



Heliosiesmic & Magnetic Imager

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Monthly Progress Report February 2006

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Table of Contents

1.0	Introduction.....	3
2.0	Executive Summary.....	3
3.0	Technical Progress Report.....	3
3.1	Filters and Optics.....	3
3.2	Mechanical.....	3
3.3	Mechanisms.....	3
3.4	Electrical.....	3
3.5	Software.....	4
3.6	I&T.....	4
3.7	Thermal.....	4
3.8	Major Sub-contracts.....	4
3.8.1	CCD – e2v.....	4
3.8.2	Camera Electronics – RAL.....	4
3.8.3	Michelson – LightMachinery.....	4
4.0	Design Updates.....	4
5.0	Resource Requirements.....	4
6.0	Schedule and Control Milestones.....	5
7.0	Critical Path.....	6
8.0	Risk Assessment.....	6
9.0	Change Control Board.....	6
10.0	Discrepancy Reporting.....	6

1.0 Introduction

This is the monthly progress report for the month of February 2006 of the HMI program for the progress undertaken by LMSAL under the phase C/D/E contract with Stanford. The LMSAL team is in collaboration with Stanford University on the HMI/SDO solar physics investigation being led by Professor Phil Scherrer of Stanford University.

2.0 Executive Summary

February was a great month we complete taking the data for the Sun testing and started reworking the optics package! Some additional highlights include: completed initial testing of the ISS, completed assembly and test of the LED assembly, started disassembly of the optics package and started testing of the CIF board. The HMI team continues to hold weekly team meetings internally, with the SDO Project and with suppliers. The daily stand up integration and test meeting continues.

3.0 Technical Progress Report

3.1 Filters and Optics

The front window filter completed the charging test. The second exposure revealed the same effect as the first and the type of o-ring used appears to have no relation to the flame structures. The effect is not fully understood and some tests are being performed to characterize the impact: material test, repeat BRDF and spectral transmission test. The Lyot has been removed from the optics package and the new E1 and E2 have been replaced. Currently, the Lyot is being tuned. The second set of Michelson's phase map measurements were completed and the baseline is to use the second set for the flight assembly. They are ready for installation.

3.2 Mechanical

The mass simulator is ready to ship and the data package was provided to Goddard. There are only a couple parts (rework items from the optics package assembly) remaining and are due eminently.

3.3 Mechanisms

The door parts are clean and being fit checked with the optics package this week prior to final assembly.

3.4 Electrical

The flight head boards have been assembled. The first is in test and the connectors are being installed on the second. The flight PCI bridgeboard and housekeeping boards are in test. The brass board camera interface test is progressing. Data is flowing and is being analyzed: testing with the DM camera will begin in a few days.

3.5 Software

The Sun testing has stopped and in the meantime development of the sequencer and the flight software for the camera interface board are progressing (getting ready for in air calibration next April).

3.6 I&T

Now the Sun test is completed, the analysis is well underway and progressing well. It turns out the front window filter is fine: the polarization effect was due to the angle of the rays through the polarization selector. This effect is inherent to the design and was not calculated originally for calibration mode. This has no impact to the operational mode. It will make calibration a little more challenging. Right now, the optics package is being reworked. The CCD fold mirrors have been removed to bond the optics. The oven has been removed: the Lyot is being reworked, the first set of Michelsons removed for storage and the wave plates in the HCM are being bonded. The next thing to come out is the ISS mirror and then the telescope (left in to continue ISS testing finishing up this week). The ISS testing was completed and meets the specification beautifully. The new part for the Limb sensor is in and the flight assembly (replacing a painted part) is being assembled. The lab set resistors will be selected, once the Sun is available again.

3.7 Thermal

A new person has joined the team to start work on the MLI drawings this week.

3.8 Major Sub-contracts

3.8.1 CCD – e2v

All flight detectors are in house and the top two have been selected. Ready for assembly.

3.8.2 Camera Electronics – RAL

DM1 was returned to RAL for the driver card upgrades done to DM3. All cards for FM 8 are in test and 3 board types are clear for production. A couple team members are visiting RAL this week to review progress and the schedule. Recent schedule slips have moved the CEB to the critical path and have reduced program schedule contingency.

3.8.3 Michelson – LightMachinery

All Michelson's are in house.

4.0 Design Updates

No updates.

5.0 Resource Requirements

The mass and power updates are attached.

6.0 Schedule and Control Milestones

The base-line schedule has been submitted.

CM#	Line#	Task	Baseline	Jan	Feb	Slack	Status
CM01	NA	Primary and Secondary Lenses Fabrication	11/24/04	11/24/04	11/24/04	0	100%
CM02	NA	Fabricate Flight Blocker Filters	08/20/04	04/19/04	04/19/04	0	100%
CM03	303	Development Camera 2 Delivery (return)	02/24/05	02/24/05	02/24/05	0	100%
CM04	NA	Structural Model Test Complete	03/15/05	03/15/05	03/15/05	0	100%
CM05	322	Test s/c High Rate Interface Brass Board	02/10/05	02/10/05	02/10/05	0	100%
CM06	8	Critical Design Review	11/20/04	11/20/04	11/20/04	0	100%
CM07	129	Michelson Delivery (first set)	05/09/05	05/09/05	05/09/05	0	100%
CM09	326	Build 2 Test (Enhanced Kernel Complete)	12/13/04	12/13/04	12/13/04	0	100%
CM10	329	ISS (Build 4)	01/19/05	12/22/05	12/22/05	0	100%
CM11	158	First Lyot Filter Complete (w/ bad E1)	08/01/05	10/28/05	10/28/05	0	100%
CM12	327	Mechanism Control (Build 3)	01/17/05	08/26/05	08/26/05	0	100%
CM13	93	Receive Pre-Amp Flight Electronics	10/03/05	11/22/05	11/22/05	0	100%
CM14	NA	Fabricate Flight Aperture Filter	07/12/05	03/07/05	03/07/05	0	100%
CM15	NA	AM Flight Assembly and Test	07/29/05	08/22/05	08/22/05	0	100%
CM16	NA	Flight Structure Delivery	06/30/05	07/08/05	07/08/05	0	100%
CM17	324	BB HEB System Test	03/15/05	11/17/05	11/17/05	21	93%
CM18	92	HMI ISS BB Testing Complete	01/24/05	01/24/05	01/24/05	0	100%
CM19	323	BB Camera Interface and DCHRI Integrated Test	03/08/05	01/24/06	01/24/06	21	93%
CM20	253	Door Flight Assembly and Test	11/21/05	03/03/06	03/23/06	7	78%
CM21	NA	Shutter Flight (2) Assembly and Test	08/26/05	08/08/05	08/08/05	0	100%
CM22	NA	Telescope Assembly and Alignment	06/28/05	05/31/05	05/31/05	0	100%
CM23	241	FW Flight (2) assembly and test	08/05/05	10/17/05	10/17/05	0	100%
CM24	308	HEB Brass board Ready w/o DCHRI & CIF	09/01/05	10/03/05	10/03/05	0	100%
CM25	NA	HCM .7 quartz Optic Assembly	08/10/05	09/16/05	09/16/05	0	100%
CM26	190	Oven Controller Pre-amp Needed	07/15/05	08/22/05	08/22/05	0	100%
CM27	200	Flight Oven Complete	08/26/05	03/16/06	03/24/06	3	0%
CM28	296	Flight CCD (3rd set) Delivery New process	07/19/05	12/19/05	12/19/05	0	100%
CM29	304	Proto-Flight Cameras 1,2 Delivery	11/11/05	05/11/06	06/06/06	0	100%
CM30	341	Mass Model Delivery to SDO	01/10/06	03/01/06	03/01/06	0	100%
CM31	413	HOP Integration Complete	02/06/06	06/01/06	06/26/06	1	0%
CM32	328	Oven Operation Heaters (Build 3)	NA	01/10/06	01/10/06	0	100%
CM34	310	HEB Flight Ready	03/01/06	07/03/06	07/03/06	31	76%
CM35	312	HEB-HOP Flight Harness Completion at Goddard	11/11/05	04/28/06	04/28/06	4	75%
CM36	432	FSW Acceptance Test	NA	08/21/06	08/29/06	0	0%
CM37	433	Comprehensive Performance Test (CPT)	05/15/06	09/04/06	09/12/06	0	0%
CM38	415	HMI Calibration	03/20/06	07/06/06	07/14/06	0	0%
CM39	422	HMI Pre-Environmental Review	03/16/06	04/18/06	04/18/06	0	0%
CM40	460	Instrument Delivery (leaves LM)	02/02/07	02/02/07	02/02/07	9	0%

7.0 Critical Path

As mentioned last month we have lost a few days of schedule contingency due to the slip in the CEB delivery date.

8.0 Risk Assessment

A risk management review board was held this month.

Risk ID	Title	Board	Status
RMHMI018	Front Window Charging	RMRB 9 Mar 2006 No change in rankings. Charging test completed; data under evaluation. Meeting tomorrow to review data and formulate a plan.	Open
RMHMI019	Electronic Parts Deliveries	RMRB 9 Mar 2006 Lowered Likelihood. Most parts have been delivered; remaining known impacts already worked into schedules.	Open
RMHMI020	Camera Interface Board Design	RMRB 9 Mar 2006 No change in rankings. CIF brass board is in test and has successfully transferred data from the camera interface to the SSIM.	Open
RMHMI022	CEB Driver Board Parts Availability	RMRB 9 Mar 2006 Lowered likelihood. Up-screening of commercial grade parts is proceeding well. Delivery of the flight grade parts has slipped to mid-March.	Open
RMHMI023	Painted Rather than Anodized Parts Discovery	RMRB 9 Mar 2006 Closed. Replacement parts are in.	Closed
RMHMI024	Power Board Relay Procurement	RMRB 9 Mar 2006 Lowered likelihood. Sufficient relays found and in procurement. 10 amp relays are replacing 5 amp relays in previous design.	Open

9.0 Change Control Board

No changes to report.

10.0 Discrepancy Reporting

The Q-note report is attached.