

SPIRE (ATC)	Monthly Report – Dec 2002	Date: 19.Dec.02
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Work Package: BSM

SPIRE-ATC-REP-001788

1. Subsystem Progress Since Project Inception				
Baseline design accepted at Delta-PDR, including digital electronics control by MCU. CPP parts requested. Single axis prototyping complete. DDR held. 2 axis prototype tests complete. IBDR complete. Development Model testing				
2. Subsystem Progress This Month				
DM-2 initial characterisation tests complete, investigative strip down and corrective mods completed. Tayco flexitapes received and re-build started.				
3. Problem Areas		Remedial Action		
<input type="checkbox"/> Full checks on repeatability/linearity in dewar to be achieved <input type="checkbox"/> Launch Latch design <input type="checkbox"/> Magnetic cross coupling		<input type="checkbox"/> Scheduled for after Xmas. <input type="checkbox"/> need to tie up with LAM. <input type="checkbox"/> Detailed investigation, Mumetal screening, servo loop mods, cold tests, magnetic modelling		
4. Engineering Activities				
Control loops closed up to the limit of (warm) motor saturation. Warm motor torque constants, repeatability and linearity tests performed and look good. A problem found with cross talk between jiggle and chop and poor unpowered repeatability on chop rest position also seen. Magnetic coupling between the chop and jiggle motors has been isolated as the cause of cross talk, and test data supports the hypothesis that the increase in spring rate (and maybe also unpowered repeatability) seen on the chop axis is due to coupling in of the jiggle spring rate by a stiff magnetic 'spring'. Discussions are progressing well with LAM on telemetry and BSM /MCU software. Discussions on the ICD with MMSL are in hand - some confusion over beam positions on the BSM. Launch latch ICD changes passed to LAM for comment.				
5. Design Changes				
Minor design changes : the most significant being to add optical alignment tolerances to several assembly drawings in the light of DM-2 build experience. Given magnetic cross talk, we have issued a prototype mumetal shield design to the ATC workshop and will test this in January. The design has not been modelled and optimised, but works on the principle of placing the maximum amount of mumetal in the only conveniently available position. If tests are encouraging we will then optimise the design.				
6. PA/QA Activities				
Progress on the update to the BSM SSSD slow due to ATC work loading, but good responses from RAL and LAM. Salvage machining to increase the range of chop travel completed. Investigative strip down of DM-2 revealed no major issues, although one motor package contaminated with Eccobond overspill from the jigged assembly process. Mumetal is now being considered for screening (already on the BSM declared materials lists against just this contingency). Discussed a change of screw lubrication regimes with RAL (ATC uses MoS ₂ but the Systems team would prefer the MSSL PFTE loaded apeizon grease scheme).				
7. Subsystem Management Issues				
Given general DM-2 delays, the project schedule is being revised to ensure that deliverable models can still be released on time (to avoid a 2-4 month delay). There is a potential loss of knowledge transfer from DM-2, QM and CQM models in doing this, so it is being carefully reviewed. The milestone dates below assume we do adopt one of the proposed changes (plan 'C': releasing QM and PFM for manufacture before DM-2 tests are complete). Cost profiles are also being reviewed, and the SPIRE proposal that ESA procure the BSM directly is being considered.				
8. Actions Requiring Immediate Attention				
MSSL (CBB) to advise screw torques for PFTE loaded apeizon grease CBB Ongoing ATC (IP) to confirm cold shake date for DM-2 ... co-ordinating with RAL. End Jan03 favoured.				
9. Status of Previous Actions				
SW11MAR02.02 IP Place contract for Zeiss motors ... ongoing.				
10. Activities Yet to be Achieved				
BSM SSSD update, BSM ICD u[date (launch latch, structure, MCU). Sign off of ATC PA plan. Improvements to the drawing configuration data base are being sought.				
11. Milestones		Status		
Milestone	Baseline	Scheduled	Actual	Change
20K test dewar available	N/A	Nov.02	Dec02	+1month
Integrate DM 2 at LAM	30 Mar 01	Nov.02		
DM release for manufacture	Oct.01	Nov.01	Dec.01	
DM-2 release for manufacture	N/A	Apr.02	Apr.02	
2 axis prototyping at ATC complete	N/A	Mar.02	Apr.02	
SPIRE IBDR	N/A	Mar.02	Mar.02	
DM-2 tests complete	30.Apr 02	21.Mar.03		+ 2 months

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BSM STM del'y to RAL	01 Feb 00	5.Nov 02	5.Nov 02	
BSM CQM delivery to LAM	Jul.02	Mar03 TBC		+ 1 month
BSM CQM del'y to RAL	13 Mar 02	26.May.03		+ 1 month
BSM QM tests complete (flight design valid)	25.Apr.03	15.Aug.03		+2 months
BSM PFM delivery to LAM	03.Jun 03	15.Aug.03		-1 month