

General

EMI is an issue on SERTF, capacitive coupling into analogue circuits, 20 MHz, Background loading (Q) is still uncertain due to ill-defined emissivity of the Herschel telescope. This needs to be frozen soon to allow JPL to continue their detailed design. BDA angle wrt the optics is still undefined and will be modelled soon. This seemed to come as a surprise to Jamie Bock.

People from the Herschel Science Centre (IPAC) (Ken Ganga) will become involved in testing of the detectors to gain familiarity with the instrument and software. There is no formal agreement between the UK and IPAC.

Schedule has only 40 days contingency, replanning of test phase should give an additional 20 days.

Budget contingency is 25%.

Did not see detailed review of detector assy due to ITAR rules.

Feed horns

No real gain from corrugated feed horns. Supplier has not been confirmed, prototype programme buy UOC and RAL. Final detailed design is not yet finalised and agreed. It is important that there is sufficient overlap between the wave bands.

Thermal.

Estimated parasitic power is $\frac{1}{2}$ of the measured values during test, 1 micro watt of heat leak is unaccounted for. Annealing of the cold finger was raised as a potential problem, as it strongly affects the thermal conductivity.

Detector arrays

Some concern expressed regarding yield at system level, perhaps some feed horn testing at individual horn level could be considered, horns are not replaceable once they are soldered into the base. Back short and front short gaps are set by measuring the fabricated parts and etching the silicon to suit.

Performance is only reaching minimum of optical efficiency of 0.45, desired is 0.88, likely acceptable figure is about 0.65.

Wire bonding to bolometer arrays and flex circuits is still not proven, some development necessary. Connection of connectors to flex cables also subject to process development.

JFETs.

JPL say that the optimum temperature is 120 K, the review board suggested that JFETs run well around 70 K, suggestion that tests are carried out because this could well solve the JFET power problem.

Discussion on vibration levels.

Lower levels, notching and force limiting was discussed. No real recommendations except that a combination of all three may be necessary. JPL cannot build to new design and test before the CDR in early September. A delay in the CDR was suggested, but later discounted for programmatic reasons.

DPU.

EM will be built at Cal Tech, FM done at CEA. EM will use commercial parts; QM and FM will use flight parts.

Concern expressed regarding parts procurement, and the concept of the split responsibilities.

The value of the bias voltage was questioned and the variation expected.

Testing.

Bakeout philosophy was questioned regarding annealing of aluminium bond wires and kapton flex circuits wires. A bakeout early in the programme is recommended, if problems are uncovered then SPIRE could press ESA for a lower spacecraft bake temperature.

Cold vibration test was done under dry nitrogen not vacuum. Kevlar friction heating will be different under vacuum.

Some release of tension after cold vibration, probably due to pulley bolt loosening off.

Some concern expressed about the overlapping fibres on the capstan.

There was lots of discussion regarding the Kevlar suspension system.

Mission assurance.

Some discussions about whether the ERD should be included in the list of agreed docs.

Safety issues discussed, particularly liquid helium handling.

Parts stress and worst case analysis, conventional analysis was initiated but did/will not work with some of the special components, e.g. the bolometers, due to lack of historical data. Individual investigations will be carried out.

Questions raised over sine levels, are these also a problem?

Implementation plan

RFA summary (last peer review)

Conclusions of the board.

Issues

Qualification status of some processes, parts and procedures (particularly bakeout requirements).

Status of agreed requirements.

Telescope background, better definition or assurance that the system will cover all likely telescope performance parameters.

Yield of all detector components.

JFET, not ready for flight construction further development required, especially thermal issues.

Software, significant software effort will be required, direct management and collocation recommended. IPAC link could be a problem.

Vibration levels. Are the improvements planned the best ones?

Recommendation: Form Tiger team now to investigate all issues.

System team should clarify and specify actual levels (3 sigma, 5 sigma?)

What is the basis of the 0.12g²/Hz acceptable limit?

Identify plans and contingencies by the time of CDR (11th, 12th September)

The Spire team requested a note of some sort from the board to use as ammunition to support negotiations with ESA/Alcatel.

Telecon with the review board or part just before CDR is proposed, possibly during a detector summit which is proposed for 7 and 10 August.

Status summary requested by e-mail just prior to the telecon.