FDC Status

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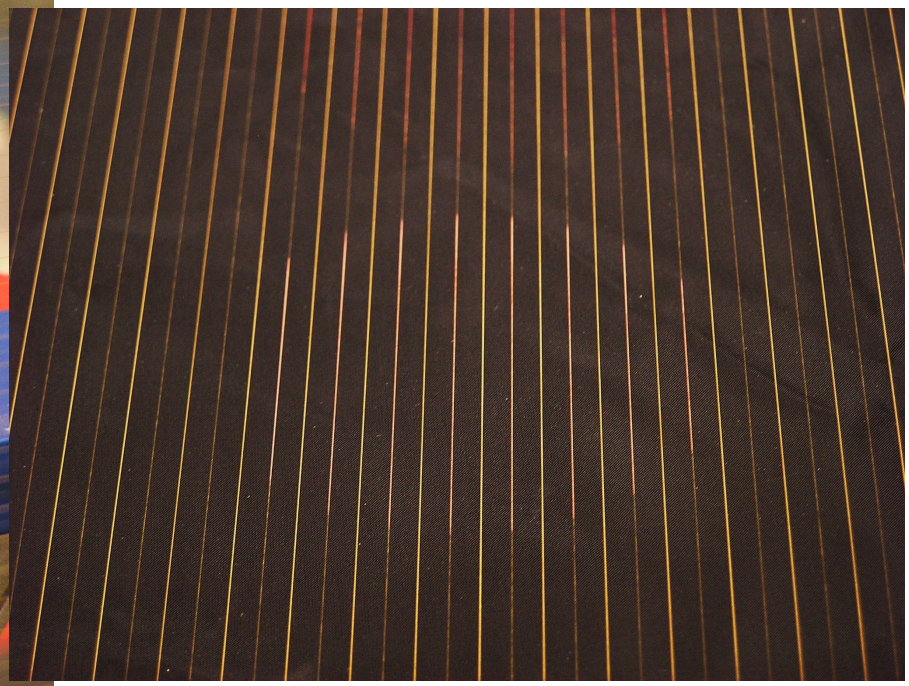
JLAB 5/12/09

Most recent activities have been geared toward producing a functional few-layer full-scale prototype.

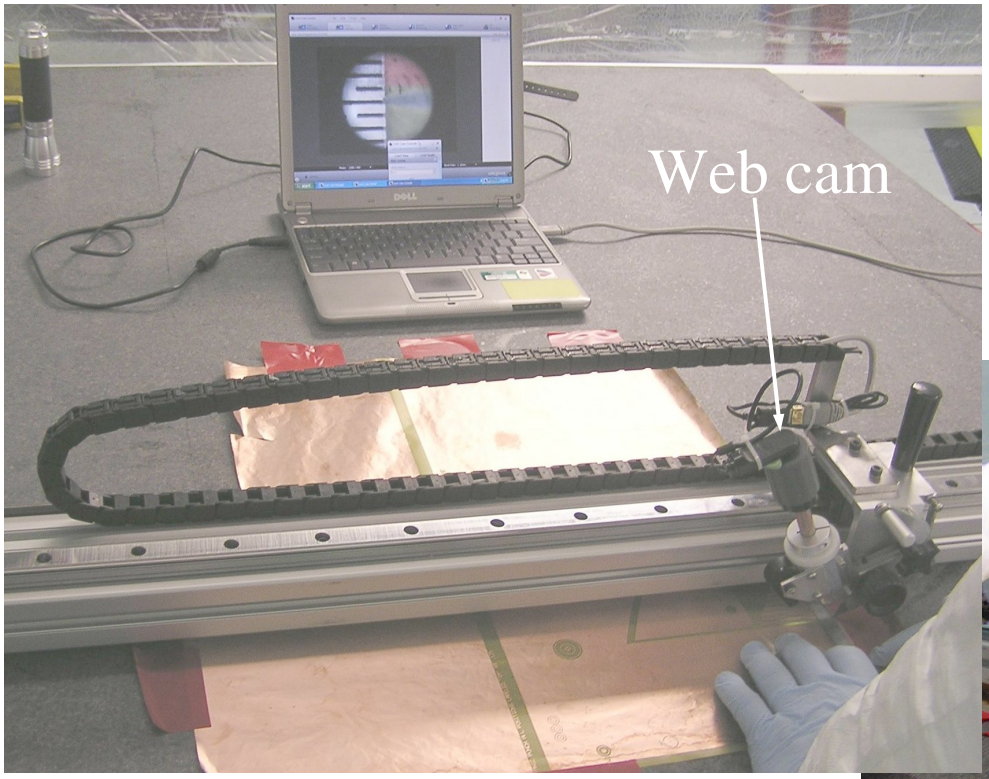
- Wire deadening
- Cathode trimming
- 3-piece cathodes – real boards soon ready for readout!
- Full-scale mechanical mock-up

Wire deadening

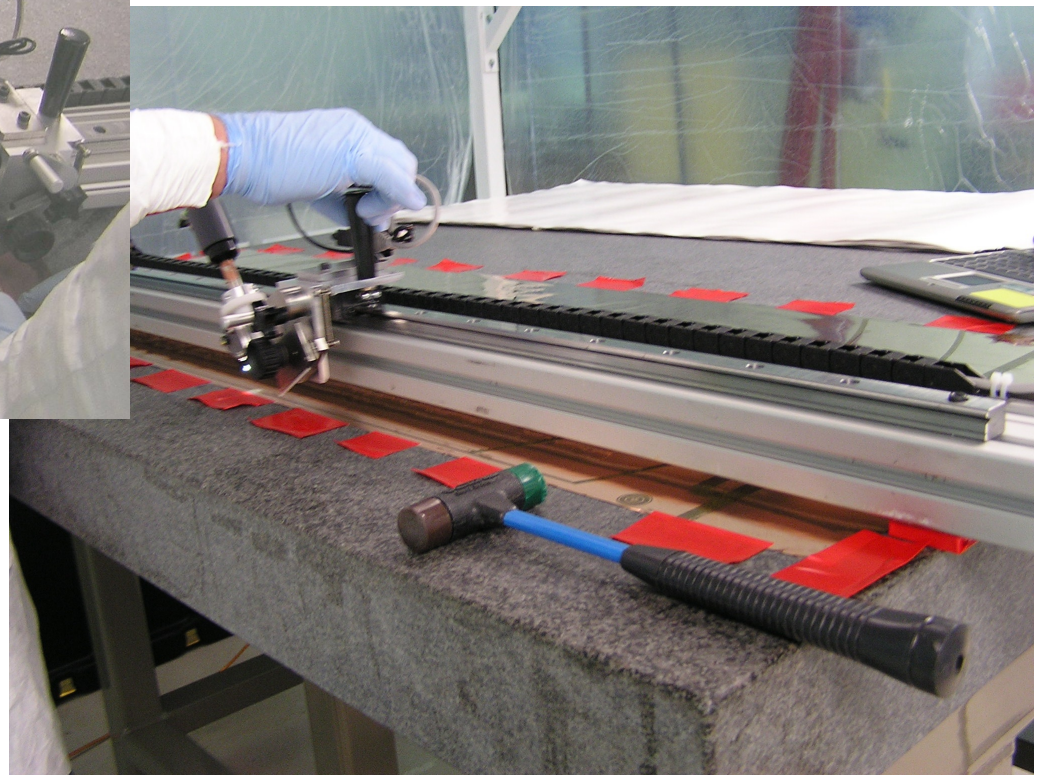
- Due to high flux of radiation near the beam line, need to suppress gain for wires within a certain radius of the beam line
  - Electric field strength near wire $\propto 1/r$
  - Technique: electro-plating using copper sulfate solution



Cathode trimming

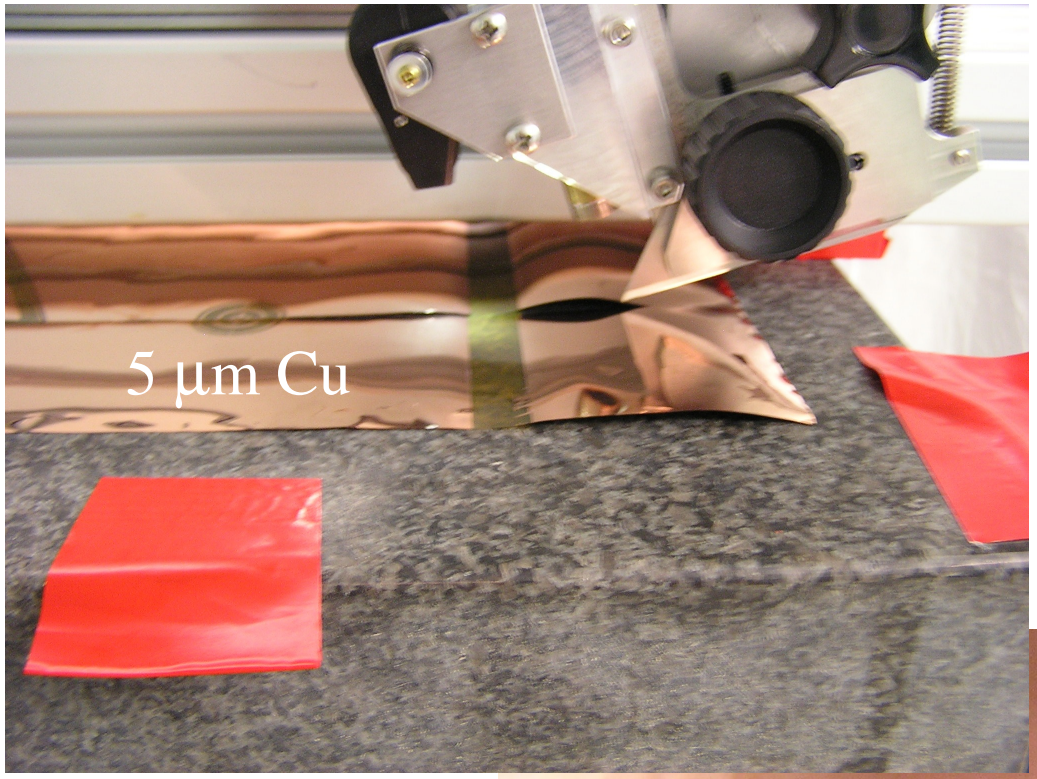


- Cathode boards do not come trimmed from the manufacturer → needed to devise our own board trimmer...

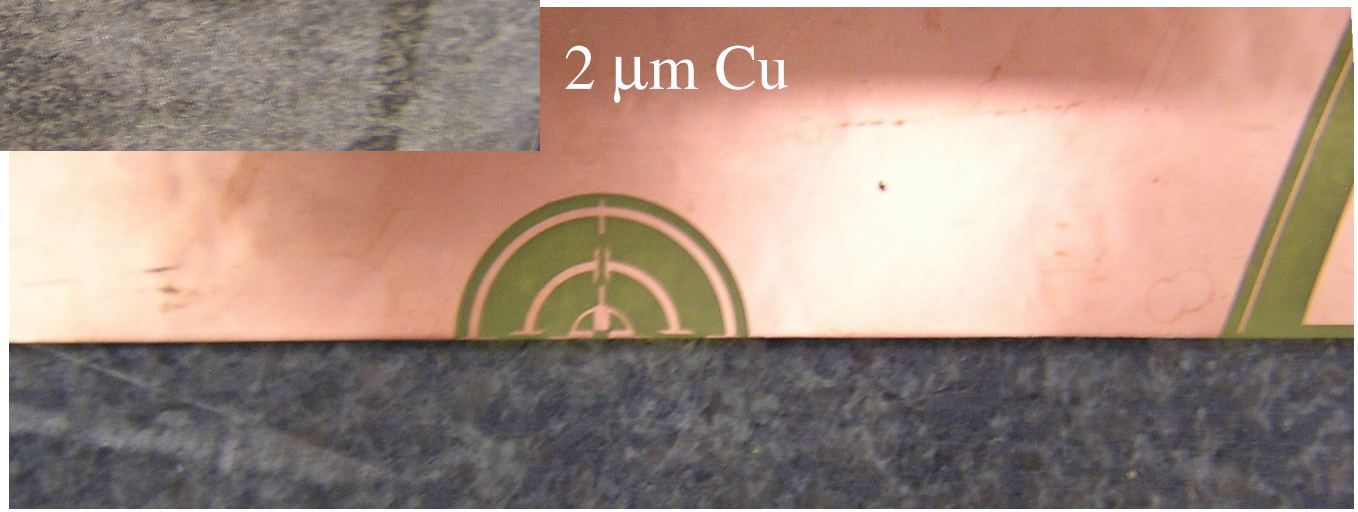


This design essentially complete

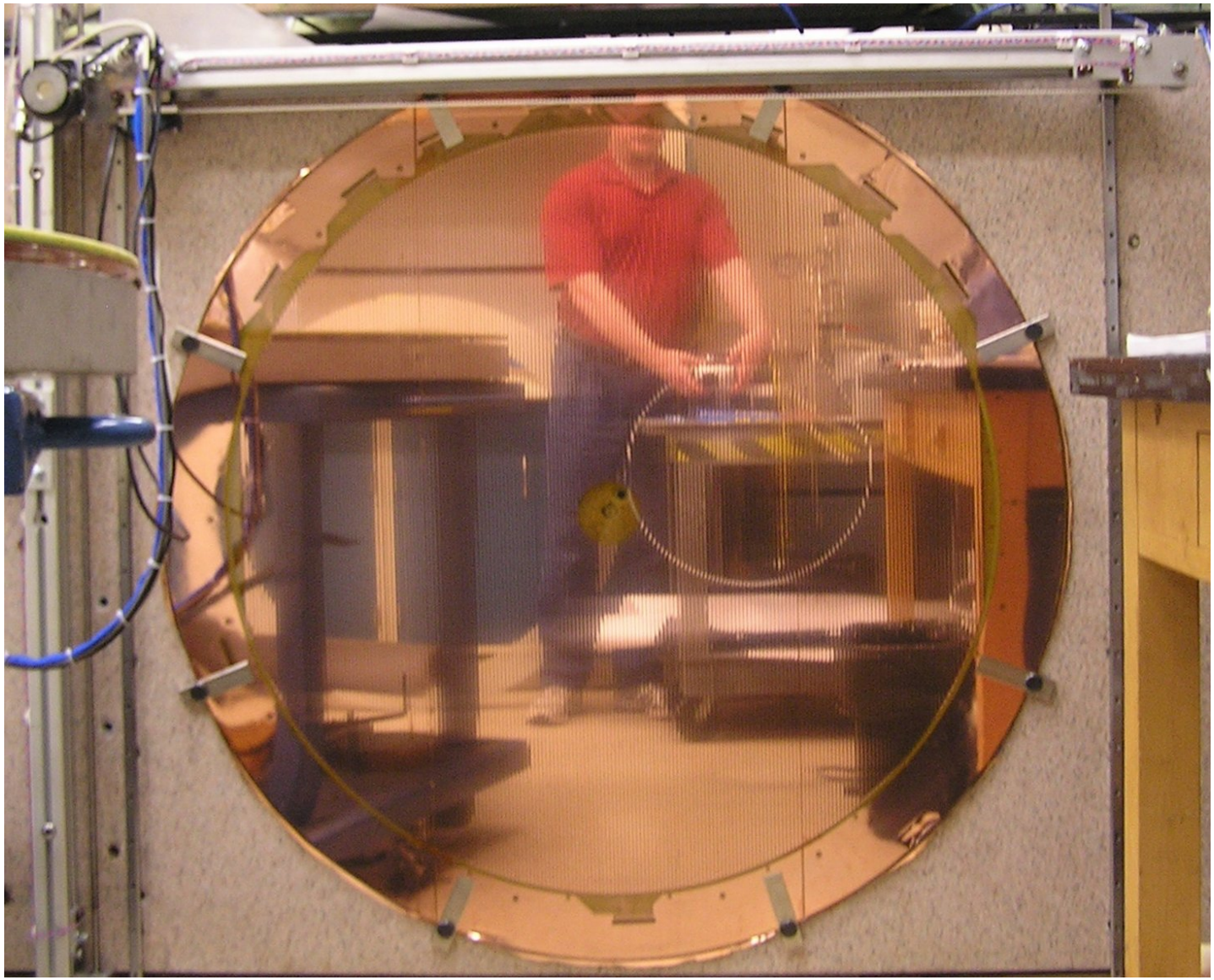
Cathode trimming



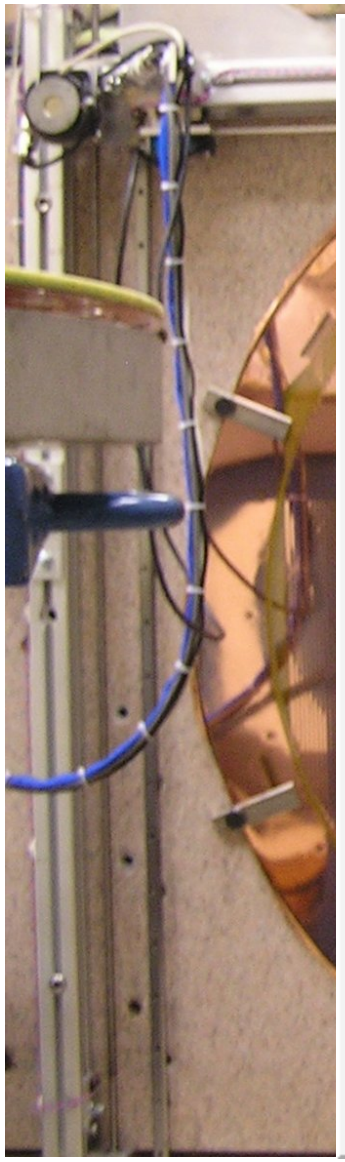
All 5 µm Cu and 2 µm Cu prototype boards on hand have been successfully trimmed!

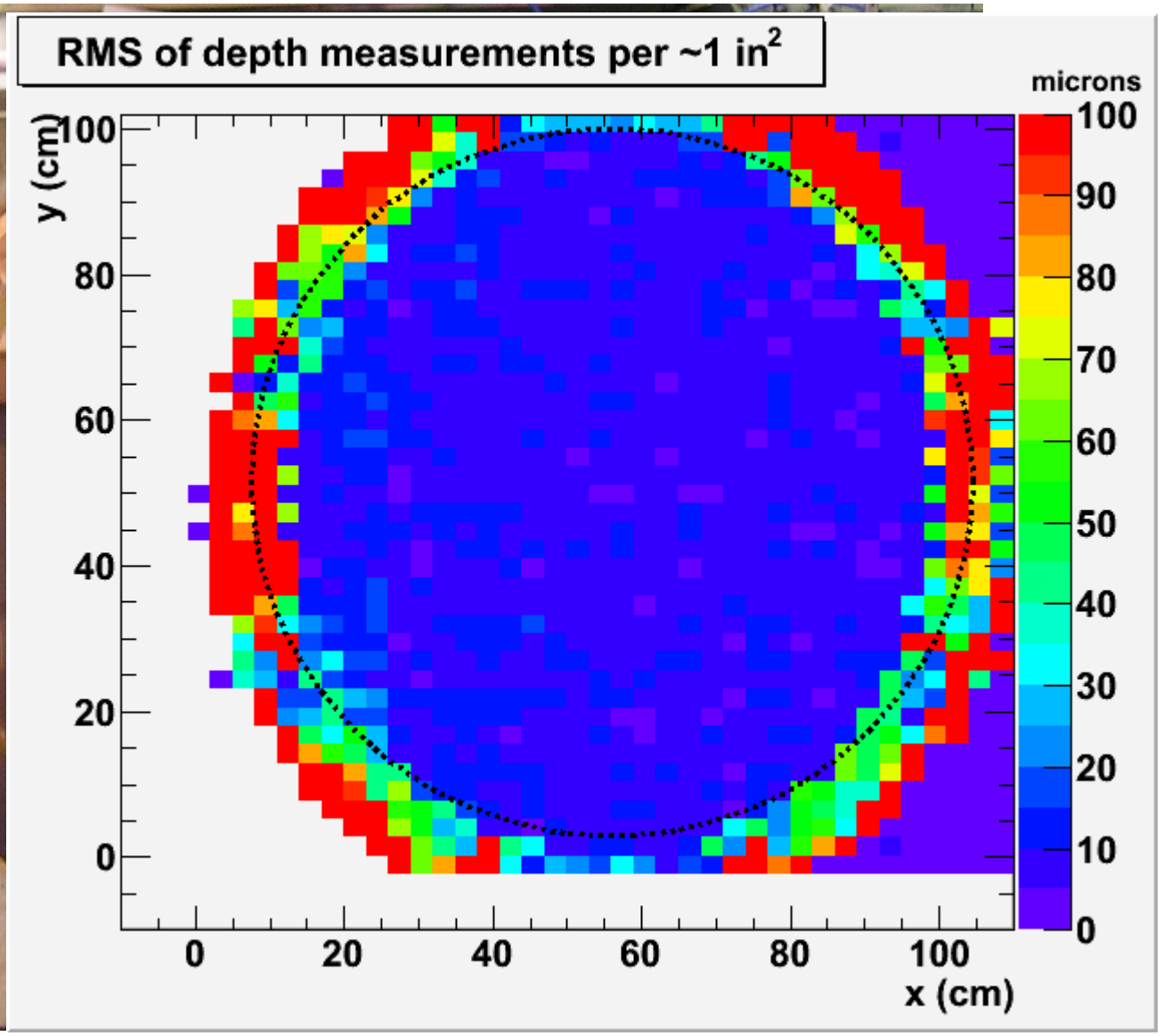


Assembled 3-piece cathode board

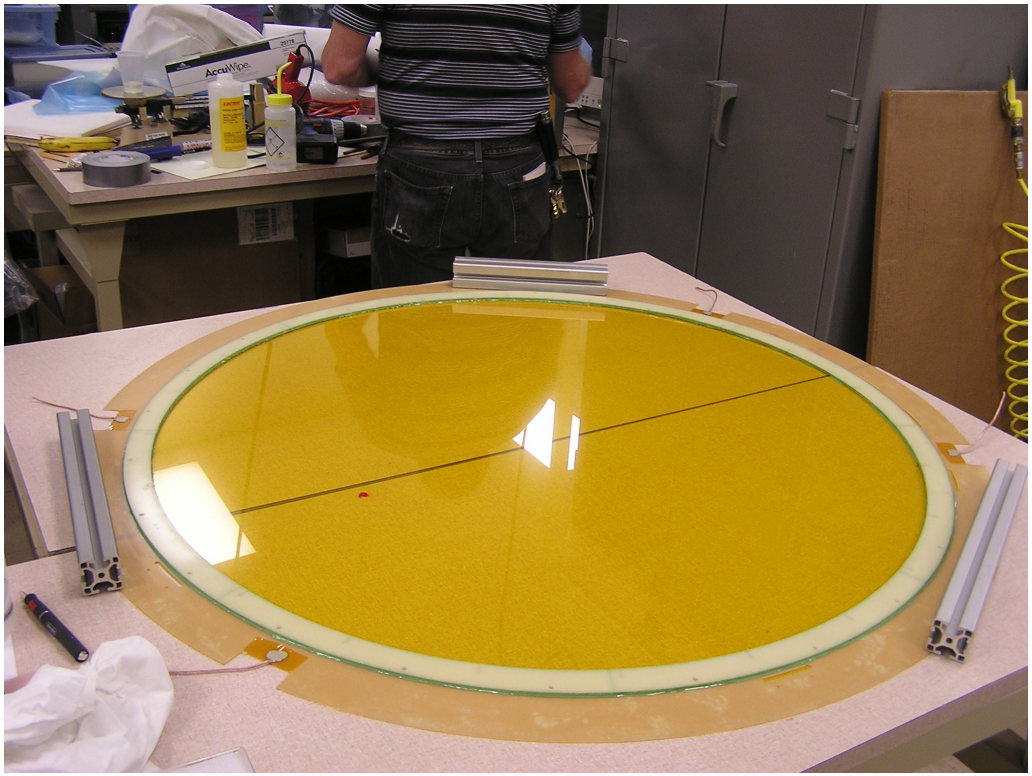


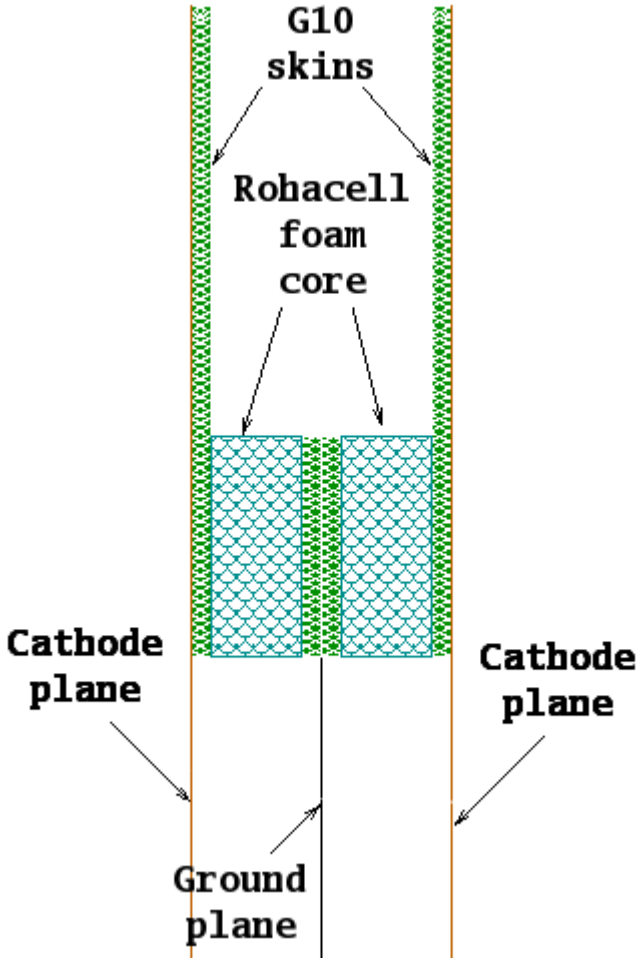
Assembled 3-piece cathode board





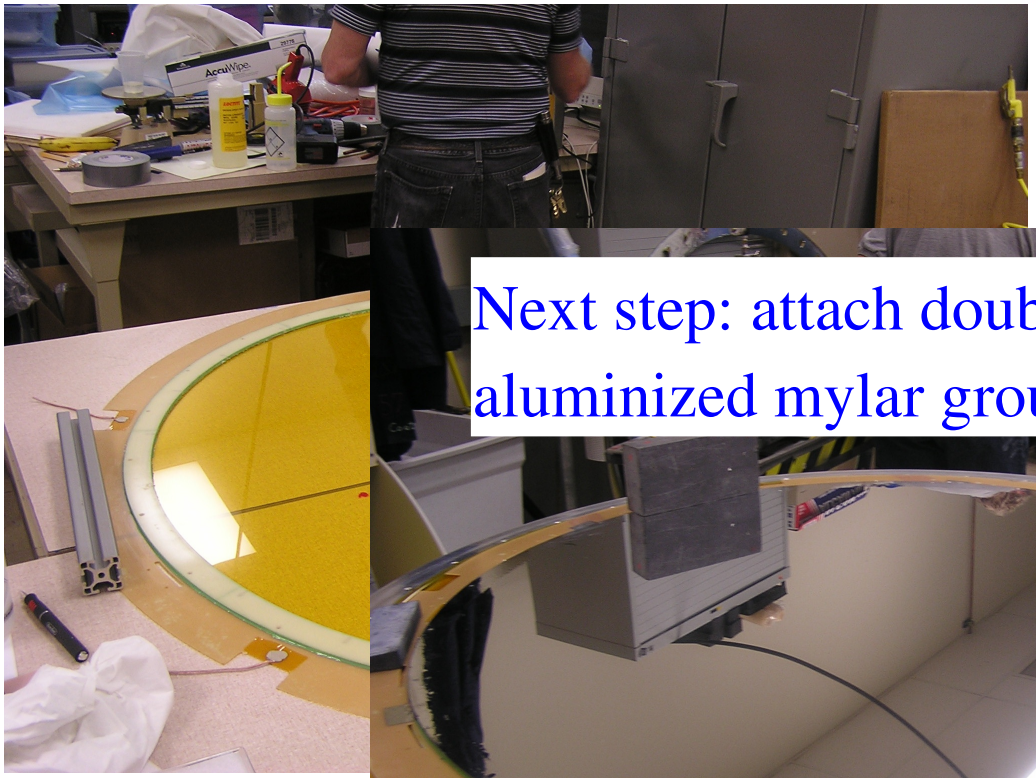
Full-scale cathode sandwich mock-up

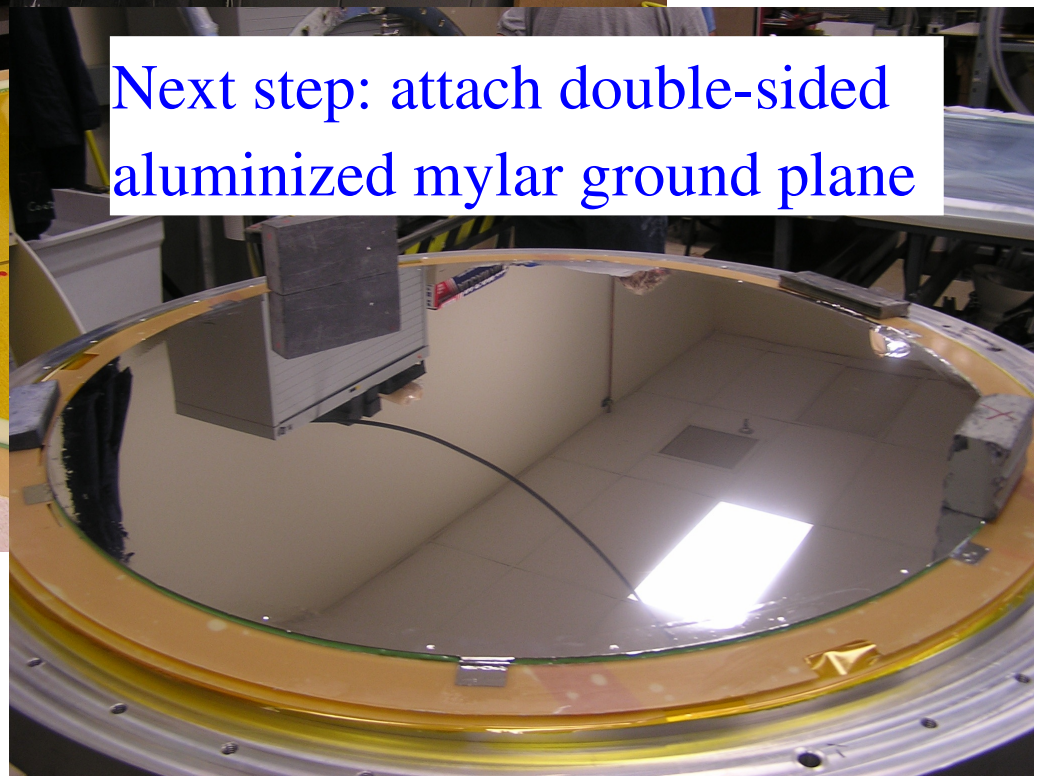




Once the full cathode 3-piece cathode board is tensioned and glued to its G10 skin, a narrow spacer ring is epoxied to the back side...

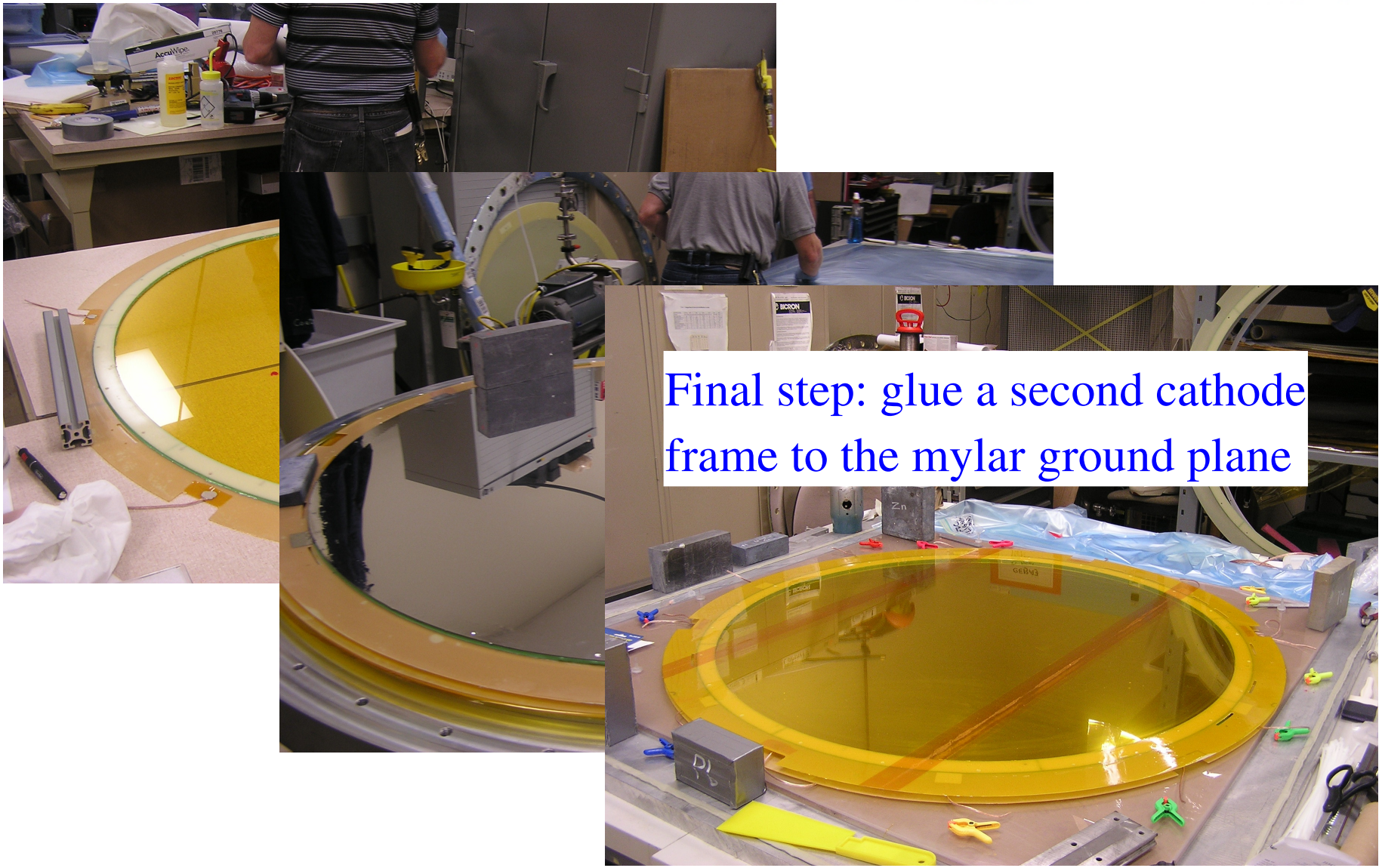
Full-scale cathode sandwich mock-up





Next step: attach double-sided aluminized mylar ground plane

Full-scale cathode sandwich mock-up



Full-scale cathode sandwich mock-up

- Very light assembly, but robust!
- Tends to buckle due to imperfectly matched tensions on two cathode boards... but it takes very little force to remove the buckling

Successful proof of principle!

Summary/Outlook

- Construction procedures coming into focus
  - Proof of principle for wire deadening
  - Cathode board trimming in good shape
  - Proof of principle for cathode sandwich construction
- 3 of 4 prototype wire frames wound by IUCF, 4th imminent
  - Mark Stevens will bring all 4 back to JLab later this month...
- Remaining part of cathode board order due from Allflex this month
- FDC test stand will be moved from Test Lab to EEL 126 this month
  - Tests of full-scale prototype – Summer '09