Gamma-ray Large Area Space Telescope

GLAST Large Area Telescope:
I & T Input to Monthly Technical/Cost/Schedule Review 03/30/06

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# Last Month's Accomplishments (1 of 2)

- **Management**
  - **Maintaining Daily Planning/Hand-off Meetings**
  - **Supporting Environmental Test Planning**
  - **Chair LAT I&T CCB**

- **IFCT**
  - **Removed (for RAD750 board inspection) and reinstalled 1 SIU and 2 EPUs**
  - **Installed FSW B0-6-3, B0-6-4, B0-6-5, B0-6-6**
  - **Completed Pathfinding II (TVAC and Radiator handling ops) activities at NRL.**

Last Month's Accomplishments (2 of 2)

- **SVAC**
  - **Preparing for full LAT tests**

- **Online**
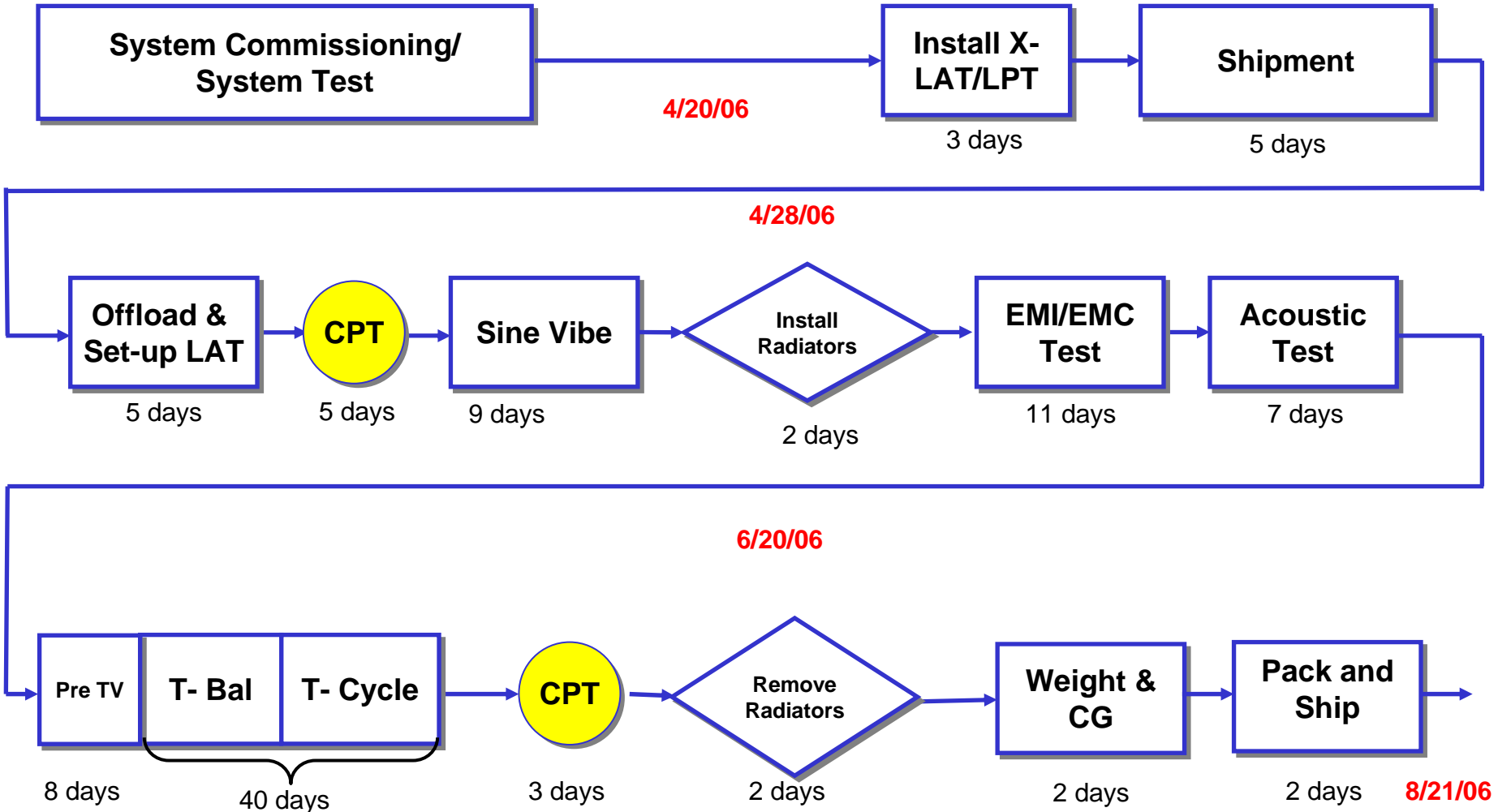 - **Developing LICOS scripts**
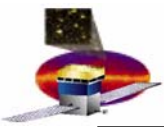
Steps to Ship to NRL

- 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, 2 Flt SIU, 3 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

LAT Test Flow

```
┌──────────────────────────┐                                    ┌──────────────┐      ┌──────────────┐
│   System Commissioning/   │ ──────────────────────────────── │  Install X-  │ ──── │  Shipment    │
│      System Test          │              4/20/06             │  LAT/LPT     │      │              │
└──────────────────────────┘                                    └──────────────┘      └──────────────┘
                                                                    3 days               5 days
```

4/28/06

```
┌──────────────┐   ╭─────╮   ┌──────────────┐   ◇ Install ◇   ┌──────────────┐   ┌──────────────┐
│  Offload &   │─→ │ CPT │─→ │  Sine Vibe   │─→ ◇ Radiators ◇─→│  EMI/EMC     │─→ │  Acoustic    │
│  Set-up LAT  │   ╰─────╯   │              │   ◇            ◇  │   Test       │   │   Test       │
└──────────────┘             └──────────────┘                  └──────────────┘   └──────────────┘
    5 days        5 days         9 days          2 days            11 days            7 days
```

6/20/06

```
┌──────┬──────────┬──────────┐   ╭─────╮   ◇ Remove    ◇   ┌──────────────┐   ┌──────────────┐
│Pre TV│  T- Bal  │ T- Cycle │─→ │ CPT │─→ ◇ Radiators ◇─→ │  Weight &    │─→ │  Pack and    │
│      │          │          │   ╰─────╯   ◇            ◇   │    CG        │   │    Ship      │
└──────┴──────────┴──────────┘                             └──────────────┘   └──────────────┘
 8 days      40 days           3 days       2 days             2 days             2 days      8/21/06
```

NOTE: Durations for moving and setup have been incorporated into the total duration for the test. SIIS Verification will be worked in as appropriate.

Detailed Plan (1 of 5)

					Daily Work Schedule		
		3/29/06					Apr
ID	Task Name	Start	% Complete	Finish	3/14	3/21	3/28
381	**Phase 1 - Complete Hardware/Software Installation**	**2/13/06**	**80%**	**4/13/06**			
463	Use LAT04x to upload new FSW B0-6-4 to EPU-12	3/18/06	100%	3/18/06			
464	Receive/Install LICOS 2.0	3/18/06	100%	3/18/06			
465	Power On Config 7 Development tests of LPA / LCI scripts	3/18/06	100%	3/20/06			
466	Remove EPU-3 per NCR 833	3/20/06	100%	3/20/06			
467	Power on Config 7 Development tests of LPA/LCI scripts	3/21/06	100%	3/21/06			
468	Perform LAT307 ACD CPT individual scripts	3/21/06	100%	3/22/06			
469	Power On Config 7 Single Tower 0	3/21/06	100%	3/21/06			
470	TKR and CAL CPT Development tests individual scripts	3/21/06	100%	3/22/06			
471	Power On Config 7 Development tests of LPA / LCI scripts	3/22/06	100%	3/22/06			
472	Use LAT04x to upload new FSW B0-6-5 to SIU-7	3/22/06	100%	3/22/06			
473	Use LAT04x to upload new FSW B0-6-5 to EPU-0	3/22/06	100%	3/22/06			
474	Use LAT04x to upload new FSW B0-6-5 to EPU-12	3/22/06	100%	3/22/06			
475	Use LAT04x to upload new FSW B0-6-5 to SIU-11	3/22/06	100%	3/22/06			
476	Power On Config 7 Development tests of LPA / LCI scripts	3/22/06	100%	3/24/06			
477	SIU-7 Uploaded with B0-6-6	3/24/06	100%	3/24/06			
478	SIU-11 Uploaded with B-6-6	3/25/06	100%	3/25/06			
479	Power On Config 4 Development tests of LPA / LCI scripts	3/25/06	100%	3/27/06			
480	Receive EPU-3 from ELX per NCR 833	3/28/06	100%	3/28/06			
481	Safe to Mate EPU-3 per NCR 833	3/28/06	100%	3/28/06			
482	Mechanically Install EPU-3 per NCR 833	3/28/06	100%	3/28/06			
483	Electrically Mate EPU-3 per NCR 833	3/28/06	100%	3/28/06			
484	Receive LAT-DS-02094 (1553 cables)	3/28/06	100%	3/28/06			
485	Route LAT-DS-02094 (1553 cables)	3/28/06	100%	3/28/06			
486	Perform JL-232, 233, 234, 235 Safe to Mate (1553)	3/28/06	100%	3/28/06			
487	Receive LAT-DS-02882 cable per NCR 777	3/28/06	100%	3/28/06			
488	Use LAT04x to upload new FSW B0-6-6 to EPU-3	3/28/06	100%	3/28/06			
489	Config 1 Development tests of LPA / LCI scripts	3/28/06	100%	3/29/06			
490	Route LAT-DS-02882 cable per NCR 777	3/29/06	100%	3/29/06			
491	Safe to Mate on LAT-DS-02882 cable at JL-39 per NCR 777	3/29/06	100%	3/29/06			
492	Power On Conf 1 Turbo, two B-31 runs	3/29/06	100%	3/29/06			
493	Switch to LATTE and external crate, ACD CPT development tests	3/29/06	50%	3/30/06			
494	Switch back to LICOS, Config 1 Development tests of LPA / LCI scripts	3/30/06	0%	3/30/06			
495	Perform Electrical Flight Mate of HCB JL-134, 137, 147, 150	3/30/06	0%	3/30/06			
496	Perform LAT21x - LAT Timing	3/30/06	0%	3/31/06			
497	Perform LAT40x CAL CPT individual scripts	3/31/06	0%	4/1/06			
498	XLAT Closeout Walk Thru Dry Run	4/3/06	0%	4/3/06			

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Detailed Plan (2 of 5)

		3/29/06			Daily Work Schedule			
ID	Task Name	Start	% Complete	Finish	3/14	3/21	Apr 3/28	
499	Perform LAT50x TKR CPT individual scripts	4/3/06	0%	4/4/06				
500	Perform NCR 822 disposition	4/4/06	0%	4/5/06				
501	Receive connector covers for blank connectors	4/5/06	0%	4/5/06				
502	Install connector covers for blank connectors	4/5/06	0%	4/5/06				
503	Finish Cable Dressing	4/5/06	0%	4/6/06				
504	Chiller line reconfiguration	4/6/06	0%	4/6/06				
505	Prepare LAT15x Thermal Control Test	4/6/06	0%	4/6/06				
506	CCB covering LAT15x Thermal Control Test	4/6/06	0%	4/6/06				
507	Receive/Install LICOS release for LAT15x Thermal Control Test	4/7/06	0%	4/7/06				
508	Perform LAT15x Thermal Control Test (Ambient w/ load box)	4/7/06	0%	4/7/06				
509	LAT Optical Survey	4/7/06	0%	4/8/06				
510	Machine Thermal Shunts	4/10/06	0%	4/10/06				
511	XLAT Installation Procedure Review	4/10/06	0%	4/10/06				
512	Compl Installation of redundant router, switch & pwr distr block	4/10/06	0%	4/10/06				
513	LAT power Impedance check per LAT-PS-07885	4/10/06	0%	4/13/06				
514	**Phase 2 - LAT Level System Test (Run for the Record)**	**4/13/06**	**0%**	**4/24/06**				
515	**Configuration 1**	**4/13/06**	**0%**	**4/17/06**				
516	LAT001 – LAT Config 1 Power On	4/13/06	0%	4/13/06				
517	LAT021 – LAT Config 1 Reinitialization	4/13/06	0%	4/13/06				
518	LAT031 – LAT Config 1 Elect Power Subsys Perf	4/13/06	0%	4/13/06				
519	LAT041 – LAT Config 1 Estab B/L Science Ops Config	4/13/06	0%	4/13/06				
520	LAT051 – LAT Config 1 Register Test	4/13/06	0%	4/13/06				
521	LAT061 – LAT Config 1 SIU/EPU H/W Funct	4/14/06	0%	4/14/06				
522	LAT071 – LAT Config 1 Energy Meas Calib	4/14/06	0%	4/14/06				
523	LAT121 – LAT Config 1 Science Modes	4/14/06	0%	4/14/06				
524	LAT131 – Config 1 LAT/Spacecraft I/F	4/14/06	0%	4/14/06				
525	LAT151 – LAT Config 1 Ambient TCS Test	4/14/06	0%	4/14/06				
526	LAT161 – LAT Config 1 Ambient Survival Heater Test	4/14/06	0%	4/14/06				
527	LAT201 – LAT Config 1 Science Performance Diag	4/14/06	0%	4/14/06				
528	LAT211 – LAT Config 1 Timing Measure & Adjust	4/15/06	0%	4/15/06				
529	LAT221 – LAT Config 1 Science Ops Demo	4/15/06	0%	4/15/06				
530	LAT231 – LAT Config 1 GRB Handling	4/15/06	0%	4/15/06				
531	LAT301 – LAT Config 1 ACD CPT	4/15/06	0%	4/15/06				
532	LAT401 – LAT Config 1 Calorimeter CPT	4/15/06	0%	4/15/06				
533	LAT501 – LAT Config 1 Tracker CPT	4/15/06	0%	4/15/06				
534	LAT521 – LAT Light Tight Test	4/15/06	0%	4/15/06				
535	LAT651 – LAT Config 1 False Triggers	4/16/06	0%	4/16/06				

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Detailed Plan (3 of 5)

		3/29/06			Daily Work Schedule			
ID	Task Name	Start	% Complete	Finish	3/14	3/21	3/28	Apr
536	LAT661 – LAT Config 1 Data Transport Errors	4/16/06	0%	4/16/06				
537	LAT701 – LAT Config 1 SVAC Flight Config on Gnd	4/16/06	0%	4/16/06				
538	LAT711 – LAT Config 1 SVAC Muon Calibrations	4/16/06	0%	4/16/06				
539	LAT801 – LAT Config 1 SVAC Pwr Feed Min Voltage	4/16/06	0%	4/16/06				
540	LAT811 – LAT Config 1 SVAC Pwr Feed Max Voltage	4/16/06	0%	4/16/06				
541	LAT821 – LAT Config 1 SVAC High Trigger Rate	4/16/06	0%	4/16/06				
542	LAT831 – LAT Config 1 SVAC High Trig Rate Muon Gain	4/17/06	0%	4/17/06				
543	LAT841 – LAT Config 1 SVAC High Trig Rate, Min Volt	4/17/06	0%	4/17/06				
544	LAT851 – LAT Config 1 SVAC High Trig Rate, Max Volt	4/17/06	0%	4/17/06				
545	LAT011 – LAT Config 1 Power Off	4/17/06	0%	4/17/06				
546	**Configuration 2**	**4/17/06**	**0%**	**4/20/06**				
547	LAT002 – LAT Config 2 Power On	4/17/06	0%	4/17/06				
548	LAT022 – LAT Config 2 Reinitialization	4/17/06	0%	4/17/06				
549	LAT032 – LAT Config 2 Elect Power Subsys Perf	4/17/06	0%	4/17/06				
550	LAT042 – LAT Config 2 Estab B/L Science Ops Config	4/18/06	0%	4/18/06				
551	LAT052 – LAT Config 2 Register Test	4/18/06	0%	4/18/06				
552	LAT062 – LAT Config 2 SIU/EPU H/W Funct	4/18/06	0%	4/18/06				
553	LAT122 – LAT Config 2 Science Modes	4/18/06	0%	4/18/06				
554	LAT132 – Config 2 LAT/Spacecraft I/F	4/18/06	0%	4/18/06				
555	LAT152 – LAT Config 2 Ambient TCS Test	4/18/06	0%	4/18/06				
556	LAT162 – LAT Config 2 Ambient Survival Heater Test	4/18/06	0%	4/18/06				
557	LAT202 – LAT Config 2 Science Performance Diag	4/19/06	0%	4/19/06				
558	LAT212 – LAT Config 2 Timing Measure & Adjust	4/19/06	0%	4/19/06				
559	LAT222 – LAT Config 2 Science Ops Demo	4/19/06	0%	4/19/06				
560	LAT232 – LAT Config 2 GRB Handling	4/19/06	0%	4/19/06				
561	LAT302 – LAT Config 2 ACD CPT	4/19/06	0%	4/19/06				
562	LAT402 – LAT Config 2 Calorimeter CPT	4/19/06	0%	4/19/06				
563	LAT502 – LAT Config 2 Tracker CPT	4/19/06	0%	4/19/06				
564	LAT702 – LAT Config 2 SVAC Flight Config on Gnd	4/20/06	0%	4/20/06				
565	LAT852 – LAT Config 2 SVAC High Trig Rate, Max Volt	4/20/06	0%	4/20/06				
566	LAT012 – LAT Config 2 Power Off	4/20/06	0%	4/20/06				
567	**Configuration 3**	**4/20/06**	**0%**	**4/21/06**				
568	LAT003 – LAT Config 3 Power On	4/20/06	0%	4/20/06				
569	LAT023 – LAT Config 3 Reinitialization	4/20/06	0%	4/20/06				
570	LAT133 – LAT Config 3 LAT/Spacecraft I/F	4/20/06	0%	4/20/06				
571	LAT223 – LAT Config 3 Science Ops Demo	4/20/06	0%	4/20/06				
572	LAT233 – LAT Config 3 GRB Handling	4/21/06	0%	4/21/06				

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		3/29/06				Daily Work Schedule
ID	Task Name	Start	% Complete	Finish	3/14 3/21 3/28	Apr
573	LAT013 – LAT Config 3 Power Off	4/21/06	0%	4/21/06	
574	**Configuration 4**	4/21/06	0%	4/22/06	
575	LAT004 – LAT Config 4 Power On	4/21/06	0%	4/21/06	
576	LAT024 – LAT Config 4 Reinitialization	4/21/06	0%	4/21/06	
577	LAT134 – LAT Config 4 LAT/Spacecraft I/F	4/21/06	0%	4/21/06	
578	LAT224 – LAT Config 4 Science Ops Demo	4/21/06	0%	4/21/06	
579	LAT234 – LAT Config 4 GRB Handling	4/21/06	0%	4/21/06	
580	LAT014 – LAT Config 4 Power Off	4/22/06	0%	4/22/06	
581	**Configuration 5**	**4/22/06**	**0%**	**4/22/06**	
582	LAT005 – LAT Config 5 Power On	4/22/06	0%	4/22/06	
583	LAT225 – LAT Config 5 Science Ops Demo	4/22/06	0%	4/22/06	
584	LAT015 – LAT Config 5 Power Off	4/22/06	0%	4/22/06	
585	**Configuration 6**	**4/22/06**	**0%**	**4/23/06**	
586	LAT006 – LAT Config 6 Power On	4/22/06	0%	4/22/06	
587	LAT026 – LAT Config 6 Reinitialization	4/22/06	0%	4/22/06	
588	LAT226 – LAT Config 6 Science Ops Demo	4/23/06	0%	4/23/06	
589	LAT016 – LAT Config 6 Power Off	4/23/06	0%	4/23/06	
590	**Configuration 7**	**4/23/06**	**0%**	**4/23/06**	
591	LAT007 – LAT Config 7 Power On	4/23/06	0%	4/23/06	
592	LAT017 – LAT Config 7 Power Off	4/23/06	0%	4/23/06	
593	**Configuration 8**	**4/23/06**	**0%**	**4/23/06**	
594	LAT008 – LAT Config 8 Power On	4/23/06	0%	4/23/06	
595	LAT018 – LAT Config 8 Power Off	4/23/06	0%	4/23/06	
596	**Configuration 9**	**4/23/06**	**0%**	**4/24/06**	
597	LAT009 – LAT Config 9 Power On	4/23/06	0%	4/24/06	
598	LAT019 – LAT Config 9 Power Off	4/24/06	0%	4/24/06	
599	**X-LAT Plate installation**	**4/24/06**	**0%**	**4/26/06**	
600	Closeout photos	4/24/06	0%	4/24/06	
601	Final internal inspection	4/24/06	0%	4/25/06	
602	X-LAT Plate installation	4/25/06	0%	4/25/06	
603	Mount X-LAT cable LAT-DS0-05056 to Temp Sensor Bracket	4/25/06	0%	4/26/06	
604	Safe to Mate X-LAT Connection JL-123	4/26/06	0%	4/26/06	
605	**Post X-LAT Baseline**	**4/26/06**	**0%**	**4/28/06**	
606	LAT001 – LAT Config 1 Power On	4/26/06	0%	4/26/06	
607	LAT301 – LAT Config 1 ACD CPT	4/26/06	0%	4/26/06	
608	LAT401 – LAT Config 1 Calorimeter CPT	4/26/06	0%	4/26/06	
609	LAT501 – LAT Config 1 Tracker CPT	4/26/06	0%	4/27/06	
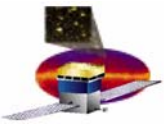
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Detailed Plan (5 of 5)

ID	Task Name	Start	% Complete	Finish
610	LAT011 – LAT Config 1 Power Off	4/27/06	0%	4/27/06
611	LAT002 – LAT Config 2 Power On	4/27/06	0%	4/27/06
612	LAT302 – LAT Config 2 ACD CPT	4/27/06	0%	4/27/06
613	LAT402 – LAT Config 2 Calorimeter CPT	4/27/06	0%	4/27/06
614	LAT502 – LAT Config 2 Tracker CPT	4/27/06	0%	4/28/06
615	LAT012 – LAT Config 2 Power Off	4/28/06	0%	4/28/06
616	**Pack & Ship to NRL**	**4/28/06**	**0%**	**5/5/06**

3/29/06 — Daily Work Schedule

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4.1.9 - Integration and Test   **10**

Online Script Status

| Tier	ID	Name	\[Configurations\] 1	2	3	4	5	6	7	8	9	TT	V&V	LAT	Status
1	LAT00x	LAT Power On	1	1	1	1	1	1	1	1	1	X	X	X	
	LAT01x	LAT Power Off	1	1	1	1	1	1	1	1	1	X	X	X	
	LAT04x	Establish Science Operations Config	1	1								X	X	X	
	LAT22x	Science Operations Demo	1	1	2	2	2	2				X	X	X	
2	LAT30x	ACD CPT	1	1								X	X	X	
	LAT40x	CAL CPT	1	1								X	X	X	
	LAT50x	TKR CPT	1	1								X	X	X	
3	LAT07x	LAT Energy Measurement Calibration	2									X	X	X	
	LAT21x	LAT Timing Measure & Adjust	1	2								X	X		ECD 3/31
4	LAT03x	Electrical Power Subsystem Performance	1	1								X			ECD 4/7
	LAT13x	LAT/Spacecraft Interface Test	1	1	2	2						X			ECD 4/7
5	LAT02x	LAT Reinitialization	2	2	2	2		2				X			ECD 5/1
	LAT06x	SIU/EPU Hardware Functional	1	1								X			ECD 4/7
6	LAT15x	LAT Ambient TCS Test	2	2								X			ECD 4/7
	LAT16x	LAT Survival Heater Test	2	2											Procedure (No Script)
	LAT521	LAT Light Tight Test	2												Procedure (No Script)
7	LAT70x	LAT SVAC Flight Config on Ground	1	2								X	X	X	
	LAT711	LAT SVAC Muon Calibration	2												ECD 5/1
8	LAT12x	LAT Science Modes	1	2								X			ECD 4/15
9	LAT20x	LAT Science Performance Diagnostics	2	2											ECD 5/1
	LAT23x	LAT GRB Handling	2	2	2	2									ECD 5/1
10	LAT31x	ACD LPT	2	2											ECD 5/1
	LAT41x	CAL LPT	2	2											ECD 5/1
	LAT51x	TKR LPT	2	2											ECD 5/1

Config Codes:

1 Executed before shipment to NRL
2 Executed before TVAC at NRL
3 Executed before delivery to Mission Office

TT   Table Top Complete
V&V   Verification and Validation Complete
LAT   Script has been run on the LAT

Color Codes:

     Successful Run on LAT

     Dry Run on LAT

     Debug on LAT
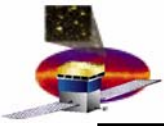
Issues and Concerns

- **Schedule**
  - **Using weekends for additional troubleshooting.**
  - **Rapid turnaround on NCR disposition and resolution.**
- **Script Availability**
  - **Addition resources from ISOC to Online to parallelize script development**
- **Availability of FMX/MOOT**