To: Jamie Bock, Dustin Crumb, Berend Winter, Chris Brockley-Blatt, John Coker, Lionel Duband
CC: Jerry Lillienthal, Bruce Swinyard, Peter Hargrave, Iris Didschuns, Matt Griffin
RE: BDA Thermal Control Hardware
Thursday 11, October 2001

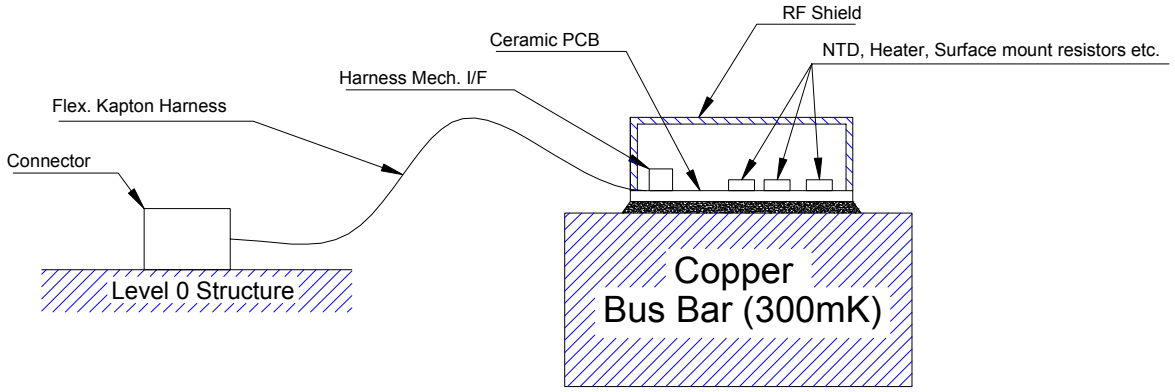
Dear All,

In the view that there *will* have to be active thermal control of the 300-mK thermal busbar to stabilise the temperature of the BDAs, the RAL project team has been thinking about the mechanical accommodation of any eventual hardware on the 300-mK busbar.

Jerry has forwarded me a drawing of JPL's proposed thermal control hardware. Essentially the drawing shows the thermal control elements contained in a box approximately 50 x 12 x 30mm with a Kapton harness leading from it to a connector.

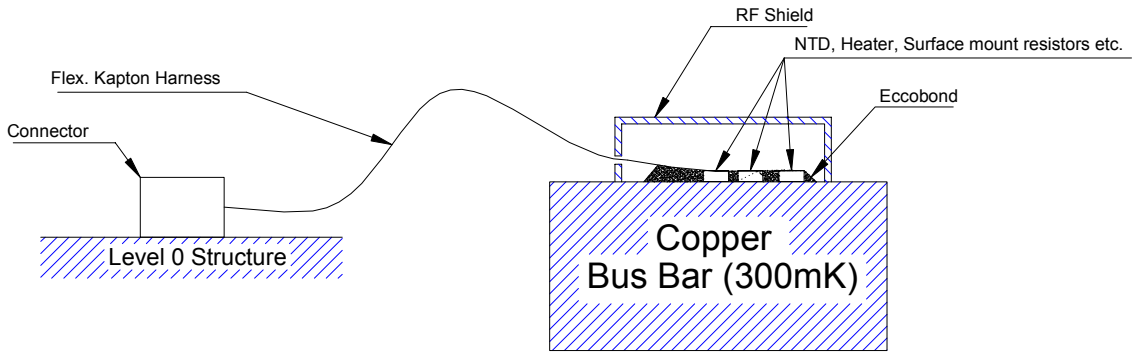
Bruce, John and I have discussed this concept. We believe that the volume, and most probably the mass of the box would be difficult to accommodate on the 300-mK architecture.

One possible means of reducing the mass would be to mount BDA TC Hardware as shown below.



- The 300-mK hardware could be mounted on a ceramic PCB that has been brazed to the Copper.
- Since it is not inside a BDA, it will require RFI shielding in the form of a metal cover over the PCB and metalised ground planes above and below the signal traces on a multi-layer Kapton harness.
- Surface mount resistors could be used for the heaters and NTD bias resistors to minimise volume (and mass).
- The prime and redundant components would be mounted on a single PBC/Harness.

Another concept would be the surface mounting of the electrical components directly onto the Kapton harness and then bonding this directly in contact with the Copper then covering the end of the harness with a RF shield as illustrated below.



Could JPL and MSSL please comment on these assertions and on the design proposals. Lionel, do you have any pearls of wisdom to add to the discussion?

In the ambit of this discussion, it would be helpful to have some quick answers to the following questions.

1. What mass and volume can we expect for the 300-mK BDA TC components? (The bus bar currently is around ∅3mm. It would be good if we did not have to grossly increase the bus bar dimensions in order to accommodate the BDA TC hardware.)
2. What would be the length and cross-section of the flex harness?
3. Can we mechanically mount the 300-mK components very close to the cold tip of the cooler?

It would be useful to have a reply by Monday 15 October.

Best regards,

Doug Griffin
Thursday 11 October 2001