



AntiCoincidence Detector

**GLAST Large Area Telescope:  
Cost/Schedule Review  
November 3, 2005  
AntiCoincidence Detector (ACD)  
Subsystem  
WBS: 4.1.6**

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# Summary of Significant Accomplishments

- The ACD is at SLAC and is Ready For Integration to the LAT
- All PR/PFRs are closed (some transferred to the LAT system)

## Key Level 3 Milestones

All completed as of 8/23/2005

Activity Description	
<b>4.1.6 ACD</b>	
✓	Test/Screening Board w/ASIC for EM1 -ACD to Elec
✓	High Voltage Power Supply (Bd & Prts)-ACD toElec
✓	Doc defining Backsplash Test Model (ACD to I&T)
✓	(11) FREE Bds & ASICS, (1) Fully Tested Bd - EM2
✓	ACD Calibration Test Unit at SLAC, Tested & RFI
✓	ACD Test Scripts (from ACD to I&T)
✓	ACD Flight Unit at SLAC, Tested/Inspected & RFI



ACD Arrival at SLAC on August 13

# Acceptance Test Data Package

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**The ACD Acceptance Test Data Package, based on our agreement with LAT management, is located at**

**[http://lhea-glast.gsfc.nasa.gov/acd/acc\\_test/](http://lhea-glast.gsfc.nasa.gov/acd/acc_test/)**

**This Web site also includes other information about ACD, including operational constraints and notes about ACD software and testing.**

**A complete set of all ACD documentation will be delivered to LAT on DVDs. A preliminary version has already been delivered.**

# Change Request/Budgeted Cost Summary

MONTH	CR#	CR Description	DELTA			AT Completion		
			LAT FAB	LAT COMM	Grand Total	LAT FAB	LAT COMM	Grand Total
Original Baseline						\$ 10,280,000	\$ 318,000	\$ 10,598,000
0209	LAT-XR-00770-01	Redundant HVBS's	\$ 59,441		\$ 59,441	\$ 10,339,441	\$ 318,000	\$ 10,657,441
	LAT-XR-01000-01	FY01 Carryover Cost	\$ 274,600		\$ 274,600	\$ 10,614,040	\$ 318,000	\$ 10,932,040
	LAT-XR-01001-01	MPS Tax Rephasing	\$ 49,541	\$ (49,540)	\$ 1	\$ 10,663,581	\$ 268,460	\$ 10,932,041
	LAT-XR-01009-01	Scheduling Support	\$ 82,206		\$ 82,206	\$ 10,745,787	\$ 268,460	\$ 11,014,247
0212	LAT-XR-01119-02	ACD CDR Date	\$ 455		\$ 455	\$ 10,746,242	\$ 268,460	\$ 11,014,702
	LAT-XR-01161-01	Micrometeoroid Shield	\$ 25,000		\$ 25,000	\$ 10,771,242	\$ 268,460	\$ 11,039,702
0303	LAT-XR-01011-01	ASIC Development Support	\$ 548,548		\$ 548,548	\$ 11,319,790	\$ 268,460	\$ 11,588,250
	LAT-XR-01750-01	EGSE Software Support	\$ 237,217		\$ 237,217	\$ 11,557,007	\$ 268,460	\$ 11,825,467
0304	LAT-XR-02000-01	ACD Base Electronics Assembly M&S Variance	\$ 467,265		\$ 467,265	\$ 12,024,272	\$ 268,460	\$ 12,292,732
0311	LAT-XR-02626-01	LAT Rebaseline	\$ 1,503,736	\$ 179,941	\$ 1,683,677	\$ 13,528,008	\$ 448,402	\$ 13,976,409
	LAT-XR-02637-01	Add'l ACD changes identified during Rebaseline	\$ 342,127		\$ 342,127	\$ 13,870,135	\$ 448,402	\$ 14,318,536
0401	LAT-XR-02862-01	4.1.6 BEA Changes	\$ 98,001		\$ 98,001	\$ 13,968,136	\$ 448,402	\$ 14,416,537
	LAT-XR-02915-01	4.1.6 ACD EGSE SW Support	\$ 52,000		\$ 52,000	\$ 14,020,136	\$ 448,402	\$ 14,468,537
0402	LAT-XR-03077-02	Stanford Benefits Rate Increase	\$ 2,011		\$ 2,011	\$ 14,022,146	\$ 448,402	\$ 14,470,548
0403	LAT-XR-03066-01	MPS Tax Reduction	\$ (820,186)	\$ (128,915)	\$ (949,101)	\$ 13,201,960	\$ 319,487	\$ 13,521,447
	LAT-XR-03306-01	4.1.6 ACD Mechanical Materials & Support	\$ 195,010		\$ 195,010	\$ 13,396,970	\$ 319,487	\$ 13,716,457
	LAT-XR-03307-01	4.1.6 ACD Photomultiplier Tube Anomaly Resolution	\$ 298,800		\$ 298,800	\$ 13,695,770	\$ 319,487	\$ 14,015,257
	LAT-XR-03308-01	4.1.6 ACD BEA	\$ 221,502		\$ 221,502	\$ 13,917,272	\$ 319,487	\$ 14,236,759
0404	LAT-XR-03063-01	Extend Commissioning Phase to Launch		\$ 37,922	\$ 37,922	\$ 13,917,272	\$ 357,409	\$ 14,274,681
	LAT-XR-03678-01	Adjust Labor Hours not implemented in prior CRs	\$ 1		\$ 1	\$ 13,917,273	\$ 357,409	\$ 14,274,682
0406	LAT-XR-04168-01	4.1.6.4 ACD ASIC Delay	\$ 400,000		\$ 400,000	\$ 14,317,273	\$ 357,409	\$ 14,674,682
	LAT-XR-04169-01	4.1.6 ACD Grassroots Estimate	\$ 690,912		\$ 690,912	\$ 15,008,185	\$ 357,409	\$ 15,365,594
0408	LAT-XR-04638-01	4.1.6 LAT-to-ACD HVBS Supply Voltage	\$ 63,002		\$ 63,002	\$ 15,071,188	\$ 357,409	\$ 15,428,596
	LAT-XR-04639-01	4.1.6 PMT Glass Crack Anomaly	\$ 378,002		\$ 378,002	\$ 15,449,190	\$ 357,409	\$ 15,806,599
	LAT-XR-04640-01	4.1.6 TSA Design & TDA Hole Location Error	\$ 84,005		\$ 84,005	\$ 15,533,195	\$ 357,409	\$ 15,890,604
	LAT-XR-04641-01	4.1.6 ACD Electronics Parts Issues	\$ 62,004		\$ 62,004	\$ 15,595,199	\$ 357,409	\$ 15,952,607
0502	LAT-XR-05950-01	LAT Rebaseline (through FY05)	\$ 1,645,052		\$ 1,645,052	\$ 17,240,250	\$ 357,409	\$ 17,597,659
0504	LAT-XR-06426-01	4.1.6 ACD Cost Increase	\$ 727,399		\$ 727,399	\$ 17,967,649	\$ 357,409	\$ 18,325,058
0805	LAT-XR-07089-01	4.1.6 ACD Cost Variance	\$ 360,800		\$ 360,800	\$ 18,328,449	\$ 357,409	\$ 18,685,858
Grand Total CR's			\$ 8,048,449	\$ 39,409	\$ 8,087,858	\$ 18,328,449	\$ 357,409	\$ 18,685,858

# ACD Cost Summary thru FY05

	Budgeted Cost At Completion	Budgeted Cost of Work Performed	Actual Cost of Work Performed thru 10-05*	Outstanding Obligations/ Liabilities	Revised Budgeted Cost At Completion	Variance to Baseline BAC
<b>4.1.6 ACD (\$K)</b>	<b>18,329</b>	<b>18,329</b>	<b>18,141</b>	<b>188</b>	<b>18,329</b>	<b>(0)</b>
4.1.6.1 PROJECT MANAGEMENT	4,128	4,128	3,952	137	4,089	(39)
4.1.6.2 SAFETY AND MISSION ASSURANCE	920	920	974	-	974	55
4.1.6.3 TILE SHELL ASSEMBLY	3,792	3,792	3,769	26	3,795	3
4.1.6.4 BASE ELECTRONICS ASSEMBLY	6,676	6,676	6,590	15	6,605	(72)
4.1.6.5 MICROMETEOROID SHIELD/THERMAL BLANKET	778	778	737	25	762	(16)
4.1.6.6 MECHANICAL QUALIFICATION & CALIBRATION UNIT	177	177	177	-	177	-
4.1.6.7 ACD INTEGRATION & TEST	891	891	887	(21)	866	(25)
4.1.6.8 LAT INTEGRATION & TEST SUPPORT	17	17	-	-	-	(17)
4.1.6.B GROUND SUPPORT EQUIPMENT & FACILITIES	951	951	1,055	6	1,061	110

Budgeted Cost At Completion = CCB approved budget thru end of FY05

\* Estimate

# Outstanding Obligations/Liabilities

	Outstanding Obligations/ Liabilities (\$K)	Explanations
<b>4.1.6 ACD (\$K)</b>	<b>188</b>	<b>TOTAL</b>
4.1.6.1 PROJECT MANAGEMENT	137	\$84K - 5 months of USRA Support (06/2005 - 10/2005); \$10K -1 month CM Support
		\$21K - Lab Tax; \$22K - Materials/Shipping
4.1.6.2 SAFETY AND MISSION ASSURANCE	-	
4.1.6.3 TILE SHELL ASSEMBLY	26	\$26K - Materials & Services (chargebacks)
4.1.6.4 BASE ELECTRONICS ASSEMBLY	15	\$15K - Materials & Services (chargebacks)
4.1.6.5 MICROMETEOROID SHIELD/THERMAL BLANKET	25	\$25K - Support thru December 2005
4.1.6.6 MECHANICAL QUALIFICATION & CALIBRATION UNIT	-	
4.1.6.7 ACD INTEGRATION & TEST	(21)	Final Close-out of Task 240
4.1.6.8 LAT INTEGRATION & TEST SUPPORT	-	
4.1.6.B GROUND SUPPORT EQUIPMENT & FACILITIES	6	\$6 - Materials

# Variances

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	Budgeted Cost At Completion	Revised Budgeted Cost At Completion	Variance to Baseline BAC	Explanations
<b>4.1.6 ACD (\$K)</b>	<b>18,329</b>	<b>18,329</b>	<b>(0)</b>	
4.1.6.1 PROJECT MANAGEMENT	4,128	4,089	(39)	Lab Tax
4.1.6.2 SAFETY AND MISSION ASSURANCE	920	974	55	\$52.3K September Assessment (3 FTE's)
4.1.6.3 TILE SHELL ASSEMBLY	3,792	3,795	3	
4.1.6.4 BASE ELECTRONICS ASSEMBLY	6,676	6,605	(72)	BEA GSE covered in 4.1.6.B
4.1.6.5 MICROMETEOROID SHIELD/THERMAL BLANKET	778	762	(16)	
4.1.6.6 MECHANICAL QUALIFICATION & CALIBRATION UNIT	177	177	-	
4.1.6.7 ACD INTEGRATION & TEST	891	866	(25)	
4.1.6.8 LAT INTEGRATION & TEST SUPPORT	17	-	(17)	Funding used to cover GSE overrun
4.1.6.B GROUND SUPPORT EQUIPMENT & FACILITIES	951	1,061	110	BEA GSE, Shipping dolly, cleanroom, He mitigation and monitor

# ACD Outyear Requirements (FY06-FY08)

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•**Current ACD Outyear budget to sustain ACD Team involvement with the LAT from FY06 thru Launch+60 days (10/31/2007). NOTE: This does not include CS Support.**

FY06 Requirements include:

\$225K for Labor (Alex Mossiev = 1 FTE/.5 Technician for 3 months)

\$32.3K for Code 600 Operating Account/Lab Tax (2.15 FTE's @ \$15K per FTE)

FY07 Requirements include:

\$205K for Labor (Alex Mossiev = 1 FTE)

\$30K for Code 600 Operating Account/Lab Tax (2 FTE's @ \$15K per FTE)

FY08 Requirements include:

\$20K for Labor (Alex Mossiev = 1 FTE for 1 month)

\$2.4K for Code 600 Operating Account/Lab Tax (.16 FTE @ \$15K per FTE)



## CS Manpower – October thru November

Civil Servant	Task Description	10/3 - 10/14 Actual	10/17 - 10/28 Estimate	November Estimate
<b>ADAMCZYK DEANNA J</b>	<b>Resource Close-out</b>	24.00 HR	24.00 HR	40.00 HR
<b>ROBBINS DARIAN E</b>	<b>WOA Close-out</b>	36.00 HR	16.00 HR	0.00 HR
<b>SEGAL KENNETH N</b>	<b>ACD Close-out/LAT I&amp;T</b>	87.00 HR	80.00 HR	80.00 HR
<b>AMATO MICHAEL J.</b>	<b>ACD Close-out/LAT I&amp;T</b>	1.00 HR	4.00 HR	40.00 HR
<b>JOHNSON THOMAS</b>	<b>ACD Close-out/LAT I&amp;T</b>	4.00 HR	8.00 HR	68.00 HR
<b>ORSBORNE SHARON</b>	<b>EGSE Software</b>	16.00 HR	16.00 HR	40.00 HR
<b>COLTHARP CHARLES C</b>	<b>ACD I&amp;T Close-out/LAT I&amp;T</b>	77.00 HR	40.00 HR	72.00 HR
<b>THOMPSON DAVID J</b>	<b>Scientist/Subsystem Manager</b>	72.00 HR	72.00 HR	150.00 HR
	Total Hours	317.00 HR	260.00 HR	490.00 HR
FTE = Hours/80 Hours (1/2 month)		3.96FTE	3.25FTE	3.06FTE
Total for October			3.61FTE	

\* CS Manpower report for first two weeks in October is suspect to error (low).

\*\* December, 2005 thru October, 2007 1 planned FTE per month (Dave Thompson).

\*\*\*Estimated FTE's thru FY06 do not include the usage of Comp Time Earned in FY05.

# Summary

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- **All ACD milestones completed as of 8/23/2005**
  - **One open lien – Delivery and installation of the ACD Thermal Blanket**
- **Acceptance Data Test Package is complete and available on-line**
- **Remaining funds sufficient to cover outstanding obligations and liabilities, without contingency.**
  - **Potential unplanned liens: CM system support, S&MA chargebacks, Code 200 transportation support**
- **The LAT books can be closed on the ACD WBS 4.1.6. Remaining ACD support to be transferred to LAT WBS 4.1.1.4 – Science Prep**
- **ACD Team is prepared to support the integration of the ACD to the LAT!**