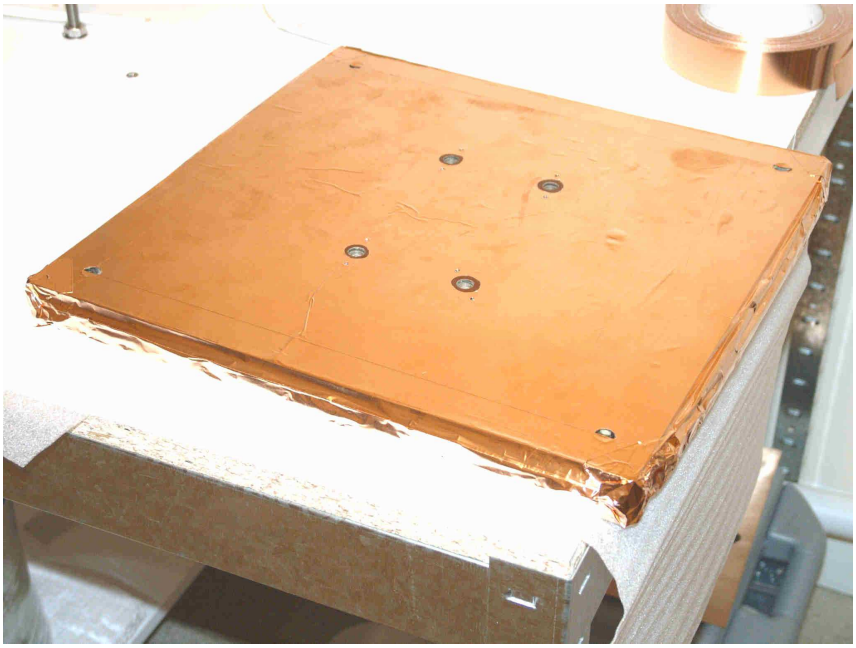
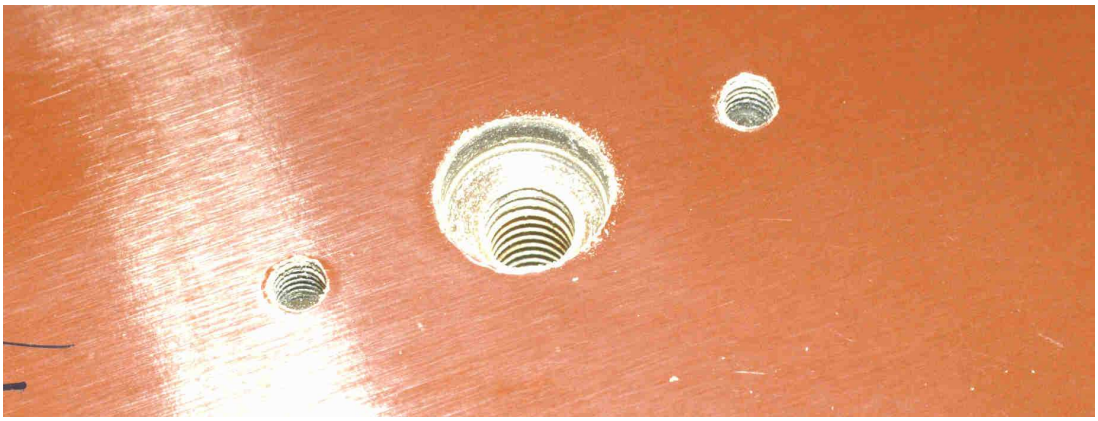
Objective:

A non-conductive (vacuum facing) EMC screened vacuum bulkhead with HV/HF feed-throughs.

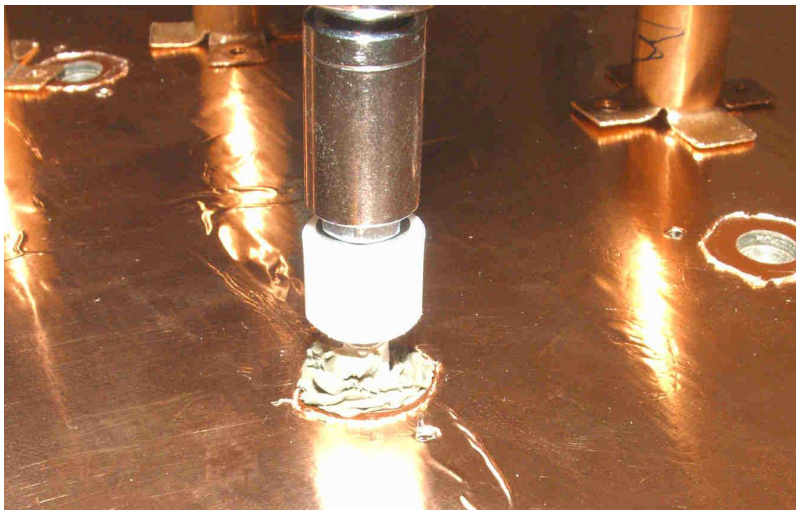


1. Basic configuration: Adhesive copper stuck to 25mm thick tufnol (phenolic laminated paper "Bakelite"). The adhesive copper will become the outer surface, and the exposed tufnol [on the other side] will be sealed against an open-ended glass vacuum cylinder, with two such bulkheads, top and bottom.

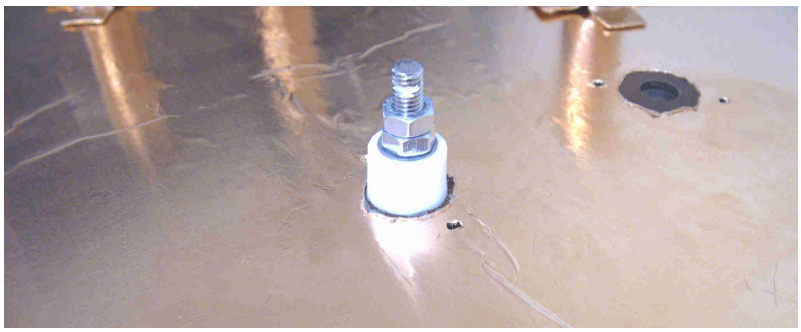


2. Centre hole M5 tapped through, with 8mm sunk hole. (Others are blind M3 for mounting purposes. No copper shown.)

3. M5 A4 stainless stud threaded through with a light wrap of teflon tape and a tapped teflon stand-off.

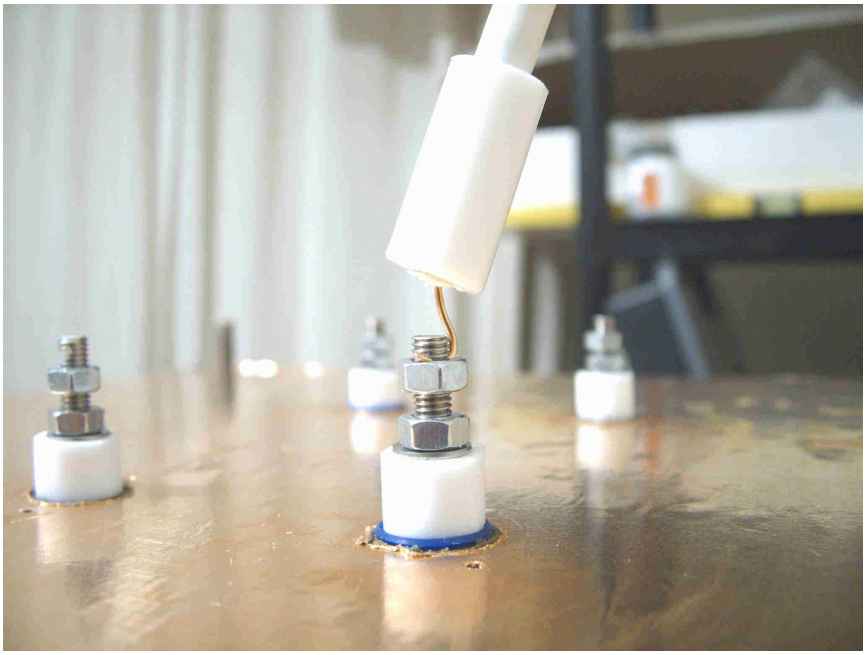


4. Countersink filled with Apiezon Q...

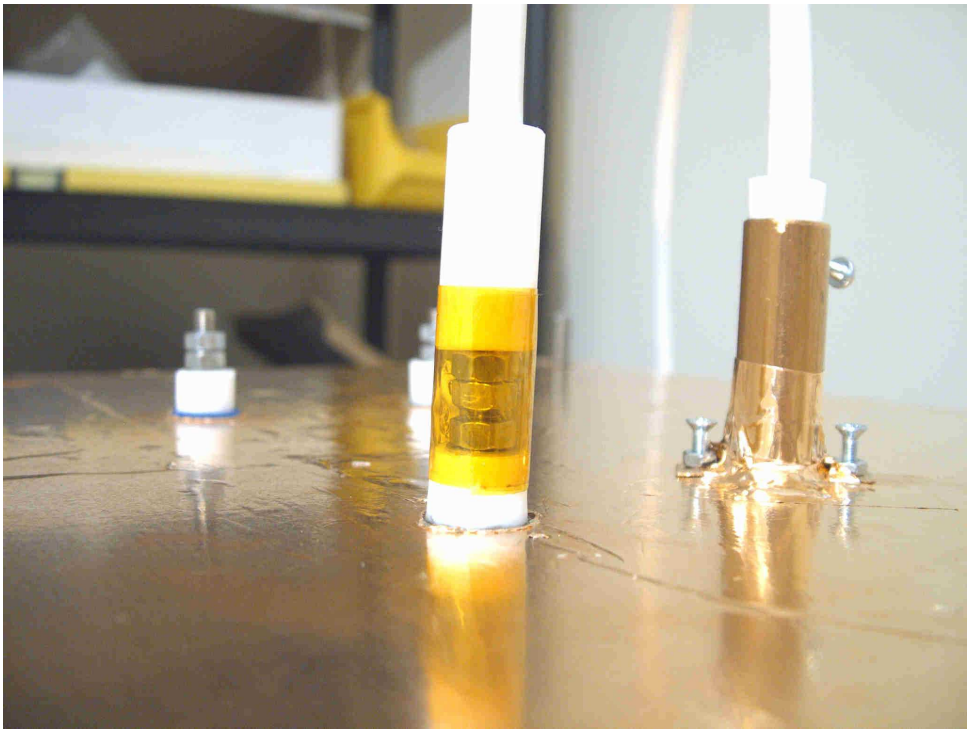


5... and tightened down.

6. The studding have little backward cuts in them...

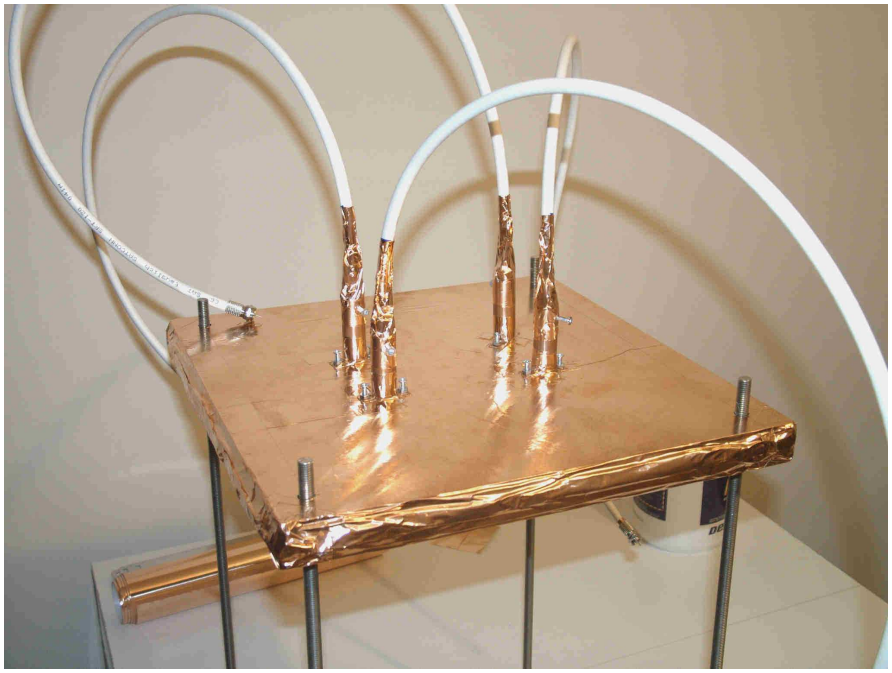


7... that allows the centre conductor of coax to be bolt-locked to the stud.

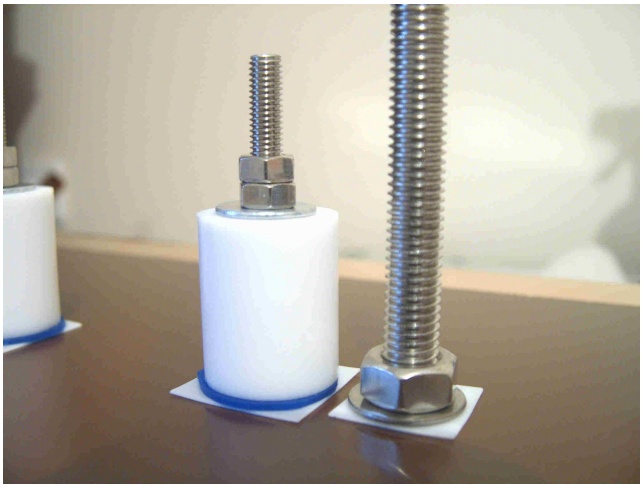


8. A teflon piece is drilled through for a very tight fit on the cable so as to act as a strain relief and to protect the cable end. Kapton tape wraps the open nuts.

9. Copper pipe petaled out and used as a screening support. Side bolt retains against the strain reliever.

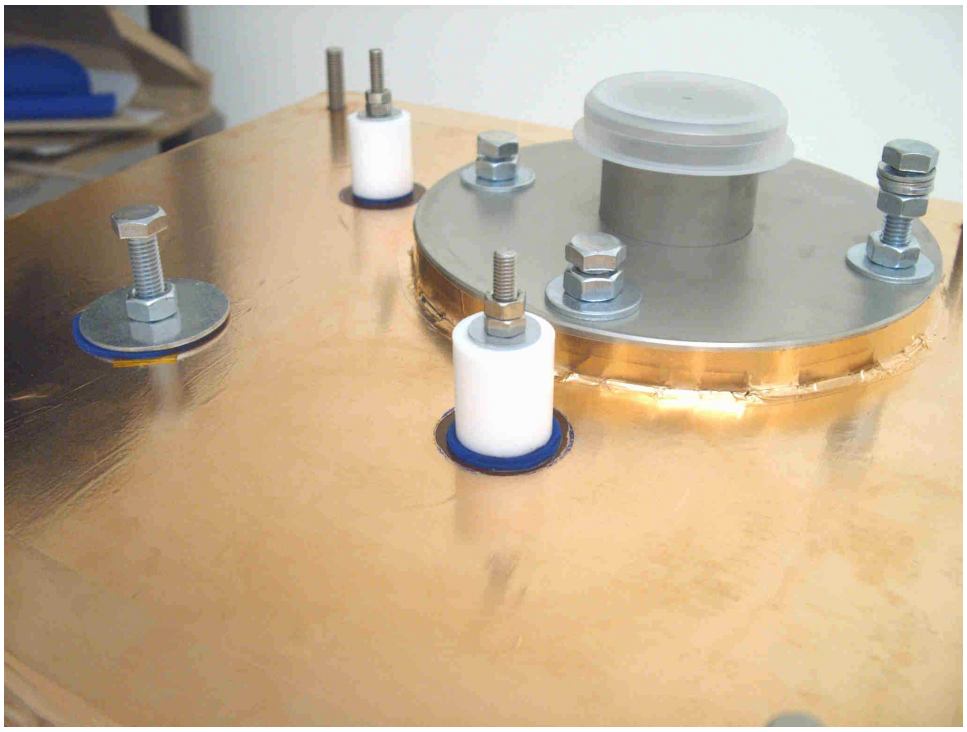


10. All wrapped up.



11. On the other side, vacuum facing, the studs come through (without a countersink) with a tapped teflon standoff tightened down onto compliant washers of silicone and a teflon piece in contact with the tufnol with the aim of surpressing tracking. (The M8 studs are mechanical supports in blind, threaded, holes. They may end up at a few kV differential to the feedthroughs.)

12. Both sides of the lower bulkhead shown.



13. Upper bulkhead has similar configuration of feedthroughs, though these are for DC and so filtering will be attached here rather than screening and coax.