

SPIRE	Monthly Report to Alcatel/ESA January 2002	Ref : SPIRE-RAL-REP-001220 Date: 20/2/02
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1. SPIRE PROJECT

1.1 General

- This report covers January 2002
- Project team has focussed on
 - IID-B update, change requests issued.
 - Preparation for IBDR

1.2 Instrument performance

- Sensitivity model updated for IBDR
- Thermal analysis of stage temperatures carried out

1.3 Problem Areas

- Requested CQM delivery date remains incompatible with the SPIRE schedule.
- Electrical isolation of cold straps
- Mass of DRCU (a mass breakdown has been produced and is more than allocation)
- Lack of cryostat dynamic thermal model from industry is holding up FPU thermal analysis.
- Undefined/unconfirmed spacecraft interfaces (IID-B) will soon cause problems.

1.4 Project-Level Meetings

- CDMS meeting at Cannes 22/2/02
- DRCU DDR preparation meeting 18/1/02
- Several project team meetings
- Several 300mK strap team meetings

1.5 Documents Issued

- IBDR data pack

2. INSTRUMENT MANAGEMENT

2.1 Personnel

No Change

2.2 Work packages

No changes.

2.3 Schedule

New Major milestone list issued for IBDR, 1.3 draft1 31st Jan 2002

2.4 Funding

- The UK funding envelope is still inadequate fore the hardware plus ICC development programme. Pressure still exists to descope hardware (BSM or Flight Spare). Project management costs must be reduced.
- High cost of DRCU electronic components poses potentially serious funding problem in France.
- Funding within JPL is a problem and is considered likely to have an impact on deliverables and/or schedule.

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3. INSTRUMENT ENGINEERING

3.1 Instrument Design Changes

- No changes

3.2 PA/QA

- On going

3.3 Budgets

- Mass of warm electronics over budget, action TBD

4. INSTRUMENT SUBSYSTEMS

Subsystem	Responsible	Status	Schedule status
BSM	ATC	Detailed 2 axis prototype warm testing completed, including control loop tests. Preparation for cryo tests started. Kick-off meeting on random response FEA held. Magnetic modelling underway at MPIA, but delayed by effort availability. Representative Zeiss/PACS motors received. Development model manufacture in progress. Cryo-upscreen rig design complete and placed with workshop for manufacture. Brazed CuBe pivots (chop axis type) order placed with C-Flex.	Currently 1 month late, does not effect overall schedule
Calibrators	Cardiff	Updating ICD HB7 source design nearing completion (with Jeff Beeman). Final PCAL drawings in progress New drawings for SCAL prototype components submitted for manufacture SCAL STM and CQM components in manufacture	OK
Cooler	SBT	- First Electron Beam welding phase on cooler heart and heat switches successfully performed - Sorption pumps made - Brazing phase on cooler heart and heat switches almost completed - Anomaly spotted on structures : EB weld has induced a deformation of 400 µm max. of the side plate onto which the switches are mounted. Deformation not acceptable. MRB held : causes and solutions identified. Selected Solution is being implemented (angle bracket will be added)– Note : future FM structures will be almost 100% similar to CQM structures with added angle bracket; the idea is of course to avoid any delta qualification. So far no impact on the planning for the CQM (structures shall be available before cooler hearts will be ready to be included in them). - STM cooler available as soon as modified structures ready. Vibration tests to follow - Following ITT for clean room, subcontractor selected. Clean room expected to be operational end of April. - Kevlar characterisation campaign : fatigue test set up has been modified – to date Kevlar 34 (breaking at 12 DaN) has been solicited 6 000 000 times between 7.8 – 9.2 DaN (nominal tension in cooler : 5 DaN) - Large test cryostat : delivery expected middle of february	OK
Detectors, JFETS and	JPL	Completed PLW array lithography. Lost our JFET fabrication	OK, but

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RF Filters		<p>engineer (left JPL). We have embarked on the process of training a new one. Began assembly of the QM BDA. We have received the Thermal Cycle Dewar and are in the process of installing it. Finished 4K measurements of the load resistor module successfully.</p> <p>We have found it necessary to modify the design of the capstan which is used to preload and secure the kevlar suspension bands. Although the kevlar is being pretensioned, the final adjustment length needed is longer than expected. Redesigned capstan to be installed. A design review is scheduled to cover this and some other minor changes to the BDA design. This review will take place on the 25th of February.</p>	under review
DPU and OBS	IFSI	<p>Box mechanical design completed, the AVM box is manufactured.</p> <p>Intensive software tests related to the S/C interface are progressing.</p> <p>The ASI Review Change Board has evaluated the ECP3 in answer to CGS ECP3 (minimum MIL-C quality for QM components), the financial/contractual aspects still to be approved by the ASI Administration Board.</p> <p>The VM Compiler/Simulator is in progress (80% ready) . HW problems with fast I/F has been solved while the slow speed I/F is still under investigation. On week 4-9 Feb IFSI representatives will be at CGS to help solve the problem.</p>	OK
DRCU and WIH	SAP	<p>DCU</p> <p>Board PCB re-design</p> <p>IBDR documentation writing in progress</p> <p>VHDL coding & Simulation in progress.</p> <p>DAQ IF fabrication file send to JPL 18/01</p> <p>BIAS PCB layout modification in progress</p> <p>LIA-P PCB layout modification in progress</p> <p>LIA-S design/part check review achieved</p> <p>SCU</p> <p>Draft Specification and preliminary (H/W & VHDL) design available.</p> <p>Draft DPU/SCU ICD issued. (internal)</p> <p>Preliminary command list available</p> <p>Heaters : prototype test in preparation</p> <p>Temperature sensors : test successful</p> <p>PCB design preparation</p> <p>Heater & temperature function implementation in progress</p> <p>Analog ports HSK in progress</p> <p>DPU IF command and data IF achieved</p> <p>PSU</p> <p>Separated power bench will be used for QM1 and QM2.</p> <p>Draft Specification available.</p> <p>Call for tender process started (Call for Application completed)</p> <p>Specification writing: finalisation</p>	Being optimised
DRCU simulator Inst simulator	Stockholm		OK
Filters, Dichroics	Cardiff	<p>Prototyping of dichroics and beam dividers</p> <p>300mK filter interface components complete</p> <p>300mK filter tests in progress (frame with representative material)</p>	OK

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		300mK filter material in manufacture	
Mirrors	LAM	Mirror sizes optimised.	OK
Shutter	USK	Some funding is now available to continue critical work	OK
Spectrometer Mechanism	LAM	<p>DDR passed in October</p> <p>STM design finalised</p> <p>Synchronisation device material chosen</p> <p>Actuator specifications written</p> <p>Studies at BE System reinitiated with STM/flight design</p> <p>Test set up for sub components (LVDT and Actuator) in progress – preliminary tests done.</p> <p>Size of electronics board received from CEA</p> <p>Boards mechanical interfaces received from CEA</p> <p>Tests on MAC Board</p> <p>MAC QM1 Reading/Writing DSP-ADC/DAC test software OK</p> <p>Connector definition for Power supply OK</p> <p>Orcad layouts of Flight Model Electronics for DDR</p> <p>Detailed list of command review</p> <p>Definition of Harness pin out</p> <p>ACTEL FGA tools provided (Leonardo). CEA VHDL analysed with success</p> <p>MAC QM1 Board DSP : Arctangent calculations and optical encoder signals acquisition OK</p>	OK
Structure	MSSL	<p>Subsystem interfaces still open are thermal busbar, thermistors, RF filters and SMEC. Detailed design for MGSE nearly completed. Minor changes to documentation have been implemented. Delivery of STM now possible in Early August with current manufacturing deadlines. Harness routing continuing. Production of second optical bench, mirror and dichroic mounts continues. Order placed with Thrust engineering for covers, optical bench and Photometer 2K box. Covers now designed to be in 2 pieces rather than 6. Detail drawings of first photometer 2K box has been completed. Stainless steel was found to have a better thermal performance for the A-frames than Titanium</p>	OK improved schedule has been established and good progress is being made.
Thermal straps	MSSL, Cardiff	<p>A small team has been formed to set up a design and test programme</p> <p>Design validation prototypes have been manufactured for several suspension concepts.</p> <p>Vibration test of one concept successful. Others to be tested next month</p>	OK
AIV/Calibration facility	RAL	<p>Cryolab: Refurbishment continues.</p> <p>Cryostat: The cryostat manufacturers are planning to deliver the cryostat at the end of June subject to delivery of the cryogenic vacuum vessel in March and successful cold testing. The MGSE to transport the instrument on the HOB simulator to the cryostat has been produced and reviewed. Detailed drawings for the cryostat filters have been produced for signing off.</p> <p>A test rig for the vacuum system is being built. Cryoharness: Tekdata have ordered materials for the harness.</p> <p>Telescope Simulator:</p> <p>Laser: The Laser has been re-aligned and is now ready for use. The vacuum pumps, water cooler and gas bottles have been moved to their purpose built cabinet.</p>	OK

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		<p>TFCS: A draft version of the User Requirements Document has been produced. Thermometer monitoring units have been ordered.</p> <p>The cryostat vacuum system has been delivered.</p> <p>Cryoharness: On order</p> <p>Telescope Simulator: The telescope-imaging mirror has been delivered to RAL and is currently undergoing 3D metrology.</p> <p>Laser: Refurbishment continues</p> <p>TFCS: A draft version of the User Requirements Document has been produced. Thermometer monitoring units have been ordered.</p>	
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5. INSTRUMENT AIV

- A detailed AIT procedure is being developed

6. ACTIONS.

See action list attached to minutes HP-ASPII-MN-390

Due to the IBDR and the lateness of this report, it is proposed to miss out the February report and submit the March report earlier in the month.