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| Investigation: FIELDS |
| Progress accomplished this period: | November 2013 Reporting Period |
| 1. | Project Management and Product Assurance |
|  | a. | Project Management* Supported review of cost change proposal submitted to SwRI 31 July.
* Continued discussion of science data processing topics as part of the weekly FIELDS team meeting agenda.
* Began planning for FIELDS and EDI data processing planning meetings (3 days) to follow the SWT meeting in late March 2014.
* Supported the following PERs:
	+ None
* Supported the following TRRs:
	+ None
* Supported the following FRBs
	+ Damaged SCM harness on Obs-3
	+ EDI GDU SN7 Optics isolation
* Supported the following Acceptance Reviews or PSRs
	+ None
* Received delivery of the following flight hardware items at UNH
	+ Parts kits for spare boards to be used in Gun refurbishment (2 sets, from IWF)
	+ SDP probe (flight spare) (from KTH)
	+ SN7 Gun/GDE (from IWF)
	+ SN7 Optics (from U of Iowa)
* Delivery of the following flight hardware items from UNH to FIELDS partners
	+ BGS SNs 11 & 5 and HV&Fil SNs 10 & 8 (to IWF)
	+ Screened HVOCs to IWF (from 3rd batch)
* Delivery of the following flight hardware items from UNH or LASP to the IS and Observatories
	+ SDP SNs 15, 16, 17 and 18, the final ship set.
	+ Maheu hats (GSE) to support EDI testing in Observatory TV
* CDRL and contract deliverable submissions this month:
	+ None
* Prioritized and coordinated the efforts of the UNH team, subcontractors, foreign partners, outside vendors and in-house workshops to optimize schedule performance.
* Supported processing of NCRs
 |
|  | b. | Product Assurance |
|  |  | Turco / Salwen* EDI FM7 integration support
* EDI FIL FM10 staking
* EDI FIL FM8 rework inspection and coating
* EDI GUN PWA refurbishment soldering documentation support
* LVPS #5 incoming test support.
* SDP ship set #4 clean and inspect.
* SDP FM2 thermal bonding.
* SDP FM2 assembly kitting.
* SDP FM2 parts cleaning.
* EDI HVOC inventory, package, and shipping.
* EDI Maheu Hat modification, cleaning, and packaging.
* EDI assembly support, Polymerics.
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| 2. | Systems Engineering and FIELDS I&T |
|  |  | Rau, Dors, Needell* Submitted EDI GDU SN04 magnetics measurements to B.Andersen
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| 3. | Post-Delivery Support (UNH) |
|  |  | * Inspected damaged SCM boom harness and participated in FRB
* Delivered spare SCM harness for installation on OBS3 boom 3A
* Delivered SDP SN15-18 to GSFC
* Delivered 4 EDI GDU Maheu Hats and installed two on OBS-2 prior to TV
* Supported OBS-1 ADP RE re-installation and testing
* Supported OBS-2 pre-TB aliveness test
* Supported OBS-2 TB testing and data reduction and summary report
* Supported OBS-2 TV test preparation including procedure review, harness GSE testing, personnel scheduling and pre-TV Aliveness Test
* Performed ADP Observatory Simulator Test prior to OBS-2 TV
* Developed test procedures for SCM special Magnetics "sniff" test
* Supported OBS-4 EMI
* Performed special SCM Magnetics "sniff" testing on OBS-4 during EMI
* Supported and reviewed WOA and procedure development at IS/OBS levels
* Reviewed test data
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| 4. | Science and Science Data Processing  |
|  |  | SWT and SWG * Continued work on drafts of FIELDS Instrumentation papers

Science data processing activities (Compiled by Chutter)* ALL
	+ Continue working through coordinate system definitions
	+ Continue populating FIELDS Processing document
* UNH
	+ Improved sample CDF v3.5 L1A and L1B files (except EDI) available at UNH and SDC
	+ Code to create those CDF files running at SDC using PODA interface to fetch data
	+ Created CDF skeleton files for all 4 observatories
* LPP
	+ SCM calibration software modified (and partially tested) in order to read the new SCM L1A CDF files provided by M. Chutter in Mag123 system.
	+ Internal versioning system (Mercurial) is operational for SCM software development
	+ SCM Cal version 0 delivered on the Sandbox :
		- [OK] return value + log file + input L1A reading
		- [partially done] check of input L1A attributes and variables values
		- [to be done] calibration + CDF output file
* UCLA
	+ Continue developing in-flight calibration procedures
	+ Continue converting analysis software to python
* GSFC
	+ Evaluated Interpolation routine for high resolution ephemeris
	+ FDOA agreed to provide attitude/ephemeris on one week notice once a time range is specified.
	+ Updated AFG\_DFG Data Products Guide: more corrections on names, coordinate systems, and variable dimensions, based on input from Mag team meeting.
	+ Created AFG/DFG L1B skeleton file with ISTP-compliant metadata.
	+ Wrote skeleton of mms\_fg\_l1b IDL function for processing L1B data from L1A, having worked out a basic interface to Mark’s scripts that will run at SDC. Worked out some issues as to locations and naming of log files and cal files.
* IRFU
	+ Working on implementation of SITL/QuickLook pipeline
* LASP
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| 5. | Magnetometers |
|  | a. | DFG  |  |
|  |  |  | * No activity this month
 |
|  | b. | AFG |  |
|  |  |  | Science* Reviewed Roy’s FIELDS paper and commented.
* Magnetometer paper now ready to be submitted.

Prelaunch Preparations* Hannes Leinweber consulting with Ken Bromund on development of magnetic field processing formats and procedures.
* Hannes Leinweber developing inflight calibration and inflight calibration procedures.
* Louise Lee converting analysis software to modern languages like Python.
* Support SODAWG – with emphasis on coordinate systems.

Engineering: Post-delivery Activity* Need connector to complete kitted parts– emailed S. Turco, who confirmed spare parts are in stock.
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|  | c. | SCM | * Provided spare SCM harness to replace damaged harness on Obs-3.
* Prepared and provided draft of SCM science paper for review
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| 6. | EDI |
|  |  | Ship Set 3 - GDU SN 7* GDU Assembly: detected anomalous resistance of 30 MOhms on Optics Extractor between HV connector and electrode electrode; swapped out optics/sensor SN7 and replaced by optics/sensor SN6 (gun support collar and upper optics SN7 remain)

Sensor* Ship Set 4 - SN 8
	+ Completed Final Assembly; Performed Electrical & Vacuum Test

Gun - UNH efforts* Completed Board Level test of HV-FIL board SN10
* Repaired HV-FIL Board SN8 (replacement of resistors R20 and R46)
* Prepared HV-FIL boards SN8 & 10 and Beam Generation System SN5-R for hand-carrying to IWF.
* Ordered and manufactured more spare parts for beam generation systems
* Began assembly of DEFL boards for Gun refurbishment activities (2 sets)

Gun - IWF efforts* Ship Set 3 - Gun SN7
	+ Replaced Beam Generation System
	+ Completed Gun Calibration
	+ Delivered Gun & GDE for GDU integration
	+ Returned anomalous Beam Generation System (SN1-R) to UNH
* Ship Set 4 - SN 6
	+ Completed Gun integration
	+ Started calibration
* Ship Set 4 - SN 8
	+ Finished population of HV sides of boards

Optics* Delivered SN7 Optics to UNH
* Continued work on SN8 & SN9

Software* Continued implementation and testing of electric field mode

HVOCs (UNH)* Device selection and Gun assignments for 3rd batch of UNH HVOCs (45 devices) is complete.
* 26 devices from this batch were delivered to IWF. These are intended for Gun SN9. The remaining devices are at UNH for assembly into the Gun boards to be used for refurbishment.
* Screening of the 4th and final planned batch of UNH HVOCs (45 devices) continues at UNH.
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| 7. | SDP/BEB/LVPS  |

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|  | a. | SDP/BEB/LVPS (KTH/IRFU/Oulu)KTH/IRFU: LVPS, SDP BEB’s, ADP BEB’s and SDP Preamp/Boom Cable Assemblies:* Done.

KTH/Oulu/IRFU: Sphere / Yo-Yo Mechanism:* Completed testing of last two Probes (including the probe designated for the flight spare SDP unit ) delivered to UNH in mid Nov.

KTH/IRFU/Oulu Management:* No activity.
 |
|  | b. | SDP/BEB/LVPS (UNH)LVPS, * No activity

AEB, S-BEB’s, Preamp/Cable Assemblies, GSE:* Done for all flight units

FS SDP:* Continued assembly of the flight spare unit (SN 2).
 |
|  | c.  | SDP (LASP)* Prepared SDP Door SN19 and SN20 as-built documentation
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| 8. | ADP |
|  | a. | LASP ADP Post-Delivery Support Activities at Goddard* Traveled to Goddard to provide ADP post-delivery support
	+ Obs #1
		- Reinstalled the -Z ADP RE on Obs #1
		- Performed post-installation latch release test on -Z ADP RE on Obs #1
		- Performed post-installation ADP RE functional test on –Z ADP RE on Obs #1. Review of the bias sweep data from this test showed that the sensor was not properly grounded during the external terminated bias sweep. All other tests were successful which indicates that the –Z ADP RE is functioning properly. Since Obs #1 was prepared for shipment to NRL immediately after the ADP RE reinstallation, the observatory was not available to rerun this portion of the test.
	+ Obs #2 – No LASP activity
	+ Obs #3 – No LASP activity
	+ Obs #4 – No LASP activity
* Reviewed and approved WOA’s for ADP-related work at GSFC

Axial Electronics Box (AEB)* No activity
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| 9. | DSP, Thermal, Systems Engineering, Product Assurance and Management (LASP) |
|  |  | DSP - No activities this month.Thermal – No activities this month.Systems Engineering and Program Management* Responded to questions regarding LASP’s cost to complete proposal
* Provided inputs to ADP instrument paper – figures, text, and performance specs.

Quality Assurance, Parts, and Materials Engineering* Supported program as needed.
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| 10. | CEB  |
|  | a. | Hardware |
|  |  |  | * No activity. CEB hardware activities are complete.
 |
|  | b. | CDPU Software,  |
|  |  |  | * Software is stable
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| 11. | GSE (Mello) |
|  |  | GSE Hardware* No activity

FIELDS Simulator* No activity

GSEOS & GSE Software* Support OBS/FIELDS testing
* Telemetry screen improvements
* New SDP Commissioning TLM screen
* New TBAL/TVAC screens
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| 12. | Commissioning and Mission Operations (Needell) |
|  |  | * Supported all MRT planning and testing activities.
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| 13. Problems encountered and updates this period |

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|  |  | EDI* [NEW] Anomalous HK value seen during first functional test (EDI GDU FM7) (PFR-10160.53-123-IP)
	+ During the first functional test of the integrated FM7 GDU, there was an anomalously high HK value seen on the outer analyzer.
	+ FRB consensus was to disassemble the GDU and re-integrate with FM6 optics. This was done.
	+ Subsequent GDU SN7 FFTs have been normal. Awaiting results of U of Iowa investigation into the problem with Optics SN7.
* [NEW] Zero counts observed during SN7 EDI Sensor characterization in vacuum (PFR-10160.53-119-IP)
	+ The initial ring around with the test pulser verified that all preamp channels were active. Following the ring around, there is a test to perform a dark counts scan. This normally would show 0-4 counts, however, there were 0 counts in all pads. After looking at the housekeeping data, the current on the MCP supply appeared to be slightly lower than expected. This suggests a connection to the HV Connector board is missing.
	+ Inspection confirmed the observation. The rework and retest of the SN7 Sensor testing completed normally. NCR to be closed.
* [UPDATE] Beam current for 500eV calibration (Gun FM7) (PFR-10160.53-122-IP)
	+ Insufficient beam at 500eV. Change in operating characteristics observed at 1 keV.
	+ FRB approved plan to replace the BGS.
	+ UPDATE: Gun 7 calibration, I&T with GDU and FFTs proceeded normally following the rework.
* [UPDATE] GDE Converter Shutdowns during TV (GDU SN FM4) (PFR-10160.53-118-IP)
	+ GDE converter shut down during continuous operations startup at first hot plateau in TV while switching gun energy to 1keV.
	+
	+ Another converter shutdown and two FPGA communication locks occurred after 101 hours of error free operation during instrument configuration for continuous operations.
	+ Subsequent instrument operation (23 hours) at HV on was nominal.
	+ UPDATE: PSR for GDU4 postponed pending planning for rework.
* [UPDATE] Off-resonance HV supply operation (Gun SN7) (PFR-10160.53-116-IP)
	+ During a test of the partially assembled board stack (lower three boards and HV stacks) the HV supply input current was 95 mA instead of the typically nominal 9.6 mA.
	+ Caused by test setup (HV probe capacitance causing off-resonance operation with high power consumption) resulting in possible overstress of two resistors (R20 and R46) on HV-FIL board SN8;
	+ The HV-FIL board SN8 was removed and replaced with SN9; Gun testing resumed.
	+ HV-FIL board will be repaired (R20 and R46)
	+ UPDATE: Gun 7 calibration, GDU integration and FFTs have proceeded normally.
* [UPDATE] Red Limit Violation of MCP supply current housekeeping monitor (EDI GDU FM4) (PFR-10160.53-117-IP)
	+ During detector characterization tests, the MCP current monitor had a single-sample red limit violation. This type of violation has occurred on other units referenced in NCRs 53-83, 53-88, and 53-105.
	+ Another single-sample red limit violation of the MCP current monitor was registered during the LFT conducted during the third hot cycle in the TV test.
	+ UPDATE: PSR for GDU4 postponed pending planning for rework.
* [UPDATE] Failure of HV supply (Gun SN6) (PFR-10160.53-113-OP)
	+ During final integration test of the FM6 gun electronics, in two cases a failure of the HV supply has been observed. The high voltage output of the stack reaches only 60% of the nominal value.
	+ As of 8 Oct 2013:
		- Diagnosed problem with insufficient HV stack output; R20 has increased resistance (700 Ohms instead of 20 Ohms); Very likely caused by test setup (HV probe capacitance causing off-resonance operation with high power consumption) resulting in overstress of two resistors (R20 and R46) on HV-FIL board.;
		- The HV-FIL board will be repaired
	+ UPDATE: The cause was identified with a similar problem was observed with Gun 7. See PFR-10160.53-116-IP. Rework is complete. Calibration of Gun/GDE SN6 is proceeding nominally.
* [UPDATE] Board-level test failure SN6 Gun Beam Board - damaged LVDS chip (PFR-10160.53-110-OP)
	+ The LVDS driver chip was damaged during board-level test on the SN6 Beam board due to a missing ground between the EGSE and the +/-5.2V power supply of the test board.
	+ Proposed Actions/Corrections:
		- Replace the part and inspect. DONE.
		- Correct the test setup and confirm. DONE.
		- Resume board level testing of the Beam Board. DONE.
		- Provide analysis assessing risk, if any, to other components on the board.
	+ UPDATE:
		- SN6 Gun has been placed back in cleanroom environment. Testing will resume when time is available.
		- Awaiting NCR details and analysis from IWF. Meanwhile, the calibration of Gun SN6 has proceeded normally.
* EDI GDU SN2 open work (PFR-10160.53-101-IP)
	+ GDU SN2 exhibited problems during the Gun calibration and component level TV test. See PFR-10160.53-56 [Thermal Vacuum Com Locks and Fold-Backs (EDI GDU SN2)] and PFR-10160.53-47 [GDE fold-back during SN2 Gun Calibration]. The unit was delivered to GSFC to participate in I&T, but needs to be returned to UNH and IWF for rework.
	+ Rework plan:
		- -Install new UNH-built optocouplers on DEFL1 and DEFL2 board and in any other gun HV amplifiers that have exhibited LED current trends.
		- -Remove 27 Ohm resistor from GUN25V supply line in GDE/Gun harness
		- -Install 20 Ohm resistor on HV-FIL board in Gun
	+ Retest plan:
		- -Gun calibration at IWF
		- Sensor stand-alone vacuum testing at UNH
		- GDU integration and environmental testing
* EDI GDU SN3 open work (PFR-10160.53-103-IP)
	+ GDU SN3 exhibited problems during the component level TV and vacuum tests. See PFR-10160.53-81 [GDE Converter Fold Back and Comm Locks observed during TV test (GDU SN FM3)] and PFR-10160.53-83 [Sensor FPGA reset (EDI GDU FM3)]. The unit was delivered to GSFC to participate in I&T, but needs to be returned to UNH and IWF for rework.
	+ Rework plan: Install new UNH-built optocouplers on DEFL1 and DEFL2 board and in any other gun HV amplifiers that have exhibited LED current trends.
	+ Retest plan:
		- Gun calibration at IWF
		- Sensor stand-alone vacuum testing at UNH
		- GDU integration and environmental testing
* EDI GDU SN5 open work (PFR-10160.53-106-IP)
	+ GDU SN5 exhibited problems during the component level TV and vacuum tests. PFR-10160.53-105 [Red Limit Violations on GDU SN5] and PFR-10160.53-96 [Converter Foldbacks (GDU FM5)]. The unit was delivered to GSFC to participate in I&T, but needs to be returned to UNH and IWF for rework.
	+ Rework plan: Install new UNH-built optocouplers on DEFL1 and DEFL2 board and in any other gun HV amplifiers that have exibited LED current trends.
	+ Retest plan:
		- Gun calibration at IWF
		- Sensor stand-alone vacuum testing at UNH
		- GDU integration and environmental testing
* [UPDATE] Negative Current spikes seen on Plate 7 Optocoupler during calibration (GUN SN4) (PFR-10160.53-85-AP)
	+ Three opto-couplers (HVOC 204, 210, 229) and one transistor (Q5, 2N2222) were replaced and submitted to GSFC for DPA. DPA results for HVOC 229 still pending.
	+ Successful Gun re-calibration performed.
	+ Waiting for successful GDU T/V test before closing. Risk of latent damage unknown. Opened risk on GDU SN4 (ID: 121)
	+ Update following GDU TV test:
		- 1) The affected Gun deflection channels – D5, D6 and D7 – performed without error during the GDU SN4 T/V test. Channel D6 exhibited a 7% trend (5 LSBs) in LED current between the first and last hot plateau of the T/V test. This is much less than the trends found on channels D3 (25%) and D8 (20%). Channel D5 showed no trend at all, channel D7 merely 2.2% (one LSB)
		- 2) The DPA report for HVOC 229 is still pending.
	+ UPDATE: PSR for GDU4 postponed pending planning for rework.
* [UPDATE] Failure to set the Wehnelt voltage (EDI Gun SN4, Q4 on HV-FIL board SN4) (PFR-10160.53-78-IP)
	+ Damage of transistor Q4 on HV-FIL board.
	+ Suspected cause: arc or ESD.
	+ Successful BLT of board SN4 after replacement of Q4, but board SN4 was not used for Gun SN4. Board SN5 was used with Gun SN4.
	+ No impact on other Gun boards seen, but risk of latent damage unknown. Opened risk on GDU SN4 (ID: 121)
	+ Converter shutdowns and communication locks were observed during GDU SN4 TV testing
	+ UPDATE: PSR for GDU4 postponed pending planning for rework.
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| 14. Issues and concerns |
|  |  | From FIELDS PM* The Gun/GDE continues to be the critical path for GDU and FIELDS. UNH will continue to coordinate support with IWF via weekly telephone calls. UNH will provide support of testing and assembly activities on site at IWF as needed. In addition, IWF has prepared and shipped kits so that UNH can assemble the Gun boards to be used in the refurbishment of GDUs. That work is underway. The intent is to have assembled and tested boards to be used as replacements and avoid rework of the boards currently in these Guns. These boards will employ UNH-built HVOCs.
* A risk record regarding GDU performance and schedule was initiated and discussed on several occasions in November with with SwRI and GSFC project leaders. The intent is to use this as a tool going forward to help coordinate mitigation efforts. Additional discussion is planned during the GDU SN7 PER.

Science Data Processing (Compiled by Chutter)* SCM
	+ [still pending] Conversion of TT2000 (64 bits long integers) to double precision floating point numbers introduces errors (tents of nanoseconds). This conversion is needed to correct for leap seconds and also for tplot variable timing => need to keep LONG64 all along the process => calibration software has to be modified.
* GSFC
	+ Update: DCE clarified that they could use DCB DMPA, but the interface with DCE still needs work. DMPA is available in DCB SITL, but DCB L2pre does not have DMPA. DCE requires L2pre input for production of DCE L2 data. Recommend that DCE uses OMB as input. I will provide routines to transform OMB to DMPA. Need confirmation from DCE.
	+ Interfaces to SDC for triggering L1B and higher level processing are somewhat in flux. There is a conflict between the concept of separate sandboxes for each instrument, and the need for mms-fields to script the spaghetti diagram for all fields instruments. The simple IDL function interface does not allow for a full implementation of the interface described in the Developer Guide.
	+ Resolution on TT2000 issue raised by SCM: all time tags should be manipulated as long integers to avoid errors due to lack of precision of double data type.
	+ Update: Need more discussion of MMS CDF Guidelines for variable naming: currently, mode and level are not included. Latest version has good guidance for variable metadata. Note that Epoch is recommended for the time variable. This is better than using distinct names, but this will require updates to current CDF files.
	+ Update: Mag DMPA SITL product is assumed to be Near GSE, but current project requirements make no mention of spin axis alignment with the ecliptic pole. Discussed with Laurie Mann, and she said she would follow up on this.
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NCR Summary: Provided separately (Excel file)

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| Activities planned for next reporting period |
|  |  | Management |
|  |  |  | * Continue to support SwRI review of the FIELDS cost change proposal submitted 31 July.
* Continue to push open NCRs to closure. Support FRBs as needed.
* Continue to prioritize and coordinate the work of the UNH team and its FIELDS partners.
* Closely monitor status and schedule performance of team members. Identify schedule risks and provide assistance for mitigation if warranted. Work to minimize schedule slippage.
* Support/staff T/V testing as needed
* Update the Gun and GDE schedule.
* Receive delivery of the following items at UNH
	+ Macor brackets for 3R and 5R Gun boards (from IWF)
* Delivery of the following flight hardware items from UNH to FIELDS partners
	+ None planned
* Prepare and conduct the following PERs and associated TRRs
	+ GDU SN7
* Prepare and conduct the following PSRs or Acceptance Reviews.
	+ None planned
* Make or coordinate delivery of the following to GSFC IS or S/C teams
	+ None planned
* CDRL and contract deliverable submissions:
	+ None planned
 |
|  |  | Product Assurance, Configuration Management, Parts, Materials, Facilities |
|  |  |  | Turco/Salwen* Provide EDI FM7 TV support as needed
* Conduct GUN PWA soldering inspection
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|  |  | Systems Engineering & FIELDS I&T |
|  |  |  | Rau, Dors, Needell* Support EDI GDU SN07 PER
* Continue submitting FIELDS verification material for closure
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|  |  | Post-Delivery Support (UNH) |
|  |  |  | IS and Observatory Support (FIELDS)* Support OBS-1 Pre-TV post ship Functional
* Support OBS-1 TV preparation including SDP Motor and HOP test
* Support OBS-2 TV testing including end to end HV testing on EDI GDU
* Support OBS-3 Baseline Mag boom 2nd/3rd motion and mag functional
* Install SDP 15-18 on OBS-3 and perform electrical integration
* Support OBS-4 Acoustics testing
* Pass damaged SCM harness to FIELDS technicians and QA for repair
 |
|  |  | Science |
|  |  |  | SWT and SWG* Support science telecons as needed
* Continue preparation FIELDS Instrumentation papers

Science data processing activities* UNH
	+ Start work on scripting to control FIELDS processing at SDC
* SCM
	+ Finalizing SCM Cal interface with SDC :
		- include software to calibrate data.
		- include software to write output CDF file.
	+ Test further the SCM calibration software with the new SCM L1A CDF files provided by M. Chutter in Mag123 system.
	+ Digital filter response will be tested in the calibration software (may be postponed to 2014 depending on work load).
* GSFC
	+ Produce skeleton SITL/Quicklook, and L2pre data files.
	+ Get sample attitude and ephemeris files from FDOA, corresponding to MRT9B.
	+ Write prototype L1A->L1B, L1B->SITL, L1A->L2pre software that reads required inputs and creates required outputs.
* UCLA
	+ Work on data products guide.
	+ Continue developing inflight calibration procedures.
	+ Submit software and calibration files to test interfaces at the SDC.
 |
|  |  | AFG |
|  |  |  | * Work on data products guide.
* Continue developing inflight calibration procedures.
* Continue software analysis activities.
* Continue to support SODAWG.
* Develop milestones for prelaunch preparations.
* Submit software and calibration files to test interfaces at the SDC.
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|  |  | DFG |
|  |  |  | * Continue with our models for the combined SCM/FG data product
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|  |  | SCM |
|  |  |  | * Organization of the FMS delivery to UNH
* Support (remotely) UNH team for the preparation of s/c EMI testing
 |
|  |  | EDI |
|  |  |  | Ship Set 3 - GDU SN 7* Complete GDU Assembly
* Baseline Functional Test in Vacuum
* PER
* Vibration
* Return lower optics SN7 to UIowa for anomaly investigation and repair. Help Iowa resolve problem.

Sensor* Ship Set 1 - SN 9
	+ Preamplifier Trimming and Delay Test

Gun – UNH efforts* Continue assembly of DEFL boards (2 sets) to be used in Gun refurbishment

Gun - IWF efforts* Ship Set 4 - SN 6
	+ Complete Gun Calibration
* Ship Set 4 - SN 8
	+ Complete board level testing
	+ Integrate lower board stack

Optics* Ship Set 3 - SN 7
	+ Ship GDU bulkhead to UNH for mounting & return of SN7 optics; Investigate anomalous resistance (30 MOhms) in SN7 extractor electrode connection

Software* Continue impementation and testing of electric field mode

HVOCs (UNH)* Complete the screening test sequence and selection activities for batch 4, the final planned batch.
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|  |  | SDP/LVPS/BEBs/Preamp/Probe (KTH/ Oulu/IRFU) |
|  |  |  | SDP:* No activity planned

S-BEB’s & Preamp & Probe:* No activity planned

A-BEBs and LVPS:* Done
 |
|  |  | SDP/LVPS/BEBs/Preamp/Probe (UNH) |
|  |  |  | UNH SDP:* Continue assembly of flight spare SDP (SN2)
* Revise plan for additional EMI testing as requested by SwRI.

LVPS* No activity planned
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|  |  | ADP/SDP/DSP (LASP) |
|  |  |  | QA/Parts/Materials* Support the project as necessary.

DSP – No activity plannedADP* Support I&T at Goddard as needed

AEB – No activity plannedSDP* Deliver SDP Door EIDP updates with as-built records for door SN19 and SN20.

Thermal – No activity plannedSystems and Program Management* Focus on EIDP and verification tasks
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|  |  | CEB Hardware and Software |
|  |  |  | * All flight hardware is delivered. Flight spare kits are complete. No further activity is planned.
* CEB flight software is stable.
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|  |  | GSE (Mello) |
|  |  |  | GSE hardware* No planned activity

GSEOS & GSE Software* Support OBS/FIELDS testing
* SupportTVAC/FIELDS testing
* Telemetry screen improvements
* Update GSEOS version
* New GSE Decoders & Screens for GSE Therm & SC telemetry

FIELDS Simulator (FS)* No planned activity
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|  |  | Commissioning and Mission Operations (Needell) |
|  |  |  | * Continue to support all MRT planning and testing activities.
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