



21st September 2001

To: Jamie Bock
From: John Delderfield
cc: Dustin, Viktor, Gary, Gerald, Bruce, Doug, Berend, Christophe, Didier, Brian, Lionel, Colin, Ken, Jean

SPIRE-RAL-COM-000869

SPIRE RF Filter implementation.

Thank you Jamie for the E-mail copied below. I like your use of \$ in assembly! I have several levels of comment.

1. Technical acceptability. All Spire people are designing for 2200pf $\pm 20\%$ with a slightly unquantified series impedance and essentially no crosstalk. These data need providing for the new proposal. As a starting point please send .pdf full product data sheet or a URL for it to this note's distribution list. Then I suggest you scrounge a sample prior to getting the real long lead time items, Viktor does some cold tests, and you circulate the results.
2. Risk. Please summarise the present qualification situation for both options, the heritage of each (cryogenic and normal range), the number of re-works needed to get say 50 Muratas well installed, etc.
3. Timescales. Besides the obvious need to meet your delivery dates whichever option is used, depending on our technical choice there are knock-on timing requirements to fit in with other sub-system design processes/schedules, which indeed could influence options away from a purely technical decision.
4. Scope of change. If points 1-3. are satisfied, the first option is clearly to keep RF filter units mechanically unchanged w.r.t. external interfaces. This option has certain attractions because the RF units' external interfaces are just about determined now and nothing else can be said to be held up for want of knowing them! The mass change would be small, and all timescale factors limited to within JPL.
5. Radical change. Rather than revising the RF filters, I would throw them away!!! This could help fund the Planck cooler? Well almost, but not quite on both points!

As regards the non-bolometer side, JPL would source filtered 37way MDMs with backshells (Glenair?) to be built into F16-F27 harnesses. Connector savers would be mandatory. Deliveries would be need to be when the subsystems need their harnesses, and be of a quantity to build all the required harness models with attrition (probably a higher number than the supply of RF modules).

On the bolometer side I would follow your suggestion in the E-mail below and say the JFET boxes would have filtered PCB mounted (although mechanically secured to chassis and sealed to chassis) MDMs for all 25way and 15 way connectors. JPL could then build two unfiltered distribution units to mount in the JFET racks and be something like JFET module sized to make things really neat. This option would I think give some useful overall mass savings.

The distribution units would still have 37 ways towards the cryoharness, TBC, with unchanged pinouts. There could be 50ways towards the JFETs however to each pick up 3 x 14 pins (with a few spares to cope with the thermal control bias that we have not seen spelt out yet). Popularly but loosely termed modularisation, there would be almost identically pinned cables to interface 3 JFET membranes to a distribution unit, "back-harness" cables which have no internal splices even for the heater wires. This is because the 50 ways do not have to have (indeed they cannot!) have 1:1 pinning to the 37ways. All rather attractive?

Cheers
John

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Subject: RF filters
Date: Wed, 19th Sep 2001 18:05:15 -0700

Hi John,

As you may know, we're investigating the possibility of using RF filtered MDM connectors that would replace the current module design. Is it possible to contemplate changing the size of the RF modules? They would only get smaller. The only trouble is that we're waiting on some connectors with pi filters which are long lead time, so we haven't yet tested them. Their RF attenuation is better than the Murata components, and would eliminate a lot of hand assembly here.

Dustin came up with an interesting idea last week, which was to install RF-filtered 15-way connectors into the JFET modules. That would eliminate the need for the RF filter modules on the JFET rack, and remove the shielding requirement on the power and bias lines. I suppose ESA could even route into the 15-ways directly, but that would probably be asking for too much... we'd probably still need a distribution plate.

Any opinions?

Jamie