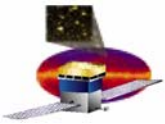


GLAST Large Area Telescope:

Electronics, Data Acquisition &
Flight Software W.B.S 4.1.7

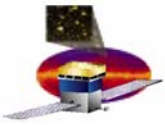
Nov 3, 05 Monthly Review

Gunther Haller
haller@slac.stanford.edu
(650) 926-4257



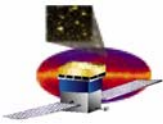
TEM/TPS Status

- **Status**
 - Qual unit review still to occur
 - 19 flight units delivered to I&T
 - 2 TPS units removed from Twr A and Twr B were partially modified
- **To do (low priority)**
 - Complete modification
 - Vibration
 - End data package review



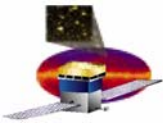
PDU Status and Schedule

- **1st unit (flight)**
 - **In hands of I&T**
- **2nd unit (spare)**
 - **Progress since last month**
 - **Boards conformal coated**
 - Includes
 - » **Coating**
 - » **AF QC, touchup, QC**
 - » **SLAC (customer) source-inspection, touch-up, CSI**
 - » **Integration into enclosure**
 - » **Started wiring**
 - **Lower priority compared to assembly of SIU modules, but progressing, estimated delivery to I&T end of December**



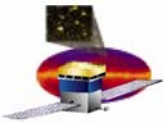
GASU Status and Schedule

- **First Unit**
 - Progress since last month
 - Received final box
 - Passed Safe-to-mate (without power)
 - Passed Stray-voltage tests (with power)
 - Passed Comprehensive Performance Tests
 - Thermal-cycled
 - Passed post TC tests
 - Vibrated to proto-flight levels
 - Passed post-vib tests
 - Started thermal-vacuum test, expected completion Nov 7
 - EMI left, if proto-flight EMI: 2 weeks, if flight acceptance: 1 day
 - GASU available Nov 9 or Nov 23, depending on EMI decision
- **Schedule for 2nd unit**
 - Progress since last month
 - QC&CSI, rework and again QC&CSI of DAQ and power-supply boards (pre-coat)
 - Boards are being installed in enclosure with harness
 - In about 3 weeks the box will be sent to SLAC for pre-coat testing, followed by conformal coat and environmental testing
 - Lower priority compared to SIU/HCB but still progressing
 - (Mid January estimated delivery to I&T)



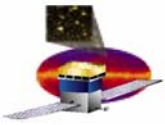
SIU Protoflight

- **Protoflight SIU crate**
 - **Progress since last month**
 - **Received backplane assembly (backplane 2412)**
 - **Integrated in enclosure**
 - **Passed short/open test**
 - **Integrated SIB2205, LCB2225 CPS2233, RAD750-CPU**
 - **All from flight assembly line, SIB has chlorine-contaminated EEPROM**
 - **Passed environmental testing**
 - **Passed Comprehensive Performance testing**
 - **Thermal-cycled**
 - **Passed testing**
 - **Vibrated to proto-flight levels**
 - **Passed testing**
 - **Thermal-Vacuum tested (proto-flight limits)**
 - **Full EMI tested (passed qualification tests, conductive/radiative)**
 - **Mass and CG measured**



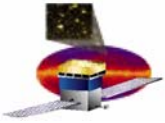
First Flight Crate

- **Progress since last month**
 - **Modules**
 - **Backplane 2414/2428**
 - integrated in crate 2513
 - **SIB 2207**
 - shipped to SLAC and module tested
 - **LCB 2227**
 - shipped to SLAC and module tested
 - **CPS 2235**
 - shipped to SLAC and module tested
 - **RAD750 14/2516**
 - **Crate integrated, tested**
 - **Thermal-cycle, tested**
 - **Vibrated, tested**
 - **Thermal vacuum tested**
 - **EMI, tested**
 - **Mass measured**
 - **No failure**
 - **Working on web-site to list test results, closing of NCR's**



Second Flight Crate

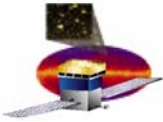
- **Progress since last month**
 - **Modules**
 - **Backplane 2415/2429**
 - harness assembly completed, coated/QC/CSI/touch-up/delivered to SLAC, open/short tested
 - **Integrated in crate 2527**
 - **SIB 2208**
 - shipped to SLAC and module tested
 - **LCB 2226**
 - coated, shipped to SLAC, tested
 - **CPS 2238**
 - shipped to SLAC and module tested
 - **RAD750 15/2517**
 - **Crate tested**
 - **Thermal-cycle, tested**
 - **Vibrated, tested**
 - **Thermal vacuum tested**
 - **EMI, tested**
 - **Mass measured**
 - **No failure**
 - **Working on web-site to list test results, closing of NCR's**
Coated really stands for: take hardware off (rails, etc), coat, QC, touch-up, CSI, touch-up, QC/CSI, add hardware, bond, QC/CSI, stake, QC/CSI



Third Flight Crate

- Progress since last month
 - Modules
 - Backplane 2420/2433
 - harness assembled, coated, shipped to SLAC, open/short tested
 - Integrated in crate 2522
 - SIB 2206
 - xrayed, shipped to Silver, tested, shipped to SLAC, tested, shipped to AF, coated, shipped to SLAC, tested
 - LCB 2228
 - coated, shipped to SLAC, tested
 - CPS 2239
 - coated, shipped to SLAC, tested
 - RAD750 17/2518
 - Crate integrated, tested
 - Thermal-cycle, tested
 - Vibrated, tested
 - Waiting for thermal vacuum testing (GASU is in TV chamber)
 - EMI, will be tested this week before TV
 - Mass measured
 - No failure up to now
 - Estimated completion of testing: Nov 15
 - Working on web-site to list test results, closing of NCR's

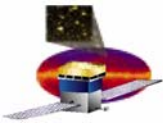
Coated really stands for: take hardware off (rails, etc), coat, QC, touch-up, CSI, touch-up, QC/CSI, add hardware, bond, QC/CSI, stake, QC/CSI



Fourth Flight Crate

- **Progress since last month**
 - **Modules**
 - **Backplane 2419/2434**
 - harness assembled, coated, shipped to SLAC, open/short tested
 - **Integrated in crate 2523**
 - **SIB 2209**
 - flying probe tested, assembled, shipped to SLAC, xrayed, shipped to Silver, tested, shipped to SLAC, tested, shipped to AF, coated, shipped to SLAC, tested
 - **LCB 2229**
 - flying probe tested, assembled, shipped to SLAC, xrayed,, tested, shipped to AF, coated, shipped to SLAC, tested
 - **CPS 2240**
 - assembled, shipped to SLAC, tested, shipped to AF, coated, shipped to SLAC, tested
 - **RAD750 18/2519**
 - **Crate integrated, tested**
 - **In Thermal-cycle**
 - **To be done**
 - Vibration
 - Thermal vacuum
 - EMI
 - Mass
 - **Estimated completion: Nov 22**

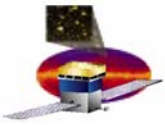
Coated really stands for: take hardware off (rails, etc), coat, QC, touch-up, CSI, touch-up, QC/CSI, add hardware, bond, QC/CSI, stake, QC/CSI



Fifth Flight Crate

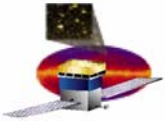
- Progress since last month
 - Modules
 - Backplane 2418/2431
 - harness assembled, coated, shipped to SLAC, QA issues, shipped back to AF, in rework, will be shipped to SLAC early next week
 - Will be in crate 2523
 - SIB 2210
 - assembled new EEPROM, flying probe tested, assembled, shipped to SLAC, xrayed, shipped to Silver, tested, shipped to SLAC, tested, shipped to AF, in coating
 - LCB 2230
 - flying probe tested, assembled, shipped to SLAC, xrayed,, tested, shipped to AF, coated, in QA/CSI, will be shipped to SLAC tomorrow
 - CPS 2234
 - Assembled, shipped to SLAC, tested. Shipped to AF, in coating
 - RAD750 13/2528
 - Crate to be integrated
 - To be done
 - TC
 - Vibration
 - Thermal vacuum
 - EMI
 - Mass
 - Estimated completion: Dec 6

Coated really stands for: take hardware off (rails, etc), coat, QC, touch-up, CSI, touch-up, QC/CSI, add hardware, bond, QC/CSI, stake, QC/CSI



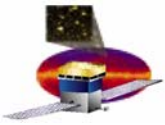
Spare crates

- **Modules**
 - **2 Backplanes**
 - Ready for integration Nov 30, Dec 7
 - **2 SIB's**
 - Ready for integration Nov 19, Nov 28
 - **2 LCB's**
 - Ready for integration Nov 19, Nov 28
 - **2 LCB's**
 - Ready for integration Nov 23, Nov 23
- **Estimates for Spare Crate availability**
 - **Dec 16 & Dec 23**



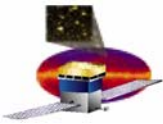
Harness Interconnect Box (HIB)

- **Task: Integrate, stake, pre-tested harness into (SIU) enclosure**
- **Progress since last month**
 - **Assembled 5 HIB's at SLAC**
 - **Two vibrated**
 - **3 more about to be vibrated**
- **Ready for hand-off to I&T early next week**



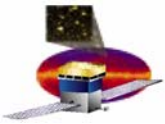
Heater Control Box (HCB)

- **6 Boards for 3 boxes assembled (2 flight + 1 spare)**
- **4 Boards for 2 boxes conformal coated**
- **2 boards integrated into one box with harness**
- **In QA at AF**
- **2nd box will be in QA early next week**
- **Then TC/TV/vib/EMI at SLAC**
- **Estimated delivery of 2 HCB's to I&T: Nov 24**

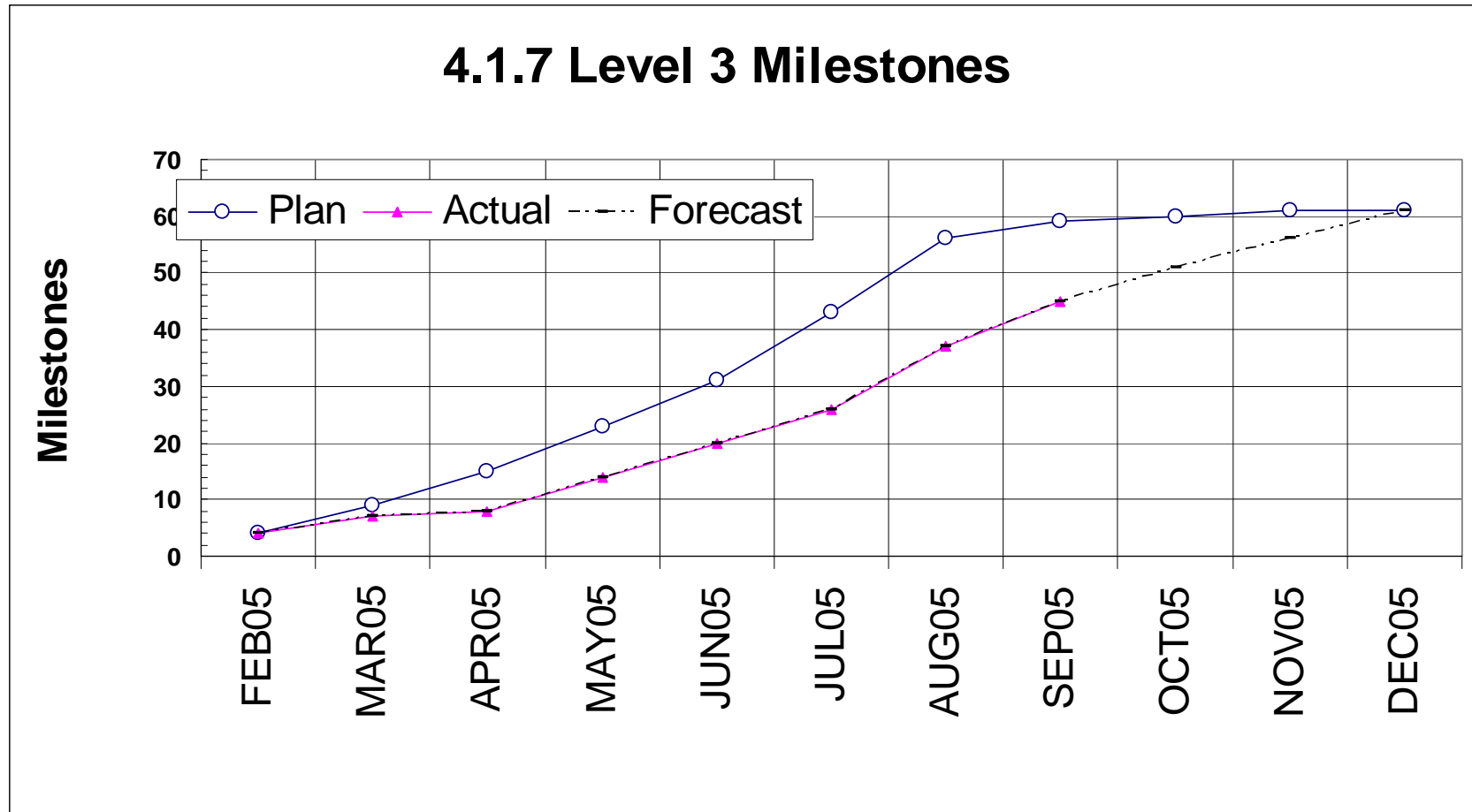


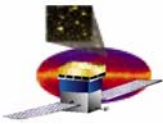
cCPI Connector Solder Joint Slide

- **SLAC Qual testing of sample boards assembled at Aeroflex**
 - **Non-flight, only connectors were assembled on cCPI board for short/open testing of solder joints**
 - **Testing was all completed without failures**
 - **Presentation at**
 - http://www-glast.slac.stanford.edu/Elec_DAQ/DAQ-Hardware/SIU-EPU/xray/xray-qual.htm
- **Overall cCPI solder joint results on flight boards**
 - **5 flight backplanes accepted to use-as-is**
 - **Process was**
 - **SLAC looked at xrays, had touched up candidates**
 - **Then GSFC supplied a list fo pins to be touched up**
 - **SLAC went thru and identified pins which are used**
 - **Those were discussed and some were touched up**
 - **Plug-in cards**
 - **Same process as with backplanes**
 - **Maybe 1 or 2 pins on some boards which GSFC likes to have touched-up**
 - **Discussed and agreed on boards already integrated**
 - **SLAC is touching up all boards not integrated yet and supply new xrays (in progress)**



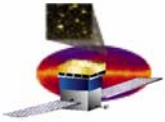
Level 3 Milestone Count





Level 3 Milestone List

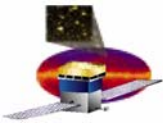
Activity Description	Baseline Finish	-2m Var	-1m Var	Bsln Var	Early Finish	2005												2006					
						FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
4.1.7 Electronics																							
Elex Ground Support Equipment																							
Final EGSE incl S/C Sim, FSW-Elec	04/01/05	-128	-169	-169	12/01/05													▽					
TEM/PS A																							
Flight TEM Assy A: Elec to I&T	02/17/05	0	0	0	02/17/05A	▼																	
Flight TEM PS Assy A: Elec to I&T	02/17/05	0	0	0	02/17/05A	▼																	
TEM/PS B																							
Flight TEM Assy B: Elec to I&T	03/07/05*	-2	-2	-2	03/09/05A	▼																	
Flight TEM PS Assy B: Elec to I&T	03/07/05*	-2	-2	-2	03/09/05A	▼																	
TEM/PS 1																							
Flight TEM Assy 1: Elec to I&T	04/22/05	-19	-19	-19	05/19/05A			▼	▼														
Flight TEM PS Assy 1: Elec to I&T	04/22/05	-19	-19	-19	05/19/05A			▼	▼														
TEM/PS 2																							
Flight TEM Assy 2: Elec to I&T	04/29/05	-14	-14	-14	05/19/05A			▼	▼														
Flight TEM PS Assy 2: Elec to I&T	04/29/05	-14	-14	-14	05/19/05A			▼	▼														
TEM/PS 3																							
Flight TEM Assy 3: Elec to I&T	05/06/05	-18	-18	-18	06/02/05A			▼	▼														
Flight TEM PS Assy 3: Elec to I&T	05/06/05	-18	-18	-18	06/02/05A			▼	▼														
TEM/PS 4																							
Flight TEM Assy 4: Elec to I&T	05/13/05	-15	-15	-15	06/06/05A			▼	▼														
Flight TEM PS Assy 4: Elec to I&T	05/13/05	-15	-15	-15	06/06/05A			▼	▼														
TEM/PS 5																							
Flight TEM Assy 5: Elec to I&T	05/20/05	-10	-10	-10	06/06/05A			▼	▼														
Flight TEM PS Assy 5: Elec to I&T	05/20/05	-10	-10	-10	06/06/05A			▼	▼														
TEM/PS 6																							
Flight TEM Assy 6: Elec to I&T	05/27/05	-38	-38	-38	07/22/05A			▼	▼														
Flight TEM PS Assy 6: Elec to I&T	05/27/05	-38	-38	-38	07/22/05A			▼	▼														
TEM/PS 7																							
Flight TEM Assy 7: Elec to I&T	06/06/05	-33	-33	-33	07/22/05A			▼	▼														
Flight TEM PS Assy 7: Elec to I&T	06/06/05	-33	-33	-33	07/22/05A			▼	▼														
Run Date	10/28/05 15:32	GLAST LAT PROJECT Level 3 Milestones Baseline Variance (Organized by Subsystem)										LT-DZ: Baseline Variance						Report #10					
Data Date	10/01/05											FL-D4: AV: Level 3 Milestones						Sheet 5					
© Primavera Systems, Inc.																							



Level 3 Milestone List

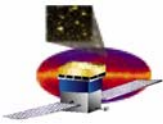
Activity Description	Baseline Finish	-2m Var	-1m Var	Bsln Var	Early Finish	2005												2006				
						FE	MA	API	MA	JU	JU	AU	SE	OC	NO	DE	JA	FE	MA	API	MA	JU
TEM/PS 8																						
Flight TEM Assy 8: Elec to I&T	06/13/05	-28	-28	-28	07/22/05A				▼	▼												
Flight TEM PS Assy 8: Elec to I&T	06/13/05	-28	-28	-28	07/22/05A				▼	▼												
TEM/PS 9																						
Flight TEM Assy 9: Elec to I&T	06/20/05	-33	-33	-33	08/05/05A				▼	▼												
Flight TEM PS Assy 9: Elec to I&T	06/20/05	-33	-33	-33	08/05/05A				▼	▼												
TEM/PS 10																						
Flight TEM Assy 10: Elec to I&T	06/27/05	-28	-28	-28	08/05/05A				▼	▼												
Flight TEM PS Assy 10: Elec to I&T	06/27/05	-28	-28	-28	08/05/05A				▼	▼												
TEM/PS 11																						
Flight TEM Assy 11: Elec to I&T	07/05/05	-23	-23	-23	08/05/05A				▼	▼												
Flight TEM PS Assy 11: Elec to I&T	07/05/05	-23	-23	-23	08/05/05A				▼	▼												
TEM/PS 12																						
Flight TEM Assy 12: Elec to I&T	07/12/05	-33	-33	-33	08/26/05A				▼	▼												
Flight TEM PS Assy 12: Elec to I&T	07/12/05	-33	-33	-33	08/26/05A				▼	▼												
TEM/PS 13																						
Flight TEM Assy 13: Elec to I&T	07/19/05	-28	-28	-28	08/26/05A				▼	▼												
Flight TEM PS Assy 13: Elec to I&T	07/19/05	-28	-28	-28	08/26/05A				▼	▼												
TEM/PS 14																						
Flight TEM Assy 14: Elec to I&T	07/26/05	-37	-37	-37	09/16/05A				▼	▼												
Flight TEM PS Assy 14: Elec to I&T	07/26/05	-37	-37	-37	09/16/05A				▼	▼												
TEM/PS 15																						
Flight TEM Assy 15: Elec to I&T	08/02/05	-32	-32	-32	09/16/05A				▼	▼												
Flight TEM PS Assy 15: Elec to I&T	08/02/05	-32	-32	-32	09/16/05A				▼	▼												
TEM/PS 16																						
Flight TEM Assy 16: Elec to I&T	08/09/05	-32	-27	-27	09/16/05A				▼	▼												
Flight TEM PS Assy 16: Elec to I&T	08/09/05	-32	-27	-27	09/16/05A				▼	▼												
Exlc Global Items																						
Flight PDU Box-Elec to I&T	07/01/05	-85	-67	-67	10/06/05				▼	▼												
Flight Harness-Elec to I&T	07/05/05	-45	-72	-72	10/14/05				▼	▼												
Flight GASU Box-Elec to I&T	07/19/05	-81	-89	-89	11/22/05				▼	▼												

Run Date	10/28/05 15:32	GLAST LAT PROJECT	LT-DZ: Baseline Variance	Report #10
Data Date	10/01/05	Level 3 Milestones	FL-D4: AV: Level 3 Milestones	Sheet 6
© Primavera Systems, Inc.		Baseline Variance (Organized by Subsystem)		



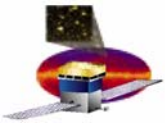
Level 3 Milestone List

Activity Description	Baseline Finish	-2m Var	-1m Var	Bsln Var	Early Finish	2005												2006					
						FE	MA	AP	MA	JU	JU	AU	SE	OC	NO	DE	JA	FE	MA	AP	MA	JU	
Elex Global Items																							
LCB Flight Units - Elec to Elec	07/20/05	-68	-55	-55	10/06/05																		
Flight Event Processor Units-Elec to	08/19/05	-70	-52	-52	11/02/05																		
1st Flight EPU/SIU-Elec to I&T	08/19/05	-70	-52	-52	11/02/05																		
2nd Flight EPU/SIU-Elec to I&T	08/24/05	-72	-57	-57	11/14/05																		
3rd Flight EPU/SIU-Elec to I&T	08/26/05	-75	-62	-62	11/23/05																		
4th Flight EPU/SIU-Elec to I&T	08/30/05	-78	-67	-67	12/06/05																		
5th Flight EPU/SIU-Elec to I&T	09/02/05	-113	-108	-108	12/20/05																		
Flight Software																							
Demo: Spacecraft Interfaces	02/14/05	0	0	0	02/14/05A	▼																	
Demo: Thermal Control	02/16/05	0	0	0	02/16/05A	▼																	
Demo: Inter-task Communications	03/11/05	-25	-25	-25	04/15/05A	▼	▼																
Demo: Housekeeping	03/18/05	-37	-37	-37	05/10/05A	▼	▼	▼															
Demo: Event Filtering	03/23/05	9	9	9	03/10/05A	▼	▼																
Demo: Watchdog	04/15/05	-15	-15	-15	05/06/05A		▼	▼															
Science Test Data Output	08/08/05	-22	-22	-22	09/08/05A																		
FSW Test Peer Review Complete	08/15/05	0	0	0	08/15/05A																		
Release FSW for FQT	08/29/05	-15	-34	-34	10/17/05																		
FQT Scripts Complete	08/30/05	-11	-38	-38	10/24/05																		
FQT Readiness Review	09/01/05	-15	-10	-10	09/16/05A																		
FQT Complete	09/15/05	-11	-32	-32	10/31/05																		
FSW RFI to I&T	10/03/05	0	-41	-41	12/01/05																		
Delta Test Readiness Review	11/18/05	0	-13	-13	12/09/05																		



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	OCT05					
4.1.7 ELECTRONICS										
4.1.7 ELECTRONICS	0	0	353	354			1	354	354	0
4.1.7.1 ELECTRONICS MANAGEMENT	45	63	2,062	2,248			186	2,248	2,248	0
4.1.7.2 RELIABILITY & QUALITY ASSURANCE	0	0	223	220			-3	220	220	0
4.1.7.3 ELECTRONICS SYSTEM DESIGN	0	0	733	733			0	733	733	0
4.1.7.4 DATAFLOW ELECS (TEMs + PROC FARM)	130	155	10,656	10,901			244	10,901	10,901	132
4.1.7.5 SPACECRAFT INTERFACE UNIT	54	18	1,827	2,165			338	2,165	2,165	164
4.1.7.6 POWER CONDITIONING	71	32	2,258	2,449			191	2,449	2,449	136
4.1.7.7 ENCLOSURES	-1	0	705	680			-26	680	680	2
4.1.7.8 CABLE HARNESS	53	0	487	649			163	649	649	44
4.1.7.9 FLIGHT SOFTWARE	77	68	6,143	6,195			52	6,195	6,195	0
4.1.7.A EGSE & OPERATIONS	0	0	2,491	2,579			87	2,579	2,579	18
4.1.7.C INSTRUMENT INTEGRATION & TEST	74	81	490	533			43	533	533	68
4.1.7.D MISSION SYSTEMS INTEGRATION & TEST	0	0	0	0			0	0	0	0
CAPW[3]Totals:	503	417	28,428	29,703			1,275	29,703	29,703	563



FTE Report (DOE/NASA-funded only)

