<b>28.8</b>	0.9	0.9	0.9	0.9	0.9	0.9	
	ACTUALS								<b>0.0</b>							
FF *** France																
FTE	PLANNED	371.8	34.3	35.6	35.9	35.8	35.9	37.1	<b>586.3</b>	37.3	36.0	35.5	35.1	26.7	30.0	
	ACTUALS								<b>0.0</b>							
FI *** Italy																
FTE	PLANNED	118.4	12.9	14.3	13.7	14.2	14.6	15.1	<b>203.3</b>	14.0	12.9	16.5	16.9	18.4	16.9	
	ACTUALS	82.9	10.9	10.9	10.9	11.9	9.8	10.9	<b>147.9</b>	0.0	0.0	0.0	0.0	0.0	0.0	
FJ *** Japan																
FTE	PLANNED	44.9	2.8	2.8	2.8	2.8	2.8	2.8	<b>61.5</b>	2.8	2.8	2.8	2.8	2.8	2.8	
	ACTUALS	35.2	1.8	1.8	1.8	1.8	1.8	1.8	<b>45.7</b>	0.0	0.0	0.0	0.0	0.0	0.0	
FK *** Sweden																
FTE	PLANNED	4.4	4.6	4.6	4.6	4.6	4.6	4.6	<b>32.0</b>	4.6	4.6	4.6	4.6	3.4	4.9	
	ACTUALS								<b>0.0</b>							
Grand Totals:																
	PLANNED	1699.7	149.7	162.0	158.7	156.1	172.6	175.7	<b>2674.5</b>	182.2	175.3	169.1	173.5	159.6	169.5	
	ACTUALS	1111.8	81.2	123.6	133.4	114.1	113.5	128.4	<b>1806.0</b>	0.0	0.0	0.0	0.0	0.0	0.0	
4.1 GLAST LAT																
Contributed																
	PLANNED	647.1	65.4	75.6	70.4	71.8	74.6	76.5	<b>1081.3</b>	73.0	68.0	70.7	71.4	63.6	68.5	
	ACTUALS	122.3	12.6	12.6	27.5	14.9	15.3	15.1	<b>220.3</b>	0.0	0.0	0.0	0.0	0.0	0.0	
Funded																
	PLANNED	1052.6	84.3	86.4	88.3	84.3	98.0	99.3	<b>1593.1</b>	109.1	107.3	98.4	102.1	96.1	101.0	
	ACTUALS	989.5	68.6	111.0	106.0	99.2	98.2	113.3	<b>1585.7</b>	0.0	0.0	0.0	0.0	0.0	0.0	
Grand Totals:																
	PLANNED	1699.7	149.7	162.0	158.7	156.1	172.6	175.7	<b>2674.5</b>	182.2	175.3	169.1	173.5	159.6	169.5	
	ACTUALS	1111.8	81.2	123.6	133.4	114.1	113.5	128.4	<b>1806.0</b>	0.0	0.0	0.0	0.0	0.0	0.0	