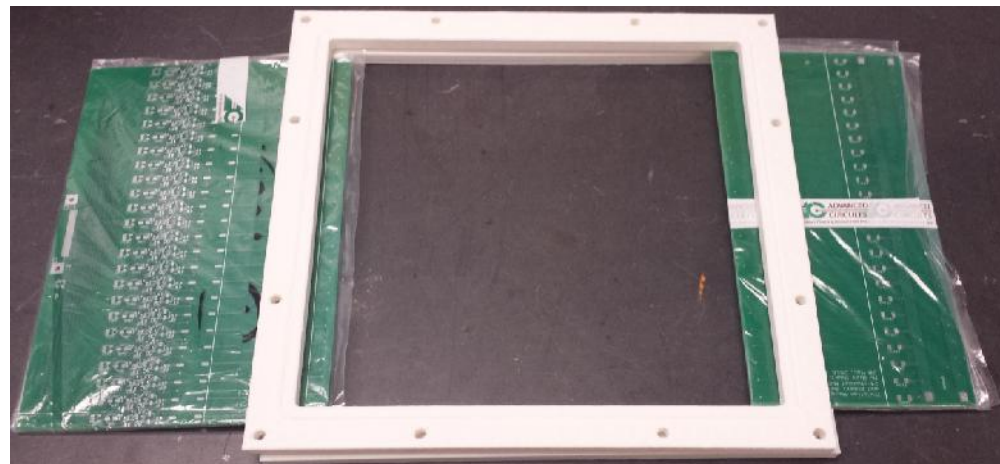
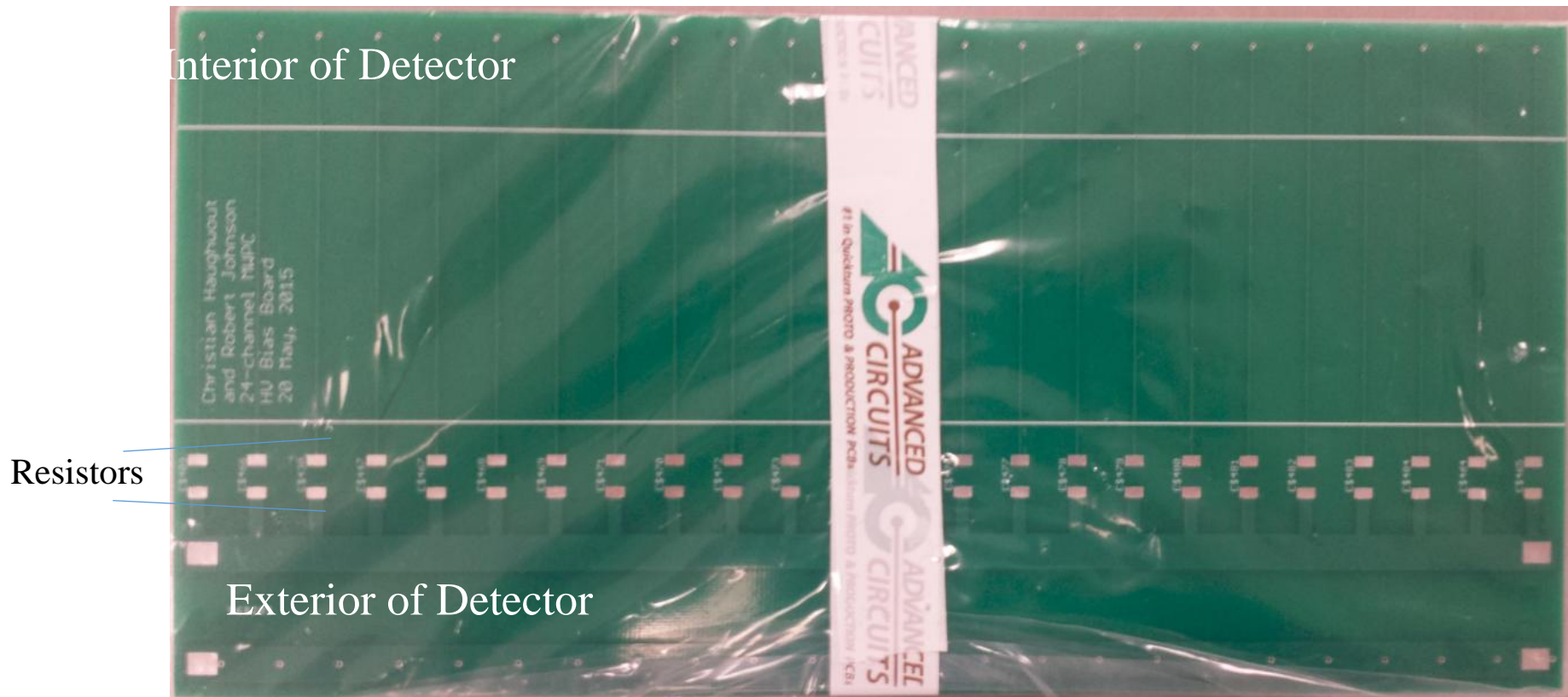


Medium-Sized MWPC Update:

- Aluminum plates have been received
- Plastic base and spacer have been printed at the UMass Digital Media Lab
- PCBs and electronic components have been received
- Assembly for PCBs is scheduled for weekend of July 11

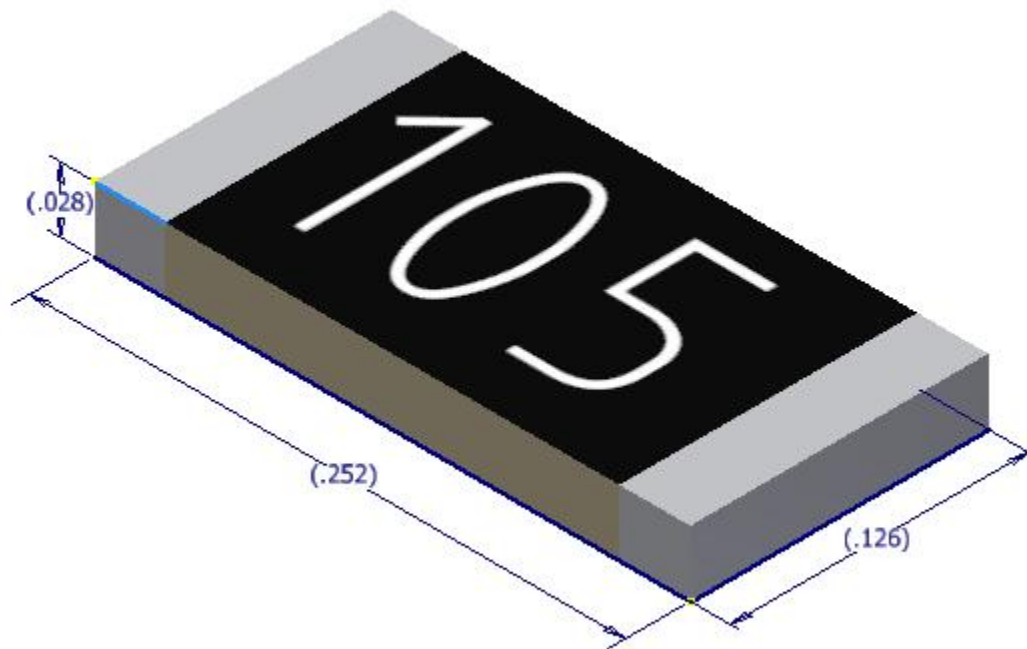


Current PCB Design has Resistors on Outside of Detector

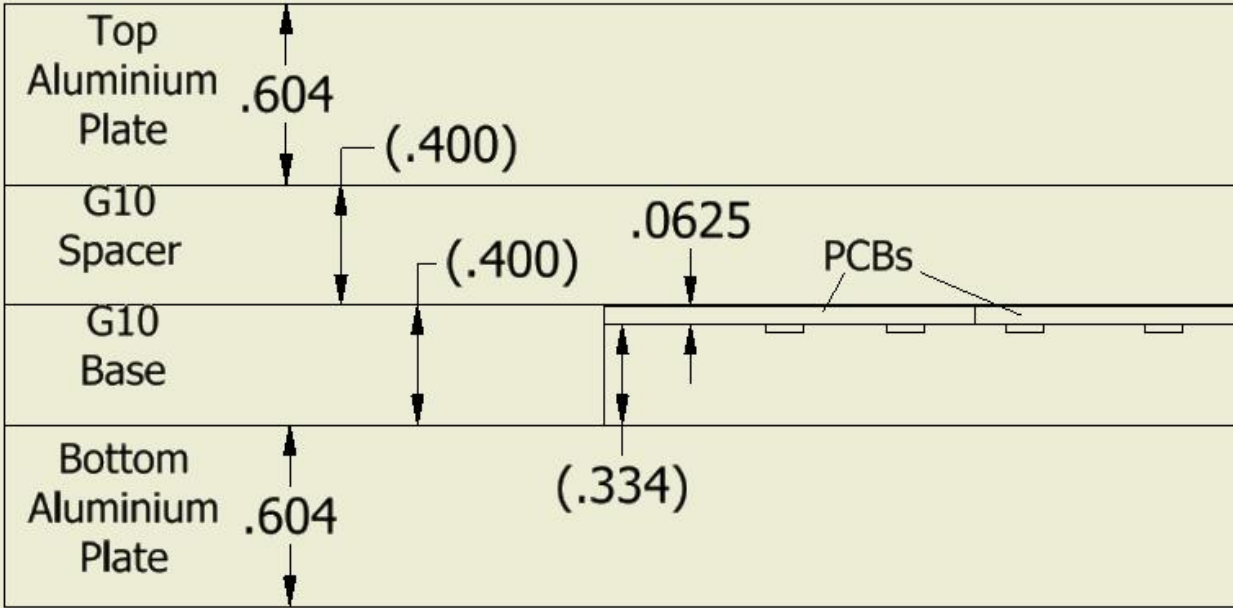
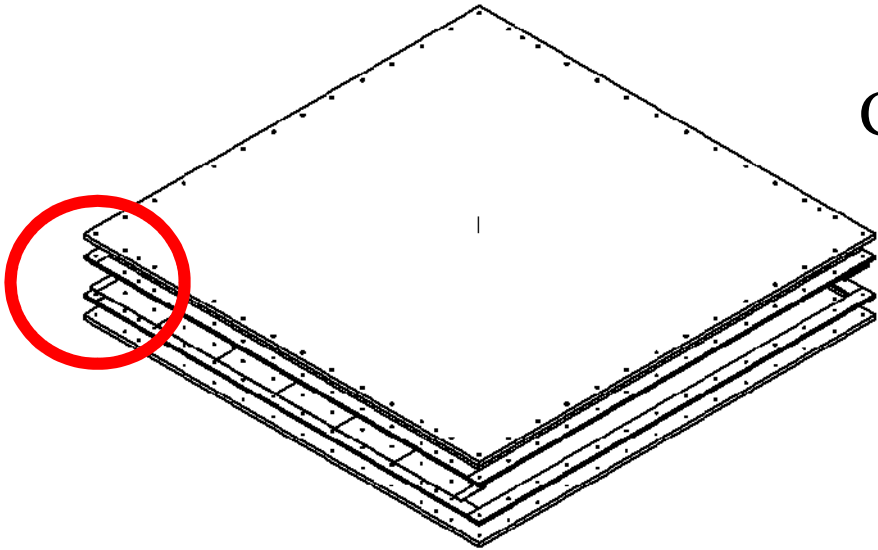


- Determine if there is enough clearance between resistor and aluminum plate to put resistors inside detector

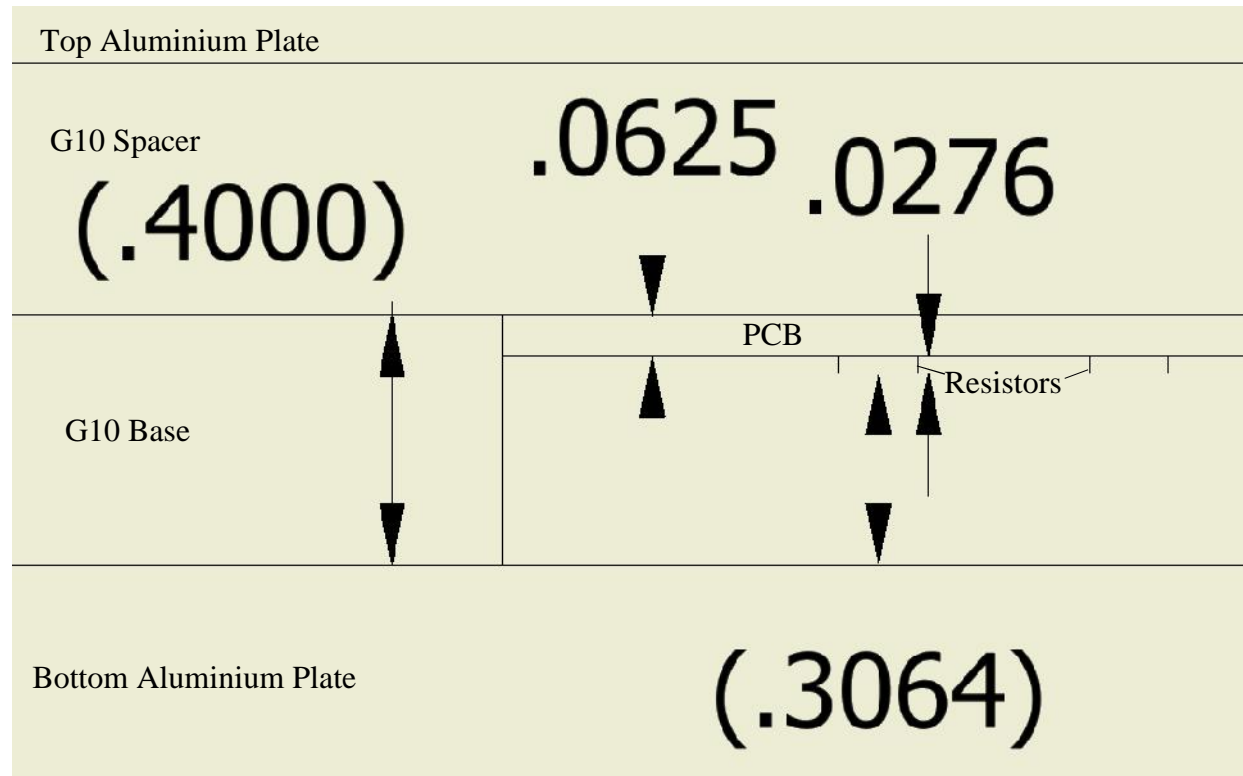
Dimensions in Inches of 1M Ohm Resistor Used on Bias Board



Cross-Section View of Detector

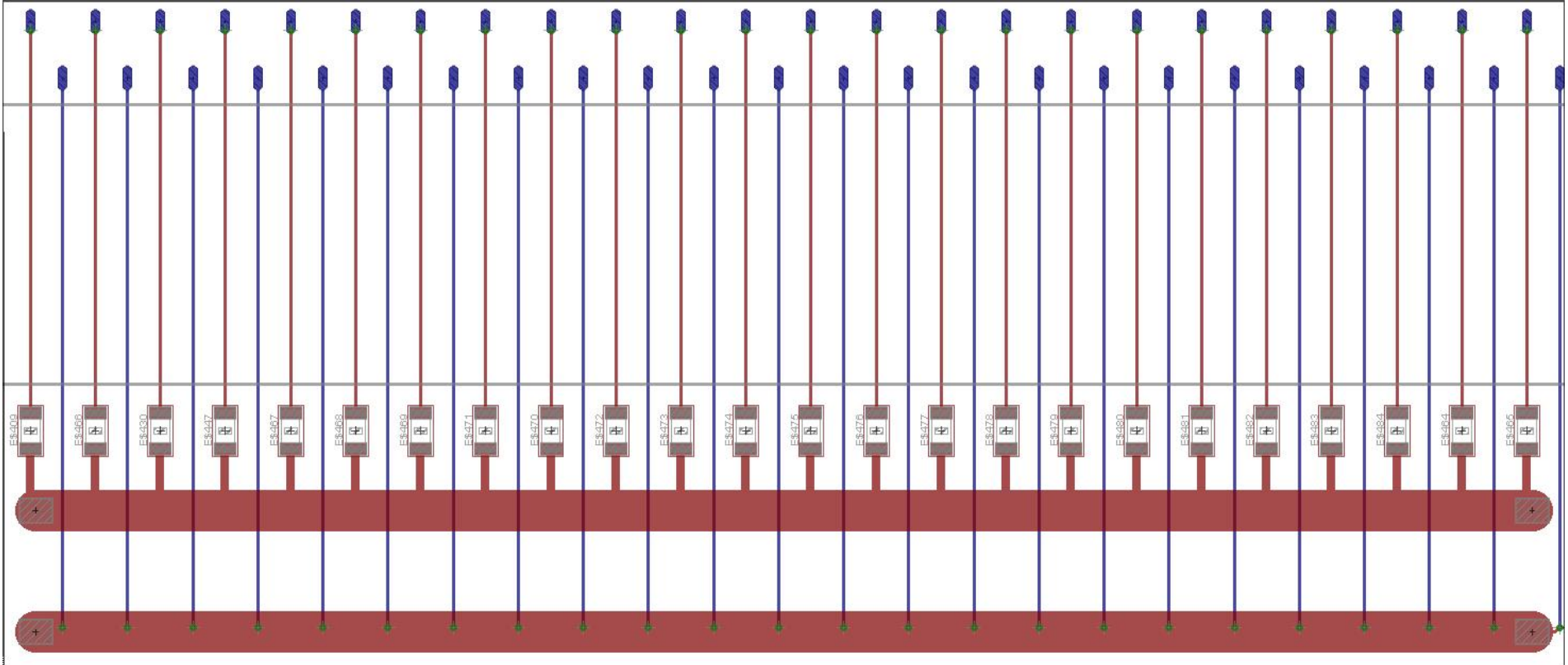


Close-Up View

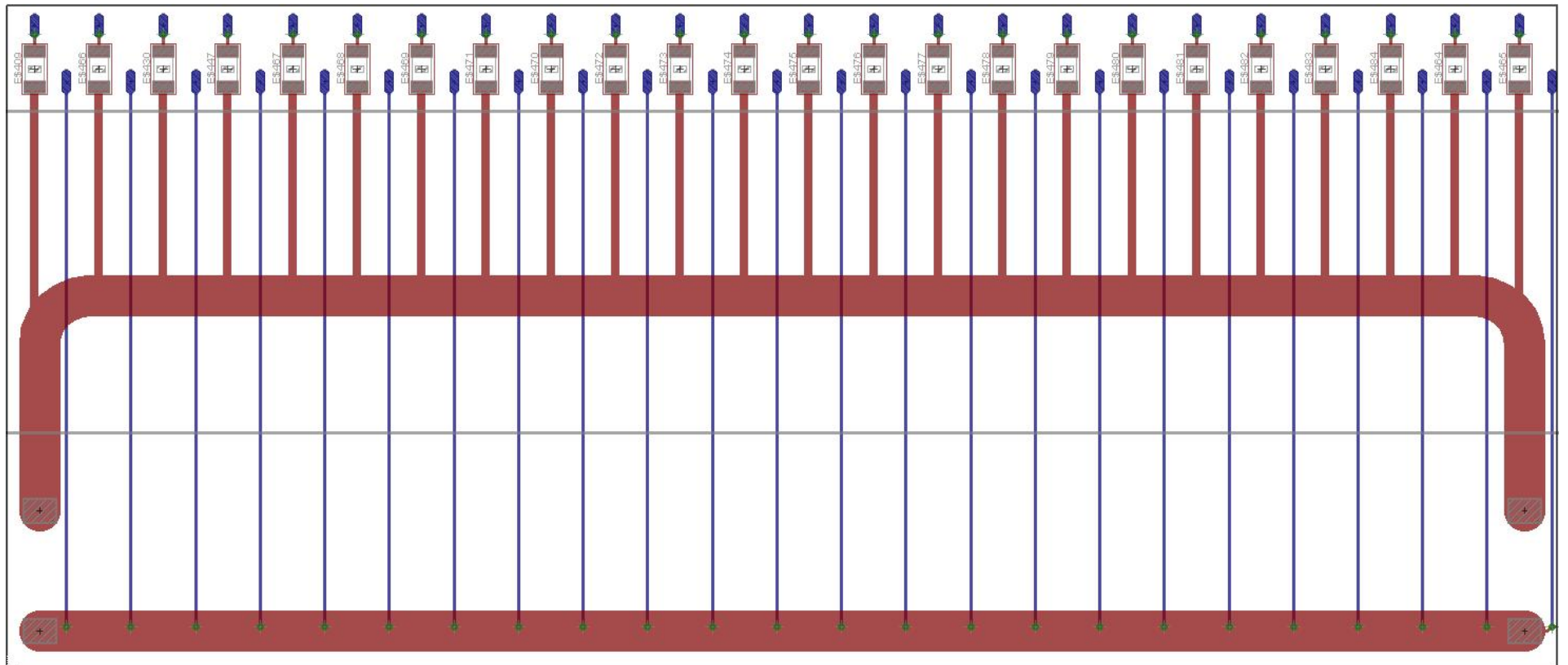


- Distance from resistor top to aluminum plate is 0.306"

Bias Board with Resistors External (Current Design)

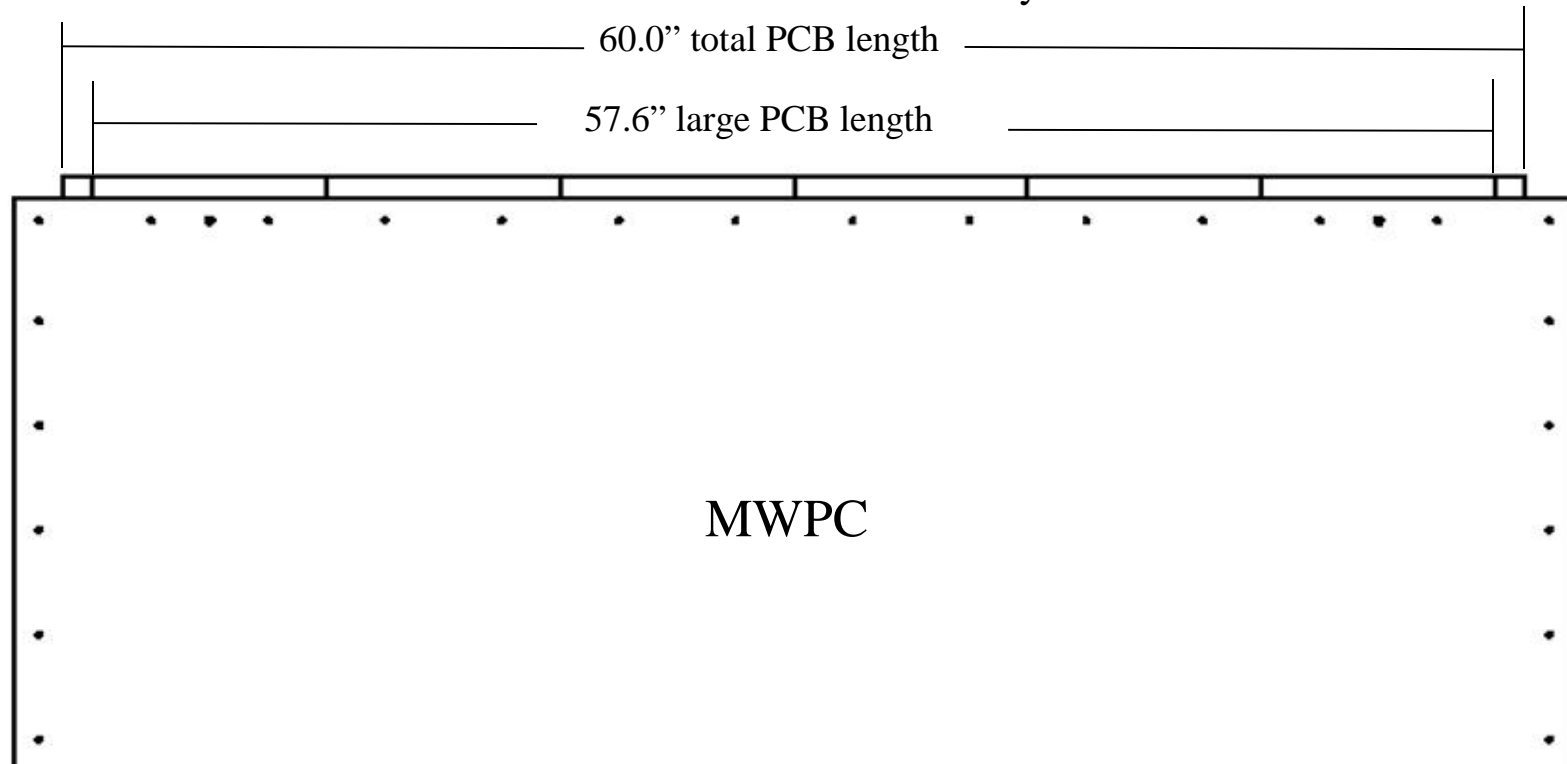


Redesigned Bias Board (Resistors Internal)



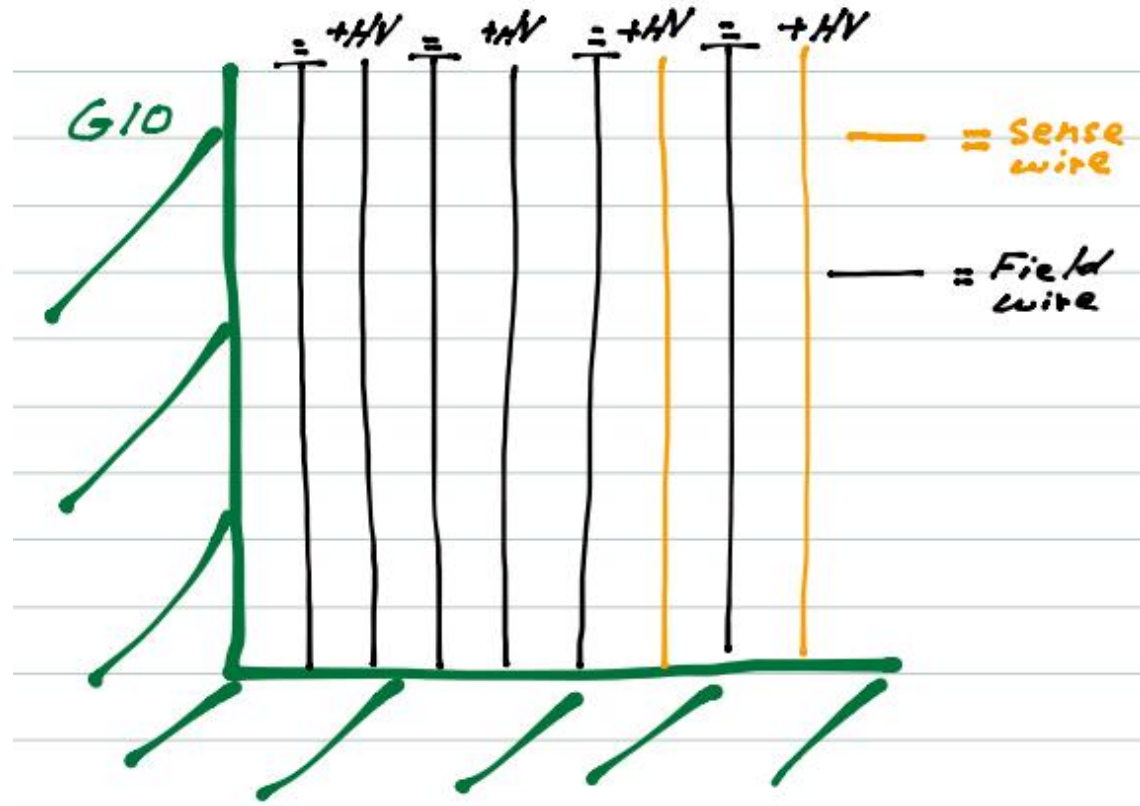
PCB Design for large detectors:

- The large detectors for the MWPC have already been designed by Christian Haughwout
- Total length available for PCBs is 60"
- There will be 6 large 9.6" PCBs, covering a length of 57.6"
- The MWPC is designed to have inactive sense wires on the ends of the PCB layout such that all active sense wires have a uniform electric field nearby

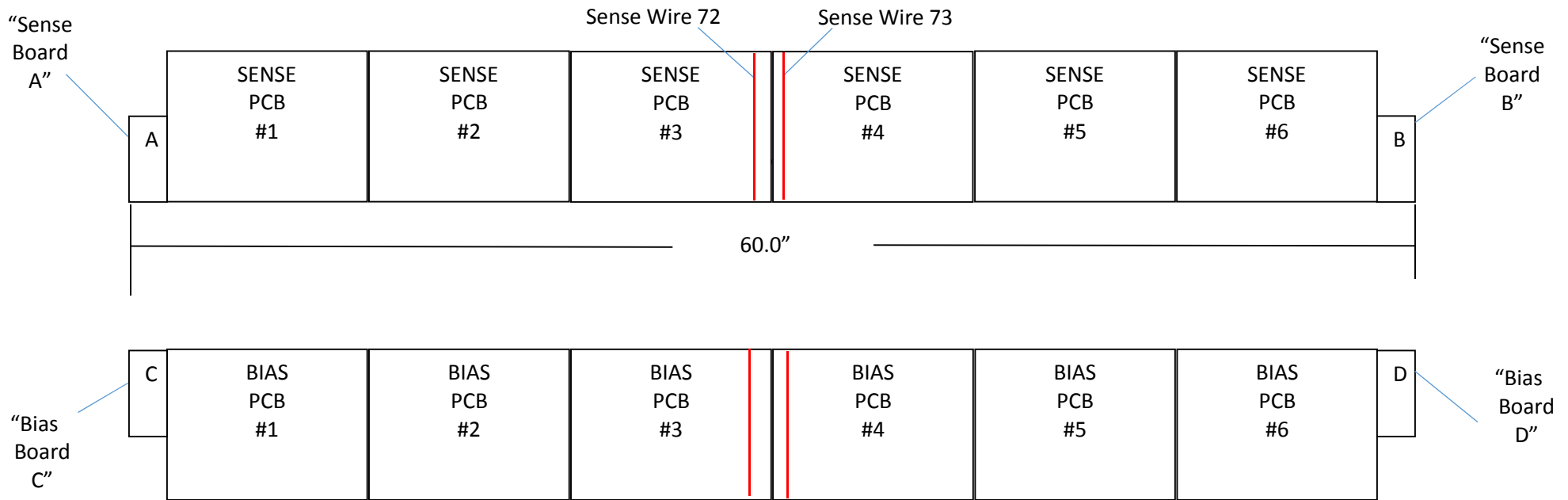


Representative Drawing of End of PCB Layout

- Yellow HV wires represent active sense wires (connected to sensing electronics)
- Black HV wires represent inactive sense wires (connected to ground) that will be used on the end of the PCB layout to maintain uniform electric field for last few active sense wires

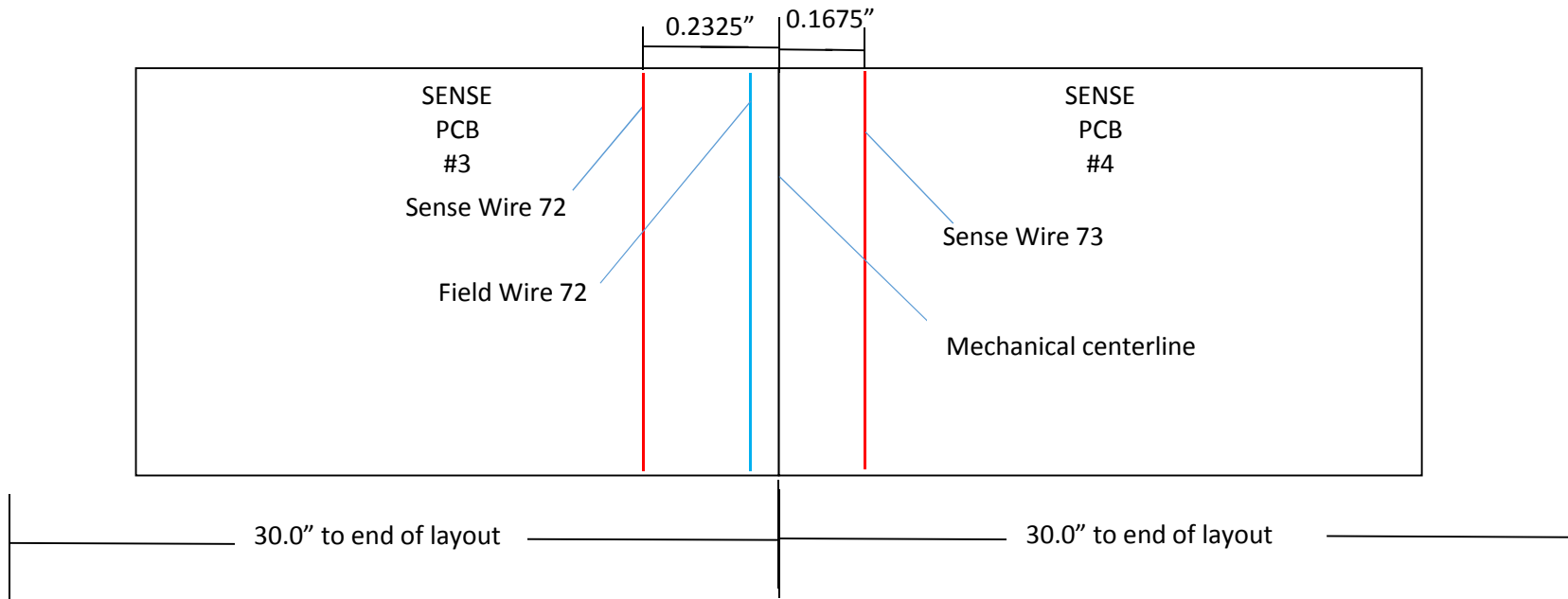


Overview of PCB Layout



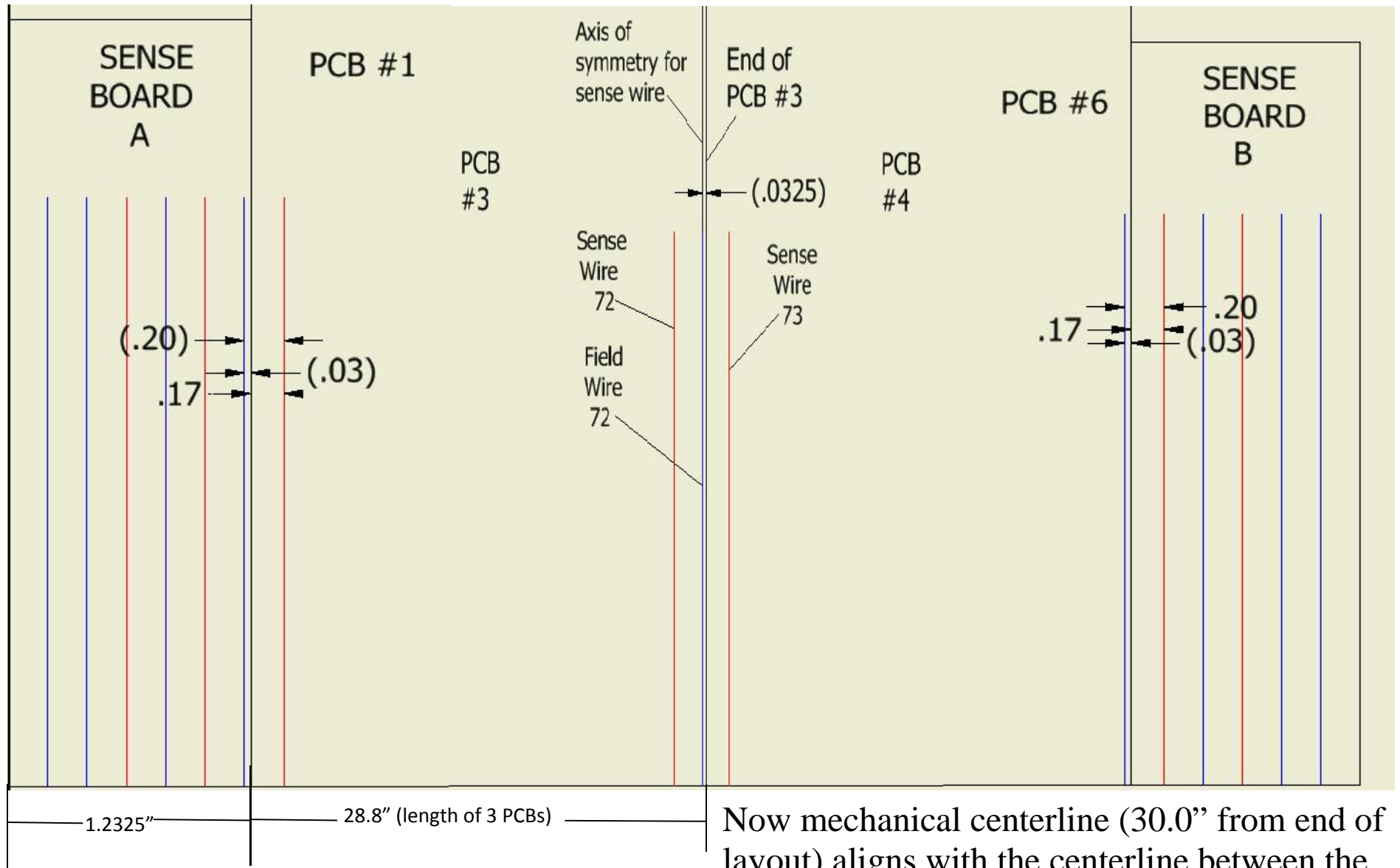
- To preserve symmetry in detector, we need mechanical center of PCB layout (30.0") to align with the electrical center of the PCBs (directly between the 72nd and 73rd sense wires)
- The large PCBs were designed with a small offset in the wiring pattern so that there was not a manufacturing issue

Layout if Small PCBs are Symmetrical (1.2" each)



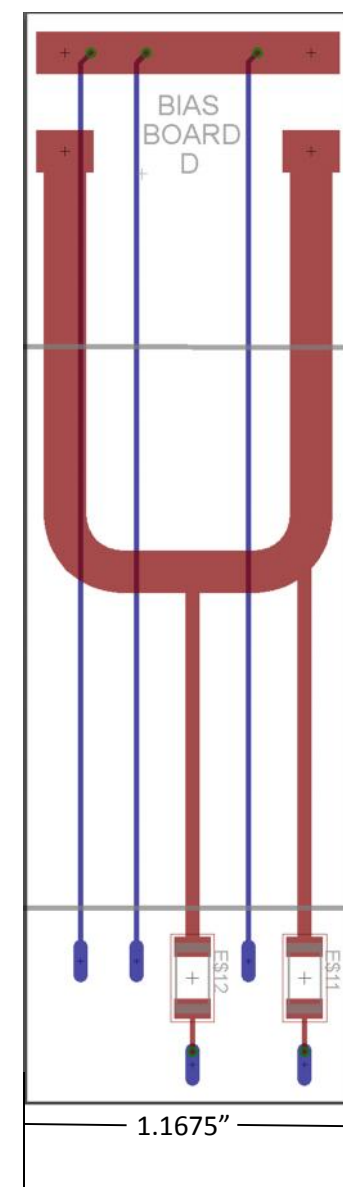
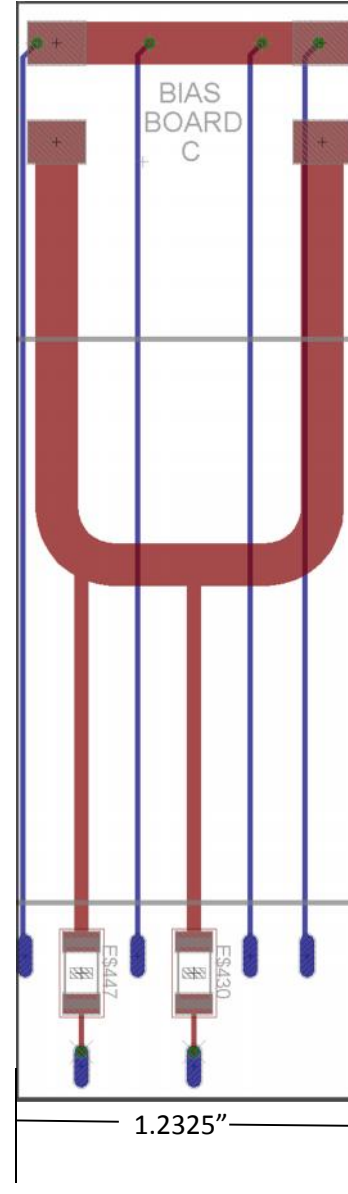
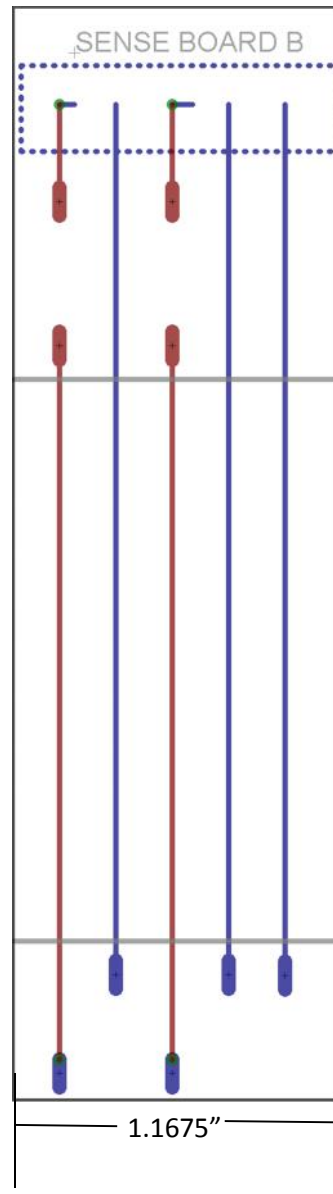
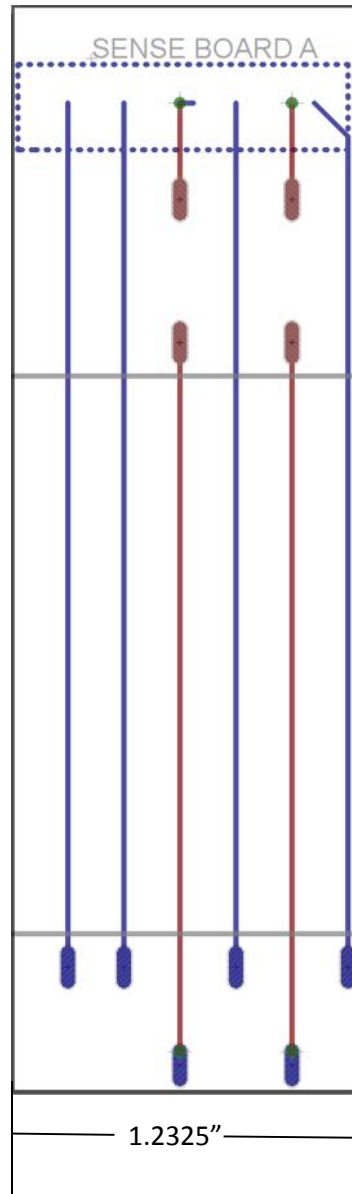
- No left-right symmetry
- Issue arises due to 0.0325" offset used

Lengthen Sense Board A and Shorten Sense Board B by an Amount Equal to the Offset



Now mechanical centerline (30.0" from end of layout) aligns with the centerline between the 72nd and 73rd sense wire

Current Small PCB Designs



Production Cost for Small PCBs

Company	Cost	Processing Time	Total Cost (Including S&H)
Oshpark	\$47.60 for 10 boards	2 weeks	\$ 190.40
Dirty PCB	\$28.00 for 10 boards	3-9 days	\$ 127.00
Advanced Circuits	\$33.92 for 12 boards	4 days	\$ 135.68
ITEAD Studio	\$14.90 for 12 boards	4 – 6 Days	\$ 83.41

- ITEAD ships from China, delivery time ~ 1 to 2 weeks