

# STEREO IMPACT Technical Progress Report

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

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

Sincerely,

David Curtis  
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**Draft**

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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.	\$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	<del>STE calibrations sources.</del>	<del>\$2,500</del>	<del>11/04</del>
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

### 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 qualification costs of 10 units. We have asked for a quote from JPL. (Amount = ~\$10,000 (guess); Probability =	\$10,000	3/04

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	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	10/04
13	Purchase 5 spare L1 detectors to replace jagged edge detectors (plus new mounts), TBD	\$23,000	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	10/04
16	Rework harness in case of EMC failure, TBD	\$20,000	11/04

### 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
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	\$40,000	7/04

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	acceptance tests for one instrument		
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
- LET detector rework progressing
- Most of new batch of HET detectors pass life test
- FM2 Boom/MAG through environments (except EMC)
- SIT FM1 integrated (except door/collimator)
- Prepare for IDPU/SWEA TRR

### 1.3. **System Design Updates**

- None

### 1.4. **System Outstanding Issues**

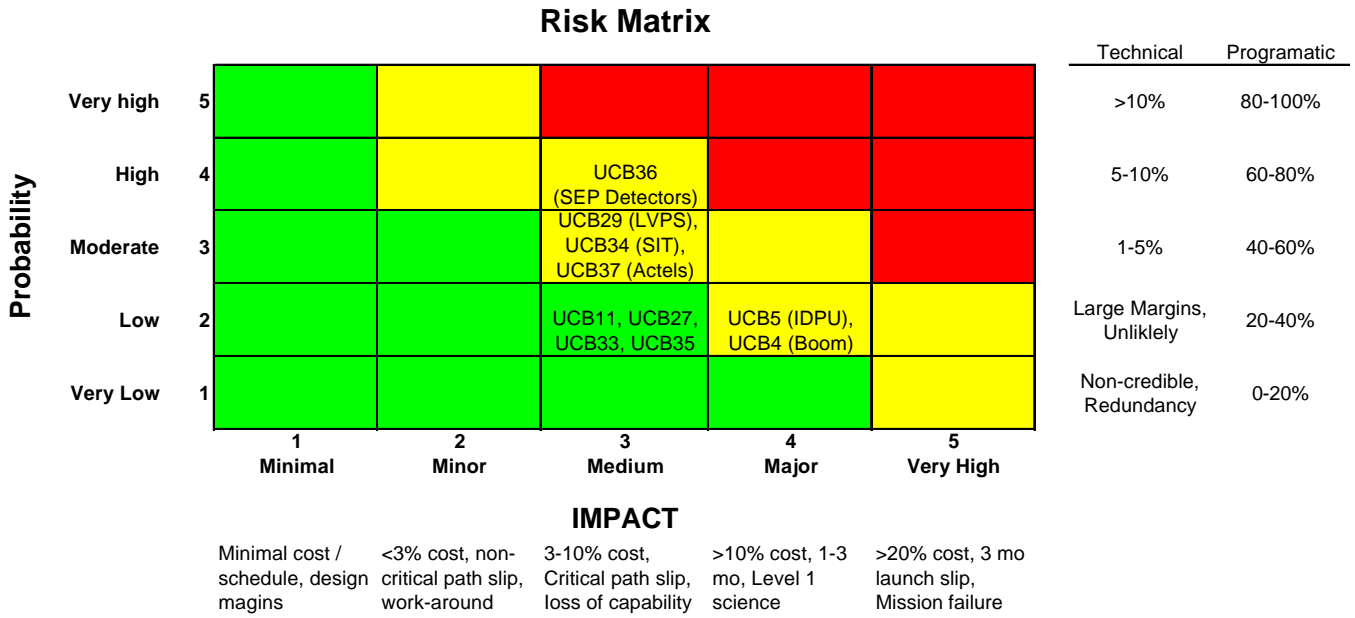
- Persistent SEP mechanical issues impacting schedule.

### 1.5. **Top 10 Risks**

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

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## IMPACT Top Ten Risks 7/2004



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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

# STEREO IMPACT Technical Progress Report

## 2. Berkeley Status

### 2.1. *Summary of Status*

Schedule status through September has been provided separately.

### 2.2. *Major Accomplishments*

SWEA/STE:

- STE-U FM1 and FM2 environmental tests (except EMC) complete
  - Door problem in calibration required replacement of actuator wires, followed by workmanship vibration and 1 cycle thermal vac, completed.
- FM1 SWEA/STE-D integrated and tested, ready for EMC
- FM2 SWEA/STE-D pending FM2 LVPS test completion, also conformal coat of SWEA/STE boards.
  - One part failure discovered/replaced, PFR1021

IDPU:

- IDPU FM1 integrated and passed CPT.
- IDPU FM2 complete except for LVPS board (see below)
- PLASTIC software continues to be late

LVPS/HVPS:

- SIT HVPS FM2 delivered. FM1 returned to UCB for conformal coat and repair of broken stack (PFR1022).
- All LTC1877s replaced
- SWEA/STE-D FM1 LVPS FM1 delivered, FM2 in test.
  - FM1 SWEA transformer failure/replaced, see PFR1023
- PLASTIC FM1 and FM2 LVPS delivered.
- SEP FM1, FM2 delivered
  - Some troubles found at Caltech, requires rework at UCB; PFR pending
- IDPU FM1 LVPS delivered, FM2 ready for conformal coat.

Boom:

- FM1 and FM2 units complete, through vib & thermal vac, mated with MAG, STE-U.
  - FM2 boom had a harnessing issue, see PFR1020.
- FM1 boom mated with FM1 SWEA for EMC.

GSE:

- All GSE delivered. Some added features in progress.

### 2.3. *Design Updates*

- None.

### 2.4. *Outstanding Problems*

### 2.5. *New Problems*

- SEP LVPS Failures.



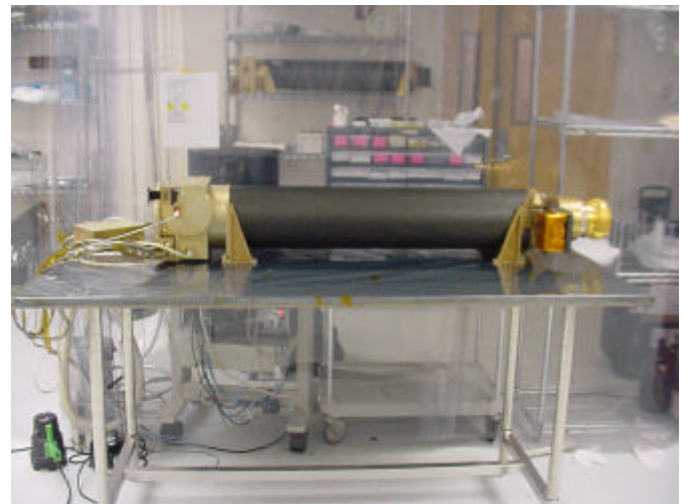
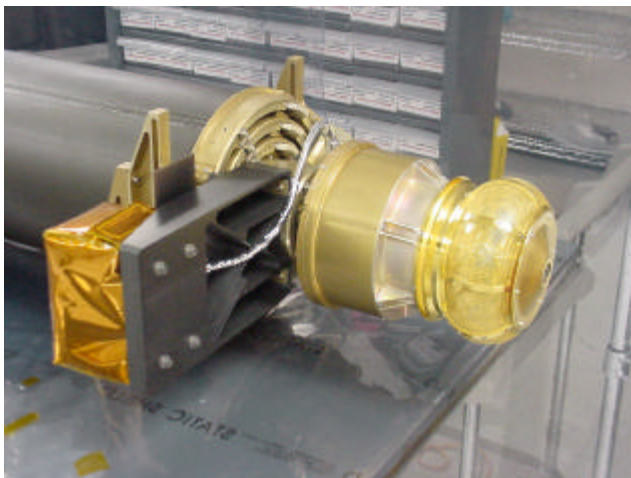
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## 2.6. *Top Risks.*

- 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	



**3. GSFC (SEP) Status**

## 4. Kiel/ESTEC (SEPT) Status

September 2004

### 4.1. *Summary of Status*

- a) FM1 SEPT-E and -NS ready for interface check with SEP-Central and EMC test of FM1 IMPACT.
- b) FM2 SEPT-E and -NS ready for interface check with SEP-Central.

### 4.2. *Major Accomplishments*

- a) FM1 and FM2 sensor calibration with radioactive sources (conversion electrons) finished.
- b) Thermal hardware installed: 8 Tayco heaters (4 operational, 4 survival), 8 Klaxon thermostats (4 nominal, 4 redundant).
- c) Conductive box labels and connector labels glued with silver epoxy (EPO-TEK E-4110 LV).
- d) EMC shield (adhesive aluminium tape Scotch 1170) applied in order to cover non-conductive parts of pin-puller, actuator wires, heater wires and heater foils. Pre-stripped wire wrapping wire (silver plated copper) incorporated to improve conductance.
- e) Those fasteners, not accessible from outside, staked with Scotch Weld 2216 B/A Gray.
- f) Radiation test boards ready to prepare for radiation tests of Max892.
- g) Rework of digital board which was damaged in Kiel accident finished, awaiting final testing of selected flight spare electronics.
- h) Preparation for TB test continued. Harness layout proposed. Harness responsibility: Caltech.
- i) Year 2004 budget problem resolved: the German funding agency DLR finally granted additional money for repetition of environmental tests, however with a 15 % reduction. We cope with the reduction by having a common TV test for all four units in the same run.
- j) Two transport containers ready, custom papers prepared, airport security and airline informed, NASA/GSFC supporting letter for transportation received.
- k) Contrary to last month's progress report, Problem/Failure Report IMPACT PR 7004 not yet closed, pending Project approval.

### 4.3. *Design Updates*

### 4.4. *Outstanding Problems*

- 1. IMPACT PR 7001, 7002, 7003 will be closed after repetition of environmental tests Vibe and TV.
- 2. IMPACT PR 7004 will be closed pending Project approval

### 4.5. *New Problems*

# STEREO IMPACT Technical Progress Report

## 4.6. *Top Risks*

## 4.7. *Problem/Failure Quick Look*

<b>ID #</b>	<b>Description</b>	<b>Assignee</b>	<b>Opened</b>	<b>Closed</b>
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	

## 5. Caltech/JPL (SEP) Status

### 5.1. Summary of Status

Activities centered on repairing the L1 detector mounts, preparing for the EMC test scheduled for October, preparing the electronics boards for conformal coat and bake out and then executing those two tasks, continued analysis of MSU accelerator test data, and software development.

Major Accomplishments:

- Began repair of the L1 detector mounts.
- Held software status review.
- Added haywires to boards to ensure there are no floating conductors in LET and SEP Central
- Updated SEP housekeeping database and SEPT science packet format.

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

- Milestone 12: SEP Suite – FM 1 I&T Complete was not completed.
- Milestone 13: IMPACT Suite EMC Test Complete was not completed.

Detectors:

- Two qual units, two EM units, and the first set of 10 flight L1 detectors were repaired at JPL by essentially haywiring across the signal traces in the flexistraps on the detector mounts. A daughter board and wirebonding were also involved in the procedure. Several iterations were required to get the final procedure in place. Before and after thermal vacuum tests were done on the two EM units and the results looked good. By the end of the month the 10 flight units were ready to be installed into the LET FM 1 unit.
- At JPL, QA reported what they thought were cracks in 4 of the 20 units on the bias-plane side of the flexistraps of the L1 detector mounts. However, Caltech personnel interpreted the photographs differently, saying that the cracks were really imperfections in the laminate on top of the trace in the mounts made by Speedy. No further action is planned.
- An acoustics test of L1 detectors was conducted at Aerospace (they are building an instrument similar to LET) and one of five detectors failed. Microscope studies revealed that the failed detector has a very jagged edge in a small unglued and unsupported section of the silicon wafer. The ones that passed had very smooth edges. Handling failures had occurred on three devices at Caltech and these were inspected. All three had jagged edges. At GSFC we had previously put 5 L1 detectors through an acoustics test some months ago with no failures. Those detectors were inspected and all five were found to have smooth edges. Thus there appears to be a strong correlation with the breakages and the presence of jagged edges. We are starting to inspect all L1 detectors. Twenty-two detectors have been inspected so far (none of them presently slated to be flight units) and 8 were found to be bad (i.e., had jagged edges), 11 were good, and 3 were marginally good. Next inspections will be of the 10 units scheduled to be flight units in FM 1. The FM2 batch of detectors is at JPL for repair and unavailable for inspection until October.

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## Electronics:

- It was discovered that there exist floating conductors in the instrument, some IC lids and some unused connector pins. The boards involved were taken to JPL and haywires were added to alleviate the problem.
- The LVPS FM 1 and FM 2 flight boards were received.
- All flight boards for FM 1 and FM 2 for LET and SEP Central were staked, conformally coated, and baked out.
- Preparations were made to receive the flight instruments from other institutions. The clean room purge flow was tested for impurities (results not yet available) and other clean room preparations were completed as well.
- By the end of the month we were ready to start the near-final assembly of LET and SEP Central flight units.

## Software:

- New version of SEP housekeeping database was generated (at least 3 updates).
- New SEPT science packet definition generated, also about 3 times.
- Continued making tweaks to the LET and SEP Central software, including adding software to handle SEPT data processing.
- Continued analysis of MSU accelerator test data.

## GSE:

- Most activity was directed towards preparing for the EMC test in October.

### 5.2. *Design Updates*

- Resource updates will be sent separately.

### 5.3. *Outstanding Problems*

- Some L1 detector mount traces were discovered broken after assembly into FM 1 and FM 2. See IMPACT\_PFR\_2002. A repair plan has been developed and is being implemented at JPL.

### 5.4. *New Problems*

- A requirement that there be no floating conductors unless they are behind 100 mils equivalent Al shielding prompted a review which produced several violations. These were resolved.
- Jagged edges on L1 detectors are present in a good fraction of the detectors inspected so far and there appears to be a correlation with breakages in handling and acoustics. We hope to identify enough detectors to avoid using ones with jagged edges in the LET instrument.

### 5.5. *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.

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## 5.6. 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	

## 5.7. Lien List

- Estimates below are rough. We have requested budget information from JPL for the past six weeks, which should give us a better handle on the numbers.
- The L1 repair procedure at JPL has taken longer than expected and we are repairing more detectors than expected. We originally planned on repairing 26 detectors. Now we plan to repair 36. Earlier estimate was \$40,000. New estimate: \$60,000, so an additional \$20,000.
- Possible purchase of five L1 spare detectors from Micron. Estimate: \$20,000 + \$3000 for new mounts.
- 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: \$5000.
- Possible redo of harnesses depending on outcome of EMC test. Estimate: \$20,000
- Actel swap. Estimate: \$0. This was done at Caltech and is absorbed into Vincent's salary.

## 6. SIT MONTHLY TECHNICAL PROGRESS REPORT

September 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 before TV.
- b) FM2
  - Energy Board – needs trim resistor installation and conformal coat.
  - TOF system – analog board needs repair. Both boards need conformal coat.
  - Logic Board – trim part installation, ungrounded IC lids need grounding, conformal coat
  - Mother Board – ungrounded copper needs grounding, conformal coat
  - Telescope – awaits assembly at GSFC
  - HVPS – FM1 at UCB for repair, conformal coat and bakeout.
- 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

The FM1 telescope was assembled, except for the sunshade/cover and thermal hardware. Initially connected to the FM1 HVPS, it was tested briefly with the FM1 electronics outside the vacuum chamber and was found to work, though with disappointing noise levels due to long SSD Cables. The FM1 HVPS was disconnected and sent to UCB for conformal coat and the telescope was assembled to FM2 HVPS. Meanwhile the FM1 electronics had final trims installed (energy threshold, longer power-on-reset pulse, larger compensation capacitors on the LM108 op amps in the housekeeping system to stop oscillation), unconnected copper was grounded and all boards were conformal coated. A test of the telescope and FM2 HVPS with the ETU electronics was performed but was inconclusive because there was insufficient time for outgassing and we were unable to get the HV above 2500v. A bench test of the completely assembled unit was performed along with a bench calibration. Good noise performance was observed in the energy system. We expect that the unit is working well but have not yet had a chance to observe an alpha track which we consider the acid test.

The unit was returned to GSFC for final external cleaning and bagging for delivery to Caltech for IMPACT integration and EMC test.



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Preparations were started for final trim and conformal coat of the FM2 electronics and for assembly of the FM2 telescope.

### 6.2.2. Next Month

Next month we will participate in FM1 IMPACT integration at Caltech and EMC test in Anaheim. We also hope to perform the tasks remaining to ready FM1 for environmental testing: integration of the sunshade/cover, installation of thermal hardware, bakeout of the electronics, successful alpha test of the unit in vacuum, final torquing/securing of all hardware.

Finally we expect to finalize and conformal coat the electronics and begin assembly of the FM2 telescope.

### 6.3. **DESIGN UPDATES**

#### 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
SIT1	Apparent failure of PH300 chip U4 of FM1 energy board	PHW	4/29/04	
	TBD			

**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.

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## 9. EPO at UCB

Monthly E/PO Report

September, 2004

### **Informal Education:**

L. Peticolas, N. Craig, Janet Luhmann, and Stuart Bale met with D. Bithell and R. Morales Manzanares on September 15<sup>th</sup> to discuss further the STEREO sounds sonification project. D. Bithell and R. Morales Manzanares have developed new programs using a new idea for reading in the data. The new programs use images rather than ASCII files to read the data in order to create the sonification. This new tool will allow for a larger range of types of data to be sonified from the IMPACT SEP and magnetic field data to the SWAVES electric and magnetic fields wave data.

I. Sicar with input from N. Craig and L. Peticolas, created a new Sounds of Space Website for the STEREO-IMPACT project: <http://cse.ssl.berkeley.edu/impact/vos/vos.html>. This website has a program created by R. Morales Manzanares on it that can be downloaded for sonifying HELIOS 1 and 2 SEP data and many more links.

N. Craig and L. Peticolas participated in the Idaho National Engineering and Environmental Laboratory (INEEL) Science and Technology Expo in Idaho Falls, ID September 23-25. For this intensive outreach event, we had several tables set up to hand out materials and perform hands-on activities. Over 6,500 students and over 3,000 teachers, parents, and chaperons attended this three day event. At our booth we handed out THEMIS flyers and went through our STEREO-IMPACT Exploring Magnetism Teacher's Guide as four different hands-on stations. We took a Sun-Spotter which the Idaho Falls Astronomical Society used at their booth outside. We partnered with Montana and Idaho Space Grant Consortiums, which provided travel funds, the Sun-Earth Connection Education Forum (SECEF), which provided materials from the Sun-Earth scale model activity to aurora books and STEREO Project from GSFC which provided aurora and STEREO posters with glasses, star pencils, book marks, rulers, Our Sun booklets . To find out more visit the URL: <http://www.inel.gov/techtransfer/expo/>

### **Public Outreach:**

L. Peticolas and T. McGill to finished creating the STEREO-IMPACT E/PO flyer with a front page describing STEREO and IMPACT and the E/PO efforts underway and a back page with the first activity in the *Exploring Magnetism* Teacher's Guide. This flyer went to print. 15,000 copies were printed and 10,000 copies were sent to NASA/CORE for dissemination with other SEC-themed materials as part of the Ancient Observatories Theme for this year.

N. Craig sent final materials to Therese Kucera for the inclusion of STEREO/IMPACT Educational materials to the new STEREO Poster that is being planned by GSFC.

## STEREO IMPACT Technical Progress Report

### **Cross Cutting:**

We have been participating with all the STEREO E/PO groups on monthly telecons. One general interest was to propose a STEREO E/PO session for the spring AGU. Nahide Craig and Therese Kucera are investigating the interest from the other SEC E/PO leads and plan to propose a session.

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