

SPIRE (LAM)	Monthly Report – Apr 2002	Date: 18/04/2002
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Work Package: MCU electronics

SPIRE-LAM-REP-001281

1. Subsystem Progress Since Project Inception		
<u>Prototyping:</u>		
<ul style="list-style-type: none"> ▪ DSP 21020 Evaluation board purchased ▪ Preliminary software for SMEC and BSM control (3 PIDs) done ▪ Performances between dSpace and evaluation board control software done ▪ Control loop performances using GSFC prototypes and DSpace done ▪ SMEC prototype board done 		
<u>MCU EM</u>		
<ul style="list-style-type: none"> ▪ MAC EM electronics layout finished ▪ MAC EM routing finished ▪ MAC EM Board received ▪ MAC EM Board Control Bus FPGA tests: electrical tests OK, DAC control ▪ MAC EM Board ADC validated 		
<u>MCU QM1</u>		
<ul style="list-style-type: none"> ▪ To be subcontracted (due to agreement to provide a form&fit MCU) 		
<u>Qualification and Flight Model</u>		
<ul style="list-style-type: none"> • List of components provided to Tecnologica (except voltage regulators, see below) • Docs for MCU call for tender nearly completed 		
2. Subsystem Progress This Month		
<ul style="list-style-type: none"> • Size of electronics board received from CEA • Boards mechanical interfaces received from CEA • MCU interfaces electrical & mechanical received 	<ul style="list-style-type: none"> • Agreement LAM-CEA to provide a QM1 form&fit 	
3. Problem Areas	Remedial Action	
<ul style="list-style-type: none"> • Waiting for environment specifications for MCU • Interface FPGA Communication VHDL compatibility potential problems 	<ul style="list-style-type: none"> • Due by 15 May 2002 • To be evaluated with CEA 	
4. Engineering Activities		
<ul style="list-style-type: none"> • On board software under development 		
5. Design Changes		
<ul style="list-style-type: none"> • Voltage regulators displaced from CEA Power supplies to the MCU • MCU boards temperature sensors implemented • Philosophy of an EGSE for the launch latches adopted 		
6. PA/QA Activities		
7. Subsystem Management Issues		
8. Actions Requiring Immediate Attention		
<ul style="list-style-type: none"> • Call for tender to be issued 		
9. Status of Previous Actions		
10. Activities Yet to be Achieved		
<ul style="list-style-type: none"> • Set of docs for the call for tender to be completed • Voltage regulators list to be provided to Tecnologica (joint action with CEA) 		
11. Milestones		Status
31/05/2002	Call for tender issued (internal milestone)	
31/12/2002	Delivery of QM1 to CEA/Sap	
13. Schedule Changes		
<ul style="list-style-type: none"> • QM1 delivery postponed till Dec 2002 (Ok with March 2002 version of the SPIRE milestones) 		

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Work Package: SMECm

1. Subsystem Progress Since Project Inception		
<u>Prototypes:</u>		
<ul style="list-style-type: none"> ▪ GSFC1 and 2 tested with commercial actuator and optical encoder ▪ Control loop performances using GSFC prototypes and dSpace done : mechanical modes identified 		
<u>Structure</u>		
STM/Flight design done. STM under manufacture.		
Harness layout in the SPIRE structure solved.		
<u>Actuator</u>		
Prototype coils received. Magnets received. Prototype actuator being tested.		
<u>Pivots</u>		
CQM BE System pivots ordered.		
<u>Position sensors</u>		
CQM optical encoder cold electronics ordered		
LVDT's received		
<u>Launch latch</u>		
Design in progress, based on the commercial product.		
<u>Test equipment</u>		
A 4K cryogenerator has been received and tested. Test setup for the mechanism in progress		
2. Subsystem Progress This Month		
<ul style="list-style-type: none"> ▪ Actuator force measurement at cryo temp test set-up design under progress. ▪ Studies at BE System with STM/flight design done. Problems with random vibrations levels 		
3. Problem Areas	Remedial Action	
<ul style="list-style-type: none"> • Mass allocation insufficient • Random vibrations levels too high 	<ul style="list-style-type: none"> ▪ Action on system team (DDR?) ▪ Wait for the SPIRE STM test results 	
4. Engineering Activities		
5. Design Changes		
<ul style="list-style-type: none"> • SMECm harness in structure problems solved : instead of 4 heavy and rigid cables, individual light twisted shielded pairs will be used. Mass estimate = 150 grams (instead of 500 grams with previous solution) • For the SMECm STM only, pivots replaced by plain axis (as planned as an option at the SMECm DDR) • For the flight models, no design change yet. May arise after STM vibrations tests. 		
6. PA/QA Activities		
7. Subsystem Management Issues		
8. Actions Requiring Immediate Attention		
9. Status of Previous Actions		
<ul style="list-style-type: none"> • Pivots call for tender postponed till end 2002 (no need for the STM and CQM + wait for STM fully tested) 		
10. Activities Yet to be Achieved		
<ul style="list-style-type: none"> ▪ Pivots to be designed for the flight by BE System (pending tests on the STM in the SPIRE Structure) ▪ Optical encoder and LVDT to be tested (vibrations, cryo + performances) ▪ Complete actuator to be vibrated at 300K and characterised at cryo temperature ▪ STM to be completed and vibrated at 300K ▪ Lifetests test-setup to be designed 		
11. Milestones		Status
July 2002	SMECm STM delivered to RAL	Ok
Jan 2003	CQM delivered to RAL	Ok
13. Schedule Changes		
None identified		

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Work Package: Mirrors

1. Subsystem Progress Since Project Inception		
<u>Optical design:</u> Frozen		
<u>Mirror manufacture</u> Successful discussion with MECASEM for optical surface machining.		
<u>Alignment tools design</u> Under progress		
2. Subsystem Progress This Month		
Alignment procedures being reviewed for tools design to be completed		
3. Problem Areas	Remedial Action	
4. Engineering Activities		
5. Design Changes		
None		
6. PA/QA Activities		
7. Subsystem Management Issues		
8. Actions Requiring Immediate Attention		
9. Status of Previous Actions		
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10. Activities Yet to be Achieved		
<ul style="list-style-type: none"> • 3 sets of Off axis and big axi-symmetric blanks to be manufactured • All mirrors optical surface to be manufactured • All mirrors to be cleaned, controlled, bake-outed • Alignment tools to be manufactured 		
11. Milestones	Status	
13. Schedule Changes		
None identified		