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| Investigation: FIELDS |
| Progress accomplished this period: | Jun 2012 Reporting Period |
| 1. | Project Management and Product Assurance |
|  | a. | Project Management* Supported the following PERs:
	+ FM4 set AFG/DFG Sensors
		- Panel recommended continue
	+ SDP SNs 3&4
		- Panel recommended continue
* Supported the following TRRs:
	+ EDI GDU S/N2 TV test
	+ SDP SNs 3&4 vibration test
	+ SDP SNs 3&4 EMI/EMC tests
	+ SDP SNs 3&4 TV tests
	+ FM4 set AFG/DFG Sensors
* Supported Peer Reviews for:
	+ None
* Received delivery of the following flight hardware items at UNH
	+ FM2 AEB (form LASP)
* Delivery of the following flight hardware items from UNH to FIELDS partners
	+ FM3 AEB to KTH
* Delivery of the following flight hardware items from UNH to the IS
	+ None. FM1 delivery was at end of May.
* CDRL and contract deliverable submissions this month:
	+ None
* Supported FRBs for:
	+ EDI Gun and DDE anomalies
* 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
		- MMS GSE for Non-Magnetic Stand
		- EDI Closeout Cover Fabrication
		- Fabricated Peek Motor Clamps for SDP
		- Fabricated Back plates for SDP
	+ UNH electronics shop
		- SDP GT Board Population
		- SDP Motor Harnesses
		- SDP Boom Wire Splicing
		- Final Assemblies of SN11-14 AM and CP Boards (AEB)
	+ Vendors
		- Coordination of vibration test activities with our vendor, BAE (SDP and CEB).
		- Syntech is now assembling the remaining A-BEB boards.
	+ FIELDS team partners
		- Coordination with magnetometer teams LPP, UCLA and IWF for delivery and acceptance testing of the next flight hardware sets (July)
		- Coordination with LASP for delivery of ADP simulators
* Continued export/import license planning and applications and associated shipping.
* Supported and staffed EDI GDU thermal; vacuum testing
* Discussed and updated the Gun/GDE schedule;
 |
|  | b. | Product Assurance |
|  |  | Turco / Salwen* FM1 AFG harness outgassing recertification
* EDI TV test support (including outgassing certification)
* AFG/DFG Sensor & AFG Electronics MIP
* Inspection of AEB FM4 & FM5 PWAs from Syntech
* SDP FM3 & FM4 anomaly support
* EDI FM2 TV PER support
* ADP RE TV PER support
* EDI FM1 Thermal Hardware bonding
* EDI FM2 TV testing
* CEB FM2 assembly QA
* SDP preamp/cable TV testing QA
* SDP testing cross training.
* SDP vibe testing
* SDP-AM kitting
* SDP FM3 EMI QA
* SDP Torque Monitor assembly.
* SDP motor cable activity sheet.
* SDP re-work witness QA.

 Software Product Assurance (Heirtzler)* EDI and CDPU software packages are stable.
 |
| 2. | Systems Engineering and FIELDS I&T |
|  |  | Rau / Dors* Released FIELDS CPT, IPA/In-Rush Test, and IS Safe to Mate procedures
* Updated FIELDS BEB load simulator box for flight like current demand
* Continued DOORS verification work for FIELDS
* Released SN01 SDP EMI report, presented to ESCB and filed outage waivers
* Performed in-house CE testing on EM SDP to prepare for FM EMI testing
* Performed CE and magnetic EMI testing on FM SDP SN03 and SN04
* Performed chassis leakage and CE07 measurements on SN02 EDI GDU
 |
| 3. | Post-Delivery Support |
|  |  | FM1 FIELDS* Performed FIELDS bench test at GSFC including FM-1 CEB, AEB, SCM, AFG and DFG and 2 flight like SDP (SN01 and QM BEB with simulators)
* Installed partial FM1 FIELDS investigation onto the IS deck
* Performed FIELDS S2M, IPA and In-rush measurements on IS deck
* Debugged grounding issue on IS deck with QM BEB
* Performed successful SDP door deploy and dual motor test on IS deck
* Performed successful FM1 CEB to ASPOC interface test on IS deck
* Developed and performed successful FIELDS IS CPT
* Performed fit check of FG and SCM to mag boom including SCM MLI
* Delivered FIELDS IS CPT scripts to SwRI. Now under configuration control by SwRI.
* Successfully tested "Virtual Machines" for GSEOS operation at GSFC.
	+ Ready for use during I&T.
	+ Waiting for IS S/C Simulator to be "assimilated" to GSFC network.
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| 4. | Science activities |
|  |  | SWT and SWG * Supported science activities as needed

Science data processing activities* Created L1A science products from data collected via CIDP at FIELDS FM1 integration
* MMS SDWG has proposed naming convention for science files and variables
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| 5. | Magnetometers |
|  | a. | DFG  |  |
|  |  |  | * Completion of FM3 delivery data package
* FM3 sensor bakeout
* FM3 full functional test before delivery
 |
|  | b. | AFG |  |
|  |  |  | Completed Deliveries:* FM1 DFG Sensor (S/N 04) delivered
* FM1 AFG Sensor (S/N 05) delivered to UCLA
* FM1 AFG Sensor (S/N 05) delivered to UNH
* FM1 Electronics (S/N 01) delivered and integrated into CEB at UNH
* FM1 Flight harness set (boom S/N 01 and S/N 02, CEBW6 S/N 01, CEBW4 S/N 01)
* FM2 DFG Sensor (S/N 08) delivered
* FM2 AFG Sensor (S/N 06) delivered to UCLA
* FM2 AFG Sensor (S/N 06) delivered to UNH
* FM2 AFG Electronics (S/N 02) delivered to UNH
* FM3 DFG Sensor (S/N 07) delivered
* FM3 AFG Sensor (S/N 09) delivered to UCLA

Sensors:* Completed FM4 Sensor (S/N 10 and S/N 11) build
* Completed S/N 10 and S/N 11 sensor (FM4) pre-environmental review
* Completed S/N 10 and S/N 11 sensor (FM4) test readiness review
* Completed S/N 10 and S/N 11 sensor (FM4) vibration tests
* FMspare TBD

Cables:* Delivered FM1 harness set End Item Data Package
* FM2/FM3/FM4 boom harnesses continuing

GSE:* Original Nulling Coil being refurbished

Flight Electronics:* FM3 (S/N 03) continued calibration tests
* FM4 (S/N 04) build continues
 |
|  |  |  |  |
|  | c. | SCM | * New coils manufacturing
	+ - All parts are in house.
		- The manufacturing will continue late in September.
* 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
	+ - Data package activities in progress.
		- Hardware ready to be delivered
* SCM FM3 => SENSOR S/N FMS + PREAMP S/N FM4
	+ - Preamp vibrated successfully, thermal vacuum complete
		- Sensor vibration at protoflight levels (31 MAY-01 JUN)
		- Thermal vacuum tests performed (JUNE 04-11)
		- Thermal cycle validations performed (cycles at ambient pressure, between 22°C and 60 °C with 5 minutes plateaus each 10°C): 2 before fastening, 2 after fastening, 2 after vibration, 3 after thermal vacuum (7 cycles since fastening + thermal vacuum cycle between survival temperatures)
* SCM FM4 => SENSOR S/N FM3 + PREAMP S/N FM5
	+ - Incoming done on the Preamp
		- 2 thermal cycles performed on the sensor before fastening
		- 2 thermal cycles performed after fastening at 0.35 N.m.
		- Vibration performed at protoflight levels (JUNE 07-08)
		- 2 thermal cycles performed after vibration
		- X-ray inspection
* SCM FMS => SENSOR S/N FM4 + PREAMP S/N FM3
	+ - 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
		- Sensor to be repaired later (two coils to change).
 |
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| 6. | EDI |
|  |  | Top level* Updated GDU Vacuum Test Procedure to Rev 1.1
* Held TRR for GDU SNo2 Thermal Vacuum Test
* Started GDU SNo2 Thermal Vacuum Test; completed 7 cycles; GDE converter shutdowns and communication locks occurred several times (13 times total), mostly at hot operational plateau (only one case at cold operational plateau);
* Currently 83 hours of failure free operation in vacuum;

Sensor* Ship set 2 - SNo 3
* Checked trimming of preamplifiers
* Performed preamplifier delay test
* Started Thermal Test of Sensor

Gun - IWF efforts* Start screening of optocouplers
* Support test at RUAG to diagnose sensitivity of GDE converter shutdown circuit
	+ Ship set 1 - SNo 1
		- Reassembled Gun and performed functional test
		- Calibration of Gun/GDE - encountered problem with GDE converter shutdowns and communication locks;
		- Found evidence of HV discharges in optocoupler of Deflector 4 HV amplifier

GDE* Started rework of GDE housings to fix issue with potential connection between secondary ground and chassis

Optics * Continued work on ship sets 2,3,4
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| 7. | SDP/BEB/LVPS  |

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|  | a. | SDP/BEB/LVPS (KTH/IRFU/Oulu)KTH/IRFU LVPS:* Parylening and inspection of units #3-5.
* Need to do final checkout.

 KTH/IRFU ADP BEB’s:* FM3 testing underway

KTH/IRFU SDP BEB’s:* Continue to review and compile data from SS#1& 2.

KTH/Oulu/IRFU Sphere / Yo-Yo Mechanism:* 8 Probe/Yo-Yo assemblies finished and ready for shipping.

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):* Final inspection of LVPS FM4 and FM5 after paralyning, before shipping
* Delivery of final inspection reports for LVPS FM4 and FM5
* Partly review of the documents included in the ADP of LVPS FM4 and FM5
* Incoming and in process inspection of the AEB FM3
	+ Delivery of intermediate inspection reports for AEB FM3 including proposal to change a component
 |
|  | b. | SDP/BEB/LVPS (UNH)LVPS:* 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 | - | - |
| FM4 | Complete | Complete | Complete | Complete | Complete | - | - |
| FM5 | Complete | Complete | Complete | Complete | Complete | - | - |

 A-BEB’s:* FM4 & 5 A-BEB received from Syntech, inspected and populated with connectors and transformers.
* FM ADP BEB

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Assembly** | **Test** | **Shipped** |
| **Unit** | **Board Status** | **MIP** | **EE at KTH** | **EE at IRFU (Thermal)** | **Parylene** |  |
| FM1 | Complete | Complete | Complete | Complete | Complete | To UNH |
| FM2 | Complete | Complete | Complete | Complete | Complete | To UNH |
| FM3 | Complete | Complete | Complete | In-process | - | - |
| FM4 | Complete | In-process | - | - | - | - |
| FM5 | Complete | In-process | - | - | - | - |

S-BEB’s:* SS#3 Completed mounting of connectors and transformer at UNH
* SS#3, Needs to be MIP and then Staked.
* Kitting of SS#4 and spares in process.

SDP MGSE:* No new developments

UNH SDP EGSE:* Minor GSEOS software up-dated.

SDP Boom Cable:* No new developments

SDP Preamp:* Conducted Pre-Amp Workmanship TVAC on SS#3.
* Crimped preamps FM3-6 with their respective probes.

SDP Mechanical:* Conducted PER and TRR for SDP FM3 & FM4 vibrations testing
* Conducted successful test campaign resulting in successful deployment, FFT's and stowage post vibs
* Delivered FM3 to EMI testing
* Reworked FM3 & FM4, FM5-FM8 GT boards for isolation (actual GND path was not observed on FM3 & FM4).
* Designed and fabricated thermal strap GND isolation hardware and installed on FM3 & FM4, due to Motor housing issue.
* Received Outer Cylinders from Stone Machine for FM7-FM10, in QA prior to surface treatment

SDP Thermal:* Conducted PER and TRR for SDP FM3 & FM4 thermal testing
* Updated Procedures, and testing profiles.

SDP EMC:* Conducted CE testing on FM1, FM3, and FM4
* FM SDP

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|  | **Electrical** | **Mechanical** |  | **Test** |
| **Unit** | **Board Status** | **Assembled** | **Inspection** | **Test (FFT)**  | **Vibe** | **Test (FFT)** | **TV** | **Post Test** |
| 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, tested | Completed | Completed | Completed | Completed | Completed | In-process | - |
| FM4 | Completed, tested | Completed | Completed | Completed | Completed | Completed | In-process | - |
| FM5 | Completed, tested | Some sub-assemblies | Some sub-assemblies | - | - | - | - | - |
| FM6 | Completed, tested | Some sub-assemblies | Some sub-assemblies | - | - | - | - | - |
| FM7-8 | Completed, tested | - | - | - | - | - | - | - |
| FM9-12 | Population in process | - | - | - | - | - | - | - |
| FM13-16 | Kitting in process | - | - | - | - | - | - | - |
| FM17-18 | Kitting in process | - | - | - | - | - | - | - |

SDP QA:* Continued working out shipping and receiving details for AEB, LVPS and SDP.
* Continued work on SDP assembly activity with compilation and review of work sheets.
* Monitored the assembly and test activities for the flight units

AEB (UNH)* Participated in the AEB / Receiving element and AEB TRR/PER’s #2.
 |
|  | c.  | SDP (LASP) (door and preamp)* Completed board-level testing of the remaining SDP Preamp boards.
* Identified conductors for SDP cable spares.
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| 8. | ADP |
|  | a. | ADP Extensible Boom * Vacuum bakeout and certification of ship set #1 ADP Booms is complete
* QM upgrade work at ATK is complete and ATK is awaiting the planned early August installation date at GSFC.
 |
|  | b. | ADP Receiving Element and Preamp* Receiving Element ship set #2 calibration testing with the AEB is complete.
* Ship set #2 TVAC test is complete. An anomaly occurred on SN05 Receiving Element in TVAC. An apparent open circuit was detected during 3 of the 5 hot to cold transitions. An investigation is underway.
* Investigated a temperature dependent resistance that was detected between the preamp output and bias lines. It was determined that this dependence was caused be the Receiving Element flex circuit assembly. The temperature at which this occurs is outside of the operating range of the ADP. It will therefore not affect the ADP on-orbit performance.
* Determined that an aluminum foil tag on a thermocouple wire caused an apparent short between the ADP inner and outer guard surfaces seen during TVAC.
* Ship set #3 and #4 hinges were functionally tested at hot and cold extremes. The deployments were successful. This test completes RFA from the ship set #1 PER.
* Received news from GSFC that notching “should” reduced ADP RE sine inputs below the component-level test specification.
 |
|  | c. | Axial Electronics Box (AEB)* Complete FM2 AEB to RE calibration testing.
* Delivered FM2 AEB to UNH.
* Improved the AEB TVAC electrical test setup so that all electrical connections are continuously monitored.
* Merged ISIS GSE test script branches for RE and AEB testing.
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| 9. | DSP, Thermal, Systems Engineering, Product Assurance and Management (LASP) |
|  |  | DSP* Characterized the DSP SCM HSBM channel permutation bug.
* Validated a ground-processing algorithm for assigning the correct channels to the DSP SCM HSBM data.
* Submitted an NCR for the DSP SCM HSBM channel permutation bug to UNH. The recommended disposition is to fly the DSP as is and correct the data on the ground.
* Completed bench testing of SN11 (ship set #3 DSP-A) and analyzed data. Thermal acceptance testing will start the first week in July.
* Bench testing of SN05 (ship set #3 DSP-B) is nearly complete. After component staking and conformal coating, thermal acceptance testing will begin in July.

Thermal* Updated ADP RE thermal analysis to verify flex circuit temperature predicts

Systems Engineering & Project Management* Supported the project as necessary.

Quality Assurance, Parts, and Materials Engineering* Supported inspection activities as necessary.
 |
| 10. | CEB  |
|  | a. | Hardware |
|  |  |  | CDPU & BPM (Bodet)* No activity

CEB (Rau, Dors, Nolin)* Finished FM-2 CEB board acceptance testing with DSP SN08 and SN09
* Completed FM2 CEB mechanical assembly.
* Performed successful FM2 CEB baseline FFT
 |
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|  | b. | CDPU Software and Support for Operations and I&T (Needell) |
|  |  |  | FSW* Supported SDP preparations for environmental testing.
* Supported SDP EMI testing.
* Supported FM2 CEB FFT

Operations and I&T:* No activity
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| 11. | GSE (Mello, Chutter, Bodet) |
|  |  | GSE Hardware* No activity

FIELDS Simulator* Minor repair at Goddard.

GSEOS & GSE Software* Updated GSEOS version
* I&T FM1 Config setup and fixes
* Many screens & TLM spreadsheet updates
* Kept software repository updated
* Supported testing efforts
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| 12. | FIELDS I&T |
|  |  | * Updated CEB trend data for CPT and FIELDS deck testing
* Compiled FIELDS component operating hours for FM-1 delivery
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| 13. Problems encountered (some resolved) and updates this period |

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|  |  | New:  Plate 4 Optocoupler Arching (EDI Gun SN1)* Optocoupler arching encountered during SN1 Gun/GDE calibration.
* This is a different device than the one that failed in the earlier SN1 calibration effort.
* The part has been removed and is to be sent to UNH for DPA

New: TVAC Anomaly on ADP RE SN05, open circuit* Investigated a temperature dependent resistance that was detected between the preamp output and bias lines. It was determined that this dependence was caused be the Receiving Element flex circuit assembly. The temperature at which this occurs is outside of the operating range of the ADP. It will therefore not affect the ADP on-orbit performance.

New (closed): [Boom Cable Shield to Chassis GND Problem (SDP SN4)](https://pims.space.swri.edu/pims/NcsReportMgmtServlet?mode=display&id=49413)* Problem traced to an unwanted connection between motor thermal strap and motor housing.
* The SDP team reviewed the design and modified the grounding for all units. SN1 (non-flight) was used to help define and confirm the fix. Fix confirmed with EMC tests of FM SNs 3 and 4.

New (closed): Zero current on return from QM SDP BEB (IS I&T)* Problem found during IS I&T using the QM SDP BEB.
* Problem traced at UNH to an unwanted connection to ground from a connector screw on the GT board… short between Chassis and 2nd GND.
* A fix was defined and implemented on all SDP flight units.

Update: EDI HV Opto-Coupler* NCR opened when Gun SN1 test failure investigation determined root cause to be optocoupler failure.
* DPA report on failed device and two other “good” devices was attached to the NCR record for continued review and discussion of the next steps. Root cause:
	+ The Failure Analysis performed on One (1) Opto-Coupler, part number HVOC3-180, and comparison examinations revealed that the failure was the result of internal contamination that induced dendrite growth while the part was under a bias. This dendrite growth induced a leakage path and device failure. The good devices (stock) were found to be free of contamination and therefore not susceptible to dendrite formation under bias. This is a device manufacturing induced defect and not the result of device application.
* The IWF team is proceeding with a 2-part device-level screening approach: 7 day operation in vacuum with HV on, x-ray inspection for voids in critical areas. Devices already mounted will be subject to an additional 7 day operation in vacuum with HV on before Gun/GDE calibration. Screening details are under discussion with the FRB.
* As of 9 July 2012:
	+ The optocoupler was replaced with a screened device. SN1 Gun was returned to calibration.
	+ A different device failed in subsequent testing. A new NCR was initiated to track this problem

Update (closed): Anomalous DSP test results - HSBM SCM channel assignments* Discovered at LASP during of FM3 set DSP testing. Applies to all DSP FPGAs. LASP is pursuing corrective action via ground data processing. FPGA changes, considered too risky at this point, are not planned.
* As of 09 Jul 2012:
	+ LASP determined the channel assignment errors could be unambiguously identified and corrected in ground data processing.

Update: FM5 GDE: Short circuit between secondary GND and mechanical GND* Plated through holes with secondary ground potential are located close/underneath the enclosure frame of the GDE unit. The short, however, was not discovered during testing of FM1-FM4.
* FRB discussions conclude the impact of a short is likely insignificant. As such, work with units SN1 and SN2 are continuing as planned with a parallel investigation on the likelihood and magnetic impact of a short if it were induced by thermal or vibration exposure. Rework is planned for the other units.
* As of 09 Jul 2012:
	+ Examination following vibration test of SN2 indicated now short. Analysis of the magnetic impact of a short if it were induced showed that it would be insignificant.

Update: HV amplifier failure during Gun/GDE calibration at IWF (S/N1 EDI Gun)* Problem traced to a failure of an op-amp in one HV amplifier circuit. The op-amp and two related transistors were replaced. The removed parts have been sent to UNH for analysis. Root cause is unknown.
* As of 9 Jul 2012:
	+ Awaiting failure analysis

Update: BGS short circuit seen during SN1 EDI Gun/GDE calibration* During electrical testing of GUN assembly, the Filament Emitter (BGS S/N3) showed a short circuit in the HK data between anode and focus. The electrical test, which was performed at ambient pressure after finishing the installation in the chamber, went fine.
* Disposition (updated):
	+ Replace the BGS S/N3 with BGS S/N4.
	+ Continue S/N1 Gun/GDE calibration at IWF
	+ Inspect BGS S/N3 without disassembly. Update: No cause could ne determined at IWF; return BGS S/N3 to UNH for investigation
	+ BGS S/N3 was returned to UNH. Awaiting inspection

Update: GDE fold-back during SN FM2 Gun/GDE calibration* GDE over-current detection and trip occurred when Gun temperature reached ~50C during calibration at IWF. Problem was subsequently avoided with use of air conditioner in the vacuum chamber lab and the calibration completed successfully.
* Investigation at IWF using the SN FM1 Gun showed problem caused by transformer resonance. A fix was confirmed: a resistor will be added to the circuit on the HV and Filament board. Provisions for this were planned in the design and layout of this board. This fix will be made on all units except SN FM2. For SN FM2 an alternative fix was identified and verified effective at IWF – a resistor added in the harness connecting the Gun to the GDE.
* This alternate fix was implemented on SN FM2 during integration at UNH.
* Update:
	+ Closed. Retest okay after rework and repair.
	+ Disposition: Combination of rework, repair and use-as-is
	+ Corresponding risk record initiated and discussed at the GDU PER remains active.

Update: SCM FM S/N 4 Sensor* Investigations on the cracks observed on the sensor S/N FM4 during post vibration thermal cycling are still in progress. Bad fastening of the coils in the holder identified as a possible source for the cracks but the extra simulations performed on the CAD model of the coils do not confirm this.FRB 20 Apr.
	+ Agreements
		- LPP to proceed as proposed to this FRB (lower torque, use of adhesive) for the subsequent FM assemblies: thermal test screening prior to assembly into structure, reduced fastening torque and use of adhesive as demonstrated with the QM
		- SCM Sensors S/N FM1 and S/N FM2 are fully qualified and will not be modified.
	+ Actions:
		- LPP: Measure the straightness of the failed Sensor tubes in the clamping area in an effort to further investigate root cause.
		- LPP: Measure straightness of the FM candidate Sensor tubes as part of the screening and selection process for flight
		- LPP. UNH and SwRI QA: define an agreed approach for documenting the use of two configurations for SCM Sensor assembly.
* New sensor tubes are in fab.
* Update: SN 4 Sensor tubes are to be replaced; it is now designated to be the flight spare.

Update: SCM Preamps, S/Ns 3 and S(spare)* FM Preamp S/N 5
	+ Is not compliant at 10 Hz and shows another unexpected additional noise at higher frequencies (revealed by the presence of the sensor => noise current source)
	+ Requirements at 100 Hz and 1000 Hz are still met
	+ NCR reference: MMS-SCM-NC-PRE-141
	+ Update 06 June 2012
		- FM Preamp S/N 5; Housing refurbished from Preamp S/N FMS. The housing label has been change do read FM5.
		- The 3D+ hybrid has been soldered.
		- MIP with a CNES representative held on April 24
		- MIP with LPP QA and AIT engineers complete
		- Rework is complete.
		- This unit is now to be part of the FM4 SCM
		- Awaiting retest.
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| 14. Issues and concerns |
|  |  | From LASP:* Concern about post-delivery support for ADP FM2 - FM4 continues.
* An open circuit was detected on SN05 ADP Receiving Element in TVAC test during 3 of 5 hot to cold transitions. Investigation of this anomaly is underway.

From FIELDS PM* Tight schedules
	+ The EDI GDUs remain on the critical path for FIELDS driven by Gun and GDE. UNH and IWF have and will continue to work closely together to minimize delays.
	+ The FIELDS and IS teams should now discuss approaches to mitigate the risk associated with late GDU deliveries.
 |

NCR Summary: Provided separately (Excel file)

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| Activities planned for next reporting period |
|  |  | Management |
|  |  |  | * Begin preparation of the FIELDS GFY2013 spending plan
* Continue work toward establishing a subcontract from UNH to University of Michigan for support of Jim Slavin. Dr. Slavin, FIELDS magnetometer team, recently left Goddard for a position at U of M where he is continuing his involvement. Awaiting UCLA advice on details for the SOW.
* Follow up with SwRI export control officer regarding status for amending the MMS TAAs to accommodate changes to the FIELDS team.
* Continue to solicit and review ideas for cost savings.
* 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 (Syntech and U of Iowa) and manufacturing and surface treatment of mechanical parts. Note the following.
	+ UNH Machine Shop:
		- FM3 SDP Remaining Parts Fabrication
		- FM3 EDI Remaining Parts Fabrication
	+ UNH Electronics Shop:
		- SDP SN 11-14 S/C Bracket Wiring
		- Bonding of Heaters and Thermostats on SN01 EDI
		- Kit parts for FM3 CDPU Boards
		- Kit parts for FM3 EDI Controller Board
	+ Syntech:
		- Awaiting final S-BEB kits from UNH
	+ BAE:
		- Vibration services for CEB and SDP
	+ FIELDS Team Partners:
		- Coordinate IWF delivery of SN1 GDE and Gun to UNH.
		- Coordinate the next set of magnetometer deliveries to UNH (LPP, IWF, UCLA)
* 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. See problems.
* Support the various EDI FRB's;
* Support/staff the SDP T/V testing;
* Coordinate vibration facility availability for FM2 CEB and FM5 & 6 SDP;
* Update the Gun and GDE schedule.
* Make delivery of the following items from UNH
	+ FM3 AEB (to KTH)
	+ FM4 DFG Sensor (to IWF)
	+ FM4 and FM5 AEB (to KTH) May be early August.
* Receive delivery of the following items at UNH
	+ Remaining SDP Preamp/Cable assemblies from LASP
	+ FM3 AFG and DFG Sensors and electronics
	+ FM2 and FM3 SCM Sensors and Preamps
	+ FM2 SCM harness
	+ SN1 EDI Gun and GDE
	+ FM4 DFG Sensor (from UCLA)
* Prepare and conduct the following PERs
	+ FM2 CEB
	+ SN1 EDI GDU
	+ SNs 5&6 SDP
* Conduct the following TRRs
	+ FM2 CEB EMI/EMC test
	+ FM2 CEB vibration test
* Coordinate the following Peer Reviews
	+ None
* Prepare for and conduct following PSRs.
	+ None
* CDRL and contract deliverable submissions:
	+ None planned
 |
|  |  | Product Assurance, Configuration Management, Parts, Materials, Facilities |
|  |  |  | Turco/Salwen* SDP TV test support
* AEB FM4 & FM5 UNH support including inspection of UNH work, staking, and assembly
* EDI Sensor FM3 staking and coating support
* CEB FM2 PER support

 Software Product Assurance (Heirtzler)* Continue support for EDI and/or CDPU software testing as needed
 |
|  |  | Systems Engineering & FIELDS I&T |
|  |  |  | Rau / Dors* Continue submitting FIELDS verification material for closure
* Support SDP SN03 and SN04 TV testing as needed
* Prepare for FM2 FIELDS integrated testing
* Perform FM2 Mag FIT testing
* Finish up additional data requests for SDP EMI waivers
* Release EDI Timing test report
* Release EDI GDU SN02 EMI/EMC test report
 |
|  |  | Post-Delivery Support |
|  |  |  | FM1 FIELDS* Provide support as needed
 |
|  |  | Science |
|  |  |  | SWT and SWG* Support science telecons as needed

Science data processing activities* Start discussion of required meta data for science data files
 |
|  |  | AFG |
|  |  |  | * Refurbishment of Nulling coil #1
* Compete FM4 sensor environmental tests and bake-out
* Deliver DFG FM4 sensor (S/N 10) to UNH
* Internally deliver AFG FM4 sensor (S/N 11) to UCLA
* Prepare and deliver End Item Data Packages for DFG FM4 sensor (S/N10) and AFG FM3 sensor (S/N 09) and AFG FM3 electronics (S/N 03)
* Continue FM2 cable and interconnect builds.
* Complete UCLA calibration tests in place of joint calibration for FM3
* Complete electronics build for FM4 and begin electronics/sensor matching
 |
|  |  |  |  |
|  |  | DFG |
|  |  |  | * Delivery of FM3 to UNH
* Transport of FM4 sensor from UNH to IWF
* Start of FM4 tuning tests
 |
|  |  |  |  |
|  |  | SCM |
|  |  |  | * Delivery of the SCM FM2 at UNH
* SCM FM3 calibration at Chambon-la-Forêt
* Delivery of the SCM FM3 at UNH
* FM harnesses over-braid cleaning and changing
* FM3 outgassing certification
 |
|  |  | EDI |
|  |  |  | Top level* Respond to RFAs from GDU SNo 2 PER

Sensor* Ship set 2 - SNo 3
	+ - Send boards out for parylening, reassemble, perform electrical and vacuum test
* Ship Set 2 - SNo 4
	+ - Assemble Sensor for threshold scan, trim preamplifiers, run thermal test

Gun - IWF efforts* Screening of first set of optocouplers
* Replace arcing optocoupler in Gun SNo1 and send arcing part to UNH for DPA
* Continue assembly and testing of Gun SNO 3

Optics* Continue work on ship sets 2,3,4
 |
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| --- | --- | --- |
|  |  | 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.

LVPS & S-BEB’s & Preamp & Probe:* Coat, and post test LVPS for shipped to UNH.
* Prepare the test reports for the FM3 set.
* Continue to manufacture and test the next SS#4,5 of probes at Oulu.

A-BEBs:* Complete test SS#3 A-BEBs

KTH Management and Product Assurance:* Final inspection of LVPS FM3, 4, 5 hardware after paralyning, before shipping
* Configuration of traveller documents
* Follow up for the spheres/yo-yo
* Inspection of new HW from UNH if available.
 |
|  |  | SDP/LVPS/BEBs/Preamp/Probe (UNH) |
|  |  |  | UNH SDP:* Conduct TV test of SDP SNs 3&4
* Continued integration activities for FM5-FM6 for test and upcoming Vibrations and thermal Testing
* FFT and PER for FM5 & FM6
* Continued flight model fabrication and integration activities. Prepare for PER.

LVPS and BEBs* SS#4-5, S-BEBs, preamp and probes. Ship to KTH.
* Ship FM4-5 AEB to KTH.
* Perform TV workmanship of next SS# 4 of preamps/boom cable assemblies, ship to KTH.
* Run through acceptance test for LVPS and then process FM3-5 LVPS.
* In-process inspection of remaining FM S-BEB PWAs at Syntech Microwave (NH)
 |

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| --- | --- | --- | --- |
|  |  |  |  |
|  |  | ADP/SDP/DSP (LASP) |
|  |  |  | QA/Parts/Materials* Support the project as necessary.

DSP* Complete ship set #3 thermal acceptance testing with target delivery to UNH in late July.
* Begin bench testing on ship set #4.
* Determine component supply status for spare board kits

ADP* Fit check ship set #1 and #2 ADP Receiving Elements with ADP Booms and perform an end-to-end electrical check (interface test, not a performance test).
* Complete ship #3 and #4 receiving element assemblies. The ship set #3 and #4 hinges were held up for the hinge thermal functional testing and are now available for assembly.
* Complete final FFT (deployment and electrical) of ship set #2 receiving elements.
* Perform final cleaning and inspection of ship set #2 receiving element.
* Investigate open circuit anomaly on SN05 Receiving Element.
* Vacuum bakeout and certification of ship set #2 and #3 ADP Booms.
* Finalize plans for QM ADP integration and testing. Testing scheduled to begin in early August.

SDP* Complete SN13 - SN16 preamps and deliver to UNH
* Complete SN17 - SN18 preamps and deliver to UNH
* Complete testing for SN17 - SN18 doors and deliver to UNH

Thermal* No activities planned.

Systems and Program Management* Deliver completed ADP RE and AEB ship set #1 verification matrix for import into DOORS.
 |
|  |  |  |
|  |  | CEB Hardware |
|  |  |  | CDPU & BPM (Bodet):* No activity planned

CEB* CEB FM2 PER
* CEB FM2 CE EMI
* CEB FM2 Vibration
* Perform acceptance testing on FM3 AFG and DFG
* Perform acceptance testing on FM2 and FM3 SCM
* Perform acceptance testing on FM2 AEB

FM, 3, 4 and FS CEB* Mechanical kitting is complete. No activity planned this month.
 |
|  |  | CDPU Software and Support for Operations and I&T (Needell) |
|  |  |  | * Prepare updates to to FIELDS IS CPT scripts.
* Support FM2 CEB environmental testing
* Support SDP Environmental testing
* Support AFG/DFG FM3 delivery/Acceptance Test
* Support SCM FM2 Delivery/Acceptance Test
 |
|  |  |  |  |
|  |  | GSE (Mello, Chutter, Bodet) |
|  |  |  | GSE hardware* Install FIS board for CEB into enclosure

GSEOS & GSE Software* Improve screens
* Test SOC connectivity
* Setup & test FM2 I&T configuration
* Keep software repository upto date
* Support testing efforts

 FIELDS Simulator (FS)* No activity planed
* Support Southwest checkout and test of FS as requested
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