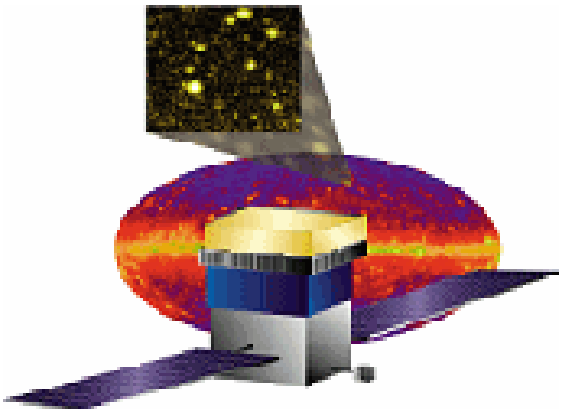
Monthly Progress Report

(Month Ending September 2003)

GLAST Large Area Telescope (LAT)



LAT-MR-02601-02

November 6, 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 September, 2003.

2.0 Recent Progress and Status

4.1.4 Tracker

All ASIC wafers have been received and tested (including radiation testing). Dicing and lapping is well advanced. Significant progress has been made in the multichip module (MCM) front end electronics pitch adapter flex circuit attachment; the manufacture of 50 preproduction parts will be started in early October. The MCM/ASIC qualification test plan, MCM test system, and burn-in system are underway. The final length of the flex circuit cables was determined; the final mechanical layout is in progress. The Tracker minitower was integrated twice by the Integration & Test subsystem. The readout controller ASIC time-over-threshold processing was found to have a problem, causing occasional event reading timeouts. Sidewall drawings are complete. Prepreg is available at both US and Italian vendors; sidewall production will begin at the vendors this week. The plan for lower face sheet repair on the bottom tray was approved and the tray has been repaired. The flexure static test plan and analysis were completed and the pre-test review was held. The mid-tray closeout drawings were released and machining has commenced. Bias circuit drawings are complete and bids are being solicited from potential vendors. An additional engineer has been hired at SLAC. The effect on tray stiffness of splitting the foils was found to be negligible.

4.1.5 Calorimeter

Over 400 CsI crystals have now been fully tested and shipped to NRL; some minor quality issues continue to be addressed. The vendor for the flight photodiode assemblies has begun practice assembly. Photodiode assemblies for the crystal detector element (CDE) qualification units were manufactured. The manufacturing readiness review for the pre-qualification CDE assembly was held. Twelve pre-qualification CDEs have been bonded with flight tooling. Optical tests have now been completed on nine CDEs. The mechanical structure titanium inserts have been manufactured. Revisions have been made to the carbon composite structure tooling design, and the tooling is being manufactured. Radiation testing of commercial, off-the-shelf, analog-to-digital and digital-to-analog converters was completed and shown to meet requirements. The ASIC functional test boards and software environment are fully functional. The flight analog front end electronics (AFEE) layout is essentially complete; a prototype board will be fabricated in October.

4.1.6 Anticoincidence Detector

A peer review of ACD electronics was held. Screening and qualification test boards for the flight version of the analog ASIC were designed, fabricated, and being prepared for assembly. Preparations are being made to test Version 3 of the readout controller ASIC.

Screening and qualification test boards are designed and in layout, test equipment is being purchased, calibrated, and/or repaired. The thermal vacuum test of the high voltage bias supply was performed, with no problems identified. A corona test was performed on the phototube, and assembly of the first set of tubes commenced. A manufacturing readiness review was held for the base frame, and it was sent out for fabrication. A manufacturing problem occurred when curing two side panels of the flight composite shell so the panels had to be discarded. Material for the flight spares will be used to replace the material from the discarded panels. A flight-like tile detector assembly was received from Fermilab; an interference problem discovered on most of the tiles was discovered and resolved.

4.1.7 Electronics

The power distribution unit continues to be tested. The tower electronics model power supply board has been laid out, fabricated, and is now undergoing testing. The crate power supply has been fabricated and is being loaded. New flight ASICS were received (Calorimeter front-end, ACD front-end, ACD readout controller, and data acquisition ASICs for electronics ground support equipment). The contract for ASIC grinding/dicing/picking was placed. The first wafer was cut and delivered to the vendor for prototype plastic packaging. The test stand for GASU testing was built. One of two new flight software engineers was hired this month.

4.1.8 Mechanical Systems

A peer review was held for the grid box structural design. A design review was held for the cross-LAT electronics box interface. Testing of the 1x4 grid was completed. The Calorimeter-grid interface detailed design has been completed. The cross-LAT thermal interface detailed design has also been completed (pending analysis and test verifications). The grid vendor has begun rough-machining the first billet.

Figure 1: Grid being rough-machined.

4.1.9 Integration & Test

The Calorimeter engineering model (EM) and Tracker minitower were integrated into the single grid bay mockup to comprise an EM tower, and a limited performance test was conducted. The muon telescope was completed (the lead filter is yet to be added). The EM tower was then de-integrated, to pursue Tracker high voltage bias debugging and Tracker characterization. The Calorimeter EM script migration was performed. The EM tower was reintegrated and data taking resumed (trigger acknowledge optimization and cosmic ray data with internal and external muon telescope triggers). Mechanical dimensions of the single grid bay were characterized, in support of the 1x4 grid fit check. An electrical safety upgrade to the LAT Integration Facility was completed.

Figure 2: Engineering Model tower integration.

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.

Engineering Model (1x4) Grid (1M1001380)

Baseline/Target Finish: 12/02/02 Projected Finish: 11/03/03 Variance: -228 days

Lack of sufficient manpower, vendor machine failure, and design maturity of the Calorimeter-grid interface definition have impacted the delivery of this milestone. An

existing 1x1 grid bay mockup will be used to develop test procedures and electrical ground support equipment (EGSE). The 1x4 grid has been received at SLAC, and is being tested prior to delivery to I&T. The Tracker vibe fixture will be modified to drill the 1x4 grid; expected delivery of the 1x4 grid to I&T is mid-December.

Tracker Engineering Model (1M1001430)
Baseline/Target Finish: 12/09/02 Projected Finish: 11/14/03 Variance: -232 days
The delivery of the full Tracker EM has been delayed by the redesign of the bottom tray. In the meantime, the upgraded EM minitower has been delivered to I&T, and will be used with the aforementioned 1x1 grid bay mockup to develop test procedures and EGSE. The delay of the full tower 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: 11/14/03 Variance: -218 days
Resources have been diverted from the completion of this milestone to other tasks with higher priority. The need for additional hardware testing is also a factor in the delay. This delay can be accommodated in the Integration & Test schedule with no further impact. (Note: this milestone will be redefined in the project rebaseline plan, and will be considered part of the GASU completion.)

EGSE EM2 Release, Electronics to I&T (1M7941150)
Baseline/Target Finish: 06/12/03 Projected Finish: 11/17/03 Variance: -110 days
Resources have been diverted from the completion of this milestone to other tasks with higher priority, most notably the power supply design. This milestone will be further delayed (until December) due to procurement delays. This can be accommodated in the Integration & Test schedule with no further impact.

EM2 Tower Engineering Model from Electronics to Calorimeter (1M75000000)
Baseline/Target Finish: 08/25/03 Projected Finish: 11/17/03 Variance: -59 days
This item is needed for the calibration unit; which will be rescheduled in accordance with the approved change in the beam test schedule.

Calibration Unit Spacecraft Simulator from Electronics to I&T (1M19500400)
Baseline/Target Finish: 08/29/03 Projected Finish: 02/02/04 Variance: -100 days
This item is needed for the calibration unit; which will be rescheduled in accordance with the approved change in the beam test schedule.

Calorimeter Engineering Model Returned to NRL (1M1001520)
Baseline/Target Finish: 09/08/03 Projected Finish: 10/17/03 Variance: -29 days
As of publication of this report, the Calorimeter EM was returned to NRL on the projected date.

EM2 Tower EM Qual Towers A,B from Electronics to Tracker (1M1000920)
Baseline/Target Finish: 10/16/03 Projected Finish: 11/17/03 Variance: -22 days
Given the delay in Tracker modules A&B (see below), resources have been diverted from this task to address other priorities. This is not a schedule driver for the Tracker tower deliveries at this time.

EGSE Calibration Unit Release – Electronics to I&T (1M7941160)
Baseline/Target Finish: 01/14/04 Projected Finish: 04/12/04 Variance: -61 days
This item is needed for the calibration unit; which will be rescheduled in accordance with the approved change in the beam test schedule.

Tracker Modules A& B Ready for Integration (1M1000200)
Baseline/Target Finish: 02/17/04 Projected Finish: 05/28/04 Variance: -73 days
The delay is primarily due to a delay in MCM procurement contract negotiations and availability of parts. This has been further compounded by problems found in the readout controller ASIC, requiring refabrication. Issues in the bottom tray design and tower sidewall fabrication have been resolved. The pending replan of the LAT project will address these issues.

Calorimeter Modules A& B Ready for Integration (1M1000210)
Baseline/Target Finish: 02/17/04 Projected Finish: 06/24/04 Variance: -91 days
Withdrawal of French support for CDE manufacturing has delayed Calorimeter deliveries to LAT Integration & Test. The pending replan of the LAT project will take this under consideration.

Flight Spacecraft Simulator from Electronics to I&T (1M19500540)
Baseline/Target Finish: 02/27/04 Projected Finish: 07/22/04 Variance: -102 days
At the time the baseline date was determined, the spacecraft vendor had not been selected. (Note: this milestone will be redefined in the project rebaseline plan, and will be considered part of the completion of the final electronics ground support equipment.)

Tracker Modules 1&2 Ready for Integration (1M1000220)
Baseline/Target Finish: 03/15/04 Projected Finish: 06/25/04 Variance: -73 days
See "Tracker Modules A&B", above.

Calorimeter Modules 1&2 Ready for Integration (1M1000230)
Baseline/Target Finish: 03/15/04 Projected Finish: 07/09/04 Variance: -82 days
See "Calorimeter Modules A&B", above.

Flight TEM Assembly 1,2 – Electronics to I&T (1M7941050)
Baseline/Target Finish: 03/15/04 Projected Finish: 05/04/04 Variance: -36 days
The schedule for flight TEM and associated power supply assemblies will be delayed, as part of the project replan.

Flight TEM Power Supply Assembly 1,2 – Electronics to I&T (1M7941060)
Baseline/Target Finish: 03/15/04 Projected Finish: 06/10/04 Variance: -62 days
The schedule for flight TEM and associated power supply assemblies will be delayed, as part of the project replan.

4.0 Financial Status

Attachment 3 depicts the costs, commitments, and performance through the end of the current reporting period.

Attachments 4 and 5 summarize the actual costs through the current period, by WBS level 3 and institution, respectively. 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
The schedule variance is largely due to a delay in the flight analog front-end electronics boards; the ASICs are not expected to be received until December, so this variance will persist until the project plan is reprogrammed.

4.1.6 Anticoincidence Detector
The flight shell and tile detector assembly tiedown procurements were not received on schedule (not considered critical path). Manpower was diverted from the MGSE design work to support the tile shell assembly design. MGSE hardware procurements have been deferred until fiscal year 2004.

The unfavorable cost variance is due to higher labor costs than planned for the tile shell assembly and base electronics assembly (BEA) work. Contract labor support is being

reduced in favor of NASA/Goddard civil servant labor, where appropriate. The GLAST mission has provided funding to appropriate ACD items, contributing to the favorable cost variance in the current period.

4.1.7 Electronics

The unfavorable cost variance is due to an advance payment required by British Aerospace for the flight processors. This advance payment was not in the baseline schedule, rather, payment was planned to occur when the items were received. This variance will be reduced as part of the project replan.

4.1.8 Mechanical Systems

The unfavorable schedule variance is due to filling key engineering and design positions slower than planned. These positions have been filled, however, additional personnel may be required to recover schedule. There has also been a delay in placement of the Lockheed Martin Phase II subcontract (now placed). This variance will be addressed as part of the project replan.

4.1.9 Integration & Test

The mechanical ground support equipment work has been unfavorably affected by the delay in receiving the engineering models. This variance will be minimized as part of the project replan.

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, less travel taken than planned, and invoicing delays.

4.1.B Instrument Operations Center

The unfavorable schedule variance results from a delay in hiring additional planned resources. Recruitment for a regular subsystem manager (non-acting) is underway at SLAC, which is the first step towards increasing the staffing. The pending replan of the LAT project includes incorporating much of the IOC cost into the SLAC operating budget; this will alleviate the positive cost variance.

4.1.D Science Analysis Software

Hiring delays at Stanford/HEPL and GSFC have resulted in a favorable cost variance. These hires have now been completed; the favorable cost variance will be returned to contingency.

6.0 Change Control and Contingency Analysis

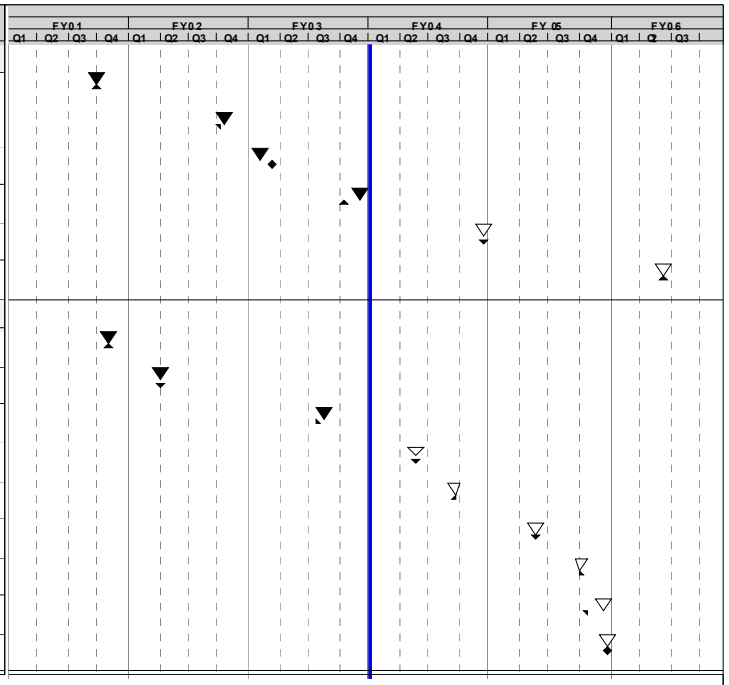
No change requests were approved by the LAT Configuration Control Board during this period. The fabrication phase cost baseline remains at $107.7M; contingency remains at $25.5M. (In anticipation of the pending replan of the project, funding was increased in August to $133.2M.)

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 ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date
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	23	11/08/02A
1M1P000030	CD-3 Approval	07/15/03	-50	09/03/03A
1M1P000060	Flight GRD 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	ICDR (Critical Design Review)	04/30/03	-12	05/16/03A
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
9I023350	AV: LAT Ready to Ship to SCO	07/22/05	-34	09/09/05
1M1000140	LAT Ready for Integration (RFI) to Spacecraft	09/22/05	0	09/22/05



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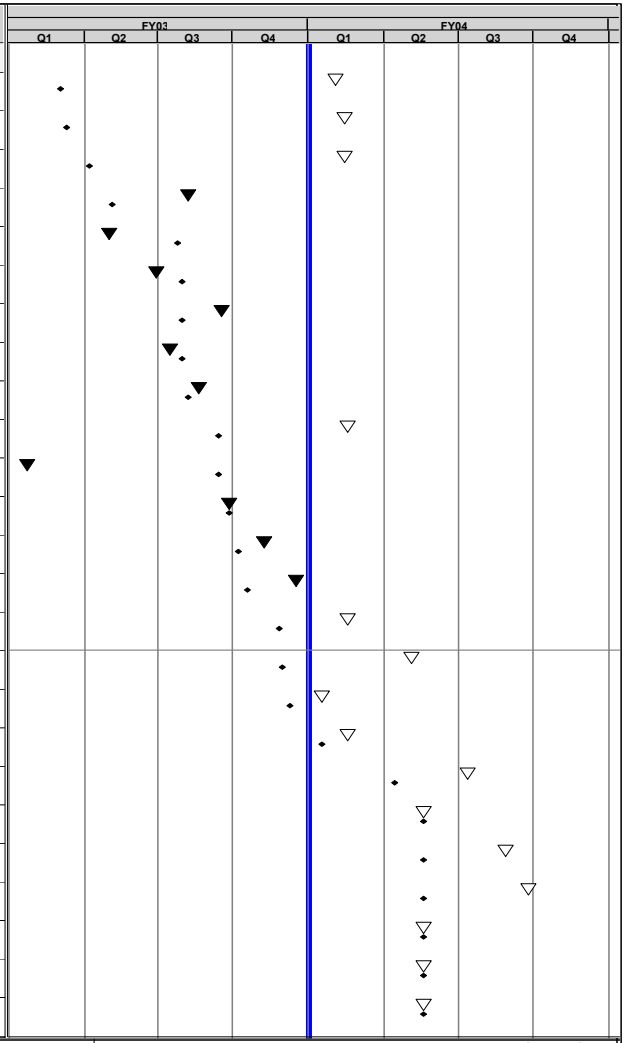
GLAST LAT PROJECT
Project Milestones (Level 1 and 2)

1022
LT_MS1-2

Sheet 1 of 1

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

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND
Instrument Project Office (Level 3						
1M1001380	Delivery of EM (1X4) Grid to I&T/MSGE	12/02/02*	-228	11/03/03*	8	9
1M1001430	Delv of TKR EM to SLAC I&T/MGSE	12/09/02*	-232	11/14/03*	4	9
1M1001390	GEM h/w driver, final ver-ELX to I&T/Online	01/07/03	-218	11/14/03	7	9
1M7941350	High Voltage Power Supply (Bd & Prts)-ACD toElec	02/03/03*	-66	05/07/03A	6	7
1M7941320	(2) ACD Electronics Modules - EM2 (Elec to ACD)	04/24/03	59	01/30/03A	7	6
1M1001490	SIS description-ELX to I&T	04/30/03*	23	03/28/03A	7	9
1M1001500	Online EM2 release #1 to FSW	04/30/03	-32	06/16/03A	9	7
1M19500500	CU IPS - ELX to I&T/Online	04/30/03*	11	04/15/03A	7	9
1M7941340	(11) FREE Bds & ASICS, (1) Fully Tested Bd - EM2	05/07/03*	-8	05/19/03A	6	7
1M7941150	EGSE EM2 Release-Elec to I&T	06/12/03*	-110	11/17/03*	7	9
1M1001570	CU Monte Carlo sim from SAS to I&T/SVAC	06/13/03*	156	10/22/02A	D	9
1M1001550	Online EM2 release #2 to ELX	06/26/03	0	06/26/03A	9	7
1M59000000	EM from CAL to I&T	07/07/03*	-23	08/07/03A	5	9
1M1000910	(36) MCM's for EM2 from Tracker to Elec	07/18/03	-40	09/15/03A	4	7
1M75000000	(6) EM2 TEM-from Elec to CAL	08/25/03	-59	11/17/03	7	5
1M19500400	CU S/C Simulator - ELX to I&T Online	08/29/03*	-100	02/02/04*	7	9
1M1001520	EM CAL Returned to NRL (arrives on dock)	09/08/03*	-29	10/17/03	9	5
1M1000920	EM2 TEM for Qual Towers A,B from Elec to Tracker	10/16/03*	-22	11/17/03*	7	4
1M7941160	EGSE Calibration Unit Release-Elec to I&T	01/14/04	-61	04/12/04	7	9
1M005480	IOC CDR	02/17/04*	0	02/17/04*	B	B
1M1000200	Tracker Modules A & B RFI (for Calibration)	02/17/04*	-73	05/28/04*	4	9
1M1000210	Calorimeter Modules A & B RFI (for Calibration)	02/17/04*	-91	06/24/04*	5	9
1M1000990	ACD Calibration Test Unit at SLAC, Tested & RFI	02/17/04*	0	02/17/04*	6	9
1M7941120	EM2 TEM Assy A,B-Elec to I&T	02/17/04*	0	02/17/04*	7	9
1M7941130	EM2 TEM PS Assy A,B-Elec to I&T	02/17/04*	0	02/17/04*	7	9



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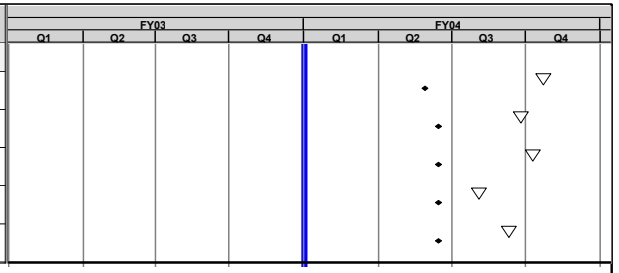
GLAST LAT PROJECT
Project Milestones (Level 3)
1 Year View (+/- 6mo)

1022
LTX1 - MS (L3)
FLX1- MS (L3)

Sheet 1 of 2

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

Activity ID	Activity Description	Target Finish Date	Variance	Scheduled Finish Date	AV	ND
Instrument Project Office (Level 3						
1M19500540	Flt S/C Simulator - ELX to I&T	02/27/04*	-102	07/22/04*	7	9
1M1000220	Tracker Modules 1 & 2 RFI (for Calibration)	03/15/04*	-73	06/25/04*	4	9
1M1000230	Calorimeter Modules 1 & 2 RFI (for Calibration)	03/15/04*	-82	07/09/04*	5	9
1M7941050	Flight TEM Assy 1,2-Elec to I&T	03/15/04*	-36	05/04/04*	7	9
1M7941060	Flight TEM PS Assy 1,2-Elec to I&T	03/15/04*	-62	06/10/04*	7	9



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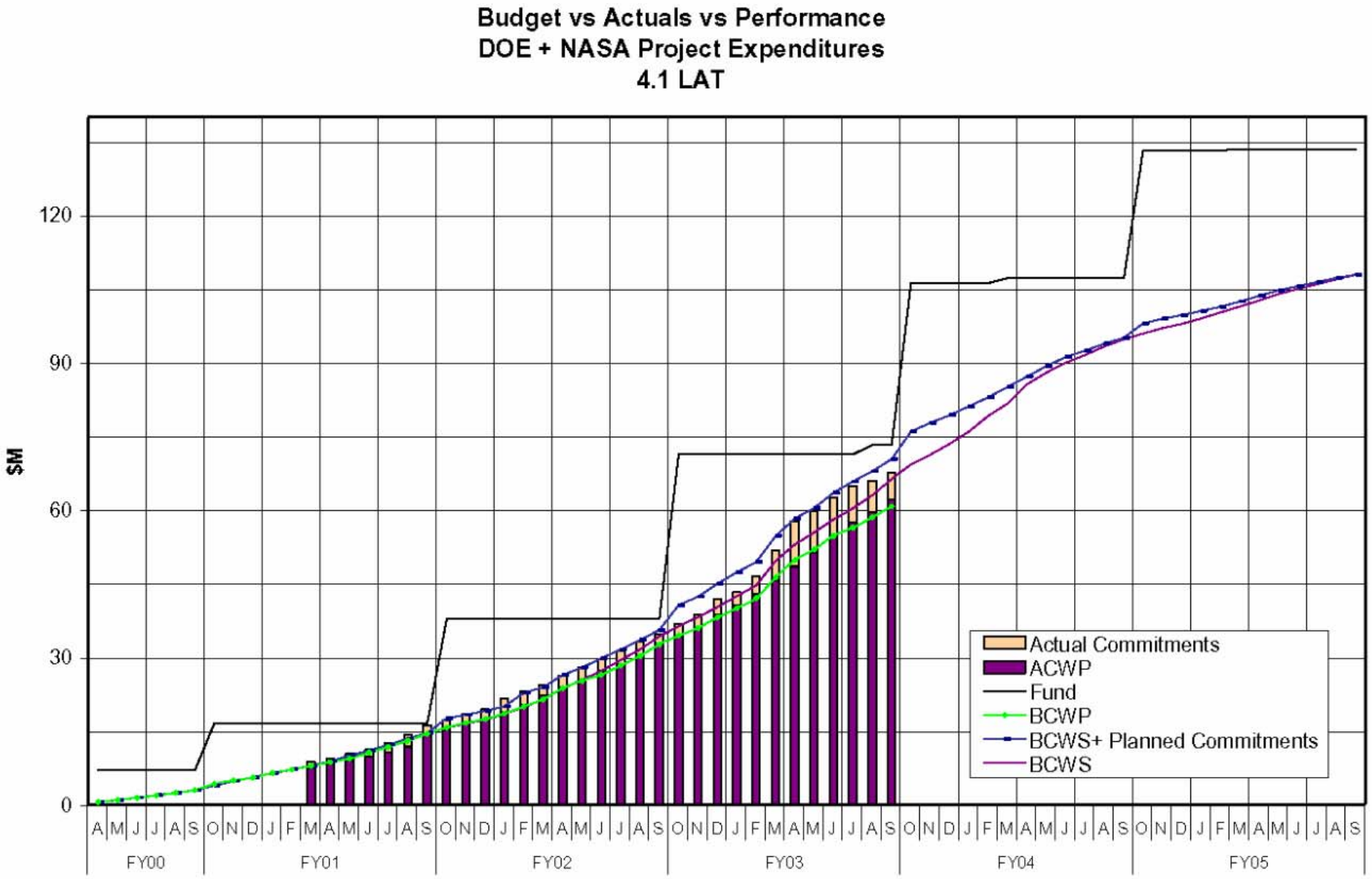
GLAST LAT PROJECT
Project Milestones (Level 3)
1 Year View (+/- 6mo)

1022
LTX1 - MS (L3)
FLX1- MS (L3)

Sheet 2 of 2

Attachment 3



Attachment 4
LAT Costs, through September 2003, by WBS

Monthly Contractor Financial Management Report									Report for Month Ending: 9/30/2003	
To: Kevin Grady, GLAST Project Manager (NASA) Ev Valle, LAT Project Manager (DOE)			From: Tanya Boysen, LAT Project Controls Manager						Budget Value Cost: 0	Fee: 0
LAT3 GLAST LAT Project	Type:								Fund Limitation: 0	
Reporting Category	Cost Incurred				Estimated Cost			4/3/2000 Estimated Final Cost	Billing	Unfilled Orders Outstanding
	During Month		Cum. to Date		Detail		Balance of Budget	Project Estimate	Budget Value	
	Actual	Planned	Actual	Planned	OCT03	NOV03				
4.1.1 INSTRUMENT MANAGEMENT	319	341	9,273	9,565	329	241	5,514	15,357	15,357	
4.1.2 SYSTEM ENGINEERING	86	166	3,731	4,266	161	128	2,432	6,453	6,453	
4.1.4 TRACKER	481	298	9,397	9,562	86	111	1,128	10,722	10,722	
4.1.5 CALORIMETER	486	381	10,129	11,835	831	508	6,361	17,830	17,830	
4.1.6 ANTICOINCIDENCE DETECTOR	137	244	8,758	9,416	275	170	2,821	12,025	12,025	
4.1.7 ELECTRONICS	545	950	7,790	8,157	577	309	7,996	16,672	16,672	
4.1.8 MECHANICAL SYSTEMS	314	462	5,766	7,181	257	191	4,158	10,373	10,373	
4.1.9 INTEGRATION & TEST	70	263	2,306	2,939	217	146	3,918	6,588	6,588	
4.1.A PERFORMANCE AND SAFETY ASSURANCE	8	55	795	1,110	50	39	723	1,607	1,607	
4.1.B LAT INSTRUMENT OPERATIONS CENTER	0	28	263	765	34	26	2,189	2,512	2,512	
4.1.C EDUCATION AND PUBLIC OUTREACH	49	45	1,001	1,187	78	58	1,547	2,684	2,684	
4.1.D SCIENCE ANALYSIS SOFTWARE	66	71	1,454	1,792	75	66	2,000	3,595	3,595	
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	2,561	3,304	61,990	69,093	2,972	1,994	40,781	107,737	107,737	

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

Monthly Contractor Financial Management Report									Report for Month Ending: 9/30/2003	
To: Kevin Grady, GLAST Project Manager (NASA) Ev Valle, LAT Project Manager (DOE)				From: Tanya Boysen, LAT Project Controls Manager					Budget Value Cost: 0	Fee: 0
LAT3 GLAST LAT Project		Type:							Fund Limitation: 0	
Reporting Category	Cost Incurred				Estimated Cost			4/3/2000 Estimated Final Cost	Billing	Unfilled Orders Outstanding
	During Month		Cum. to Date		Detail		Balance of Budget	Project Estimate	Budget Value	
	Actual	Planned	Actual	Planned	OCT03	NOV03				
DG *** GSFC	135	272	9,749	10,894	327	210	4,288	14,573	14,573	
DH *** HEPL	0	230	3,777	4,995	202	143	5,075	9,197	9,197	
DL *** SLAC	1,714	2,155	33,044	34,379	1,213	868	18,936	54,061	54,061	
DN *** NRL	576	558	12,474	15,618	1,104	676	10,046	24,300	24,300	
DO *** Financial Plan Transfer/Sub Out	0	0	38	32	0	0	-6	32	32	
DS *** SSU	49	45	996	1,179	75	56	1,482	2,609	2,609	
DT *** Texas A&M	0	0	15	16	0	0	0	16	16	
DU *** UCSC	59	37	1,818	1,896	42	33	774	2,666	2,666	
DW *** UW	30	8	79	85	9	7	188	283	283	
Total	2,561	3,304	61,990	69,093	2,972	1,994	40,781	107,737	107,737	

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	OCT03	NOV03				
RL LABOR	1,038	1,318	34,033	36,469	1,412	1,254	21,804	58,503	58,503	
FTE (DOE/NASA)	*99.1*	*113.1*	*3,023.3*	*3,060.8*	*112.0*	*120.0*	*1,789.8*	*5,045.2*	*5,045.2*	
HOURS (DOE/NASA)	*16,643*	*19,004*	*507,817*	*506,056*	*20,587*	*17,268*	*287,156*	*832,828*	*832,828*	
RT TRAVEL	34	67	923	1,727	82	84	2,217	3,306	3,306	
RM MATERIAL & SERVICES	1,467	1,814	25,060	28,521	1,462	610	15,005	42,137	42,137	
RX MPS & LAB TAX	23	105	1,974	2,376	16	46	1,755	3,791	3,791	
Total (not incl FTE/Hours)	2,561	3,304	61,990	69,093	2,972	1,994	40,781	107,737	107,737	

Attachment 6
LAT Performance, through September 2003, by WBS

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:					Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 10/30/2003 9/30/2003			
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]	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	341	341	319	0	22	9,235	9,235	9,273	0	-37	15,357	15,357	0
4.1.2 SYSTEM ENGINEERING	166	166	86	0	80	4,105	4,105	3,731	0	373	6,453	6,453	0
4.1.4 TRACKER	298	112	481	-186	-368	9,476	8,682	9,397	-793	-715	10,722	10,722	0
4.1.5 CALORIMETER	381	184	486	-197	-302	11,004	9,568	10,129	-1,436	-562	17,830	17,830	0
4.1.6 ANTICOINCIDENCE DETECTOR	244	230	137	-15	92	9,140	7,705	8,758	-1,435	-1,053	12,025	12,025	0
4.1.7 ELECTRONICS	950	495	545	-455	-51	7,580	7,142	7,790	-438	-648	16,672	16,672	0
4.1.8 MECHANICAL SYSTEMS	462	317	314	-145	2	6,923	5,955	5,766	-968	189	10,373	10,373	0
4.1.9 INTEGRATION & TEST	263	135	70	-128	65	2,722	2,412	2,306	-310	106	6,588	6,588	0
4.1.A PERFORMANCE AND SAFETY ASS	55	55	8	0	47	1,059	1,059	795	0	264	1,607	1,607	0
4.1.B LAT INSTRUMENT OPERATIONS (	28	20	0	-8	20	731	607	263	-124	344	2,512	2,512	0
4.1.C EDUCATION AND PUBLIC OUTRE	45	34	49	-11	-15	1,109	1,033	1,001	-76	32	2,684	2,684	0
4.1.D SCIENCE ANALYSIS SOFTWARE	71	111	66	41	46	1,717	1,724	1,454	7	269	3,595	3,595	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	3,304	2,199	2,561	-1,105	-362	66,122	60,548	61,990	-5,574	-1,443	107,737	107,737	0
Contingency											25,483	25,483	0
Total	3,304	2,199	2,561	-1,105	-362	66,122	60,548	61,990	-5,574	-1,443	133,220	133,220	0

Attachment 7
LAT Performance, through September 2003, by Organization

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:					Contract Type/No:			Project Name/No: GLAST LAT Project		Report Period: 10/30/2003	9/30/2003		
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[1]	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	272	258	135	-15	123	10,567	9,132	9,749	-1,435	-617	14,573	14,573	0
DH *** HEPL	230	222	0	-7	222	4,794	4,604	3,777	-189	827	9,197	9,197	0
DL *** SLAC	2,155	1,343	1,714	-811	-370	33,166	30,700	33,044	-2,466	-2,344	54,061	54,061	0
DN *** NRL	558	298	576	-260	-278	14,514	13,125	12,474	-1,389	651	24,300	24,300	0
DO *** Financial Plan	0	0	0	0	0	32	32	38	0	-6	32	32	0
DS *** SSU	45	34	49	-11	-15	1,104	1,030	996	-74	34	2,609	2,609	0
DT *** Texas A&M	0	0	0	0	0	16	16	15	0	0	16	16	0
DU *** UCSC	37	36	59	-1	-23	1,854	1,833	1,818	-21	15	2,666	2,666	0
DW *** UW	8	8	30	0	-21	76	76	79	0	-3	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	3,304	2,199	2,561	-1,105	-362	66,122	60,548	61,990	-5,574	-1,443	107,737	107,737	0
Management Resrv.											25,483	25,483	0
Total	3,304	2,199	2,561	-1,105	-362	66,122	60,548	61,990	-5,574	-1,443	133,220	133,220	0

Attachment 8
LAT Performance Analysis, September 2003

	WBS	BAC	BCWS	BCWP	ACWP	SV $	CV $	% BCWS	% BCWP	% ACWP	SPI Trend	CPI Trend	SPI	CPI	Cpi_Fcst	CpiSpi_Fcst
1	4.1	107,737	66,122	60,548	61,990	-5,574	-1,443	61.37	56.20	57.54	↓	↓	0.916	0.977	110,304	114,752
2	4.1.1	15,357	9,235	9,235	9,273	0	-37	60.14	60.14	60.38	↔	↑	1.000	0.996	15,419	15,419
3	4.1.2	6,453	4,105	4,105	3,731	0	373	63.61	63.61	57.83	↔	↑	1.000	1.100	5,866	5,866
4	4.1.4	10,722	9,476	8,682	9,397	-793	-715	88.37	80.97	87.64	↓	↓	0.916	0.924	11,605	11,807
5	4.1.5	17,830	11,004	9,568	10,129	-1,436	-562	61.72	53.66	56.81	↓	↓	0.870	0.945	18,876	20,189
6	4.1.6	12,025	9,140	7,705	8,758	-1,435	-1,053	76.01	64.08	72.84	↔	↔	0.843	0.880	13,668	14,582
7	4.1.7	16,672	7,580	7,142	7,790	-438	-648	45.47	42.84	46.72	↓	↔	0.942	0.917	18,185	18,823
8	4.1.8	10,373	6,923	5,955	5,767	-968	189	66.75	57.41	55.59	↔	↔	0.860	1.033	10,044	10,739
9	4.1.9	6,588	2,722	2,412	2,306	-310	106	41.32	36.61	35.01	↓	↑	0.886	1.046	6,299	6,812
10	4.1.A	1,607	1,059	1,059	795	0	264	65.90	65.90	49.49	↔	↑	1.000	1.332	1,207	1,207
11	4.1.B	2,512	731	607	263	-124	344	29.10	24.16	10.48	↔	↔	0.830	2.304	1,090	1,259
12	4.1.C	2,684	1,109	1,033	1,001	-76	32	41.32	38.48	37.30	↓	↓	0.931	1.032	2,601	2,719
13	4.1.D	3,595	1,717	1,724	1,454	7	269	47.75	47.95	40.45	↑	↑	1.004	1.185	3,033	3,027
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

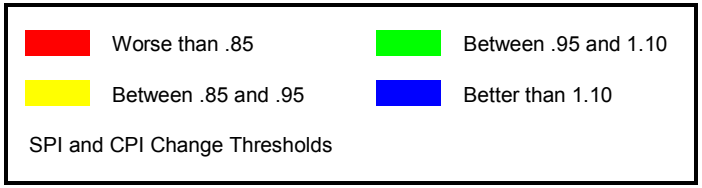
LEGEND

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)

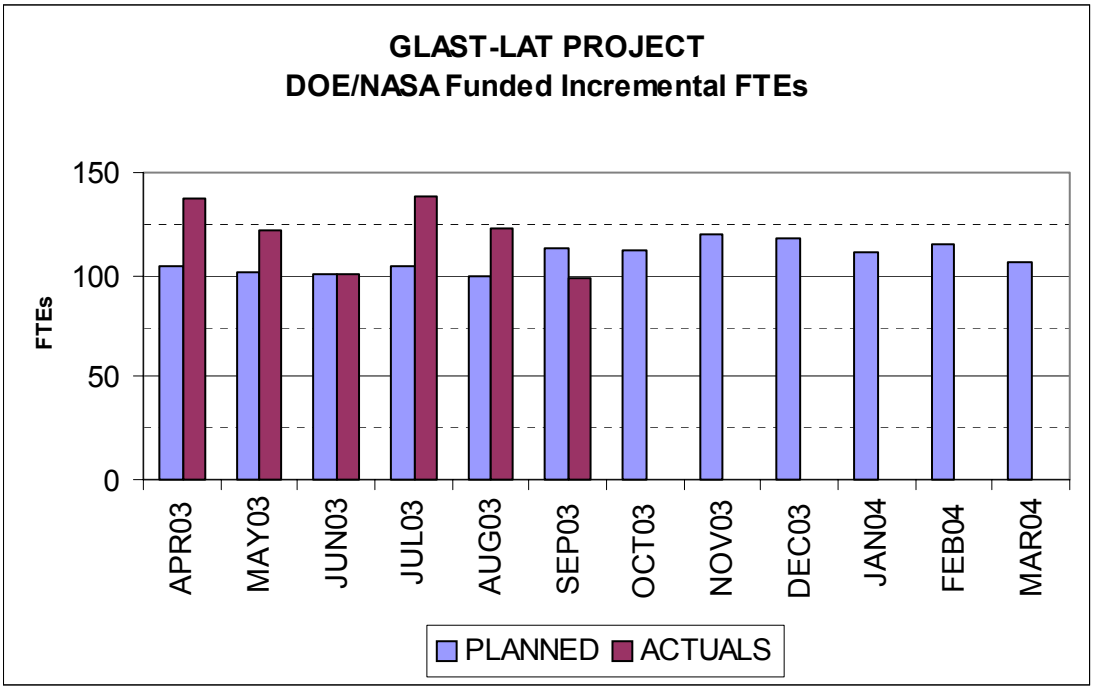
SV $: Schedule Variance = BCWP - BCWS
CV $: Cost Variance = BCWP - ACWP
SPI: Schedule Performance Index = BCWP/BCWS
CPI: Cost Performance Index = BCWP/ACWP

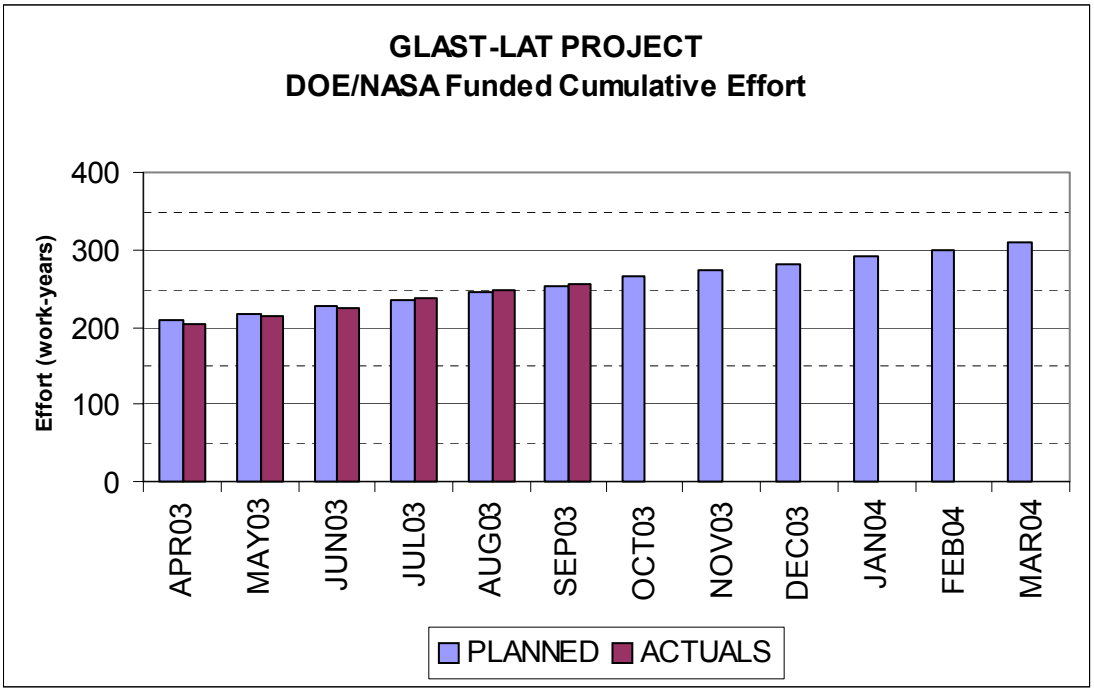
% BCWS: Percent Scheduled = BCWS/BAC
% BCWP: Percent Complete = BCWP/BAC
% ACWP: Percent Spent = ACWP/BAC

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 September 2003, by Organization

Program:	Description:	Approval:
LAT3	GLAST LAT Project	Program Manager
Run Date:	Status Date:	Functional Manager
10/30/2003	9/30/2003	Cost Account Manager

OBS		PRIOR	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	Cum-to-Date	OCT03	NOV03	DEC03	JAN04	FEB04	MAR04
DG *** GSFC															
FTE	PLANNED	553.9	25.4	22.7	22.4	17.6	18.6	22.0	**682.5**	22.2	19.8	20.8	22.7	22.3	20.8
	ACTUALS	496.0	42.5	29.0	11.8	52.6	39.3	23.6	**694.9**	0.0	0.0	0.0	0.0	0.0	0.0
DH *** HEPL															
FTE	PLANNED	252.2	7.5	7.7	6.4	7.2	6.6	8.8	**296.3**	7.2	5.9	7.7	7.7	10.8	8.0
	ACTUALS	203.8	2.9	3.6	3.3	5.1	4.5	0.0	**223.3**	0.0	0.0	0.0	0.0	0.0	0.0
DL *** SLAC															
FTE	PLANNED	1155.2	63.2	61.3	56.1	60.9	62.4	64.7	**1523.7**	62.7	62.8	59.3	54.1	56.2	55.1
	ACTUALS	1072.4	64.1	62.7	55.8	50.3	52.2	55.0	**1412.5**	0.0	0.0	0.0	0.0	0.0	0.0
DN *** NRL															
FTE	PLANNED	544.7	18.5	19.8	26.7	28.7	21.9	25.8	**685.9**	32.5	43.7	40.1	33.2	30.0	27.7
	ACTUALS	544.9	23.5	26.0	30.3	27.3	25.7	30.1	**707.7**	0.0	0.0	0.0	0.0	0.0	0.0
DS *** SSU															
FTE	PLANNED	55.3	1.9	2.9	2.9	2.9	2.9	2.9	**71.5**	2.3	2.4	2.3	2.3	2.3	2.2
	ACTUALS	64.4	4.3	3.3	1.3	2.5	4.4	3.7	**83.8**	0.0	0.0	0.0	0.0	0.0	0.0
DU *** UCSC															
FTE	PLANNED	179.0	5.7	4.8	4.7	4.5	4.5	4.5	**207.6**	4.5	4.5	4.5	4.5	4.5	4.5
	ACTUALS	218.5	9.3	8.4	6.9	7.1	6.4	-5.2	**251.4**	0.0	0.0	0.0	0.0	0.0	0.0
DW *** UW															
FTE	PLANNED	34.5	0.4	0.4	0.4	0.4	0.4	0.4	**36.9**	0.4	0.4	0.4	0.4	0.4	0.4
	ACTUALS	3.2	1.0	0.0	1.7	1.1	0.0	2.0	**9.0**	0.0	0.0	0.0	0.0	0.0	0.0
FF *** France															
FTE	PLANNED	849.5	31.3	31.2	31.0	31.0	31.0	31.0	**1035.9**	31.4	31.4	24.1	14.2	14.5	14.5
	ACTUALS								**0.0**						
FI *** Italy															
FTE	PLANNED	329.1	18.9	19.2	13.0	11.1	12.0	14.1	**417.4**	14.8	15.3	15.1	13.4	11.3	8.6
	ACTUALS	234.7	10.9	10.9	10.9	10.9	10.9	10.9	**299.8**	0.0	0.0	0.0	0.0	0.0	0.0
FJ *** Japan															
FTE	PLANNED	83.6	2.8	2.8	1.1	1.0	1.0	1.0	**93.3**	1.0	1.0	1.0	1.0	1.0	0.9
	ACTUALS	59.7	1.8	1.8	1.8	1.8	1.8	1.8	**70.2**	0.0	0.0	0.0	0.0	0.0	0.0
FK *** Sweden															
FTE	PLANNED	68.9	5.1	5.1	5.1	5.1	5.1	5.1	**99.5**	5.1	5.1	3.8	3.5	3.6	3.6
	ACTUALS								**0.0**						
Grand Totals:															
	PLANNED	4105.8	180.7	177.7	169.7	170.2	166.3	180.1	**5150.6**	184.2	192.4	179.1	156.9	156.9	146.3
	ACTUALS	2897.6	160.3	145.6	123.6	158.6	145.1	121.9	**3752.6**	0.0	0.0	0.0	0.0	0.0	0.0

4.1 GLAST LAT															
Contributed	PLANNED	1669.3	76.4	76.0	69.5	65.5	66.1	67.0	**2089.8**	72.3	72.5	60.6	45.3	42.2	40.0
	ACTUALS	593.7	23.2	23.8	22.8	20.6	22.5	22.8	**729.3**	0.0	0.0	0.0	0.0	0.0	0.0
Funded	PLANNED	2436.5	104.3	101.8	100.3	104.7	100.1	113.1	**3060.8**	111.9	119.9	118.5	111.6	114.7	106.3
	ACTUALS	2304.0	137.0	121.8	100.8	138.0	122.7	99.1	**3023.3**	0.0	0.0	0.0	0.0	0.0	0.0
Grand Totals:	PLANNED	4105.8	180.7	177.8	169.8	170.2	166.3	180.1	**5150.6**	184.1	192.4	179.1	156.9	156.9	146.3
	ACTUALS	2897.6	160.2	145.6	123.6	158.6	145.1	121.9	**3752.6**	0.0	0.0	0.0	0.0	0.0	0.0