

STEREO IMPACT Technical Progress Report

Lillian Reichenthal , Code 463.0
STEREO IMPACT Instrument Manager
Goddard Space Flight Center
Greenbelt, MD. 20771

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 February 2005.

Sincerely,

David Curtis
IMPACT Project Manager
University of California, Berkeley

CC:

Julie.A.Janus.1@gsfc.nasa.gov
Debra.G.Dusterwald.1@gsfc.nasa.gov
Lillian.S.Reichenthal@nasa.gov
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 June 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 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, with continuing effort at a lower level through March 2005;	\$130,000	9/04

STEREO IMPACT Technical Progress Report

	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:

Provided separately

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 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

STEREO IMPACT Technical Progress Report

1.2. **Significant System-Level Accomplishments**

- Participated in Project EMC committee meeting
- Participated in various MRB/FRB meetings
- Participated in several SEP thermal vac test planning meetings
- Participated in several PLASTIC Flight Software meetings
- IDPU FM2 repeat thermal vac complete.
- Prepare for FM1 IDPU Pre-ship review

1.3. **System Design Updates**

- None

1.4. **System Outstanding Issues**

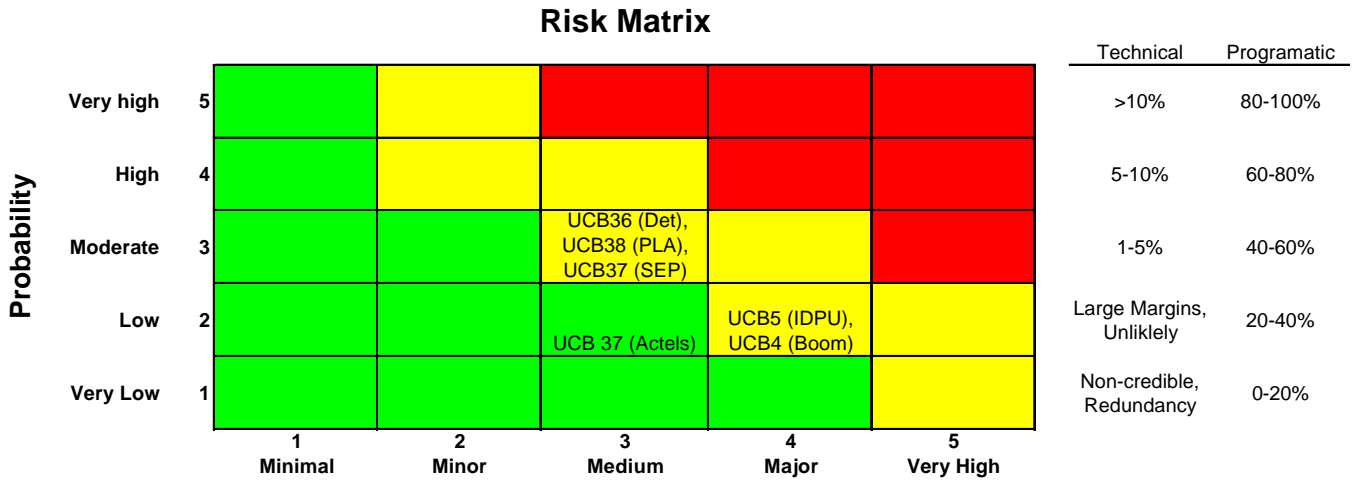
- SIT spare detector issues
- PLASTIC Flight Software chronically behind schedule, beginning to impact PLASTIC test schedule
- SEP LVPS and connector fix holding up SEP Central start of environments
- SWEA Preamp issue

1.5. **Top 10 Risks**

Top risks are attached. Many have fallen out now that we are in test, and a few new risks against schedule have been added.

STEREO IMPACT Technical Progress Report

IMPACT Top Ten Risks 1/2005



IMPACT

Minimal cost / no schedule, design margins	<3% cost, non- critical path slip, work-around	3-10% cost, Critical path slip, loss of capability	>10% cost, 1-3 mo, Level 1 science	>20% cost, 3 mo launch slip, Mission failure
--	--	---	--	--

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. Few or no spares for SIT and HET. New detectors being obtained, but a there is a schedule risk	MEDIUM	Work to get spare detectors	MEDIUM	MEDIUM	MEDIUM	LOW
UCB_38	PLASTIC Flight Software is behind schedule	MEDIUM	Additional manpower to improve schedule	MEDIUM	MEDIUM	MEDIUM	MEDIUM
UCB_39	Continued problems with SEP (LVPS, connectors) risks delaying test schedules	MEDIUM	Identify and solve problems	MEDIUM	MEDIUM	MEDIUM	MEDIUM
UCB_37	Some Actels have been programmed with the old algorithm. Recent data from RK indicates the possibility of failure of these parts	LOW	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

STEREO IMPACT Technical Progress Report

2. Berkeley Status

2.1. *Summary of Status*

Schedule status through February has been provided separately.

2.2. *Major Accomplishments*

SWEA/STE:

- STE-U FM1 and FM2 environmental tests complete
- FM1 SWEA/STE-D Environments complete, FM1 boom assembly complete.
- FM2 SWEA/STE-D assembled, in calibration. A problem with the Actel has held up completion of calibration (PFR1035)

IDPU:

- IDPU FM1 retest complete, ready to deliver. Accumulating operation hours with FM1 boom suite.
- IDPU FM2 retest complete, supporting SWEA FM2 testing.
- PLASTIC software continues to be late. No problem with IMPACT Flight Software during Suite I&T. FM1 IDPU loaded with version 25, includes PLASTIC rev 2.6.

LVPS/HVPS:

- All units delivered.
 - FM2 PLASTIC rework complete and returned
 - SEP LVPS need a fix (PFR1036) to solve an excessive current draw at power-up.

Boom:

- FM1 and FM2 units complete, through vib & thermal vac, mated with MAG, STE-U.
- FM1 also has the flight SWEA installed, and is complete.

GSE:

- All GSE delivered. Some added features in progress.

2.3. *Design Updates*

- None.

2.4. *Outstanding Problems*

- PLASTIC flight software behind schedule

2.5. *New Problems*

- SEP LVPS rework
- SWEA preamp problems

2.6. *Top Risks.*

- Open Actel problems
- PLASTIC IDPU software late

STEREO IMPACT Technical Progress Report

2.7. Problem/Failure Quick Look

ID #	Description	Assignee	Opened	Closed
1001	Qual boom deployment failure in Thermal Vac	McCauley	2003-08-15	2005-02-16
1002	STE-U Assembly problems (broken bond wire)	Curtis	2004-04-12	2005-02-16
1004	SEP LVPS Middle FM1 Problem	Heavner	2004-04-23	
1005	SEP LVPS Top FM1 Problem	Heavner	2004-04-27	2005-02-16
1006	STE-U FM1 Mis-wire (thermal vac feed-through)	Curtis	2004-04-30	2005-02-16
1007	SWEA LVPS FM1 LTC1877 Failure	Curtis	2004-05-10	2005-02-16
1008	STE-U FM1 Door failure (cold)	Curtis	2004-05-10	2005-02-16
1009	STE-U FM1 preamp oscillations	Curtis	2004-06-14	
1011	STE-U FM1 Door failure (post-vib)	Curtis	2004-06-28	2005-02-16
1012	IDPU FM1 LVPS part failure	Curtis	2004-07-15	2005-02-25
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	2005-02-25
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	
1031	FM2 IDPU Cold Start	Curtis	2004-12-28	2005-02-25
1032	FM2 IDPU Cold Start 2	Curtis	2005-01-14	2005-02-25
1033	FM1 SWEA Interface Errors	Curtis	2005-01-18	
1035	FM2 SWEA Anode12 (Actel)	Curtis	2005-02-17	
1036	SEP LVPS (Excess current at power-on)	Heavner	2005-02-27	

STEREO IMPACT Technical Progress Report

3. GSFC (SEP) Status

STEREO Progress Report for February, 2005 (GSFC: Tycho von Rosenvinge, Sandy Shuman, Kristin Wortman, and John Hawk)

During the past month we supported the SIT/SEPT Thermal Balance (TB) tests taking place at Goddard. This has required providing personnel 24 hours per day, including week-ends, when instruments were ON. An important part of this support has been the ability to monitor the instruments remotely over the internet (e.g. from Germany) using a Virtual Private Network (VPN) which is accessible through the Goddard firewall. We have had to extend the operation of this network way past the originally scheduled end-date. We are investigating the possibility of having a similar network to support the upcoming SEP FM2 EMC test.

We completed assembly of the SIT FM2 model for the TB Phase 2 test. For this we took extensive photographs and wrote a complete assembly procedure. Miswiring of the SIT FM1 pin-puller was corrected after the TB Phase 1 test was completed.

The Phase 2 test was delayed because we were having problems with the engineering SEP Central unit coming ON in a high current mode. The unit was returned to Berkeley where the cause was determined and repaired. The same fixes are going to be made on the two flight models.

We had three problems during the Phase 2 test. The most serious of these was the fact that the SIT solid-state detector became so noisy that we could not continue the test. We worked around this by opening up the TV chamber, disconnecting the detector, and resuming the test. Meanwhile we have received two new detectors from Ortec and they are currently under test to provide a replacement SIT detector so that we can proceed with the SIT TV test.

The second problem was that one of the eight SEPT doors failed to open cold when the other doors did open. Unfortunately the door released when the chamber was being returned to room temperature, so it was not possible to determine the exact cause of the door staying closed. After reopening the chamber we were able to see that the door latch was dragging over the surface of the thermal blanket. On the other hand, the amount of drag at room temperature was not nearly enough to prevent the door from opening. As a result, it is not altogether clear whether this was the cause of the failure or whether the mechanism bound up for some other reason. This is still under investigation.

The third problem is that, following the TB tests, it was discovered that the ITO-coated silver Teflon radiators had been attached to both the SITs and to the SEPTs with the wrong surface facing outward. This will be corrected next month. In the meantime the thermal properties of the surfaces which were actually exposed are being measured and calculations will be performed to make sure that the existing TB data is adequate to assure the thermal design.

The SIT door has been opening just barely enough for the latch to clear the field of view, which in principle is good enough. However it has not been opening to the original design

STEREO IMPACT Technical Progress Report

point, so we have obtained new springs which open the door completely. These will be installed prior to the SIT TV test. This installation is fairly easy. So far there have been no SIT door opening failures.

New L1 detector mounts were provided to Micron.

Next Month

Further investigate the cause of the SEPT door opening failure. An improved thermal blanket design is being developed and will be completed.

Complete testing of the two new Ortec detectors; install one of these in SIT FM2 so that we can begin the SIT TV test.

Install new radiators on all 4 SEPTs and 2 SITs.

Support the SIT vibration and TV tests at GSFC.

Support the acoustic/vibration tests, TB, and TV tests of LET/HET/SEP Central at JPL.

Investigate possible accelerator exposures to verify the new HET on-board processing algorithm.

4. Kiel/ESTEC (SEPT) Status

February 2005

4.1. Summary of Status

- a) Thermal Balance Test

4.2. Major Accomplishments

- a) Check-out of FM1 and FM2 after transport to GSFC. CPT without radioactive source, but with muon run. Passed.
- b) Bake-out of FM1 and FM2 simultaneously for 6 hours at 47 °C. Goal: outgassing rate <math>< 1.0 \cdot 10^{-11} \text{ g/cm}^2/\text{sec}</math> at 35 °C (predicted operational temperature). This corresponds to a TQCM criterion of $\dot{f} < 100 \text{ Hz/hr}$. Reached $\dot{f} = 30 \text{ Hz/hr}$. Passed.
- c) Install test heaters, thermocouples, MLI blankets.
- d) Perform TB Test Phase 1 (FM1 SEPT-E and FM2 SEPT-E). One out of 8 doors failed to open during hot soak because MLI blanket was blocking the door (see PR-7007). Otherwise passed.
- e) Perform CPT after TB Test Phase 1, including radioactive source (Co60). Passed.
- f) Postpone TB Test Phase 2 (FM1 SEPT-NS and FM2 SEPT-NS) until March 2005 because of SITFM2 and SEP-Central ETU availability.

4.3. Design Updates

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. Next step by ESTEC person in charge of Non-Disclosure Agreement.

4.5. New Problems

- 1. During the Hot Door Actuation the FM2 SEPT-E rear proton door did not open. The electron door that is opened by the same pin-puller did open. Pin-puller actuation was nominal. Chamber break and inspection revealed: MLI blanket was blocking the door. Need a blanket re-design. PR-7007 SEPT TB Door test failure raised.

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	
7007	SEPT TB Door test failure	Reichenthal	2005-02-11	

5. Caltech/JPL (SEP) Status

5.1. Summary of Status

Activities were primarily devoted to assessing what to do about two major problems that cropped up: high current at turn on of FM2 LVPS and shorting or potential shorting on EM Analog/Post Reg board. By month's end the repair procedures were in place and repairs had begun.

Major Accomplishments:

- SEP User's manual generated and sent to GSFC along with SEP Central EM unit to use with SIT/SEPT thermal balancing test.

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:

- L1 splice procedure was approved and repairs started at JPL.

Electronics:

- On Feb. 1, two major problems were discovered.
 - High current condition was noted upon turn on of FM2 LVPS when installed in SEP Central. Problem was eventually traced to floating FETs in LVPS. Solution is to install 8 resistors in each supply and also replace the potentially damaged FETs in the FM2 supply. By month's end the procedure was nearly in place and repairs were to be accomplished in March.
 - An intermittent short was found in the EM Analog Post/Reg board. It was traced to the pins on an MDM connector being so close to the metal body of the connector that when the connector was put on the board, the connector body shorted to the pads around the holes that receive the pins. In addition, there are traces and vias under some connectors (Nanonics and MDMs) that are relying on solder mask to keep from shorting. This also was found to affect one connector on the LVPS. By month's end a plan to remove the connectors involved on both flight and EM boards and install a thin insulator was devised. The repair of the EM Analog Post Reg board was done quickly and the unit installed in the EM SEP Central. The flight unit repairs will occur in early March.
- The SEP Central EM unit was shipped to GSFC along with a newly created user's manual so that the SIT/SEPT thermal balance test could get underway.

Software:

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

GSE:

- Worked on the User's Guide.

STEREO IMPACT Technical Progress Report

5.2. *Design Updates*

- Resource updates will be sent separately.

5.3. *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 were repaired by moving the epoxy blobs that provide strain relief. A procedure for splicing the broken wires was approved and repairs started.

5.4. *New Problems*

- High current at turn on of FM2 LVPS.
- Potential shorts under connectors on Analog Post/Reg board and LVPS.

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.

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*

- The lien list will be transmitted separately.

SIT MONTHLY TECHNICAL PROGRESS REPORT

February 2005

5.8. SUMMARY of STATUS

- a. FM1 unit - At GSFC complete. Waiting for vibration and TV testing
- b. FM2 - At GSFC complete. Waiting for vibration or thermal balance, and thermal v
- c. Spare SSDs – At Ortec waiting replacement.
- d. Flight Software – Current version is 09/03/04 and is under test at UMD .

5.8.1. Schedule Changes

The current SIT schedule is available from the project scheduler.

5.9. MAJOR ACCOMPLISHMENTS

5.9.1. This Month

- FM1 – fully assembled. Door function verified.
- FM2 – Final internal assembly and inspection of telescope and electronics. Returned to UMD for successful high voltage and alpha tests.
- Thermal Balance – performed thermal balance testing on FM1
- Acoustic test was performed on both FM1 and FM2. No damage to foils on either unit.
- Spare SSDs (2) – returned to Ortec for replacement

5.9.2. Next Month

Thermal balance test on FM2. Vibration on both units. Thermal vacuum testing, both units.

5.10. DESIGN UPDATES

5.10.1. Resources

	Last Month	This Month	Change
Mass (kg) *	1.46	1.565	0.105
Power (W)	1.65	1.65	0
Telemetry (bps)	418	418	0

* Weighed

5.11. OUTSTANDING PROBLEMS

We still have not succeeded in procuring any flyable SSD spares.

STEREO IMPACT Technical Progress Report

5.12. **NEW PROBLEMS**

Spring opening angle on SIT door mechanism is marginal. Have ordered replacement springs to open door about 20 degrees wider.

5.13. **NEW RISKS**

5.14. **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	
PR3006	Fit problem of SSD in telescope	PHW	1/7/05	
PR3007				

6. CESR (SWEA) Status

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

7. 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

8. EPO at UCB

Monthly E/PO Report

February, 2005

Formal Education:

R. Morales Manzanares continued to make updates to the classroom sonification software for the STEREO sounds project to better accommodate the “Running from the Sun to Earth” lesson.

L. Peticolas submitted an invited talk abstract for Spring AGU on the STEREO-IMPACT project of converting solar data to sounds. The title of the abstract is: “Space Weather Sonification for scientists, educators, and musicians” with authors L. M. Peticolas, R. Morales Manzanares, D. Bithell, N. Craig, J. G. Luhmann, and S. D. Bale.

500 *Stereo-Impact lithos* were requested to be used for Teacher professional Development programs and shipped to a NASA/JPL Solar System Ambassadors in Massachusetts.

Informal Education:

STEREO Publics Affairs officer and STEREO E/PO Leads had telecon February 24th to discuss how to share the list of EPO activities that are in the plan for each organization and update the websites reflecting the overall collaboration of various groups.

N. Craig and L. Peticolas will participate at the SWG meeting in Hamburg Planetarium in May 2nd through 4th giving an overview of the E/PO programs on behalf of the all STEREO E/PO programs and also participate in the public program with the Magnetism Activity demonstrations at the Planetarium.

L. Peticolas attended the “Expanding Your Horizon” Event on February 26th where 500 girls came to discover potential career choices. 150 STEREO flyers were handed out along with other NASA solar and aurora materials and girls explored 3-D magnetic fields using iron filings in a bottle and a cow magnet in the middle in a cylinder made of rolled up cardboard.

STEREO in general:

N. Craig, T. Kucera and D. Christopher planned the final Spring AGU SH02 -. *Bringing the Sun to Earth: Solar and Sun-Earth Science Education and Public Outreach Efforts* - session papers and talks, submitting to AGU for the final program

We had not yet received the FY05 E/PO funds from GSFC and inquiries were made.

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