

STEREO IMPACT Technical Progress Report

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Subject: IMPACT Monthly Technical Progress Report, Contract NAS5-00133

Lil:

Enclosed is the monthly technical progress report for the STEREO IMPACT project for the month of December 2004.

Sincerely,

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IMPACT Team

STEREO IMPACT Technical Progress Report

1. IMPACT Overview

This report is presented in sections by institution. Section 1 is an IMPACT Project Manager / System Engineer's overview.

1.1. Contracting / Funding

Funding through January 2005 has recently been received and subcontracts will be augmented.

1.1.1. Liens

This is a list of Liens. Liens for activities at other institutions are sometimes repeated in their subsections of this report. These liens are estimated additional costs that might be incurred if problems happen. Only problems with a significant likelihood of occurrence are tracked. These liens are usually associated with risks in the risk list (see section 1.5), and you can see the predicted likelihood of occurrence there. Some of these liens have been requested to be encumbered by Project, marked (*). Items included in the POP04 budget recently submitted are marked in yellow.

UCB:

No.	Cause	Amount	Date
1*	LVPS schedule delays extend manpower (Risk UCB29). Cost a 1-month delay at full LVPS team spending rate.	\$35,000+	01/04
2	Late failure in thermal vac requires rework/retest (Risk UCB27, etc).	\$30,000	10/04
3	Testing failure requires rebuild/retest a board (using existing spare parts)	\$20,000	10/04
4	EMC rework and retest required (Risk UCB11). Assume rework can be done in a week or two. Does not include cost of retest of vibration & thermal vac. (see also item 17)	\$30,000	10/04
5	Schedule delays cause the consumption of boom suite schedule contingency (various risks). Cost 35 days of contingency at UCB I&T team rate.	\$50,000+	07/04
6	STE calibrations sources.	\$2,500	11/04
7	SEP Thermostats. These were over the budgeted amount. Budget was \$10K at Caltech. Parts were actually \$21,200, paid by UCB. New budget takes this into account.	\$11,200	11/03
8	Subcontract J&T for board assembly work to maintain schedule	\$50,000	1/04
9	Calibration and thermal vac chambers at UCB use oil roughing pumps. Replace those pumps with dry scroll pumps to reduce risk of contamination	\$14,000	3/04
10	Increase travel to cover staffing requirements at APL during I&T	\$40,000	10/04-1/06
11	Launch delay costs (launch 2/06)	\$226,000	12/05
12	Redesign & rework costs should Actels need to be replaced due to reliability problems. Depends strongly on what kind of replacement is selected.	\$500,000	?
13	PLASTIC Software extended effort to complete to 10/04,	\$130,000	9/04

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	with continuing effort at a lower level through March 2005; 100% probability		
14	LVPS completion, including rescreening and replacement of LTC1877s, 100% probability	\$75,000	9/04
15	UCB SWEA/STE effort to complete, 100% probability	\$40,000	9/04
16	DCB Actel swap-out with parts programmed with new algorithm, plus replace the 1553 connectors, 100% probability	\$8,000	8/04
17	Extra EMC facility costs due to diagnostics and retest, 100% probability	\$5,136	10/04

Caltech:

No.	Cause	Amount	Date
1	Budget does not contain funding for investigations of part failures or contamination failures, re-makes of boards if coupons fail, etc. Some of this has already occurred, as more rework has been required in the hybrid development area than we budgeted for. Some die have failed test, some units have failed PIND testing, and in a couple of cases leaks have occurred after lead bending, which was caused by a problem with the tooling that has been corrected. In addition, QA costs have been a far bigger percentage of the overall cost than anticipated. Currently the yield of hybrids has improved with 16 of 20 passing electrical test in the last batch. (Amount = ~\$50,000 (guess); Probability = 100%; time frame = March 2004).	\$50,000	03/04
2	Unfunded schedule reserve: ~\$25,000. This is becoming a reality, as our latest schedules show delivery in September 2004 (as required), whereas we had budgeted for delivery in July 2004. (Amount = \$25,000; Probability = 100%; time frame = August 2004).	\$25,000	8/04
3	Possible under-budgeting of environmental testing and bake out. \$100K has been allocated. However, recent estimates suggest that the thermal balance/thermal vacuum test may require about 3 weeks. Recent cost estimates at JPL suggest that that might take the entire \$100K. We are investigating other places for the environmental test program where the costs may be less. (Amount = ~\$50,000 (guess); Probability = 50%; time frame = July 2004).	\$50,000	7/04
4*	GSE Software support (extend a few months after January 2004)	\$60,000	1/04
5*	Engineering Assistant (Risk UCB033)	\$24,000	1/04
6*	Engineering support to maintain schedule (Risk UCB033)	\$63,000	1/04
7*	Technician Support to maintain schedule (Risk UCB033)	\$38,000	1/04
8	Overlooked hybrid costs: it was not realized that the cost estimate we were given for the hybrids did not include the	\$10,000	3/04

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	qualification costs of 10 units. We have asked for a quote from JPL. (Amount = ~\$10,000 (guess); Probability = 100%; time frame = March 2004).		
9	Unbudgeted tests: there are a number of tests outlined in the STEREO/IMPACT Requirements Verification Matrix that we are listed as responsible for but for which we did not budget. (Some I wasn't aware of and some I mistakenly thought would be done at UCB as part of EMC testing.) Test plans and procedures will need to be written and existing instrumentation either calibrated or new instrumentation obtained. These include requirements 4.10, 4.12, 4.23, 4.27, 4.28, and 4.42. If we have to get JPL to help us, the cost could be significant. (Amount = ~\$25,000 (guess); Probability = 50% (UCB might help us); time frame = July 2004).	\$25,000	7/04
10	Launch delay costs to Feb 06	\$67,757	12/05
11	Extra work due to schedule delays, delivery in Jan 2005, probability 100%	\$133,115	10/04
12.	LET L1 detector repair, probability 100%	\$60,000 \$80,000	10/04
13	Purchase 5 6 spare L1 detectors to replace jagged edge detectors (plus new mounts), 100%	\$23,000 \$30,000	10/04
14.	Repair Analog post reg. & Bias supply boards, 100%	\$5,000	9/04
15.	Design & Fab radiation test fixture (was at GSFC), 100%	\$5,000 \$8,000	10/04
16.	Rebuild Rework SEP flight harnesses, 100%	\$20,000 \$10,000	11/04
17.	Purchase 8 HET H3 detectors, 100%	\$25,000	11/04
18.	Additional GSE, 100%	\$3,000	11/04
19.	SEP Thermal Vac cables; cannot use ACE parts, 100%	\$6,000	11/04
20	SOTA thin film resistor swap, probability low	\$5,000	11/04
21.	Hardware changes to SEP logic board (EEPROM reset issue), 100%	\$4,000	11/04
22	Repair L1 detectors at JPL + associated manpower due to schedule delay, 100%	\$150,000 \$120,000	12/04
23	New L1 detectors from Micron, incl. test at Caltech (unlikely)	\$106,000	1/05
24	Install new L1s in SEP, repeat some environments (unlikely)	\$125,000	5/05

UMd:

No.	Cause	Amount	Date
1	SIT foils fail acoustic test	\$20,000	2/04
2	SIT Vibration (currently planned to be combined with HET instruments, but may not work out)	\$15,000	2/04
3	Parts screening (some parts not yet Oked by PCB and may need addition screening)	\$10,000	9/03

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4	Particle Calibration at BNL.	\$20,000	8/04
5*	Engineering Support to maintain schedule (Risk UCB033)	\$60,000	1/04
6	Replacement SSD detectors (only 2 of 5 detectors passed)	\$10,000	5/04
7	Extend Peter Walpole due to late delivery	\$17,800	11/04

GSFC (Tycho):

No.	Cause	Amount	Date
1	Revise SEP Central/LET/HET vibration analysis if required	\$5,000	11/03
2*	Extra Solid-state Detector Lab manpower support to accommodate late detector delivery (Risk UCB033)	\$20,000	12/03
3	Travel for accelerator end-to-end test, 100%	\$5,000	6/04
4	Tom Nolan flight software support (Risk UCB033)	\$15,000	5/04
5*	Engineering support to maintain schedule (Risk UCB033)	\$40,000	1/04
6	Tycho's thermal vac chamber is planned for SIT and SEPT tests. If that fails we will have to rent a chamber. Probability low-moderate.	\$25,000	8/04
7	Late HET Detector delivery resulting in additional acceptance tests for one instrument	\$40,000	7/04
8	LET foils fail acoustic testing (unlikely since ETU tests passed)	\$10,000	5/04
9	HET Actel additional testing	\$20,000	6/04
10	SEPT re-test if Kiel cannot pay for it	\$30,000	5/04

1.2. **Significant System-Level Accomplishments**

- Participated in Project EMC committee meetings
- Participated in various MRB/FRB meetings
- Participated in several SEP thermal vac test planning meetings
- Participated in several PLASTIC Flight Software meetings
- IDPU FM1 vibrations and thermal vac completed, IDPU FM2 vibration completed, thermal vac started.

1.3. **System Design Updates**

- None

1.4. **System Outstanding Issues**

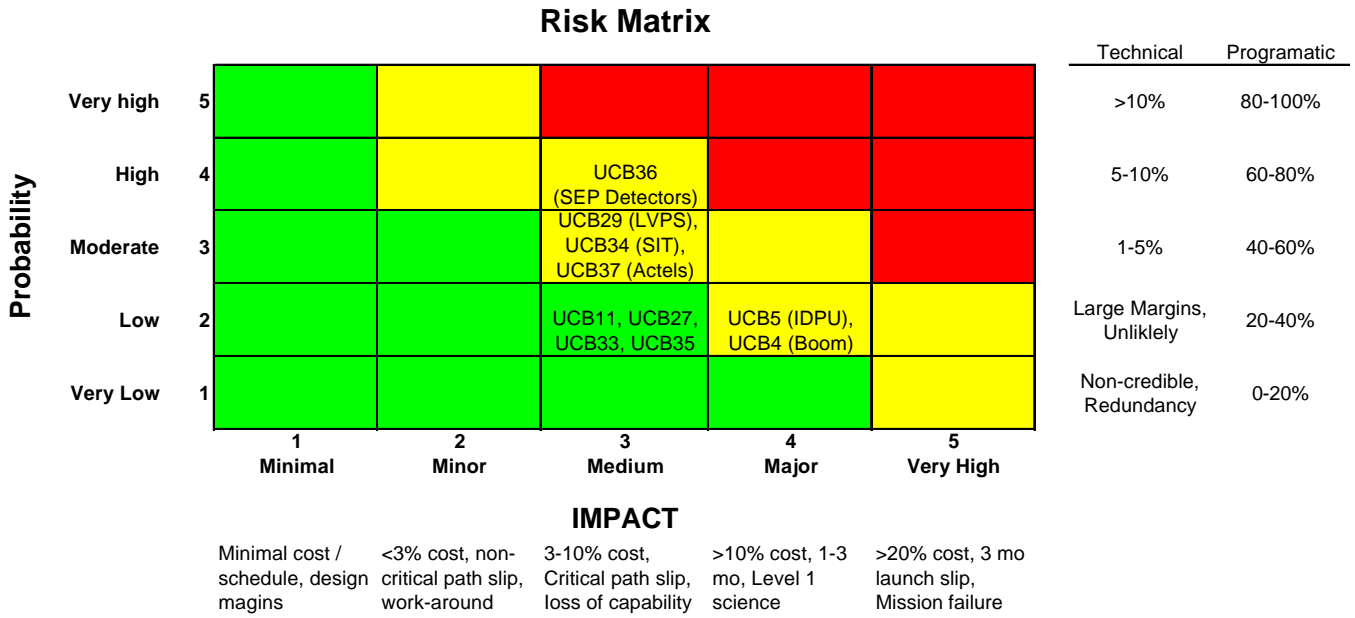
- LET L1 detector problems.
- PLASTIC Flight Software chronically behind schedule, beginning to impact PLASTIC test schedule

1.5. **Top 10 Risks**

Top 10 risks are attached. No change since last month.

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IMPACT Top Ten Risks 10/2004



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No.	Risk Item	Score	Mitigation	Mitigation Schedule			
				Sub-system Test	System Test	Env test	Early Orbit Test
UCB_5	IMPACT boom is a new design. Failure could affect Imager pointing requirements as well as boom-mounted instruments.	MEDIUM	Design for reliability. Early prototype testing. Qual model testing completed. Adequate force margins demonstrated.	MEDIUM	MEDIUM	MEDIUM	LOW
UCB_4	The IDPU is a single point failure mechanism for the IMPACT suite and PLASTIC	MEDIUM	IDPU is a simple, reliable system. Extra attention has been paid to ensuring its reliability, minimizing the risk of fault propagation. Extensive EM & FM testing	MEDIUM	MEDIUM	MEDIUM	MEDIUM
UCB_36	HET, LET, and SIT detector fallout during life test. Not enough HET detectors for the flight build, and few or no spares for SIT and LET. New detectors being obtained, but there is a schedule risk	MEDIUM	Prep for early delivery of replacement detectors. Proceed with poor detectors and replace them with new ones later in the schedule	MEDIUM	MEDIUM	MEDIUM	LOW
UCB_34	SIT Schedule slippage, on critical path	MEDIUM	Add manpower to recover schedule	MEDIUM	LOW	LOW	LOW
UCB_29	LVPS behind schedule, on critical path; further slipping could delay delivery to spacecraft	MEDIUM	Add manpower to LVPS task to avoid further slippage	MEDIUM	LOW	LOW	LOW
UCB_37	Some Actels have been programmed with the old algorithm. Recent data from RK indicates the possibility of failure of these parts	MEDIUM	Replace Actels in IDPU and SEP Central since these are single point failures for multiple instruments. SEPT, SWEA, STE, HET Actels not changed. Accumulate test hours to reduce risk	LOW	MEDIUM	MEDIUM	MEDIUM
UCB_35	New undiagnosed Actel part failures may impact flight hardware	LOW	Keep abreast of Actel's analysis results; Make changes to minimize ground bounce which may be related to failures according	LOW	LOW	LOW	LOW
UCB_33	Instrument fabrication & test schedule limited by available personnel	LOW	Subcontract assembly work, authorize over time, bring on new people	LOW	LOW	LOW	LOW
UCB_11	Stringent EMI requirements may delay schedule if testing fails	LOW	Careful design, ETU power converter testing, early system testing	LOW	LOW	LOW	LOW
UCB_27	Actel timing differences between flight & ETU parts may cause failures late in testing impacting delivery schedule	LOW	Do FM Thermal Vac early to allow time for finding and fixing timing problems; for designs on the critical path, consider installing a flight Actel in the ETU &	LOW	LOW	LOW	LOW

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2. Berkeley Status

2.1. *Summary of Status*

Schedule status through December has been provided separately.

2.2. *Major Accomplishments*

SWEA/STE:

- STE-U FM1 and FM2 environmental tests complete
- FM1 SWEA/STE-D integrated and tested, completed calibrations. One channel is found to fail during calibrations when it was warm (PFR1029). Thermal Balance in progress; unit is running too cold, needs rework (PFR1030).
- FM2 SWEA/STE-D ready to assemble

IDPU:

- IDPU FM1 integrated and passed vibration., thermal vac (including retest after diode replacement).
- IDPU FM2 passed vibration, started thermal vac.
- PLASTIC software continues to be late. No problem with IMPACT Flight Software during Suite I&T.

LVPS/HVPS:

- All units delivered.
 - FM2 PLASTIC needs rework as soon as it is returned from UNH
- An open PFR against SEP suite intermittent resets (PFR1025) could be caused by LVPS
 - In January problem was found in both IDPU and SEP LVPS involving a reverse-biased tantalum capacitor. SEP unit shall be fixed prior to start of environments. IDPU units will require retest.
- The SWEA unit fails cold-start in thermal balance (PFR1028). Tracked down to a current inrush into the Actel which exceeds the supplies internal current limit. Fixed by extending the delay associated with the supplies internal current limit and tweaking the supply turn-on sequencer to reduce the Actel inrush (Note we already sequence the supplies to avoid the known Actel inrush issue, but details of the sequencer timing seem to effect this smaller, but still significant, inrush).

Boom:

- FM1 and FM2 units complete, through vib & thermal vac, mated with MAG, STE-U.

GSE:

- All GSE delivered. Some added features in progress.

2.3. *Design Updates*

- None.

2.4. *Outstanding Problems*

- PLASTIC LVPS rework
- PLASTIC flight software behind schedule

2.5. *New Problems*

- SEP, IDPU LVPS reverse-biased capacitor issue

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- SWEA cold-start problem
- SWEA too cold in thermal balance

2.6. *Top Risks.*

- Open Actel problems
- PLASTIC IDPU software late

2.7. *Problem/Failure Quick Look*

ID #	Description	Assignee	Opened	Closed
1001	Qual boom deployment failure in Thermal Vac	McCauley	2003-08-15	2004-01-07
1002	STE-U Assembly problems (broken bond wire)	Curtis	2004-04-12	2004-06-25
1004	SEP LVPS Middle FM1 Problem	Heavner	2004-04-23	2004-06-08
1005	SEP LVPS Top FM1 Problem	Heavner	2004-04-27	2004-06-08
1006	STE-U FM1 Mis-wire (thermal vac feed-through)	Curtis	2004-04-30	2004-06-25
1007	SWEA LVPS FM1 LTC1877 Failure	Curtis	2004-05-10	
1008	STE-U FM1 Door failure (cold)	Curtis	2004-05-10	2004-06-25
1009	STE-U FM1 preamp oscillations	Curtis	2004-06-14	2004-06-25
1011	STE-U FM1 Door failure (post-vib)	Curtis	2004-06-28	
1012	IDPU FM1 LVPS part failure	Curtis	2004-07-15	
1013	STE-U FM2 door failure (status sense switch)	Curtis	2004-07-27	
1014	STE-U FM2 door failure, actuator burn-out	Curtis	2004-07-30	
1015	SEP FM1 LVPS Middle Board, pin damage	Heavner	2004-07-28	
1016	FM2 Boom Lock Pins, epoxy in the hole	McCauley	2004-08-02	
1017	SEP FM2 LVPS Middle board, wire damage	Heavner	2004-08-05	
1018	SIT FM2 HVPS stack broke	Berg	2004-08-25	
1020	FM2 Boom Actuator Harness	McCauley	2004-09-13	
1021	FM2 SWEA/STE-D Temp Sensor	Curtis	2004-09-27	
1022	SIT FM1 HVPS Stack broke	Curtis	2004-09-28	
1023	SWEA FM1 LVPS Transformer	Curtis	2004-10-04	
1024	SEP FM1 LVPS flex problem	Curtis	2004-10-08	
1025	SEP Intermittents during Suite I&T	Curtis	2004-11-05	
1026	FM2 PLASTIC LVPS short	Heavner	2004-12-1	
1027	FM1 IDPU Thermal Vac D5 Failure	Curtis	2004-11-23	
1028	FM1 SWEA/STE-D Cold Start problem	Curtis	2004-12-13	
1029	FM1 SWEA, One anode fails when warm	Curtis	2004-12-20	
1030	FM1 SWEA too cold	Curtis	2004-12-28	

3. GSFC (SEP) Status

4. Kiel/ESTEC (SEPT) Status

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4.1. *Summary of Status*

- a) Calibration runs on all four SEPT units using radioactive sources.
- b) Preparation for thermal balance (TB) test.
- c) Submission of 6 out of 6 Problem/Failure Reports for closure approvals.

4.2. *Major Accomplishments*

- a) Environmental tests for all four SEPT units were completed (except TB test). Preliminary test reports were written by SEPT staff and were circulated. Final test reports (voluminous!) were compiled by test facility staff and can be circulated to interested parties.
- b) Magnet deflection efficiency was checked and energy calibration was performed using conversion electrons from radioactive sources Bi-207, Cd-109, and Ba-133.
- c) All six SEPT Problem/Failure Reports have been submitted for closure approvals (IMPACT PR-7001 through PR-7006).
- d) The failed digital board (see IMPACT PR-7005 SEPT-Counting) shall serve as flight spare after repair. However, the failing component (FPGA) has not yet been replaced, awaiting further instructions from the Project failure review board. This is holding up the repair work for the board. The flight spare electronics is urgently needed for SEPT proton calibration at an accelerator facility!
- e) Discussion of thermal hardware and preparation for the upcoming thermal balance test are continuing. A decision was taken to tie down the MLI blankets around the critical sensor apertures using eyelets. The eyelets (6 per SEPT unit) were fabricated in Kiel and received anodising surface treatment. They will be glued to the sensor housing at appropriate locations using the conductive adhesive EPO-TEK E4110-LV. A sample of this glue will be sent to Therese to verify compliance with contamination requirements.

4.3. *Design Updates*

1. All four SEPT units were weighed in flight configuration with washers, Ultem bushings, brackets, ground straps, and eyelets, but without Project supplied MLI blankets, titanium fasteners (4 per SEPT unit) and ground strap fasteners (1 per SEPT-E):

FM1-SEPT-E	796.0	g
FM1-SEPT-NS	1176.5	g
FM2-SEPT-E	794.2	g
FM2-SEPT-NS	1174.8	g

2. The power consumption of all four SEPT units is identical within $\pm 3\%$. It was measured in nominal observation mode with a Bi-207 radioactive source in front of the detectors to stimulate a modest counting activity. Worst case power consumption is calculated for a maximum counting rate of 250 kHz (affects low voltage rails) and failure in all detectors causing maximum leakage currents (affects bias rail):

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	+2.6 V digital [mA]	+5.3 V digital [mA]	+5.6 V analog [mA]	-80 V bias [μA]	Power [mW]
Nominal	32	17	76	4.5	600
Worst case	34	42	80	58	764

4.4. *Outstanding Problems*

1. IMPACT PR-7005 SEPT-Counting needs Failure Review Board approval in order to continue repair work of the flight spare electronics. Unresolved situation delays the proton accelerator calibration activities.

4.5. *New Problems*

4.6. *Top Risks*

4.7. *Problem/Failure Quick Look*

ID #	Description	Assignee	Opened	Closed
7001	SEPT-DoorOpening	Mueller-Mellin	2004-02-20	
7002	SEPT-Detector	Mueller-Mellin	2004-03-05	
7003	SEPT-Pinpuller	Mueller-Mellin	2004-03-10	
7004	FM2 SEPT-NS accident	Mueller-Mellin	2004-05-04	
7005	SEPT-Counting	Mueller-Mellin	2004-10-10	
7006	SEPT-Rod	Mueller-Mellin	2004-11-23	

5. Caltech/JPL (SEP) Status

5.1. *Summary of Status*

Activities centered on repairing the L1 detector mounts, acoustic screening of L1 detectors, and assembling HET/LET/SEP Central FM 1.

5.2. *Major Accomplishments:*

- Successful acoustic test on 6 bad-edge L1 detectors.
- HET/LET/SEP Central FM 1 assembled in nearly final flight configuration.

Critical Milestones status (from Critical/Key Milestone chart of 3/31/04):

- Milestone 17: SEP Suite – FM 1 Environmental Tests were not completed.
- Milestone 19: SEP Suite – FM 2 Ready for Delivery to APL was not completed.

Detectors:

- Work continued on the second repair of the L1 detector mounts. An MRB was held to review and approve the procedure to move the epoxy blobs that provide strain relief to the haywires. Work started on repairing the mounts that only needed this fix and by month's end, on most detector mounts, the epoxy strain-relief blobs were moved to provide proper strain relief of the haywires that were added. For the 6 detectors that have necked-down or broken haywires, a procedure was still in development at month's end.
- We also investigated the possibility of buying new L1 mounts and detectors in case we had massive failures in acoustics testing. Mark Wiedenbeck visited Micron and material availability was assessed and a cost estimate prepared. As part of this effort, the L1 mount was redesigned by Sandy Shuman at GSFC. This new mount will have a shorter, proper-length flexistrip, and the Cu traces will not be Ni-plated. A quote for 80 new mounts was obtained from Rigiflex.
- An acoustic screening test was done on the LET EM unit. We tested 7 bad-edge L1 detectors per the following schedule: 1 min at -3dB from protoflight levels, 1 min at protoflight levels, and 2 min at protoflight levels. This was to simulate all the testing that would be required, including launch. All but one detector passed. L1-10 broke during the -3dB run and that was not unexpected as it had a known small crack in it. So, the test was a big success and we have decided not to use edge condition as a constraint in selecting detectors for flight.

Electronics:

- LET/HET/SEP Central FM 1 was assembled. It is still missing a few mechanical parts. It will be running over the holidays to accumulate some trouble-free hours.
- Preparations began for the Test Readiness Review, which is scheduled for 20 January 2005 on the Caltech campus.

Software:

- Continued making tweaks to the LET and SEP Central software.
- Continued analysis of MSU accelerator test data.

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GSE:

- Worked on the User's Guide.

5.3. *Design Updates*

- Resource updates will be sent separately.

5.4. *Outstanding Problems*

- The L1 haywire repair did not leave enough strain relief and several wires were broken or stretched thin upon installation into FM 1. A new repair cycle is underway. Most can be repaired by moving the epoxy blobs that provide strain relief. A procedure for splicing the broken wires is in development.
- Reboots of SEP Central that happened during EMC pre-test and test.

5.5. *New Problems*

- None

5.6. *Top Risks.*

- Actel parts may not be reliable. This would affect many NASA projects.
- Some problem may crop up during environmental testing to delay the schedule.
- The budget is very tight with no reserve being held at Caltech.
- L1 detectors may break during acoustics.

5.7. *Problem/Failure Quick Look*

ID #	Description	Assignee	Opened	Closed
2001	SEP Bias Supply post-regulator failure FM 1	Kecman	2004-04-27	
2002	L1 Detector mounts with fissure in traces	Cummings	2004-07-01	

5.8. *Lien List*

- The L1 repair procedure at JPL took longer than expected and more detectors were repaired than expected. We originally planned on repairing 26 detectors. A total of 36 were repaired. Earlier estimate was \$40,000. New estimate for expenditures to date: \$120,000.
- Purchase of eight H3 detectors from Micron. Cost = \$25,000.

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- Repairs to Analog/post reg and Bias Supply boards at JPL were not in budget. Estimate: \$5,000.
- Partial design, fab, assembly, and cleaning of LET radiation test fixture was not in budget. Estimate: \$8000.
- Remove Solithane 113 from harnesses and replace with Conathane at JPL. Estimate: \$10,000
- Additional GSE: \$3000
- Design and fab T/V test cables. We had hoped to use the ones from ACE and make adapters but the connectors have cadmium and will outgas too much. We had \$4,000 in for this activity. New estimate: \$10,000, for a delta of \$6,000.
- Hardware changes to SEP Central logic boards. Estimate: \$4000.
- Estimate of costs for L1 detector repair and replacement (\$383,000 +):
 - Purchase of six L1 spare detectors from Micron. Estimate: \$18,000 for Micron.
 - New L1 order for 30 L1s: \$75,000
 - Testing manpower at Caltech/JPL (36 units): \$18,000
 - Modify Caltech test mounts: \$5,000
 - JPL 2nd round of repairs on haywires: \$50,000 + \$10,000 for fixture mods
 - Acoustic test of 7 bad-edge detectors: \$2,000
 - Schedule slip: \$80,000
 - Retest environments at JPL in May: \$100,000
 - Manpower for reassembly and test in May: \$20,000
 - Extra travel for removing instrument from spacecraft: \$5,000
 - New mounts and inspection costs: GSFC to provide.

6. SIT MONTHLY TECHNICAL PROGRESS REPORT

December 2004

6.1. **SUMMARY of STATUS**

- a. FM1 unit - Conformal coated and Assembled (with FM2 HVPS) but missing: Sunshade/cover, thermal hardware. Needs final bakeout of electronics plus installation of shield board and thermal hardware before TV.
- b. FM2 - Electronics – conformal coated and baked out and tested. At GSFC waiting installation of shield board and thermal hardware. Telescope is assembled but missing sunshade/cover and thermal hardware. It is assembled to the coated and baked FM1 HVPS. Under test at Umd.
- c. Spare SSDs – still in manufacture at Ortec.
- d. Flight Software – Current version is 09/03/04 and is under test at UMD .

6.1.1. Schedule Changes

The current SIT schedule is available from the project scheduler.

6.2. **MAJOR ACCOMPLISHMENTS**

6.2.1. This Month

FM2 telescope high voltage problem was worked. A couple of assembly errors were found and fixed. Some kapton tape was added to areas where it was felt the 1000v HV was coming too close to ground.

We were able to get the HV up to the working level of “B8” and took an acceptable alpha peak. We were also able to run the system at c8 overnight and to go successfully to d0 the next day. These levels are considerably in excess of what we intend to run SIT at initially. In fact, based on our experience with STEP on WIND these levels are in excess of what we will need to run SIT at after 10 years of data taking.

Axel delivered the flight spare TOF unit and we tested it.

The two SIT Test Pulsers were completed and tested.

SIT sunshade and acoustic pieces were received from the shop and coatings were begun.

6.2.2. Next Month

Finish assembling the two flight units and begin environmental testing.

6.3. **DESIGN UPDATES**

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6.3.1. Resources

	Last Month	This Month	Change
Mass (kg) *	1.46	1.46	0
Power (W)	1.65	1.65	0
Telemetry (bps)	418	418	0

* Includes 200g book-kept by GSFC for SIT structure

6.4. **OUTSTANDING PROBLEMS**

Spare SSDs are stuck in manufacturing at Ortec.

6.5. **NEW PROBLEMS**

6.6. **NEW RISKS**

6.7. **PROBLEM/FAILURE QUICK LOOK**

Starts at first turn-on of flight hardware.

ID #	Description	Assignee	Opened	Closed
PR3001	Failure of PH300 chip U4 of FM1 energy board	PHW	4/27/04	
PR3002	Failure of FM1 ATOF START front end	PHW	4/29/04	
PR3003	Failure of FM2 ATOF START and STOP front end	Waterman	8/10/04	
PR3004	Failure of FM1 ATOP start and stop front end	Waterman	8/30/04	
PR3005	Oscillation of FM2 HVPS output	Waterman	9/1/04	

7. CESR (SWEA) Status

Both flight units delivered to UCB, no open issues. Integration with UCB electronics covered in UCB section.

8. GSFC (MAG) Status

FM1 and FM2 complete and delivered to UCB for integration with the IDPU and Boom. See the UCB section for status of that activity.

STEREO IMPACT Technical Progress Report

9. EPO at UCB

Monthly E/PO Report

December, 2004

Informal Education:

D. Bithell, R. Morales Manzanares, N. Craig, and L. Peticolas presented the sonification project to STEREO scientists at the Dec. 18th, 2004 STEREO science team meeting. In addition, *Exploring Magnetism* and *Exploring Magnetism in the Solar Wind* Teachers' Guides were given out to a couple scientists who do their own teacher professional development workshops.

L. Peticolas participated in the Dec. 21st, 2004 Sun-Earth Connection Education Forum and Exploratorium "Ancient Observatories" Webcast, describing coronal mass ejections and their interaction with Earth's magnetosphere. The expected audience for this outreach event is 400,000. The archived webcast can be viewed from this URL:
<http://www.exploratorium.edu/chaco/HTML/webcast.html>

STEREO in general:

N. Craig, T. Kucara and D.Christopher's request for a new AGU Joint Assembly special session for Spring '05 is approved. The title is *Bringing the Sun to Earth: Solar and Sun-Earth Science Education and Public Outreach Efforts*.

Respectfully Submitted,
IMPACT E/PO Lead and Specialist, Nahide Craig and Laura Peticolas