

<b>SPIRE (LAM)</b>	<b>Monthly Report – June 2001</b>	<b>Date:</b> 25/06/2001
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**Work Package: MCU electronics**

**SPIRE-LAM-REP-000791**

<b>1. Subsystem Progress Since Project Inception</b>		
<b>Prototyping:</b>		
<ul style="list-style-type: none"> <li>▪ DSP 21020 Evaluation board purchased</li> <li>▪ Preliminary software for SMEC and BSM control (3 PIDs) done</li> <li>▪ Performances between dSpace and evaluation board control software done</li> <li>▪ Control loop performances using GSFC prototypes and dSpace done</li> <li>▪ SMEC prototype board done</li> </ul>		
<b>Development Model</b>		
<ul style="list-style-type: none"> <li>▪ MAC DM electronics layout finished</li> <li>▪ MAC DM routing almost finished</li> </ul>		
<b>Qualification and Flight Model</b>		
<ul style="list-style-type: none"> <li>▪ First list of critical components done/Participation of final list with Tecnologica</li> </ul>		
<b>2. Subsystem Progress This Month</b>		
<ul style="list-style-type: none"> <li>▪ Routing of the MAC DM board</li> <li>▪ Control Bus FPGA VHDL program</li> <li>▪ LVDT conditioning electronics breadboard</li> <li>▪ Planning questions raised and partially settled with UKATC. No problem foreseen.</li> </ul>		
<b>3. Problem Areas</b>		<b>Remedial Action</b>
<ul style="list-style-type: none"> <li>▪ The telemetry/HK philosophy need to be validated</li> <li>▪ Interface with CEA generic communication FPGA to be validated</li> <li>▪ BSM analog electronics need to be validated before final component list</li> <li>▪ Size of electronics board to be validated</li> <li>▪ Mechanical mounting of the boards to be validated</li> <li>▪ Connector for Power supply</li> </ul>		<ul style="list-style-type: none"> <li>▪ OBS meeting @ IFSI 11<sup>th</sup> July</li> <li>▪ Definition of interfaces with CEA</li>   <li>▪ BSM Analog electronics under review by Brian Staubie</li> <li>▪ CEA to provide mechanical sizes</li> <li>▪ CEA to provide the stiffeners design</li>   <li>▪ CEA to provide type and implementation info</li> </ul>
<b>4. Engineering Activities</b>		
<ul style="list-style-type: none"> <li>▪ Simulation activities: assessment of LVDT control system performances</li> <li>▪ Simulation activities: assessment of external vibration acceptable on SMEC mechanism to fulfil velocity stability requirements</li> </ul>		
<b>5. Design Changes</b>		
Confirmation that there is no link between Telemetry signals and DSP acquisitions		
<b>6. PA/QA Activities</b>		
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<b>7. Subsystem Management Issues</b>		
MCU subsystem WPs and detailed schedule update		
<b>8. Actions Requiring Immediate Attention</b>		
The Call for tender of QM electronics manufacture needs to be started September this year. Before that all necessary info must be validated (See Problem area list)		
<b>9. Status of Previous Actions</b>		
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<b>10. Activities Yet to be Achieved</b>		
<ul style="list-style-type: none"> <li>▪ Communication FPGA ( not started)</li> <li>▪ Tests of MAC DM</li> <li>▪ SMEC Board DM model.</li> <li>▪ Final component list (active and passive)</li> </ul>		
<b>11. Milestones</b>		<b>Status</b>
01/03/2002	MAC DM model ready (internal milestone)	
01/09/2002	Delivery of QM1 to CEA/Sap	
<b>13. Schedule Changes</b>		

None identified
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**Work Package: SMECm**

<b>1. Subsystem Progress Since Project Inception</b>		
<p><b>Prototypes:</b></p> <ul style="list-style-type: none"> <li>▪ GSFC1 and 2 tested with commercial actuator and optical encoder</li> <li>▪ Control loop performances using GSFC prototypes and dSpace done : mechanical modes identified</li> </ul> <p><b>Actuator</b> Specifications under writing</p> <p><b>Optical encoder</b> Preliminary cryogenic tests on a prototype successful</p> <p><b>Launch latch</b> Under design, based on the commercial product</p> <p><b>LVDT</b> Mounting of a long stroke LVDT on the prototype GSFC 1 unseccessful</p>		
<b>2. Subsystem Progress This Month</b>		
<ul style="list-style-type: none"> <li>▪ Flight design under progress</li> <li>▪ Synchronisation device differential dilatation under investigation</li> <li>▪ BE System Mechanical study of the pivots done</li> <li>▪ Position sensor with LVDT's only under investigation (in case of problem with optical encoder)</li> </ul>		
<b>3. Problem Areas</b>		<b>Remedial Action</b>
<ul style="list-style-type: none"> <li>• The pivots do not bear the launch random vibration levels</li> <li>• Mass allocation insufficient</li> <li>• LVDT only solution cannot achieve better than resolution 500 due to mechanical mounting and mass</li> </ul>		<ul style="list-style-type: none"> <li>▪ To be defined during BE System - LAM- CNES meeting : maybe latching the upper plate, notches,...</li> <li>▪ Action on system team as soon as new mass estimate available</li> <li>▪ Closed control loop under R=500 and Open control loop for R&gt;500</li> </ul>
<b>4. Engineering Activities</b>		
BE System finite element analysis Magnetic field simulation of the actuator		
<b>5. Design Changes</b>		
Wait for results of the BE System-CNES-LAM meeting		
<b>6. PA/QA Activities</b>		
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<b>7. Subsystem Management Issues</b>		
SMECm subsystem WPs and detailed schedule is to be updated		
<b>8. Actions Requiring Immediate Attention</b>		
Mass budget to be updated ASAP The Call for tender of pivots needs to be started September this year.		
<b>9. Status of Previous Actions</b>		
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<b>10. Activities Yet to be Achieved</b>		
<ul style="list-style-type: none"> <li>▪ Definitive flight design</li> <li>▪ Prototype actuator and launch latch(es) to be built and tested</li> <li>▪ Synchronisation materials to be chosen</li> <li>▪ Flight designed optical encoder to be cryogenically tested</li> <li>▪ LVDT to be chosen and tested</li> </ul>		
<b>11. Milestones</b>		<b>Status</b>
26/06/2001	BE System, CNES, LAM meeting	
End 09/2001	SMECm DDR	
<b>13. Schedule Changes</b>		
None identified		

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**Work Package: Mirrors**

<b>1. Subsystem Progress Since Project Inception</b>		
<u>Optical design:</u> Frozen		
<u>Mirror manufacture</u> Blanks to be manufactured at LAM and in the industry Successful discussion with MECASEM for optical surface machining. (No problem)		
<u>Alignment tools design</u> Under progress		
<b>2. Subsystem Progress This Month</b>		
Detailed design done (to prepare the DDR)		
<b>3. Problem Areas</b>	<b>Remedial Action</b>	
None identified		
<b>4. Engineering Activities</b>		
<b>5. Design Changes</b>		
None		
<b>6. PA/QA Activities</b>		
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<b>7. Subsystem Management Issues</b>		
Mirrors subsystem WPs and detailed schedule to be updated		
<b>8. Actions Requiring Immediate Attention</b>		
None		
<b>9. Status of Previous Actions</b>		
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<b>10. Activities Yet to be Achieved</b>		
<ul style="list-style-type: none"> <li>▪ Definitive flight design (if modification after DDR)</li> <li>▪ Detailed drawing sheets to be sent to MECASEM for acceptance plus minute modifications (if any)</li> <li>▪ Blanks manufacture</li> <li>▪ Optical surface manufacture</li> <li>▪ Alignment tools manufacture</li> </ul>		
<b>11. Milestones</b>		<b>Status</b>
09/07/2001	Mirrors DDR (date to be confirmed)	
<b>13. Schedule Changes</b>		
None identified		