Monthly Progress Report

(Month Ending October 2002)

GLAST Large Area Telescope (LAT)

LAT-MR-01147-01

December 12, 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 October, 2002.

2.0 Recent Progress and Status

Tracker: Work on the test stations in Italy has started, as well as development of the tower testing scripts. Flight ladder assembly has commenced; encapsulation is still pending testing. Flexure mount/bottom tray redesign efforts continue; a plan for the reinforced carbon-fiber option has been developed. Engineering model tray fabrication in Italy continued. Two test ladders have been shipped to UCSC for ASIC development testing.

Calorimeter: Kalmar University (Sweden) has processed and delivered to NRL all the CsI crystals for the first engineering model. The first test bonds were made with the French collaborators' tooling. 66 crystal detector elements (CDEs) for the engineering model have been manufactured. Testing of the silicone encapsulant for the PIN diode optical window has begun. The design of the engineering model closeout plates is complete. Test of the integration procedure of CDEs into the mechanical structure was completed. Functional and margin testing started on the pre-engineering model analog front-end electronics (AFEE) X-board. The engineering model AFEE Y-board layout is complete and undergoing review.

ACD: Vibration testing was performed on a tile detector assembly (TDA), wave shifting fiber/clear fiber connector, TDA tiedowns, and composite panel. Preliminary results indicate no problems following the test. Hardware fabrication for all tile detector tests was completed. Six phototube resistor network assemblies were built. Ballistic tests were performed on the micrometeoroid shield/thermal blanket using the recently updated orbital debris model. The tests confirmed the analysis that the new model will require a modest enhancement of the micrometeoroid shield in order to meet the reliability requirement. The first set of flight phototubes was received, as well as the long bottom row TDA. The long bottom TDA performance exceeded requirements (this had been a concern expressed at PDR). An 8x8 scintillating tile hodoscope was fabricated. This will be used to map the TDAs and was used before and after the vibration test.

Electronics: Test code was updated for the next ASIC submission. A prototype spacecraft interface board was fabricated; it communicates using PCI (a standard data acquisition bus). The science data interface is still being defined, and will be included in the next version of this board. Studies on the BAE RAD750 CPU board show that it is feasible to be used for the LAT event builder and spacecraft interface unit processor. The final version of the flight software for the engineerimg model has been completed and tested. Work on defining heater control and monitoring has commenced with the LAT thermal group.

Mechanical Systems: The reduced thermal and structural analytical models have been delivered to GSFC. Phase I of the engineering model heat pipe testing has been completed. The mechanical engineer position has been filled, and two candidates have been identified for the electronic box packaging work.

Integration & Test: A workshop was held to discuss the online development path toward the engineering model test. SLAC's Building 33 was reviewed and accepted as the integration & test facility. All mechanical ground support equipment tools for the Calorimeter installation test have been completed. Plans for the engineering model SVAC (Science Verification Analysis & Calibration) data analysis have been made. The feasibility of using Van de Graaff in the engineering model to test prototype hardware and software tools for science verification of LAT low energy acceptance was proven. A major release of the first engineering model online system (electrical ground support equipment) was made.

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.

The final version of the AEM (ACD Electronics Module) hardware driver (1M1001420) was completed in November. The ACD Electronics Module EM1 delivery (1M7941310) will be completed in mid-December. A workaround plan for the ACD Electronics Module EM2 delivery (1M7941320) is underway and the schedule is expected to be restored next reporting period.

A workaround plan is in place for the EM1 electrical ground support equipment software releases to the subsystems (1M1001510, 1M1001511, 1M1001512, 1M1001513, and 1M1001514), and they are expected to be completed in December.

The flight software system specification milestone (1M1001360) shows a 32-day delay; this document is expected to be completed in December.

The Instrument Power System description milestone (1M1001460) definition is being refined , and a workaround plan is expected to be in place in January.

The Calorimeter engineering model (1M59000000) is expected to be completed in May, as is the first release of the online EM2 to Flight Software (1M1001500).

The as-built drawings for the Tracker Engineering Model (1M1001280) were completed in early December.

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 carries 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.

The unfavorable cost variance in 4.1.2 System Engineering is due to more subcontractor labor being applied than was planned in the following areas: subsystem interface control documentation, spacecraft interface control documentation, and test planning. In addition, the subcontractor labor cost for IOC management has been temporarily charged to System Engineering until a permanent replacement IOC manager has been appointed.

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, late completion of the engineering model AFEE boards, and delays in the ground support equipment. These variances are not currently considered critical, but their unfavorable trend is a concern and a workaround plan is in progress.

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; there is adequate internal float to accommodate this delay without impacting the TDA testing schedule. The base electronics assembly (BEA) packaging design board layouts have been delayed. There are delays in the photomultiplier tube resistor network assembly and testing; the details are still being worked out. 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 mechanical ground support

equipment design is behind schedule; the possibility of modifing existing hardware (rather than purchasing new) to recover schedule is being evaluated.

The unfavorable cost variance in 4.1.7 Electronics is largely due to ACD and Calorimeter electronics work being charged to 4.1.7; change requests are being prepared to create new work packages at SLAC for that work. Two software professionals working on Flight Sofware were added to the project cost (currently planned as contributed labor); a change request is being prepared to address this.

The favorable cost variance in 4.1.8 Mechanical Systems is due to subcontractor efficiencies, and delaying the start of detailed design work due to the spacecraft accomodation studies. The schedule for the Lockheed Martin work is being rephased to match the approved subcontract. The unfavorable schedule variance is centered in three areas: mechanical systems development, thermal control system work, and the grid engineering model (EM). The LAT Instrument Project Manager is concerned by the unfavorable trend of this variance, and is working directly with the Mechanical Systems subsystem manager to recover the 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 unfavorable cost and schedule variances in 4.1.9 Integration & Test, and is expected to be resolved in next month's 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. The budget will be adjusted after a permanent replacement subsystem manager has been appointed.

The favorable cost variance in 4.1.C Education & Public Outreach is due to SSU's not receiving funding in time to correspond with scheduled work. This funding was received in mid-November, so the variance is expected to be reduced next reporting period.

6.0 Change Control and Contingency Analysis

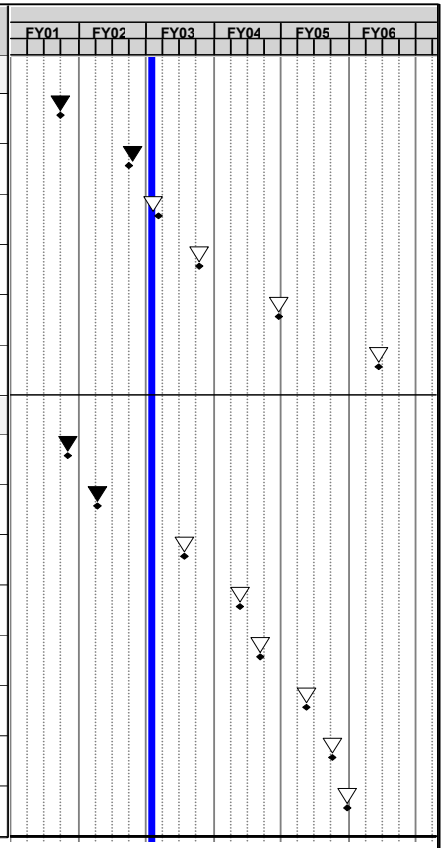
No change requests were approved by the LAT Configuration Control Board during this period. The fabrication phase cost baseline is $100.7M. Funding applicable to that baseline is $121.2M; resulting contingency is $20.5M.

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
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
1M1P00002(	CD-2 Approval	12/13/02*	27	11/04/02*
1M1P000030	CD-3 Approval	07/15/03*	0	07/15/03*
1M1P000060	Flight GRID Complete	09/15/04*	0	09/15/04*
1M1P00004(	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*
1M100073(	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*
1M100012(	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 12/05/02 10:01	**GLAST LAT PROJECT**	1120
	Project Milestones (Level 1 and 2)	LT_MS1-2
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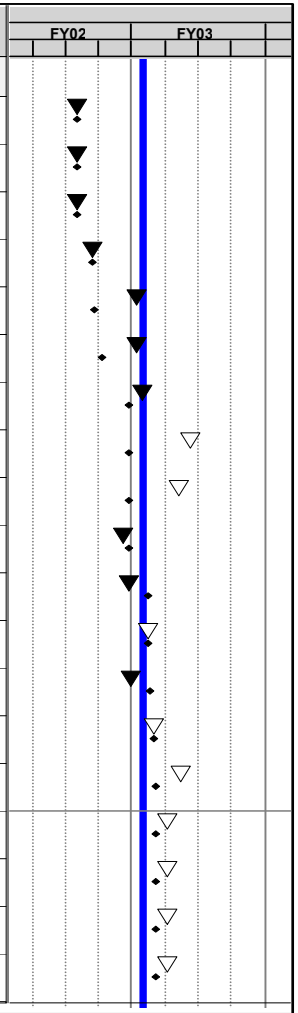
Attachment 2 (Page 1 of 2)
Level 3 Milestones (One-Year View)

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND
Instrument Project Office (Level 3						
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
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	-110	03/10/03	7	9
1M7941310	ACD Electronics Module - EM1 (Elec to ACD)	09/20/02	-89	02/06/03	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
1M7941350	High Voltage Power Supply (Bd & Prts)-ACD toElec	11/15/02*	0	11/15/02*	6	7
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*	0	12/02/02*	8	9
1M1001280	As-Built dwgs for EM TKR-TKR to I&T	12/05/02	-40	02/11/03	4	9
1M1001510	EM1 EGSE WS-S/W R2 I&T to ACD	12/05/02	-17	01/08/03	9	6
1M1001511	EM1 EGSE WS-S/W R2 I&T to CAL	12/05/02	-17	01/08/03	9	5
1M1001512	EM1 EGSE WS-S/W R2 I&T to ELX	12/05/02	-17	01/08/03	9	7
1M1001513	EM1 EGSE WS-S/W R2 I&T to IOC	12/05/02	-17	01/08/03	9	B



Run Date 12/03/02 14:42	**GLAST LAT PROJECT**	1120
	Project Milestones (Level 3)	LT - MS (L3)
	1 Year View (+/- 6mo)	Sheet 1 of 2

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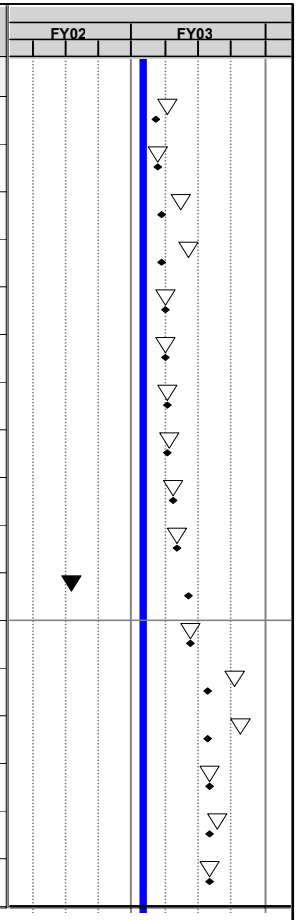
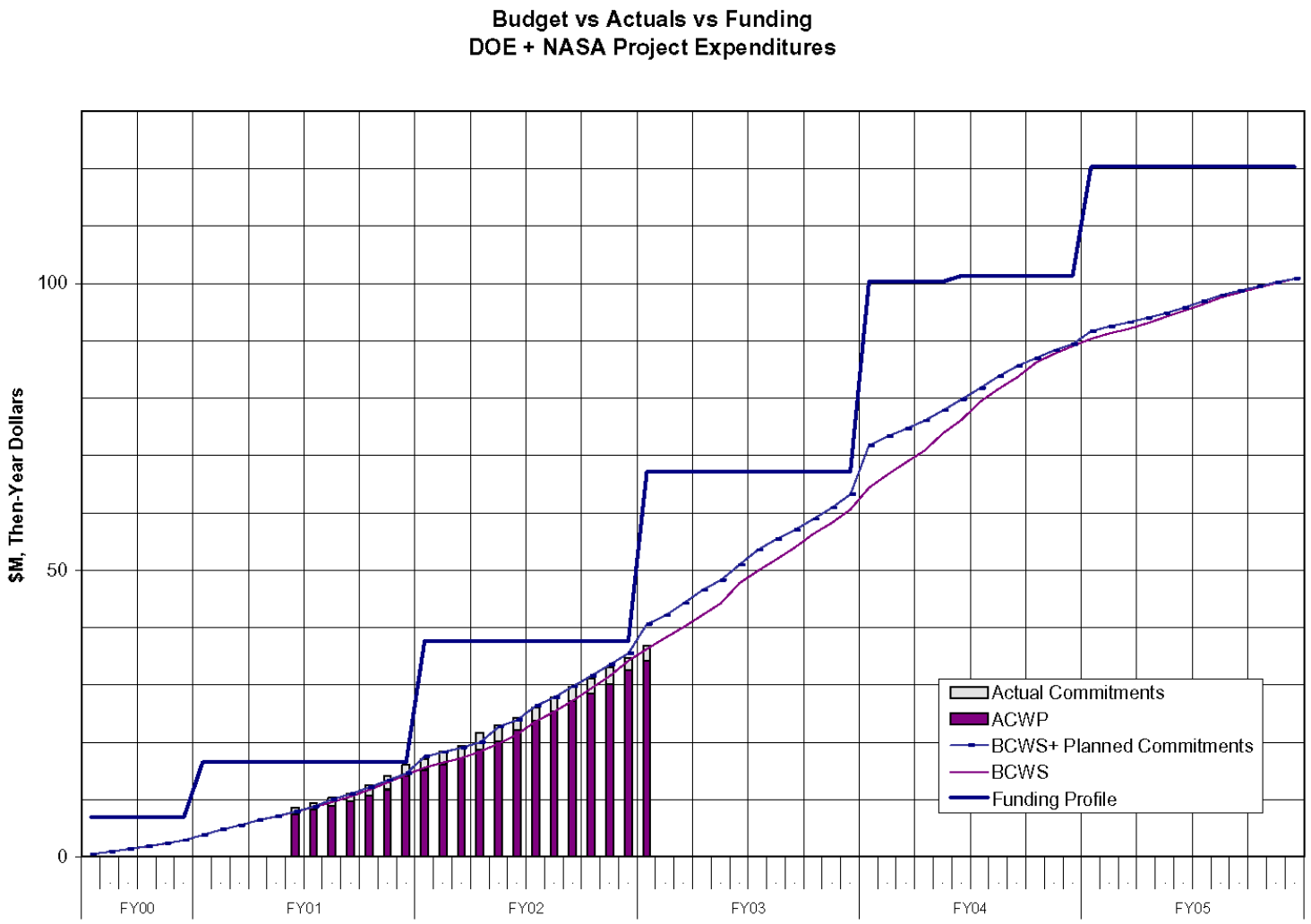
Attachment 2, Continued (Page 2 of 2)
Level 3 Milestones (One-Year View)

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND
Instrument Project Office (Level 3						
1M1001514	EM1 EGSE WS-S/W R2 I&T to TKR	12/05/02	-17	01/08/03	9	4
1M1001430	Delv of TKR EM to SLAC I&T/MGSE	12/09/02*	0	12/09/02*	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
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
1M7941380	EGSE Workstation / Software #3 (I&T to ACD)	03/03/03*	216	04/15/02A	9	6
1M7941340	(11) FREE Bds & ASICS, (1) Fully Tested Bd - EM2	03/10/03*	0	03/10/03*	6	7
1M7941320	(2) ACD Electronics Modules - EM2 (Elec to ACD)	04/24/03	-53	07/10/03	7	6
1M59000000	EM from CAL to I&T	04/25/03	-62	07/24/03	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	-17	05/23/03	9	7
1M19500500	CU IPS - ELX to I&T/Online*	04/30/03*	0	04/30/03*	7	9



Run Date 12/03/02 14:42 © Primavera Systems, Inc.	**GLAST LAT PROJECT** **Project Milestones (Level 3)** **1 Year View (+/- 6mo)**	1120 LT - MS (L3) Sheet 2 of 2

Attachment 3



Attachment 4
LAT Costs, through October 2002, by WBS

Monthly Contractor Financial Management Report								Report for Month Ending: 10/31/02		
To: Al Vernacchio, Acting 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 Estimated Final Cost	Billing	Unfilled Orders Outstanding
	During Month		Cum. to Date		Detail		Balance of Budget	Project Estimate	Budget Value	
	Actual	Planned	Actual	Planned	NOV02	DEC02				
4.1.1 INSTRUMENT MANAGEMENT	194	210	5,385	5,371	175	147	5,895	11,602	11,602	
4.1.2 SYSTEM ENGINEERING	231	110	2,337	2,229	91	76	2,143	4,647	4,647	
4.1.4 TRACKER	129	84	5,169	5,165	131	324	4,293	9,917	9,917	
4.1.5 CALORIMETER	359	571	5,799	6,412	694	301	10,781	17,574	17,574	
4.1.6 ANTICOINCIDENCE DETECTOR	278	245	4,501	4,668	192	458	5,595	10,746	10,746	
4.1.7 ELECTRONICS	126	168	3,764	3,514	134	184	11,656	15,738	15,738	
4.1.8 MECHANICAL SYSTEMS	104	324	2,507	3,496	299	196	8,848	11,850	11,850	
4.1.9 INTEGRATION & TEST	112	133	1,042	1,098	82	70	5,479	6,673	6,673	
4.1.A PERFORMANCE AND SAFETY ASSURANCE	33	60	633	956	49	42	1,451	2,174	2,174	
4.1.B LAT INSTRUMENT OPERATIONS CENTER	0	33	262	402	28	23	2,238	2,552	2,552	
4.1.C EDUCATION AND PUBLIC OUTREACH	0	39	530	667	29	23	2,016	2,598	2,598	
4.1.D SCIENCE ANALYSIS SOFTWARE	36	63	819	857	52	45	2,412	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	1,603	2,041	34,071	36,156	1,955	1,889	62,803	100,719	100,719	

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

Monthly Contractor Financial Management Report								Report for Month Ending: 10/31/02		
To: Al Vernacchio, Acting 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 Estimated Final Cost		Unfilled Orders Outstanding
	During Month		Cum. to Date		Detail		Balance of Budget	Project Estimate	Budget Value	
	Actual	Planned	Actual	Planned	NOV02	DEC02				
DG *** GSFC	272	295	5,671	6,022	233	493	7,311	13,708	13,708	
DH *** HEPL	59	106	2,794	3,048	95	82	4,622	7,593	7,593	
DL *** SLAC	872	873	16,425	16,596	785	887	32,186	50,283	50,283	
DN *** NRL	360	678	7,396	8,364	771	366	15,322	23,855	23,855	
DS *** SSU	0	39	530	667	29	23	1,966	2,548	2,548	
DT *** Texas A&M	0	0	15	16	0	0	0	16	16	
DU *** UCSC	41	50	1,240	1,443	42	39	1,395	2,716	2,716	
Total	1,603	2,041	34,071	36,156	1,955	1,889	62,803	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	NOV02	DEC02				
RL LABOR	1,013	1,248	20,783	21,830	1,008	800	32,468	55,059	55,059	
FTE (DOE/NASA)	*92.2*	*102.4*	*1,730.9*	*1,905.6*	*102.0*	*94.0*	*2,873.1*	*4,800.0*	*4,800.0*	
HOURS (DOE/NASA)	*16,957*	*18,834*	*297,064*	*317,625*	*15,435*	*12,026*	*468,208*	*792,733*	*792,733*	
RT TRAVEL	8	68	598	1,007	52	44	2,528	3,222	3,222	
RM MATERIAL & SERVICES	560	710	11,485	11,973	849	885	25,436	38,656	38,656	
RX MPS & LAB TAX	23	15	1,206	1,346	46	160	2,371	3,783	3,783	
Total (not incl FTE/Hours)	1,603	2,041	34,071	36,156	1,955	1,889	62,804	100,719	100,719	

Attachment 6
LAT Performance, through October 2002, by WBS

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:					Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 9/30/02	10/31/02		
Quantity 1	Negotiated Cost 0		Est. Cost Authorized Unpriced Work 0		Tgt. Profit/ Fee % 0	0	Tgt. Price 0	Est Price 0	Share Ratio	Contract Ceiling 0	Estimated Contract Ceiling 0		
CAPW[3]	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
4.1.1 INSTRUMENT MANAGEMENT	210	210	194	0	16	5,371	5,371	5,385	0	-15	11,602	11,602	0
4.1.2 SYSTEM ENGINEERING	110	85	231	-25	-147	2,229	2,142	2,337	-87	-194	4,647	4,647	0
4.1.4 TRACKER	84	161	129	78	33	5,165	5,049	5,169	-116	-120	9,917	9,917	0
4.1.5 CALORIMETER	571	485	359	-86	126	6,412	6,072	5,799	-340	273	17,574	17,574	0
4.1.6 ANTICOINCIDENCE DETECTOR	245	205	278	-40	-73	4,668	4,195	4,501	-473	-306	10,746	10,746	0
4.1.7 ELECTRONICS	168	110	126	-58	-16	3,514	3,390	3,764	-124	-373	15,738	15,738	0
4.1.8 MECHANICAL SYSTEMS	324	232	104	-92	128	3,496	2,945	2,507	-551	438	11,850	11,850	0
4.1.9 INTEGRATION & TEST	133	78	112	-55	-34	1,098	938	1,042	-160	-104	6,673	6,673	0
4.1.A PERFORMANCE AND SAFETY ASSURA	60	60	33	0	27	956	956	633	0	323	2,174	2,174	0
4.1.B LAT INSTRUMENT OPERATIONS CENTI	33	23	0	-10	23	402	369	262	-33	107	2,552	2,552	0
4.1.C EDUCATION AND PUBLIC OUTREACH	39	19	0	-20	19	667	647	530	-20	117	2,598	2,598	0
4.1.D SCIENCE ANALYSIS SOFTWARE	63	70	36	7	35	857	840	819	-17	20	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	2,041	1,739	1,603	-302	136	36,156	34,234	34,072	-1,922	162	100,719	100,719	0
Contingency											20,521	20,521	
Total	2,041	1,739	1,603	-302	136	36,156	34,234	34,072	-1,922	162	121,240	121,240	

Attachment 7
LAT Performance, through October 2002, by Organization

Cost Performance Report - Organization													
Contractor: Location:					Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 9/30/02 10/31/02			
Quantity 1	Negotiated Cost 0		Est. Cost Authorized Unpriced Work 0		Tgt. Profit/ Fee % 0 0		Tgt. Price 0	Est Price 0	Share Ratio	Contract Ceiling 0	Estimated Contract Ceiling 0		
OBS	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
DG *** GSFC	295	245	272	-50	-27	6,022	5,536	5,671	-486	-135	13,708	13,708	0
DH *** HEPL	106	90	59	-16	32	3,048	2,987	2,794	-61	193	7,593	7,593	0
DL *** SLAC	873	749	872	-124	-123	16,596	15,622	16,425	-974	-803	50,283	50,283	0
DN *** NRL	678	581	360	-97	221	8,364	7,984	7,396	-380	588	23,855	23,855	0
DS *** SSU	39	19	0	-20	19	667	647	530	-20	117	2,548	2,548	0
DT *** Texas A&M	0	0	0	0	0	16	16	15	0	0	16	16	0
DU *** UCSC	50	56	41	6	15	1,443	1,442	1,240	-1	202	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	2,041	1,739	1,603	-302	136	36,156	34,234	34,071	-1,922	162	100,719	100,719	0
Contingency											20,521	20,521	
Total	2,041	1,739	1,603	-302	136	36,156	34,234	34,071	-1,922	162	121,240	121,240	

Attachment 8
LAT Performance Analysis, October 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	36,156	34,234	34,071	-1,922	162	35.90	33.99	33.83	↓	↑	0.947	1.005	100,241	103,956
3	4.1.1	11,602	5,371	5,371	5,385	0	-15	46.29	46.29	46.42	↔	↑	1.000	0.997	11,634	11,634
4	4.1.2	4,647	2,229	2,142	2,337	-87	-194	47.98	46.11	50.28	↓	↓	0.961	0.917	5,068	5,179
5	4.1.4	9,917	5,165	5,049	5,169	-116	-120	52.08	50.91	52.12	↑	↑	0.978	0.977	10,152	10,267
6	4.1.5	17,575	6,412	6,072	5,799	-340	273	36.48	34.55	32.99	↓	↑	0.947	1.047	16,783	17,398
7	4.1.6	10,746	4,668	4,195	4,501	-473	-306	43.44	39.04	41.88	↔	↓	0.899	0.932	11,530	12,324
8	4.1.7	15,738	3,514	3,390	3,764	-124	-373	22.33	21.54	23.91	↓	↔	0.965	0.901	17,469	17,970
9	4.1.8	11,850	3,496	2,945	2,507	-551	438	29.50	24.85	21.16	↔	↑	0.842	1.175	10,089	11,508
10	4.1.9	6,673	1,098	938	1,042	-160	-104	16.46	14.05	15.61	↓	↓	0.854	0.900	7,414	8,503
11	4.1.A	2,174	956	956	633	0	323	43.96	43.96	29.10	↔	↔	1.000	1.511	1,439	1,439
12	4.1.B	2,552	402	369	262	-33	107	15.74	14.47	10.28	↓	↑	0.919	1.407	1,814	1,951
13	4.1.C	2,598	667	647	530	-20	117	25.68	24.90	20.39	↔	↑	0.969	1.221	2,128	2,178
14	4.1.D	3,328	857	840	819	-17	20	25.75	25.23	24.61	↑	↑	0.980	1.025	3,247	3,297
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]	100,719	36,156	34,234	34,071	-1,922	162	35.90	33.99	33.83	↓	↑	0.947	1.005	100,241	103,956

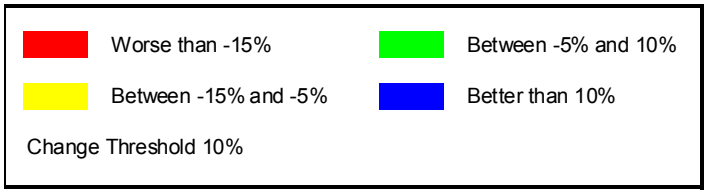
LEGEND

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)

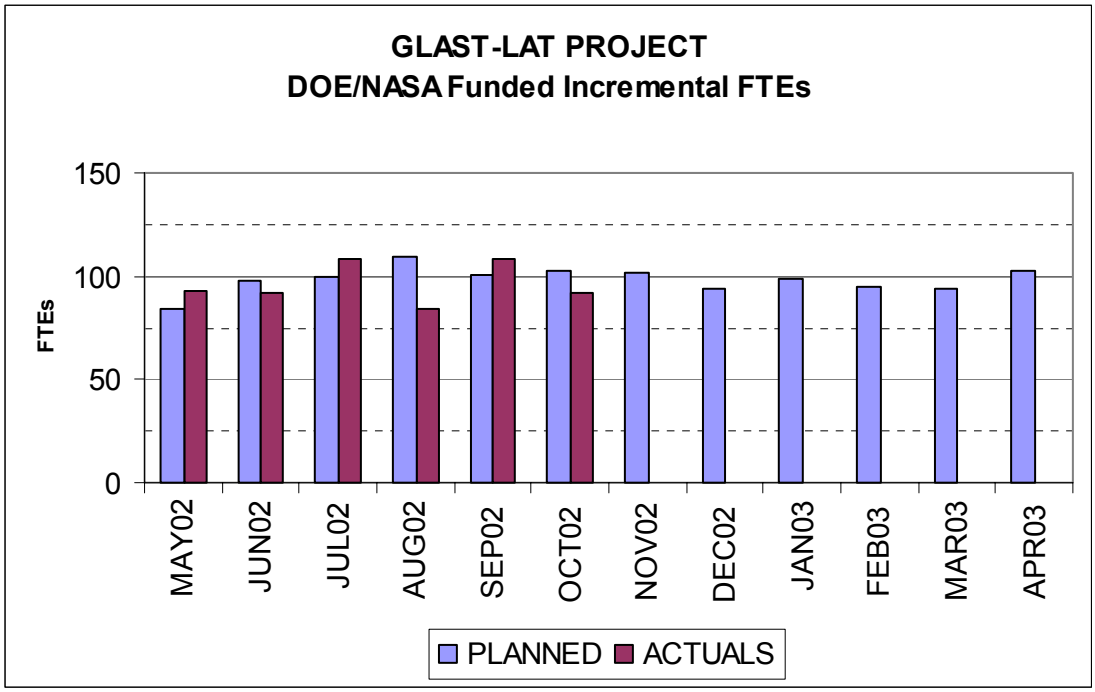
SV $: Schedule Variance = BCWP - BCWS
CV $: Cost Variance = BCWP - ACWP
SPI: Schedule Performance Index = BCWP/BCWS
CPI: Cost Performance Index = BCWP/ACWP

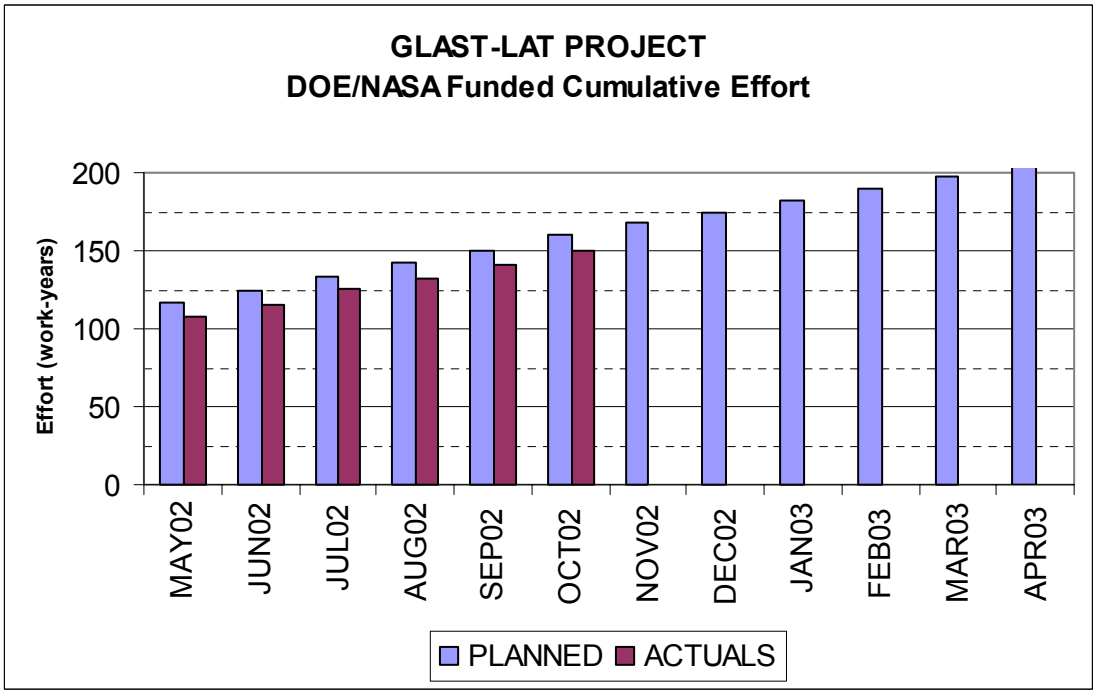
% BCWS: Percent Scheduled = BCWS/BAC
% BCWP: Percent Complete = BCWP/BAC
% ACWP: Percent Spent = ACWP/BAC

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)



Attachment 9
LAT Manpower (DOE/NASA-Funded)





Attachment 10
LAT Manpower Data, through October 2002, by Organization

Program: LAT3	Description: GLAST LAT Project	Approval: Program Manager
Run Date: 12/5/02	Status Date: 10/31/02	Functional Manager
		Cost Account Manager

OBS		PRIOR	MAY02	JUN02	JUL02	AUG02	SEP02	OCT02	**Cum-to-Date**	NOV02	DEC02	JAN03	FEB03	MAR03	APR03
DG *** GSFC															
FTE	PLANNED	258.8	24.6	24.2	24.9	25.1	38.8	26.4	**422.8**	26.1	22.3	23.5	22.4	21.5	24.3
	ACTUALS	179.1	25.9	13.7	42.5	27.6	28.1	26.4	**343.2**	0.0	0.0	0.0	0.0	0.0	0.0
DH *** HEPL															
FTE	PLANNED	169.4	7.7	7.8	8.5	7.3	6.9	7.2	**214.8**	8.0	8.1	7.3	7.2	6.7	7.5
	ACTUALS	156.0	6.0	8.9	5.5	0.0	3.2	4.1	**183.7**	0.0	0.0	0.0	0.0	0.0	0.0
DL *** SLAC															
FTE	PLANNED	550.9	43.0	54.7	51.1	60.0	61.4	42.4	**863.6**	48.3	48.7	53.0	52.6	54.4	60.8
	ACTUALS	482.2	37.8	39.4	37.6	85.9	53.7	44.8	**781.3**	0.0	0.0	0.0	0.0	0.0	0.0
DN *** NRL															
FTE	PLANNED	291.0	15.2	20.7	21.6	23.7	28.9	30.4	**431.4**	23.8	20.5	23.0	23.5	22.2	22.2
	ACTUALS	287.9	23.5	30.1	21.1	17.0	31.1	21.9	**432.4**	0.0	0.0	0.0	0.0	0.0	0.0
DS *** SSU															
FTE	PLANNED	34.3	1.5	1.5	4.2	1.5	1.5	1.7	**46.2**	1.7	1.6	1.6	1.6	1.6	1.6
	ACTUALS	34.6	2.4	4.0	2.8	3.1	0.4	0.0	**47.4**	0.0	0.0	0.0	0.0	0.0	0.0
DU *** UCSC															
FTE	PLANNED	131.5	6.0	4.8	4.8	4.8	4.8	5.1	**161.8**	5.1	4.7	4.8	5.4	6.4	5.7
	ACTUALS	154.4	4.9	5.9	6.3	6.2	4.4	5.5	**187.7**	0.0	0.0	0.0	0.0	0.0	0.0
DW *** UW															
FTE	PLANNED	25.8	0.9	1.1	1.0	0.9	0.9	0.9	**31.5**	0.9	0.9	0.9	0.9	0.9	0.9
	ACTUALS								**0.0**						
FF *** France															
FTE	PLANNED	477.6	35.8	35.9	37.1	37.3	36.0	35.5	**695.1**	35.1	26.7	30.0	31.3	31.3	31.3
	ACTUALS								**0.0**						
FI *** Italy															
FTE	PLANNED	159.3	14.2	14.6	15.1	14.0	12.9	16.5	**246.6**	16.9	18.4	16.9	16.6	13.7	18.9
	ACTUALS	115.4	11.9	9.8	10.9	10.9	10.9	10.9	**180.4**	0.0	0.0	0.0	0.0	0.0	0.0
FJ *** Japan															
FTE	PLANNED	53.2	2.8	2.8	2.8	2.8	2.8	2.8	**69.8**	2.8	2.8	2.8	2.8	2.8	2.8
	ACTUALS	40.5	1.8	1.8	1.8	1.8	1.8	1.8	**51.0**	0.0	0.0	0.0	0.0	0.0	0.0
FK *** Sweden															
FTE	PLANNED	18.2	4.6	4.6	4.6	4.6	4.6	4.6	**45.8**	4.6	3.4	4.9	5.1	5.1	5.1
	ACTUALS								**0.0**						
Grand Totals:															
	PLANNED	2170.1	156.1	172.6	175.7	182.2	199.4	173.3	**3229.4**	173.2	158.2	168.7	169.4	166.6	181.1
	ACTUALS	1450.0	114.1	113.5	128.4	152.4	133.5	115.3	**2207.2**	0.0	0.0	0.0	0.0	0.0	0.0

4.1 GLAST LAT															
Contributed	PLANNED	858.5	71.9	74.6	76.5	73.0	98.4	71.0	**1323.8**	71.7	64.3	70.2	74.4	73.1	78.6
	ACTUALS	296.4	21.4	21.4	20.2	68.2	25.5	23.1	**476.3**	0.0	0.0	0.0	0.0	0.0	0.0
Funded	PLANNED	1311.6	84.3	98.0	99.3	109.1	101.0	102.4	**1905.6**	101.6	94.0	98.5	95.1	93.5	102.4
	ACTUALS	1153.6	92.7	92.1	108.2	84.2	108.0	92.2	**1730.9**	0.0	0.0	0.0	0.0	0.0	0.0
Grand Totals:	PLANNED	2170.1	156.1	172.6	175.7	182.2	199.4	173.3	**3229.4**	173.2	158.2	168.7	169.4	166.6	181.1
	ACTUALS	1450.0	114.1	113.5	128.4	152.4	133.5	115.3	**2207.2**	0.0	0.0	0.0	0.0	0.0	0.0