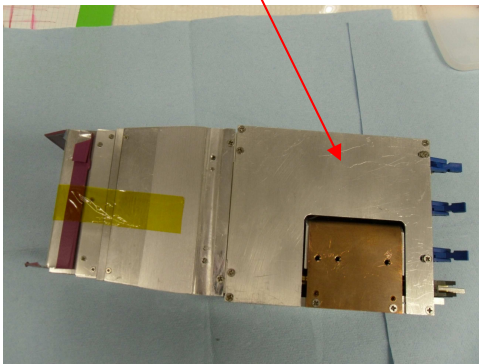


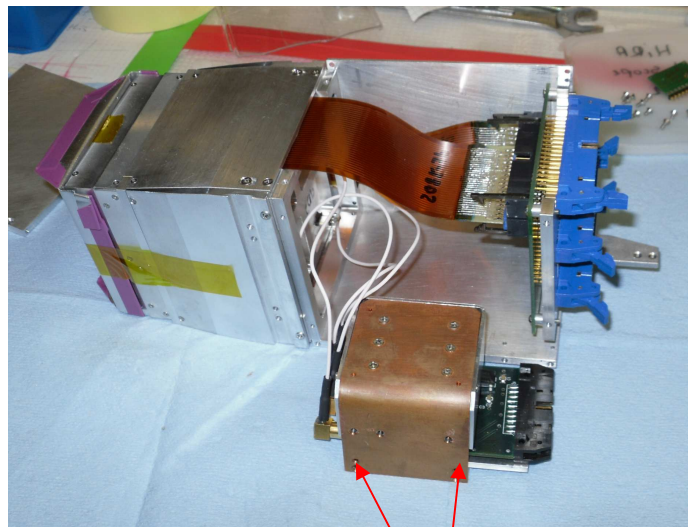
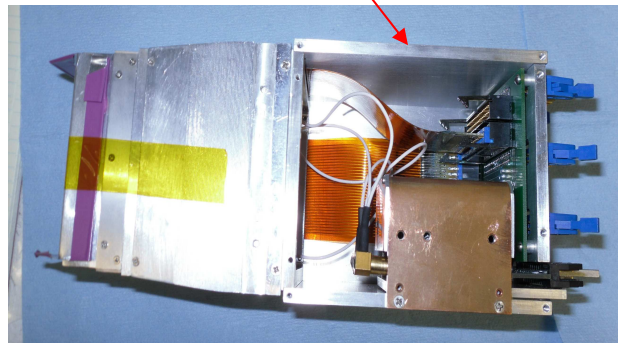
## Procedure for replacing bad CsI pre-amp:

- 1) Test if the pre-amp (PA) is bad with pulser. The wooden box at the HiRA lab can be used as chamber. You can use a special cable (marked “HiRA CsI testing cable”) attached with 20 pin connector for testing.
- 2) To open the PA box in the back of the telescope; first remove the aluminum telescope cover plate from the side you see the copper plate that covers the PA box. You may require to remove another side plate of the back side of the telescope (see photo).

Step1: Uncover this plate

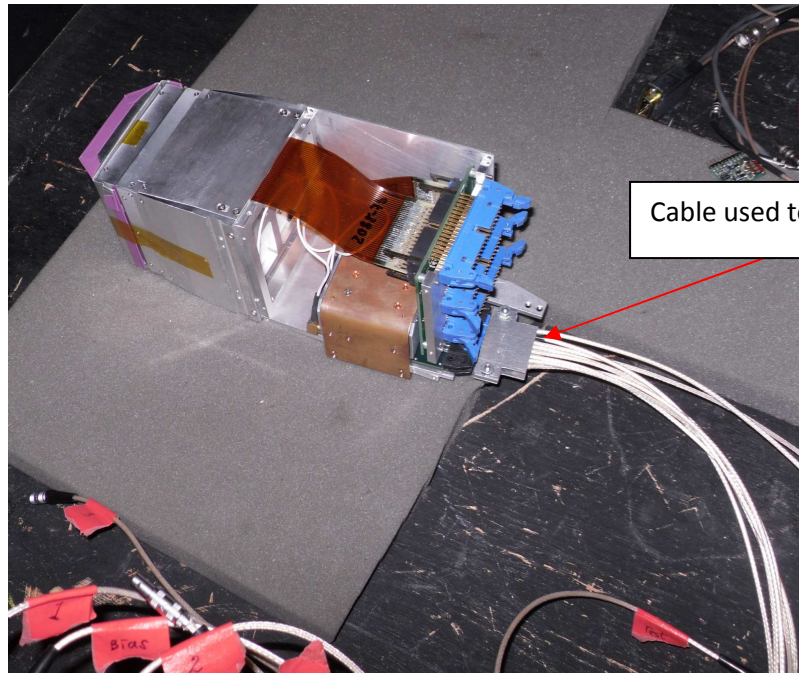


Step2: Uncover this plate



Step3: Removing these two screws will allow to take out PA box from the telescope. To get access of the preamps, you need to uncover the copper plate.

- 3) Find replacement preamp:
  - a) Gain: 60 mV/MeV (Si equivalent). You may find the gain written backside of the PA or check in the HiRA preamp data base.
  - b) If require, correct the bias resistor. It should be 100 Meg-Ohm. You may check against the PA you replace.
  - c) Before replacing the bias resistor, check the pulser input capacitor by comparing the test pulses coming from the output of all 4 PA in the telescope.
  - d) Check also the pulser rise and fall times against the others.
  
- 4) After replacing the preamp, do the testing with pulser on the motherboard for the CsI's.



Cable used to test the pre-amps.