|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Investigation: FIELDS | | | | |
| Progress accomplished this period: | | | | Dec 2012 Reporting Period |
| 1. | Project Management and Product Assurance | | | |
|  | a. | Project Management   * Supported the following Acceptance Reviews   + SDP SNs 7&8.     - Panel agreed to delivery. * Supported the following PSRs:   + None * Supported the following PERs:   + None * Supported the following TRRs:   + SDP 7&8 penalty TV test   + FM3 CEB TV test * Supported the following FRBs   + SN3 GDU fold-backs and communication locks * Received delivery of the following flight hardware items at UNH   + FM4 set DFG – sensor and electronics (from IWF)   + FM4 set AFG – sensor and electronics (from UCLA)   + FM3 set fluxgate harnesses (from UCLA) * Delivery of the following flight hardware items from UNH to FIELDS partners   + None * Delivery of the following flight hardware items from UNH to the IS   + SDP SNs 7&8 * CDRL and contract deliverable submissions this month:   + None * Prioritized and coordinated the efforts of subcontractors, foreign partners, outside vendors and in-house workshops to optimize schedule performance. This month’s activities in this regard include:   + UNH machine shop     - Fabricated remaining EDI Bulkheads (SN08, SN09)     - Fabricated EDI MCP Clamp Rings     - Fabricated EDI GDE Closeout Covers     - Worked on small SDP parts (installed drive pins in metering wheels, cleaned helicoils)   + - UNH electronics shop     - Worked on SDP motor harness wiring for SN09/10     - Began population of the FM4 EDI Controller Board     - Began population of FM4 CDPU-A Board   + Vendors     - Coordination of vibration test activities with our vendor, BAE (SDP).     - Surface treatment of FM SDP and EDI parts   + FIELDS team partners, IS and S/C teams     - This continues to be a major part of the agenda at weekly FIELDS team meetings     - The weekly meeting is used to coordinate deliveries to and testing at IS and S/C levels. It is important that these teams participate in the weekly FIELDS meeting.     - U of Iowa completed assembly of the remaining EDI Sensor Digital Boards | | |
|  | b. | Product Assurance | | |
|  |  | Turco / Salwen   * Supported EDI FM3 TV testing * Stake FM5 EDI Sensor PWAs * Sent Sensor Digital PWA kits to Iowa * Outgas certification for EDI FM3 * Final inspection, contamination control and bagging of SDP FM 7&8 * Inspection of EDI Preamp 6 trimming * Receipt from Iowa and inspection of Sensor Digital 6 PWA * Outgas certification of SCM FM3 harness * Support of SDP crimp wire investigation * Parylene source inspection of EDI Sensor FM4 PWAs * Kitting: EDI Controller, CDPU A/B, EDI-MCP, and EDI HV Filament boards. All FIELDS electronics kitting is now complete. * SDP FM 7 and 8 TVAC Testing * SDP FM7 and 8 Instrument and Preamp closeout activity * SDP FM 9 and 10 Bracket thermal bonding activity * CEB TVAC support.   Software Product Assurance (Heirtzler)   * EDI and CDPU software packages are stable. | | |
| 2. | Systems Engineering and FIELDS I&T | | | |
|  |  | Rau / Dors   * Performed SDP SN07/08 EMI, FIT and FIELDS Acceptance testing * Received FM4 DFG/AFG electronics and sensors and FM3 mag harnesses and performed Acceptance testing * Continued FIELDS verification entry into DOORS | | |
| 3. | Post-Delivery Support | | | |
|  |  | * Supported and reviewed WOA development at IS and OBS   IS-1 and Obs-1 FIELDS   * Fit checked the magnetometer harnesses to flight mag boom * Supported OBS-1 EMI Risk Reduction Test and data review * Removed SDP SN01/EQM from OBS-1 and returned to UNH * Removed EDI GDU SN02 from OBS-1 and returned to UNH   IS-2 and Obs-2 FIELDS   * Delivered SDP SN07/08 to IS I&T * Installed SDP SN07/08 onto OBS-2 * Supported integration of IS deck 2 to S/C deck 2 | | |
|  |  | | | |
| 4. | Science activities | | | |
|  |  | SWT and SWG   * Supported science activities as needed   Science data processing activities   * Began planning for FIELDS data processing meeting to be held at LASP n March | | |
|  |  |  | | |
| 5. | Magnetometers | | | |
|  | a. | DFG |  | |
|  |  |  | * Delivered the forth flight model and the data package | |
|  | b. | AFG |  | |
|  |  |  | Completed deliveries prior to December:   * FM1 complete set [DFG Sensor S/N 04, AFG Sensor S/N 05, AFG Electronics S/N 01], * FM1 flight harness set (boom S/N 01 and S/N 02, CEBW6 S/N 01, CEBW4 S/N 01) * FM2 complete set [DFG Sensor S/N 08, AFG Sensor S/N 06, AFG Electronics S/N 02], * FM2 flight harness set (boom S/N 03 and S/N 04, CEBW6 S/N 02, CEBW4 S/N 02) * FM3 complete set [DFG Sensor S/N 07, AFG Sensor S/N 09, AFG Electronics S/N 03] * FM4 DFG Sensor (S/N 10) delivered * FM4 AFG Sensor (S/N 11) delivered to UCLA   Cables:   * FM3 Harness delivered and FM3 Harness EIDP posted on SiteScape for review * Continued FM4 harness set fabrication   Flight Sensor and Electronics:   * AFG AFG FM4 delivered to UNH (AFG Sensor S/N 11, AFG Electronics S/N 04) * AFG FM4 EIDP posted on SiteScape for review | |
|  |  |  |  | |
|  | c. | SCM | * SCM FM1 => SENSOR S/N FM1 + PREAMP S/N FM1   + - Delivered to UNH, 03 OCT 2011 * SCM FM2 => SENSOR S/N FM2 + PREAMP S/N FM2   + - Delivered to UNH, 25 JUL 2012 * SCM FM3 => SENSOR S/N FMS + PREAMP S/N FM4   + - Delivered to UNH, 25 JUL 2012     - FM3 harness delivered at UNH without the outgassing certification * SCM FM4 => SENSOR S/N FM3 + PREAMP S/N FM5   + - Calibrated at Chambon-la-Forêt in December * SCM FMS => SENSOR S/N FM4 + PREAMP S/N FM3   + - Sensor coils at LPP (8 coils). Remaining steps of the manufacturing are the first X-ray inspection, the potting, the mounting in the triaxial interface and the cabling.     - Preamp vibrated safely at acceptance levels     - No additional drift measured on the Preamp noise after vibration.     - Preamp compliant with the sensitivity requirements, except at 10 Hz where the noise is slightly above the requirement     - Waiver requested for a use as a spare model     - NCR => MMS-SCM-NC-PRE-140     - Waiver => MMS-SCM-RW-PRE-606 * NCR and alignment measurements report to be completed (MMS-SCM-NC-TRI-623-LPP and MMS-SCM-PR-TRI-622). | |
|  |  |  |  | |
| 6. | EDI | | | |
|  |  | Ship set 1 - GDU SN 1  Top level (GDU)   * Received GDU SN 2 – returned to UNH from GSFC. * Ship set 1 - GDU SN 3   + T/V test   + Detector Characterization   Sensor   * Ship set 2 - SN 5   + Sent out boards for parylening * Ship set 3 - SN 6   + Preamp Trimming, Preamp Delay Test   + MCP Supply Board level test   Gun - UNH efforts   * Received damaged HV-FIL board SN 4 and BGS SN 5 from IWF for inspection and repair   Gun - IWF efforts   * Ship set 2 - SN 4   + Finished re-assembly of Gun   + Started calibration (finished in early January)   + Calibration data review revealed anomalous behavior of 2 optocouplers (deflection 6&7) * Ship set 2 - SN 5   + Finished board level testing * Opto-coupler screening   + A total of 100 couplers have received vacuum burn-in and have been x-rayed   GDE   * Finished acceptance testing for all remaining units * Delivered SN 5 & 6 to IWF   Optics   * Continued work on ship sets 2,3,4 | | |
|  |  |  | | |
| 7. | SDP/BEB/LVPS | | | |

|  |  |  |
| --- | --- | --- |
|  | a. | SDP/BEB/LVPS (KTH/IRFU/Oulu)  KTH/IRFU SDP BEB’s:   * Sent and receive back units FM13-14 from parylening. * Need to perform final testing on Unit FM13-14. * Unit FM15-16 completed comprehensive testing at IRFU, all nominal. * Sent and receive back units FM15-16 from paralyning, need to perform incoming inspection and final test. * Continue to define and manufacture SDP Calibration test at IRF-U, ready for testing during King’s next trip to Sweden end of Jan.   KTH/IRFU SDP Preamp/Boom Cable Assembly:   * Comprehensive testing of unit FM15-16 have been completed at IRFU along with S-BEB’s (all nominal)..   KTH/Oulu/IRFU Sphere / Yo-Yo Mechanism:   * Received E2 and now C2 probe for refurbishment after slipped crimp investigation. * Needed to manufacture more crimps to complete refurbishment of these probes and for the ones to come. * Crimps have been receive at KTH and are at the platters.   KTH/IRFU/Oulu Management:   * Continue to work all issues related to testing, documentation, hardware, shipping and QA/PA and shipping needs.   KTH Product Assurance (OHB Sweden):   * Inspection of SDP FM15-16, before parylening, including documentation and test results * Final inspection of SDP FM13-14 after parylening * Discussions about issues found during parylene of FM13-14 (This has to do with minor change in the masking technique and has been resolved) |
|  | b. | SDP/BEB/LVPS (UNH)  LVPS:   * Open work: FM5 Comprehensive test at UNH. * FM LVPS  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  | **Assembly** | | **Test** | | | **Shipped** | **Incoming** | | **Unit** | **Board Status** | **MIP** | **EE at KTH** | **EE at IRFU (Thermal)** | **Parylene** | **To** | **Inspection** | | FM1 | Complete | Complete | Complete | Complete | Complete | UNH | Complete | | FM2 | Complete | Complete | Complete | Complete | Complete | UNH | Complete | | FM3 | Complete | Complete | Complete | Complete | Complete | UNH | Complete | | FM4 | Complete | Complete | Complete | Complete | Complete | UNH | Complete | | FM5 | Complete | Complete | Complete | Complete | Complete | UNH | waiting UNH Test |     A-BEB’s:   * Removed two bad helicoils from FM5 (spare) housing based on discussion with LASP. After which shipped lower housing to LASP to replace locking helicoils (need special tool). * AEB SN5 (spare): Received lower housing back from LASP with repaired heliciols. * FM ADP  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  | **Assembly** | | **Test** | | | **Shipped** | | | **Unit** | **Board Status** | **MIP** | **EE at KTH** | **EE at IRFU (Thermal)** | **Parylene** | **To UNH,**  **Incoming Inspection** | **To LASP** | | FM1 | Complete | Complete | Complete | Complete | Complete | Complete | Done | | FM2 | Complete | Complete | Complete | Complete | Complete | Complete | Done | | FM3 | Complete | Complete | Complete | Complete | Complete | Complete | Done | | FM4 | Complete | Complete | Complete | Complete | Complete | Complete | Done | | FM5 | Complete | Complete | Complete | Complete | Complete | Complete | Stored at UNH |   S-BEB’s:   * Set up, but not yet executed, is the review of FM 12 BEB set. Returned early from KTH with possible bad connector causing motor/ HOP intermitted operation (parylene suspected in connector socket). See problems: • Post Coating Functional Test Anomaly (SN12 SDP BEB CP12 and AM12 PWAs) (AR-10160.53-13-IP).   SDP MGSE:   * Continuing documentation updates to reflect duel set-up and assembly   UNH SDP EGSE:   * Minor GSEOS software up-dates (displays).   SDP Preamp:   * Updated preamp assembly process for S/N9 and 10 and of future unit to incorporate an Arathane mask between the boot-strapped cylinder and incoming 7 conductors. This is added margin to the Teflon wire break down due to radiation for the extended mission. See problems: Wrong Teflon insulation used on SDP Preamplifier wiring (SNs 9-18) (AR-10160.53-11-AP).   SDP Mechanical:   * 5 Trumpet pieces machined, platted, inspected. Began damper sub-assembly of these 5 pieces. * Prepared FM7 & FM8 for delivery to FIELDS Systems Engineering and onto NASA. Units accepted at GSFC prior to break. * Integrated FM9 & FM10 with incorporated fixes to thin wire crimping and pre-amp coating for added insulation. Units to move to vibs. * Shop is working on various piece parts for FM11 onward including Trumpet insulators, Torque Monitor bushings for assembly of FM11 T/M's onward * FM13 & FM14 kits started   SDP Thermal:   * Completed thermal vacuum testing on SDP FM7 & FM8 thermal testing * Continue to write thermal test report / as run procedure for FM5-6, FM7-8.   SDP EMC:   * Conducted EMC/EMI and magnetic testing for unit FM7-8. Both FM7, 8 passed but are not in family with FM3-6. Preliminary study is focus on synchronization of the two H-bridge drives used to drive the motor.   SDP Motors:   * On going, Data compiled and Motor Selection/Characterization report.   FM SDP   * Invited Bill V. to UNH to complete the study/FRB and conduct crimp on S/N 7-10 with before and after test witness. * Sent Ti wire to LASP for testing crimps.  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | **Electrical** | **Mechanical** | |  | **Test** | | | | | | **Unit** | **Board Status** | **Assembled** | **Inspection** | **Test (FFT)** | | **Vibe** | **Test (FFT)** | **TV** | **Post Test** | | Test Unit FM1 | Needs rework | Modified & in test | NA, test unit | NA, test unit | | NA, test unit | NA, test unit | NA, test unit | NA, test unit | | FM2 | Needs rework | In Storage | NA | NA | | NA | NA | NA | NA | | FM3 | Completed | Completed | Completed | Completed | | Completed | Completed | Completed | Completed | | FM4 | Completed | Completed | Completed | Completed | | Completed | Completed | Completed | Completed | | FM5 | Completed | Completed | Completed | Completed | | Completed | Completed | Completed | Completed | | FM6 | Completed | Completed | Completed | Completed | | Completed | Completed | Completed | Completed | | FM7, 8 | Completed | Completed | Completed | Completed | | Completed | Completed | Completed | Completed | | FM9-10 | Completed | Completed | Completed | In-process | |  |  |  |  | | FM11-12 | Complete |  |  |  | |  |  |  |  | | FM13-14 | Complete |  |  |  | |  |  |  |  | | FM15-16 | In-process |  |  |  | |  |  |  |  | | FM17-18 | In-process |  |  |  | |  |  |  |  |   SDP QA:   * Continued working out shipping and receiving details for SDP. * Continued work on individual deployer issues, update assembly activity sheet to reflect any changes, with review and complying of work sheets. * Monitored the assembly and test activities for the flight units   AEB (UNH)   * Received completed reworking of two housing heliciols, need to re-assemble A-BEB’s into housing. |
|  | c. | SDP (LASP) (door and preamp)   * Supported fine wire crimp failure investigation and recovery   + Updated and released drawings for flight crimp ferrules   + Ordered parts for flight crimp ferrules   + Ordered a torque wrench and fabricated an adapter for the wrench / chuck interface   + Fabricated fifteen test ferrules for torque requirement determination |

|  |  |  |  |
| --- | --- | --- | --- |
| 8. | ADP | | |
|  | a. | ADP Extensible Booms, Receiving Elements & AEB   * MLI attachment buttons bonded to all 8 FM ADP Booms * A process was developed for repainting DAG coated surfaces using coupons and the ADP QM Receiving Element. The process details were provided to the UNH and SwRI and direction was provided to proceed with rework on SN01 ADP Receiving Element. This rework will happen mid-January followed by a full functional test. * ADP RE horizontal deployment procedure was revised and updated as a result of the scratched sensor anomaly. * An electrical full functional and a horizontal deployment of ADP RE SN01 were performed (post-anomaly). * Calibration was performed on ship set #4 ADP RE's (SN07 and SN08) and the FM4 AEB. Calibration data analysis is in process. * Improvements in the ADP/BEB noise test were made. * Parts and materials for the additional ADP IS and Obs simulators were procured. * Participated in a planning telecon for -Z ADP integration on the first observatory * ADP ship sets 1 and 2 were shipped to GSFC. * TV testing of the FM4 AEB was completed. During the cold survival cycle the FM4 AEB was inadvertently taken to -63 C while unpowered. The cold survival protoflight test temperature for AEB is -45 C (+/- 2 C). Two serial human errors led to this over-test condition. After the anomaly, the TV test was continued and all electrical tests passed. LASP is currently in the process of evaluating the 8 different BEB parts that do not have storage temperature ratings of -65 C. * Ship set #4 ADP RE's (SN07 and SN08) were calibrated with the FM4 AEB. | |
|  |  |  | |
| 9. | DSP, Thermal, Systems Engineering, Product Assurance and Management (LASP) | | |
|  |  | DSP   * DSP verification for ship set #4 (SN12 and SN13) completed. * DSP ship set #4 ready for shipment to UNH. Board will be shipped when UNH requests delivery. DSP ship set #4 calibration report cannot be completed until the FIELDS FIT test absolute timing test results are provided to LASP.   Thermal   * Supported AEB FM4 TVAC test   Systems Engineering & Project Management   * The cost estimate for the ADP RE spare was iterated per UNH and SwRI request.   Quality Assurance, Parts, and Materials Engineering   * Supported inspection activities as necessary. | |
| 10. | CEB | | |
|  | a. | Hardware | |
|  |  |  | CDPU & BPM (Bodet)   * FM4 BPM assembled, coated, tested – ready for CEB. * Kitting complete; began assembly of FM4 set CDPU boards   CEB (Rau, Dors, Nolin)   * Prepared for and started FM3 CEB TV testing. Test suspended after first 5 cycles for the holiday break. So far, no anolamies. |
|  |  |  |  |
|  | b. | CDPU Software, Support for Operations, I&T and Post-Delivery activities (Needell) | |
|  |  |  | * Supported IS2 CTP/ Burst Test * Supported IOBS1 EMI Risk Reduction Test * Supported CEB FM3 TVac |
|  |  |  |  |
| 11. | GSE (Mello, Chutter, Bodet) | | |
|  |  | GSE Hardware   * No activity   FIELDS Simulator   * No activity   GSEOS & GSE Software   * Support CDPU FM3 Testing * Support SDP Testing * Support I&T Efforts * SOC Connectivity Testing * EDI Beam Generation System Improvements * Telemetry Screen Improvements * Telemetry Spreadsheets Updated * Keep software repository update | |
|  |  |  | |
|  | | | |
| 12. Problems encountered (some resolved) and updates this period | | | |

|  |  |  |
| --- | --- | --- |
|  |  | AEB   * Lower Temp Limit Exceeded during TV test (AEB FM4) (PFR-10160.53-82-IP)   + FM4 AEB was tested to -63 C during its survival cycle. The correct protoflight test temperature was -45 C. The AEB was unpowered during this over-test.   + It was recommended to proceed with the TV testing with elevated awareness to patterns of drift with respect to offsets, currents, and voltages through the future thermal transitions. This was done and included two additional TV test cycles.. No anomalous performance was observed.   + The storage temperatures of all parts within the AEB were reviewed to determine if the temperature exceeded any manufacturer's recommendations. In light of the successful completion of the TV testing without any anomalies, it is UNH's recommendation to "use-as-is".   + The list of devices was provided by KTH (Olsson) to LASP for review of manufacture data. Closure awaits completion of that review.   ADP RE   * Sensor Tip Scratches during Deployment (ADP RE SN01) (PFR-10160.53-76-CR)   + Scratch the ADP RE SN01 (ship set #3) sensor during a functional deployment test. The deployment test procedure has been corrected to prevent this from happening again. The plan going forward is to repair SN01.   + LASP has developed and demonstrated a rework process using non-flight hardware. The description and plan is attached, filename; MMS\_ADP\_SN01\_scratched\_sensor\_anomaly (rev2).pptx. Dirks, Gerhardus, Turco, Rau, and Macri reviewed and approved the plan presented. LASP is authorized to rework the SN01 RE per this plan.   + Closure awaits customer approval.   SDP   * Anomalous wire deployment (EMI-related) (SDP TVAC, S/N FM7 & FN8) (PFR-10160.53-77-IP)   + Still resolving EMI issue seen in TV chamber.   + FRB disposition: study the effect using EM hardware when available. Proceed with SN7&8 acceptance testing and delivery.   + SN7&8 acceptance testing and delivery were completed in December.   + EM SDP hardware was removed from the IS decks in December and returned to UNH. King and Olsson are using it to investigate for root cause. * SDP Anomalous wire deployment (2nd of 2, EMI-related) (SDP TVAC, S/N FM5) (PFR-10160.53-69-IP)   + Fully recoverable situation   + Evidence points to EMI related to the TV test environment as the cause. NCR to remain open until additional testing can clearly identify the root cause.   + Risk of proceeding with SDP delivery is low.   + Continued monitoring for and studying this anomaly during the SDP 7&8 TV test. Still unresolved.   + SN7&8 acceptance testing and delivery were completed in December.   + EM SDP hardware was removed from the IS decks in December and returned to UNH. King and Olsson are using it to investigate for root cause. * Wrong teflon insulation used on SDP Preamplifier wiring (SNs 9-18) (AR-10160.53-11-AP)   + It was determined the PFTE insulated wire was used in 10 of the SDP preamps.   + LASP analysis concludes radiation exposure will be below level of concern   + Determine if an insulator can easily be added between the bootstrap and PTFE insulated wires on the affected preamps.   + Disposition (FRB 7 Dec): coat bootstrap surface with arethane respecting a keep-out zone where the Ultem sleeve makes contact.   + Process defined and approved to apply additional insulation (conformal coating) to the surfaces that may contact the subject wires. Implemented successfully on SNs 9&10.   + NCR closure awaiting customer approval   + Impact to other units:     - SNs 3-8 have the correct insulation.     - Conformal coating process will be performed on remaining units (SNs 11-18) * Sweep Test Response - fine wire disconnected (SDP FM8) (PFR-10160.53-75-IP)   + Inspection revealed the fine wire from the probe/yo-yo assembly had come completely out of the crimp ferrule inside the preamplifier during the TV test.   + TV test of SDP SNs 7&8 was completed.   + Root cause investigation revealed inadequate control of the crimping process. FRB defined rework and retest activities.   + Crimp process redefined and approved   + Impact to other units:     - SNs 3-6 will be reworked     - New process applied successfully to 7-10     - New process applies for all subsequent units   + Macri recommends NCR remain open until rework is complete on units already delivered: SNs 3-6. * Post Coating Functional Test Anomaly (SN12 SDP BEB CP12 and AM12 PWAs) (AR-10160.53-13-IP)   + Observed at KTH just prior to planned hand-carry of multiple units by Brian King to UNH.   + Import licensing required this unit to be returned to UNH.   + Olsson (KTH) at UNH week of 7 Jan 2013 inspected the unit with QA and King. Problem identified as Parylene on the contacts inside the connector on one board. Plan forward is to have the Parylene removed and perform a retest of the board at UNH. In discussion with KTH it is agreed that the unit need not return to Sweden for retest or repeat of calibration.   EDI   * Negative Current spikes seen on Plate 7 Optocoupler during calibration (GUN SN4) (PFR-10160.53-85-IP)   + HK data analysis done at IWF indicates problems with several optocouplers. OC7 shows the isolated downward spikes. Manfred (IWF) is confident that replacing the positive side optocoupler will solve the issue. For OC6 the case is not as clear as we do not understand the behavior, so we may have to replace both optocouplers and maybe also the drive circuit for the LEDs.   + An FRB, conducted 4 Jan 2013, defined additional diagnostic steps. Another FRB will be conducted to review the diagnostic results prior to any disassembly   + Screening of optocouplers: all optocouplers in Gun FM4 were screened. It is pretty obvious that our screening process is not helping us to identify bad parts. Lack of being able to use elevated temperatures may be the most likely factor. * Sensor FPGA reset (EDI GDU FM3) (PFR-10160.53-83-IP)   + While obtaining additional operating hours in vacuum (UNH vacuum chamber room 145), there were two red limit violations. It was noticed that the MCP supply was off. In looking at the HK data it turns out that all setpoints (MCP ref, preamp ref, MCP limit) were zero, so this was likely caused by a sensor FPGA reset.   + Cause: Likely due to a HV discharge within the sensor. Still under investigation. * GDE Converter Fold Back and Comm Locks observed during TV test (GDU SN FM3) (PFR-10160.53-81-IP)   + Three converter shut downs and 1 comm lock observed. Normal operation restored upon reset.   + TV test is continuing; data analysis is underway for root cause investigation.   + Additional observations were made in extended testing in vacuum in the EDI test chamber, Morse hall room 145. Results to be presented to FRB. * GDE Converter Shutdown during TV power-on (GDU SN FM3) (PFR-10160.53-80-IP)   + Root cause determined to be current limit setting on GSE power supply. Retest successful upon reset of current limit setting.   + The functional test procedures will be modified to use a higher current limit setting of the GSE power supply for instrument power-on. After power-on the current limit will be set back to a lower value. Note that the instrument does not violate the inrush current requirements and the proposed modifications affect merely instrument level testing. There will be no impact on testing on the IS deck or observatory. * [CLOSED} Damaged LVDS IC (EDI Gun SN05) (PFR-10160.53-79-IP)   + Damage occurred during board level testing at IWF   + Test setup, operator error   + Part replaced. Retest successful. * Failure to set the Wehnelt voltage (EDI Gun SN4) (PFR-10160.53-78-IP)   + During inital tests in vacuum preparing for the calibration of Gun S/N 4 a failure to set the wehnelt voltage occurred (at IWF).   + The failure mode could be explained by a damaged transistor on the HV-FIL board.   + The HV-FIL board was replaced in SN4 Gun. The suspect board was returned to UNH for test and, most likely, DPA of the suspected part. * Increase of beam and filament current (EDI Gun SN3) (PFR-10160.53-73-IP)   + Observation made at IWF during calibration with GDE. Evidence of failing filament.   + BGS replaced; SN3 Gun/GDE calibration completed successfully   + Awaiting further inspection of the defective BGS. Defective BGS was sent back to UNH for refurbishment. Add 24 hr. burn-in for future BGS assemblies.   CEB   * AFG current trip at power on - TV Cold, 25.5V (CEB FM3) (PFR-10160.53-84-IP)   + Cause: Turn on procedure did not adequately account for the AFG in rush with enough margin to reliably turn on the board every time.   + Discussed with UCLA and KTH. Disposition: Implement a two tier current limit setting similar to that implemented on the BEB's.   + Open work (Rau): Investigate whether this two tiered approach should also be implemented for the EDI controller, DFG and DSP turn ons. * DSP Time Tag Anomaly (FM3 CEB TV test, DSP PWA SN11) (PFR-10160.53-87-OP)   + An anomaly in the DSP time tags was detected once during FM3 CEB TV testing. Time tags fail to increment the Coarse Time (Seconds) at the same time. Other CDPU and EDI generated packets at the same time do update the Coarse Time as expected.   + The fine time tag was incrementing normally. Note also that this condition is fully recognizable and correctable.   + Proposed disposition: use as is. Needell to comment on cause investigation, impact and proposed disposition.   [CLOSED] DSP   * Invalid HSBM packet (DSP SN05) (AR-10160.53-10-IP)   + An invalid HSBM packet was intermittently generated in the SN05 DSP thermal acceptance test. It was determined that the cause of this anomalous test data was EMI that resulted from switching 180 Vpp test signals between DSP E-field inputs. The offending script was corrected, and the problem was resolved.   + NCR report received from LASP to close the item in the PIMS |

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
| 13. Issues and concerns | | |
|  |  | From FIELDS PM   * Further delays of SDP and GDU deliveries given technical problems encountered with most recent units. See problems.   From LASP   * ADP RE sine vibration levels – Vibration testing of the spacecraft with the QM ADP is complete. Although the low the sub-50 Hz sine loads did not pose a concern, there is a new concern about loads at approximately 65 Hz. * ADP RE spare - Risk added to PIMS in November. Cost estimate and DAG repainting results will be added to the risk record. * LASP MMS engineering personnel will be transitioning off MMS starting in January. After January LASP will switch to post-delivery support which requires fewer personnel.   From SDP/AEB PM/SE (King)   * BEBs (AEB and SDP)   + Still some missing documents to finish up the Acceptance Data package for the hardware already delivered- especially the IFRU test reports * SDP (UNH)   + Magnaplate coating issues of outer cylinders continue to need attention. Four outer cylinders received were acceptable, albeit not perfect. This seems to be getting better. Four more were received in early January and await inspection. |

NCR Summary: Provided separately (Excel file)

|  |  |  |  |
| --- | --- | --- | --- |
| Activities planned for next reporting period | | | |
|  |  | Management | |
|  |  |  | * Respond to open RFAs * Continue to prioritize and schedule flight PWA builds in the UNH electronics shop and flight and flight parts machining in the UNH machine shop. Similarly, prioritize and schedule the work in outside shops assembling flight electronics (U of Iowa) and manufacturing and surface treatment of mechanical parts. Note the following.   + UNH Machine Shop:     - Continue fabricating remaining EDI and SDP parts   + UNH Electronics Shop:     - Complete population of FM4 EDI Controller Board     - Complete population of FM4 CDPU-A Board     - Populate FM4 CDPU-B Board     - Begin population of the ship set 4 EDI Sensor Boards   + BAE:     - Vibration services for SDP and EDI   + FIELDS Team, IS and S/C Partners:     - Continue to use the weekly FIELDS meeting for coordination of near-term activities     - Coordinate shipping of remaining EDI Sensor digital boards with U of Iowa. Received at UNH in early January     - Coordinate LASP and UCLA support for ADP and magnetometer integration activities at GSFC * Closely monitor status and schedule performance of team members. Identify schedule risks and provide assistance for mitigation if warranted. Work to minimize schedule slippage. * Coordinate problem investigations and associated resolution. * Support FRBs; * Support/staff the EDI, CEB and SDP T/V testing; * Update the Gun and GDE schedule. * Make delivery of the following items from UNH to FIELDS partners   + SDP preamplifier/cable assemblies SNs 17&18 (final units) * Receive delivery of the following items at UNH   + SN4 Gun/GDE (from IWF)   + SN4 EDI Optics (from U of Iowa)   + FM4 AEB * Prepare and conduct the following PERs and associated TRRs   + SDP SNs 9 & 10 * Prepare for and conduct following PSRs.   + GDU SNs 1 & 3   + SDP SNs 7-10   + FM3 FIELDS (partial, all except EDI and SDP) * Make or coordinate delivery of the following to GSFC IS or S/C teams   + Ship sets 1 and 2 ADP Booms and REs (from LASP)   + FM3 FIELDS (partial, all except EDI and SDP) * CDRL and contract deliverable submissions:   + None planned * Support/staff the CEB, EDI and SDP T/V testing; * Update the Gun and GDE schedule |
|  |  | Product Assurance, Configuration Management, Parts, Materials, Facilities | |
|  |  |  | Turco/Salwen   * Support for CEB and SDP TV testing * Outgas certification of CEB FM3 * Ongoing in process assembly inspection of EDI and CEB PWAs * Support SDP FM 7 & 8 PSR * Support of SDP FM 9 & 10 PER and PSR   Software Product Assurance (Heirtzler)   * Continue support for EDI and/or CDPU software testing as needed |
|  |  | Systems Engineering & FIELDS I&T | |
|  |  |  | Rau / Dors   * Perform SDP SN09/10 EMI, FIT, Magnetics and FIELDS Acceptance testing * Release SDP ship set 2 (SN07-10) EMI and FIT test reports * Perform FM3 Magnetics testing on CEB, AEB and SCM * Perform FM3 Mag FIT testing and data analysis * Perform FM3 FIELDS CPT and prepare for delivery to IS Deck-4 * Perform FM3 SCM Preamp and Sensor thermal bake out * Support FIELDS FM3 PSR, SDP SN09/10 PER, GDU SN01/03 PSR * Prepare for FM4 SCM preamp and sensor delivery * Continue submitting FIELDS verification material for closure |
|  |  | Post-Delivery Support | |
|  |  |  | IS-1 and Obs-1 FIELDS   * Support installation of ADP booms onto OBS-1 * Perform S2M and functional testing of Observatory ADP simulator at GSFC * Support integration of FM1 magnetometers to OBS 1 mag booms. On site UCLA support is planned.   IS-2 and Obs-2 FIELDS   * Continue preparation for OBS-2 functional testing with FIELDS ADP simulator and FM Magnetometer setup, S2M and electrical test * Support Observatory #2 electrical integration and functional testing * Perform SDP SN07/08 IPA, In-rush and functional testing on OBS#2 |
|  |  | Science | |
|  |  |  | SWT and SWG   * Support science telecons as needed   Science data processing activities   * Begin working on the MMS Data Products Guide – due in March |
|  |  | AFG | |
|  |  |  | * Start fabrication of DFG Spare Sensor * Start preparing FM4 Harness set for delivery, including EIDP preparation |
|  |  |  |  |
|  |  | DFG | |
|  |  |  | * Processing of the FM3 MAG FIT data |
|  |  |  |  |
|  |  | SCM | |
|  |  |  | * Organization of the FM4 delivery to UNH without the harness * Bakeout of the FM4 Sensor and Preamp * Preparation of the FM4 harness outgassing certification (planned in February) * Remaining steps of the coils manufacturing for the SCM FMS sensor. |
|  |  | EDI | |
|  |  |  | Top level   * PSR for GDU SN1 & SN3 * Ship set 1 - GDU SN 3   + - Diagnostic testing regarding converter shutdowns / communication locks     - FIT Test, Magnetics Test, Pre-ship inspections   Controller   * Ship set 4, SN 4   + - Board population   Sensor   * Ship set 2 - SN 5   + - MCP assembly     - Final Sensor Assembly and Electrical Test * Ship set 3 - SN 6   + - Thermal Test     - Send out boards for parylening   Gun - UNH efforts   * Diagnose damaged HV-FIL board SN 4 * Vacuum Testing of Beam Generation Systems SN 1 & 3   Gun - IWF efforts   * Ship set 2 - SN 4   + - Finish Gun calibration; data review revealed anomalous behavior of 2 optocouplers     - More diagnostic testing; disassembly and replacement of optocouplers   Ship set 2 - SN 5   * Start assembly of Gun   GDE   * Ship Set 3 SN 7 and Ship Set 4 SN 8 & 9   + - Delivery to IWF   Optics   * Continue work on ship sets 2,3,4 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | SDP/LVPS/BEBs/Preamp/Probe (KTH/ Oulu/IRFU) | |
|  |  |  | SDP:   * Continue fabrication of Deployer test calibration set-up at IRFU. This is to provide high resolution calibration data. This should be conducted at the end of Jan. 2013. * Investigate noise contribution to SDP/ADP system.   LVPS & S-BEB’s & Preamp & Probe:   * Complete testing of SS#5 S-BEBs, preamp and probes. * Coat, and post test SS#4 S-BEBs for shipment to UNH. * Prepare the test reports for the all shipped units. * Continue to manufacture and test the next SS#5 of probes at Oulu.   A-BEBs:   * Done   KTH Management and Product Assurance:   * Final inspection of SDP FM15-16 after parylening * Submission of inspection reports for SDP FM13-16 and some dedicated activity sheets for the tasks performed. * Acceptance data package preparation for all delivered hardware * Follow up for the spheres/yo-yo |
|  |  | SDP/LVPS/BEBs/Preamp/Probe (UNH) | |
|  |  |  | UNH SDP:   * Continued integration activities for FM9-FM10 for PER, TRRs and upcoming vibration and thermal vacuum testing * Continued flight model fabrication and integration activities. * Follow up with LASP on crimp manufacturing and acceptance testing.   LVPS and BEBs   * Conduct workmanship TV cycle on the final 2 Preamp/cable assemblies (SNs 17&18). * Ship SS#5, S-BEBs, preamp and probes to KTH. * Run through acceptance test for LVPS and then process FM5 LVPS. |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  | ADP/SDP/DSP (LASP) | |
|  |  |  | QA/Parts/Materials   * Support the project as necessary.   DSP   * EIDP paperwork closeout   ADP   * Repaint SN01 sensor and complete post-TVAC FFT * Perform SS4 ADP RE vibration test and post-test FFT * Integrate the -Z ADP Boom and ADP RE Launch Latches on observatory #1.   AEB   * Investigate BEB parts storage temperature ratings * Deliver FM4 AEB   SDP   * Deliver updated fine wire ferrules * Support SDP integration activities at UNH as needed.   Thermal   * Prepare AEB FM4 TV test report   Systems and Program Management   * Support requirement verification and EIDP prep |
|  |  |  | |
|  |  | CEB Hardware | |
|  |  |  | CDPU & BPM (Bodet):   * Begin testing of FM4CDPU boards   FM3 CEB   * Finish FM3 CEB TV testing and TQCM measurement * Perform FM3 CEB Acceptance Testing * Perform FM3CEB In-rush testing   FM4 and FS CEB   * No activity planned |
|  |  | CDPU Software, Support for Operations, I&T and Post-Delivery activities (Needell) | |
|  |  |  | * Continued support of CEB FM3 TV * Support FIELDS FM3 integration * Support FIELDS FM3 Delivery to IS4 * Support IS2 Functional Test |
|  |  |  |  |
|  |  | GSE (Mello, Chutter, Bodet) | |
|  |  |  | GSE hardware   * No planned activity   GSEOS & GSE Software   * Support CDPU FM3 Testing * Support SDP Testing * Support I&T Efforts * More SOC Connectivity Testing * Create GSEOS IS4 Configuration * EDI Beam Generation System Improvements * Telemetry Screen Improvements * Keep software repository updated   FIELDS Simulator (FS)   * No activity planed |
|  |  |  | |

This document contains technical data that is controlled by the International Traffic in Arms Regulations (22 CFR 120-130) and is being transferred by authority granted under TA 1741-05 and TA 3514-09. This information may not be transferred to any other foreign person or entity without prior approval of the US State Department.

\*\*\* end \*\*\*