

# GLAST Large Area Telescope: I & T Input to Monthly Technical/Cost/Schedule Review 12/1/05

Ken Fouts  
SU-SLAC  
Subsystem Engineering Manager

kfouts@slac.stanford.edu  
650-926-2553



# Last Month's Accomplishments (1 of 3)

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- **Management**
  - Completed Phase 0 IRR/TRR
  - Supporting Environmental Test Planning
  - Tracking hardware shortages for LAT integration.
    - ELX Boxes
- **IFCT**
  - Integrated flight PDU
  - Installed all +Z fly away instrumentation
  - Completed optical survey
  - Bonded downspout heatpipes
  - Integrated the ACD



# Last Month's Accomplishments (2 of 3)

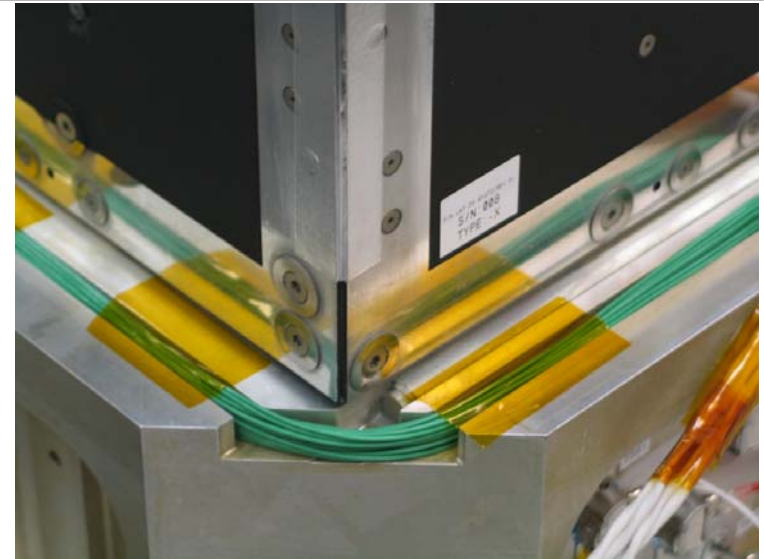
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- **SVAC**
  - **Preparing for full LAT tests (Phase 1 and 2)**
    - Finalizing muon collection definition for system test.
    - Continued work on infrastructure for LAT data analysis.
    - Working with Online and Offline to prepare cosmic ray data analysis.
    - Working with ISOC to provide data quality monitoring.
    - Working with ACD and SAS to develop code for ACD calibrations.
- **Online**
  - **Developing LICOS scripts for system level test (Phase 1 and 2).**

# I&T Activities



**16 towers in the grid**



**Grid thermocouple wires**

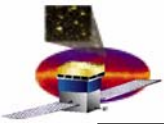


**X-LAT Plate fitcheck**

4.1.9 - Integration and Test



**ACD Installation**

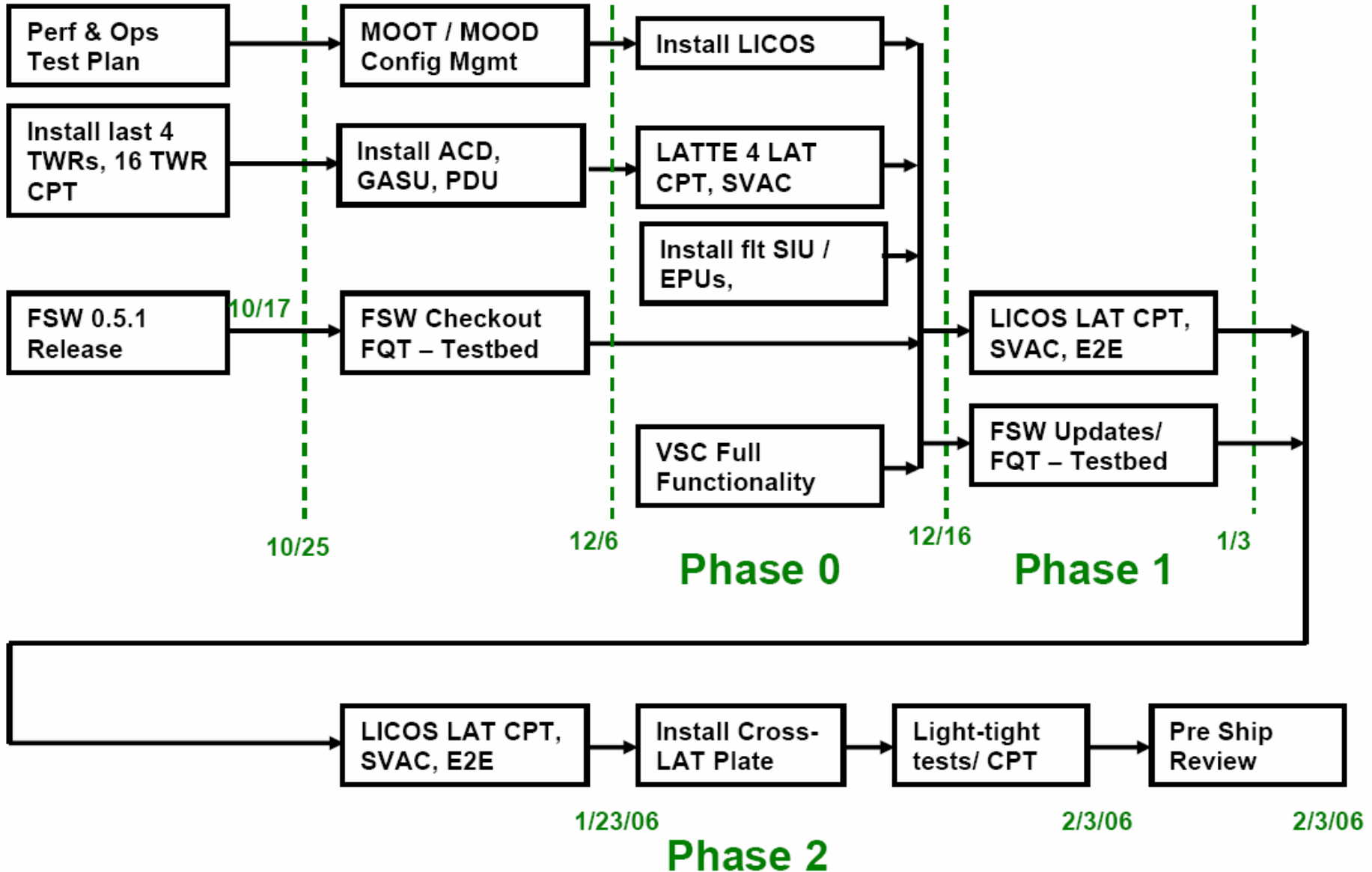


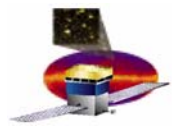
# Steps to Ship to NRL

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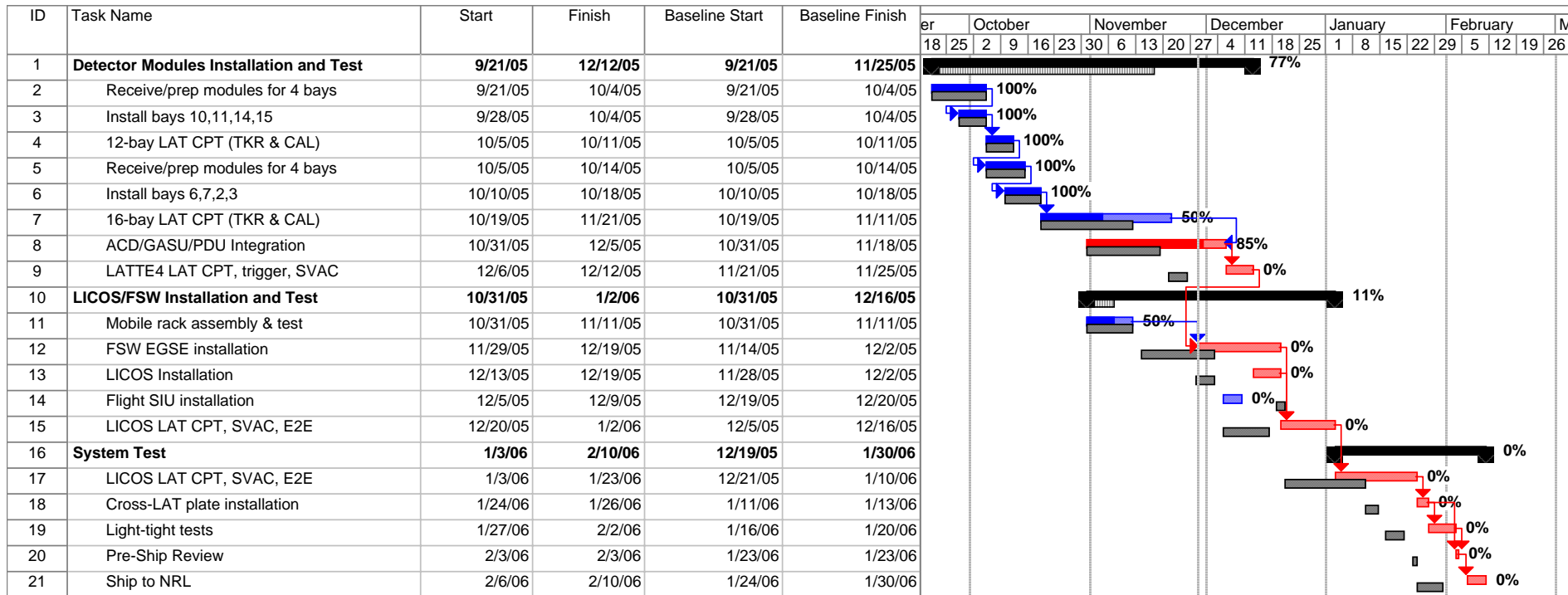
- Phase 0 – Hardware check out
  - Hardware
    - ACD
    - Flt PDU, Flt GASU (EM GASU), Flt Cables, EMI Skirt, no SIU/EPU
  - Software
    - LATTE 4
  - Exit
    - Successful LATTE 4 CPT
- Phase 1 – Software check out
  - Hardware
    - Flt PDU, Flt GASU (EM GASU), 2 (1) Flt SIU, 3 (2) Flt EPU, VSC, Control/Pwr Racks
  - Software
    - FSW, VSC, LICOS, Configuration Database
  - Exit
    - Successful LICOS CPT
- Phase 2 – Run for the record
  - Hardware
    - Full complement of flight hardware (See Above)
  - Software
    - Flight release of FSW, VSC, LICOS, Configuration Database
  - Exit
    - Successful LICOS CPT, SVAC, E2E, Verification w/SIIS

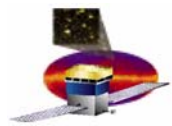
# System Test Plan



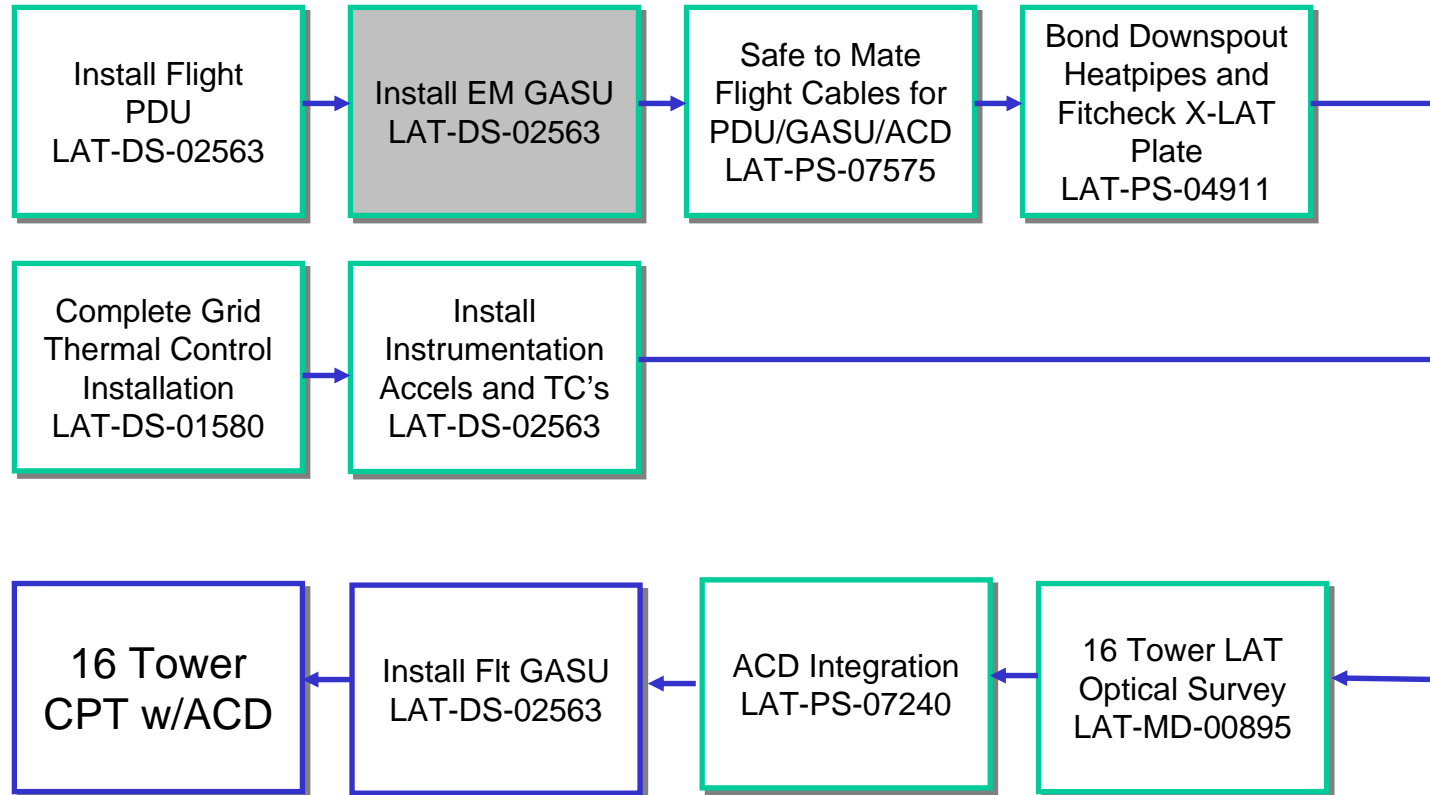


# I&T Summary Plan



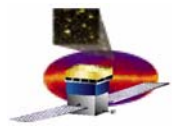


# Roadmap to ACD Integration and Test

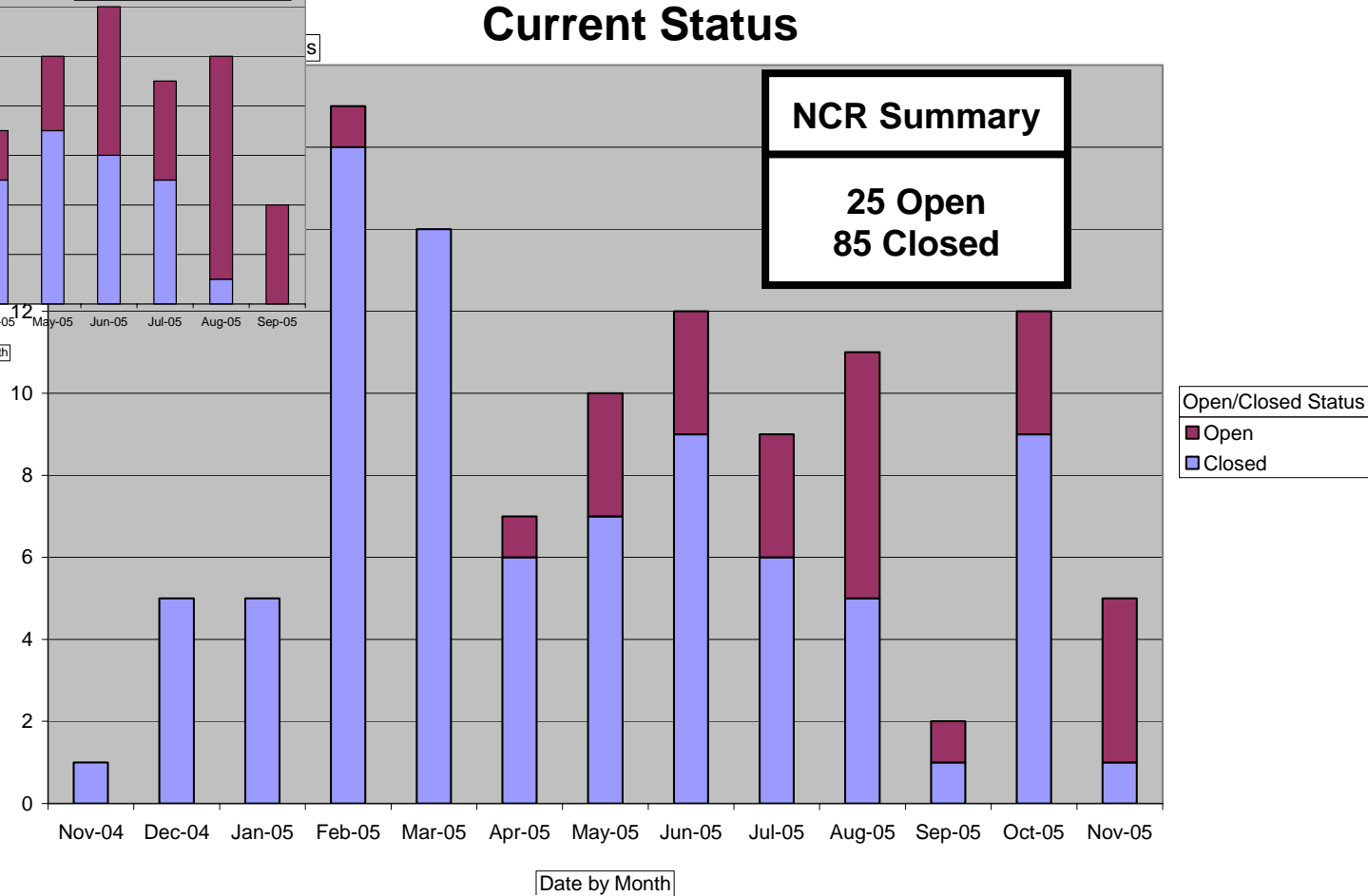
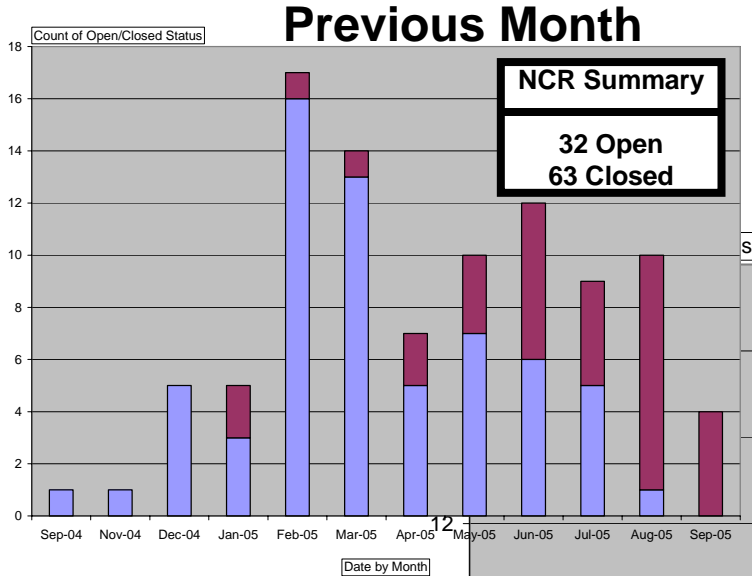


***Critical steps have been identified and are in the current I&T plan***

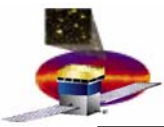




# I&T NCRs by Month Open/Closed Status



## Month NCR Opened



# Upcoming I&T Events

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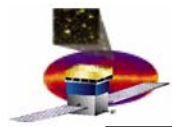
- ACD I&T Receiving Tests **(Complete)**
- Shear plate and cable tray installation for 8 towers **(Complete)**
- STR #35 CAL re-trigger characterization **(Complete)**
- TKR (2) Receiving **(Complete)**
- Complete 10 tower LPT's **(Complete)**
- Install and test 11<sup>th</sup> and 12<sup>th</sup> towers **(Complete)**
- Install and test 13<sup>th</sup> and 14<sup>th</sup> towers **(Complete)**
- Install and test 15<sup>th</sup> and 16<sup>th</sup> towers ECD **(Complete)**
- Install test instrumentation (accels, T/C's) ECD **(Complete)**
- Complete mechanical assembly (EMI skirt, downspout H/P's, bulkhead brackets, etc.) **(Complete)**
- Install and Test ACD ECD ~~11/9~~ 12/9

# I&T Detail Schedule (1 of 2)

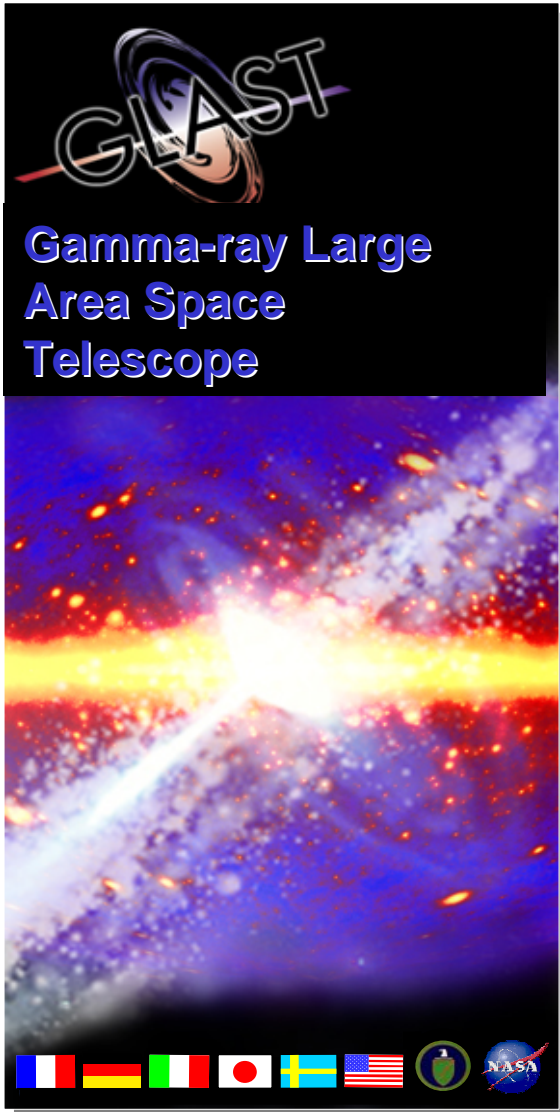
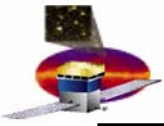
I&T work schedule11-28-05		11/30/05		
ID	Task Name	Start	% Complete	Finish
1	Tracker Towers	1/14/05	0%	12/13/05
56	Electronics Receiving	3/19/04	0%	12/23/05
123	<b>MGSE</b>	<b>10/4/05</b>	<b>41%</b>	<b>12/9/05</b>
124	15 ton crane repair	12/2/05	0%	12/2/05
125	<b>Grid 2</b>	<b>10/4/05</b>	<b>43%</b>	<b>12/9/05</b>
127	Grid 2 Flexure Testing	11/7/05	10%	12/9/05
128	<b>Tower 8, Spare/Beam Test</b>	<b>6/13/05</b>	<b>76%</b>	<b>10/21/05</b>
185	<b>Tower 16, Spare / Beam Test</b>	<b>12/10/04</b>	<b>36%</b>	<b>12/14/05</b>
248	<b>Install LAT hardware</b>	<b>11/3/05</b>	<b>37%</b>	<b>12/15/05</b>
249	<b>Bulkhead Panel and Cable Installation</b>	<b>11/10/05</b>	<b>44%</b>	<b>12/1/05</b>
250	<b>Heat Pipe Patch Panel Integration</b>	<b>11/10/05</b>	<b>44%</b>	<b>12/1/05</b>
258	LAT Auxiliary Cooling System Set-up and Operation Checkout	11/16/05	5%	12/1/05
259	X-LAT Plate rework	11/29/05	0%	11/30/05
260	<b>Grid Mechanical Part Integration</b>	<b>11/3/05</b>	<b>11%</b>	<b>12/15/05</b>
261	Heater Control Box (HCB) Integrations	12/9/05	0%	12/12/05
262	Install Temp Sensor Brackets	12/12/05	0%	12/12/05
263	Fit check Blanket Bars	12/12/05	0%	12/13/05
264	Mount Blanket Bar Brackets	12/13/05	0%	12/14/05
265	<b>Grid Box Electrical Connection</b>	<b>11/3/05</b>	<b>33%</b>	<b>12/15/05</b>
267	Check Grid heaters, thermal sensors	12/14/05	0%	12/15/05
268	<b>Install Electronics and Cables</b>	<b>11/2/05</b>	<b>68%</b>	<b>12/7/05</b>
274	Fabricate & receive HIB Cable LAT-DS-5054	12/6/05	0%	12/6/05
277	Install LAT-DS-3663 cables & safe to mate	11/29/05	0%	11/29/05
280	Install GASU	11/30/05	0%	11/30/05
281	Install GASU cables, verify routing, perform flight mate	11/30/05	0%	12/2/05
282	Test GASU cables	12/2/05	0%	12/6/05
283	GASU EICITs	12/6/05	0%	12/6/05
284	Configure PDU and GASU to Redundant Mode, Perform LAT power on	12/6/05	0%	12/6/05
285	Configure PDU and GASU to Primary Mode, Perform LAT power on	12/6/05	0%	12/6/05
286	Perform LAT power on	12/6/05	0%	12/7/05
287	Perform 16 Bay TKR CPT	12/7/05	0%	12/7/05

# I&T Detail Schedule (2 of 2)

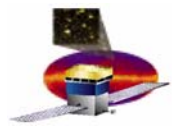
I&T work schedule11-28-05				
ID	Task Name	Start	% Complete	Finish
288	Perform TKRSimOcc Test	12/7/05	0%	12/7/05
289	Perform 16 Bay CAL CPT	12/7/05	0%	12/7/05
290	<b>LAT Test Rack</b>	<b>11/2/05</b>	<b>64%</b>	<b>12/16/05</b>
295	Complete 2nd Mobile Rack firewall Configuration	11/22/05	23%	11/29/05
297	Ship 2nd Firewall, Switch, Bastion Host and LATTE PC to NRL	11/30/05	0%	12/7/05
298	Certify NRL Network Security	12/15/05	0%	12/15/05
299	Verify NRL-SLAC Connectivity	12/16/05	0%	12/16/05
300	<b>ACD Installation &amp; Test with 16 Towers</b>	<b>11/2/05</b>	<b>23%</b>	<b>12/20/05</b>
304	Re-label 2111 cables per print & return to stores	11/28/05	0%	11/28/05
305	<b>LATTE 4.x/ACD/16 tower testing</b>	<b>11/28/05</b>	<b>17%</b>	<b>12/20/05</b>
306	ACD safe-2-mate	11/28/05	50%	12/2/05
307	AEM/ACD Clock Phase Bit Test	12/7/05	0%	12/7/05
308	GASU register test	12/7/05	0%	12/8/05
309	register test - redundant GASU/PDU	12/8/05	0%	12/8/05
310	register test - primary GASU/PDU	12/8/05	0%	12/8/05
311	ACD CPT	12/8/05	0%	12/9/05
312	LAT CPT - TKR Section	12/9/05	0%	12/9/05
313	LAT CPT - CAL Section	12/9/05	0%	12/9/05
314	ACD Channel Uniformity	12/9/05	0%	12/12/05
315	ACD Hitmap Latching	12/12/05	0%	12/12/05
316	ACD CI Circuit Retriggering	12/12/05	0%	12/12/05
317	CAL Channel Uniformity	12/12/05	0%	12/12/05
318	CAL FLE Muon Scan	12/12/05	0%	12/12/05
319	ACD TREQ with ext trigger	12/12/05	0%	12/12/05
320	ACD Trigger Rate Test	12/12/05	0%	12/13/05
321	CAL, TKR TREQ Alignment	12/13/05	0%	12/13/05
322	ACD TREQ with TKR trigger	12/13/05	0%	12/14/05
323	ACD, CAL, TKR TACK Scan	12/14/05	0%	12/14/05
324	Trigger Efficiency	12/14/05	0%	12/14/05
325	ACD Veto Mode Run	12/15/05	0%	12/15/05
326	CalibDac (CAL discriminator scans)	12/15/05	0%	12/15/05



I&T work schedule11-28-05					11/30/05
ID	Task Name	Start	% Complete	Finish	
327	CalibGen (CAL charge injection scan)	12/15/05	0%	12/15/05	
328	MuTrig (CAL muon data)****	12/15/05	0%	12/15/05	
329	TE601 (TKR threshold scan)	12/15/05	0%	12/15/05	
330	TE602 (TKR full range charge inj. scan)	12/15/05	0%	12/16/05	
331	TE604 (TKR charge scan at threshold)	12/16/05	0%	12/16/05	
332	TE702 (TKR trigger jitter)	12/16/05	0%	12/16/05	
333	e2e B-2, B-10, B-13 (1 minute ea.)	12/16/05	0%	12/16/05	
334	e2e B-13 (15 min)	12/16/05	0%	12/16/05	
335	e2e B-10 (15 hours)	12/16/05	0%	12/20/05	
336	e2e B-2 (4 hours)	12/20/05	0%	12/20/05	
337	ACD Bulkhead Panel Cable Installation	12/6/05	0%	12/7/05	
338	<b>Phase 1 Hardware installation</b>	<b>12/20/05</b>	<b>0%</b>	<b>12/21/05</b>	
339	Install one SIU	12/20/05	0%	12/20/05	
340	Install two EPUs	12/20/05	0%	12/21/05	
341	<b>FSW/LICOS Installation</b>	<b>12/21/05</b>	<b>0%</b>	<b>1/17/06</b>	
342	Flight Software Delivery	12/21/05	0%	12/21/05	
343	FSW Install and Checkout	12/21/05	0%	1/3/06	
346	<b>LAT Level System Test</b>	<b>12/23/05</b>	<b>0%</b>	<b>1/24/06</b>	
347	Install Final EPU/SIU	12/23/05	0%	12/23/05	

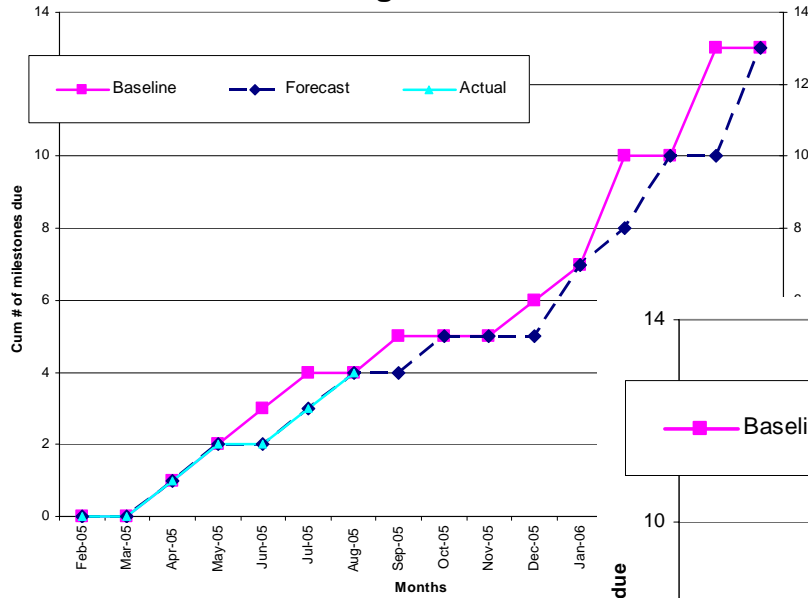


# **Cost/Schedule Reports for Presentation 4.1.9 Integration & Test October 2005 Month End**

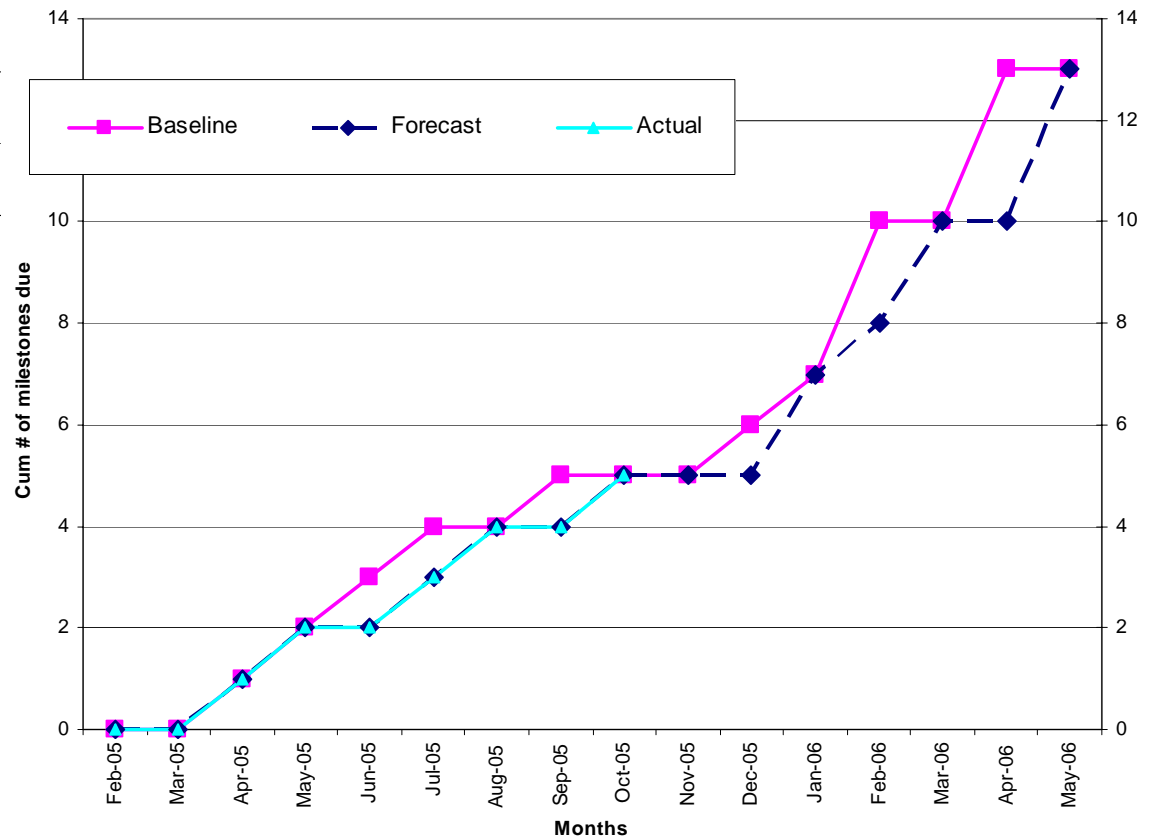


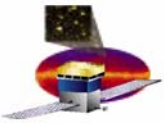
# Level 3 Milestone Count

### Aug 05



### Oct 05





# Level 3 Milestone List

Activity Description	Baseline Finish	-2m Var	-1m Var	Bsln Var	Early Finish	2005												2006					
						FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
<b>4.1.9 I&amp;T</b>																							
Start 2 Tower Comprehensive	04/20/05	-3	-3	-3	04/25/05A			▼															
Start 4 Tower Comprehensive	05/12/05	-12	-12	-12	05/31/05A			▼	▼														
Start 8 Tower Comprehensive	06/20/05	-33	-33	-33	08/05/05A				▼	▼													
Online FU S/W Final Release-I&T to	07/14/05	0	0	0	07/14/05A					▼													
Start 16 Tower Comprehensive	09/07/05	-23	-28	-30	10/19/05A						▼												
LAT Ready to Ship to NRL for Env	12/20/05	-17	-13	-15	01/19/06							▼											
Ship LAT to NRL for Env Test	12/26/05	-30	-23	-24	01/22/06								▼										
LAT EMI/EMC Test	02/01/06	-43	-40	-40	03/13/06									▼									
LAT Sine Vibe	02/14/06	-9	-1	-1	02/15/06										▼								
LAT Acoustic Test	02/26/06	-29	-24	-24	03/22/06											▼							
LAT TVAC	04/15/06	-31	-26	-26	05/11/06												▼						
LAT Weight & CG	04/17/06	-38	-35	-35	05/22/06												▼						
Ship LAT to Spectrum Astro	04/23/06	-34	-31	-31	05/24/06												▼						





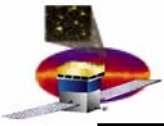
# Milestone Variance Explanation

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- **Schedule Impact**
  - **Delay in delivery to NRL**
- **Cost Impact**
  - **Currently underrun**
- **Corrective Action**
  - **None required**

# Cost Report

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 Contract	Contractor Estimate	Contract Value	
	Actual	Planned	Actual	Planned	NOV05	ATCOMPLET				
4.1.9 INTEGRATION & TEST										
4.1.9.1 I&T MANAGEMENT	52	51	1,337	1,405	52	350	67	1,806	1,806	1
4.1.9.3 INSTR OPS COORDINATOR	0	0	31	31	0	0	1	31	31	0
4.1.9.4 MECH GROUND SUPT EQUIP	5	29	2,120	2,127	24	0	8	2,151	2,151	99
4.1.9.5 ONLINE SOFTWARE	0	0	654	654	0	0	0	654	654	0
4.1.9.6 INTEG, FACILITIES, CONFIG & TEST	194	150	3,714	4,369	154	636	655	5,159	5,159	40
4.1.9.7 PARTICLE TEST	0	0	44	48	0	0	4	48	48	4
4.1.9.8 ENVIRONMENTAL TEST	73	213	668	960	273	1,012	292	2,246	2,246	27
4.1.9.9 SCIENCE VERif, ANALYSIS & CALIBRATION	0	0	300	300	0	0	0	300	300	0
4.1.9.A I&T MISSION SUPPORT	0	0	0	0	0	1,468	0	1,468	1,468	0
<b>CAPW[3]Totals:</b>	<b>324</b>	<b>443</b>	<b>8,868</b>	<b>9,894</b>	<b>502</b>	<b>3,466</b>	<b>1,026</b>	<b>13,863</b>	<b>13,863</b>	<b>171</b>



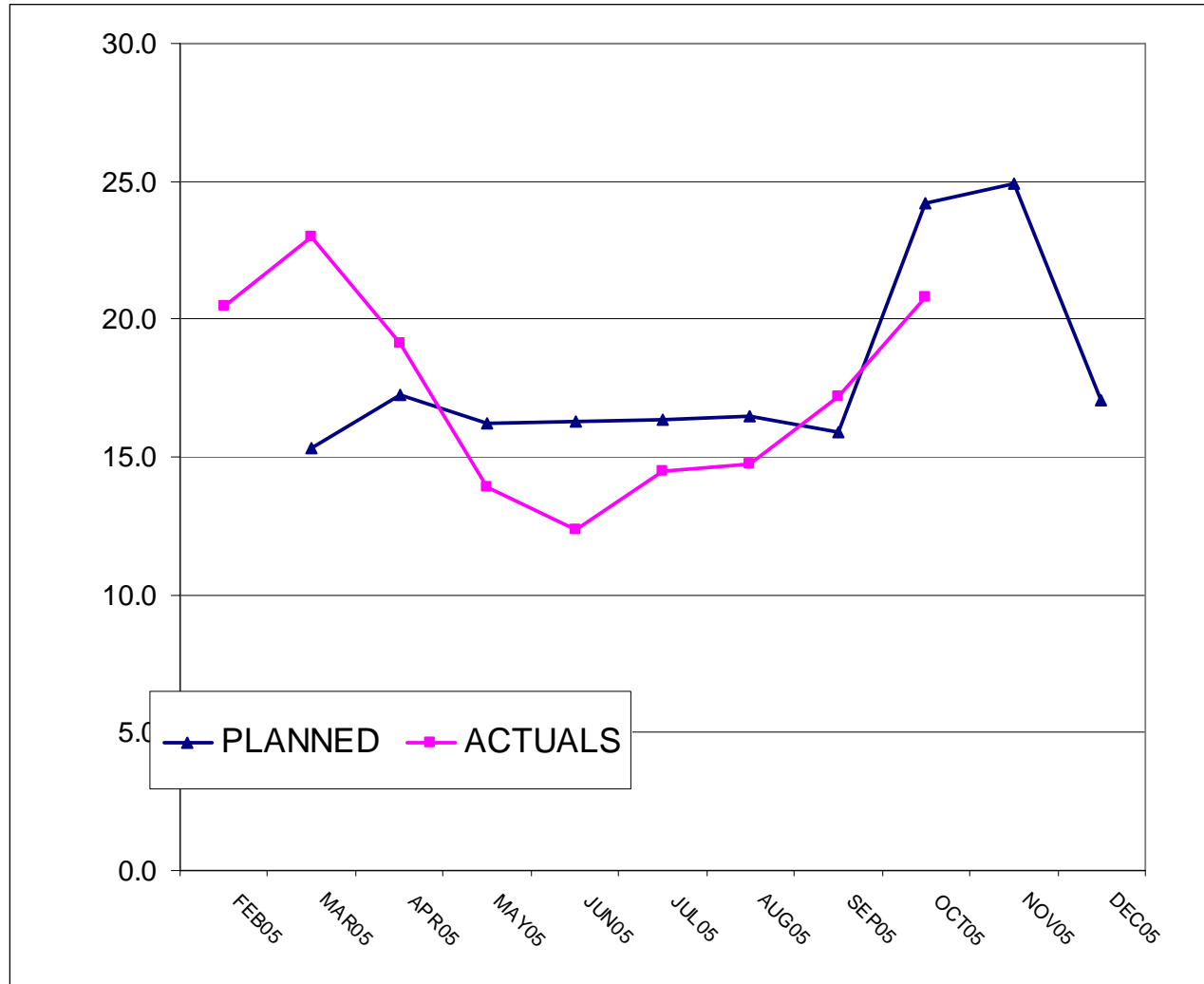
# Cost Variance Explanation

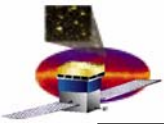
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- **Why overrun/underrun?**
  - **Underrun due to schedule delay.**
- **What will be done to correct?**
  - **Working through holiday shutdown.**

# FTE Report

## (DOE/NASA-funded only)





# FTE Variance Explanation

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- **Why overrun/underrun?**
  - **Level of support has been adequate for current tasks**
- **What is the impact?**
  - **Some schedule delay.**
- **What will be done to correct?**
  - **Additional manpower has been identified and will be added.**