

**Work Package: MCU electronics** **SPIRE-LAM-REP-001043**

<b>1. Subsystem Progress Since Project Inception</b>	
<u>Prototyping:</u>	
<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>	
<u>MCU QM1</u>	
<ul style="list-style-type: none"> <li>▪ MAC QM1 electronics layout finished</li> <li>▪ MAC QM1 routing finished</li> <li>▪ MAC QM1 Board received</li> <li>▪ MAC QM1 Board Control Bus FPGA tests: electrical tests OK, DAC control</li> <li>▪ MAC QM1 Board ADC validated</li> </ul>	
<u>Qualification and Flight Model</u>	
<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>• DDR passed in October</li> <li>• Size of electronics board received from CEA</li> <li>• Boards mechanical interfaces received from CEA</li> <li>• Tests on MAC Board</li> <li>• MAC QM1 Reading/Writing DSP-ADC/DAC test software OK</li> <li>• Connector definition for Power supply OK</li> </ul>	<ul style="list-style-type: none"> <li>▪ Orcad layouts of Flight Model Electronics for DDR</li> <li>▪ Detailed list of command review</li> <li>▪ Definition of Harness pin out</li> <li>▪ ACTEL FGA tools provided (Leonardo). CEA VHDL analysed with success</li> <li>▪ MAC QM1 Board DSP : Arctangent calculations and optical encoder signals acquisition OK</li> </ul>
<b>3. Problem Areas</b>	<b>Remedial Action</b>
<ul style="list-style-type: none"> <li>• Interface with CEA generic communication FPGA to be validated</li> <li>• Size of electronics board to be validated</li> <li>• Mechanical and thermal design of the mechanical mountings boards to be validated</li> </ul>	<ul style="list-style-type: none"> <li>▪ Definition of interfaces with CEA : meeting 29/11/2001</li> </ul>
<b>4. Engineering Activities</b>	
Robust Control control system for digital controller under investigation with SUPELEC	
<b>5. Design Changes</b>	
MCU Boards temperature acquisition under investigation	
<b>6. PA/QA Activities</b>	
PA/QA engineer appointed : Gérard Rousset PA plan for call for tender to be written	
<b>7. Subsystem Management Issues</b>	
/	
<b>8. Actions Requiring Immediate Attention</b>	
<ul style="list-style-type: none"> <li>• MCU Call for tender : under writing. 1<sup>st</sup> contact with Austrian Aerospace</li> <li>• Mechanical and thermal design of the mechanical mountings boards to be validated following visit from Austrian Aerospace</li> </ul>	
<b>9. Status of Previous Actions</b>	
/	
<b>10. Activities Yet to be Achieved</b>	
<ul style="list-style-type: none"> <li>▪ Updating of docs following DDR</li> <li>▪ Tests of MAC QM1 to be completed : EEPROM implementation, Boot mechanism, Encoder interface to be done</li> </ul>	<ul style="list-style-type: none"> <li>▪ List of components : passive parts for Tecnologica</li> <li>▪ SMECm simulator hardware procurement under progress (DSPACE based compact system)</li> <li>▪ SMECm CQM, DM + spare LVDT's procurement</li> </ul>
<b>11. Milestones</b>	<b>Status</b>
01/03/2002	
01/09/2002	
MAC QM1 model ready (internal milestone) Delivery of QM1 to CEA/Sap	
<b>13. Schedule Changes</b>	
None identified since DDR	

**Work Package: SMECm**

<b>1. Subsystem Progress Since Project Inception</b>		
<u>Prototypes:</u>		
<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>		
<u>Actuator</u>		
Specifications written		
<u>Position sensors</u>		
Preliminary cryogenic tests on a prototype successful		
Position sensor with LVDT's investigated : 2 implemented for absolute position and 2 implementable if necessary		
<u>Launch latch</u>		
Under design, based on the commercial product		
<b>2. Subsystem Progress This Month</b>		
<ul style="list-style-type: none"> <li>▪ DDR passed in October</li> <li>▪ STM design finalised</li> <li>▪ Synchronisation device material chosen</li> <li>▪ Actuator specifications written</li> <li>▪ Studies at BE System reinitiated with STM/flight design</li> <li>▪ Test set up for sub components (LVDT and Actuator) in progress – preliminary tests done</li> </ul>		
<b>3. Problem Areas</b>		<b>Remedial Action</b>
<ul style="list-style-type: none"> <li>• Mass allocation insufficient</li> </ul>		<ul style="list-style-type: none"> <li>▪ Action on system team (DDR?)</li> </ul>
<b>4. Engineering Activities</b>		
BE System finite element analysis		
Lifetests test-setup to be designed		
<b>5. Design Changes</b>		
None		
<b>6. PA/QA Activities</b>		
PA/QA engineer appointed : Gérard Rousset		
<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 (harness)		
<b>9. Status of Previous Actions</b>		
Call for tender postponed till beginning 2002 (no need for the STM and CQM)		
<b>10. Activities Yet to be Achieved</b>		
<ul style="list-style-type: none"> <li>▪ Pivots to be designed by BE System</li> <li>▪ Prototype actuator and launch latch(es) to be built and tested</li> <li>▪ Flight designed optical encoder to be cryogenically tested</li> <li>▪ LVDT to be tested</li> </ul>		
<b>11. Milestones</b>		<b>Status</b>
June 2002	SMECm STM delivered to RAL	
<b>13. Schedule Changes</b>		
None identified		

**Work Package: Mirrors**

<b>1. Subsystem Progress Since Project Inception</b>	
<u>Optical design:</u> Frozen	
<u>Mirror manufacture</u> Successful discussion with MECASEM for optical surface machining. (Minor problems)	
<u>Alignment tools design</u> Under progress	
<b>2. Subsystem Progress This Month</b>	
Big off-axis mirror prototype manufactured and controlled : undulations detected 3 sets of blanks for the small axi-symmetric mirrors done at LAM, except interface finish	
<b>3. Problem Areas</b>	<b>Remedial Action</b>
Mirror mounting procedure during surface machining	Correction in progress
<b>4. Engineering Activities</b>	
Manufacturing tool for off axis mirrors to be modified	
<b>5. Design Changes</b>	
None	
<b>6. PA/QA Activities</b>	
PA/QA engineer appointed : Gérard Rousset	
<b>7. Subsystem Management Issues</b>	
Mirrors subsystem WPs and detailed schedule to be updated	
<b>8. Actions Requiring Immediate Attention</b>	
The mounting procedure	
<b>9. Status of Previous Actions</b>	
/	
<b>10. Activities Yet to be Achieved</b>	
<ul style="list-style-type: none"> <li>• Small blanks interface to be finished</li> <li>• 3 sets of Off axis and big axi-symmetric blanks to be manufactured</li> <li>• All mirrors optical surface to be manufactured</li> <li>• All mirrors to be cleaned, controlled, bake-outed</li> <li>• Alignment tools to be manufactured</li> </ul>	
<b>11. Milestones</b>	<b>Status</b>
<b>13. Schedule Changes</b>	
None identified	