

Microboone Wire Stringing and Assembly

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Scope of Talk

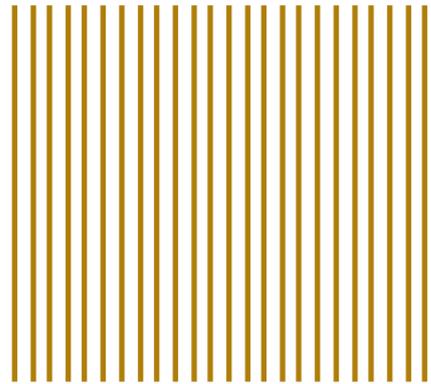
Summary of Wire System in Microboone
Overview of Stringing Process
Storage and Transport of Wires
Microboone Assembly work and status

Wire Planes Design in Microboone

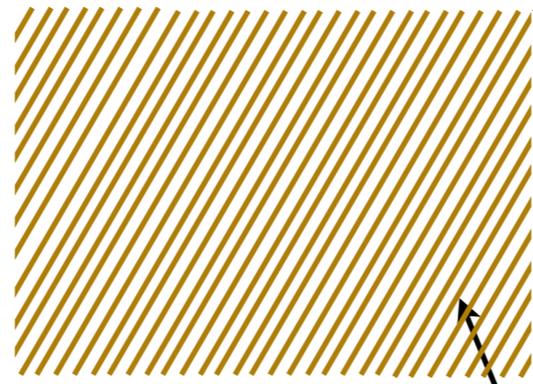
Vertical

+ 60°

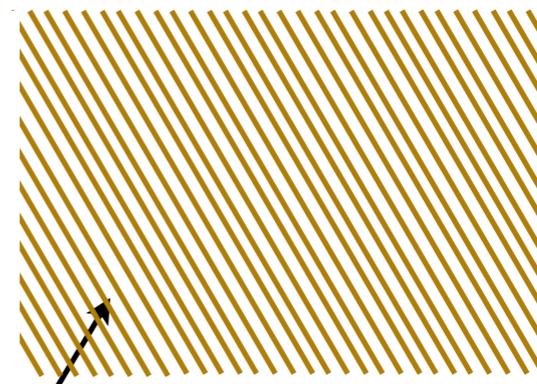
- 60°



Syracuse



Yale



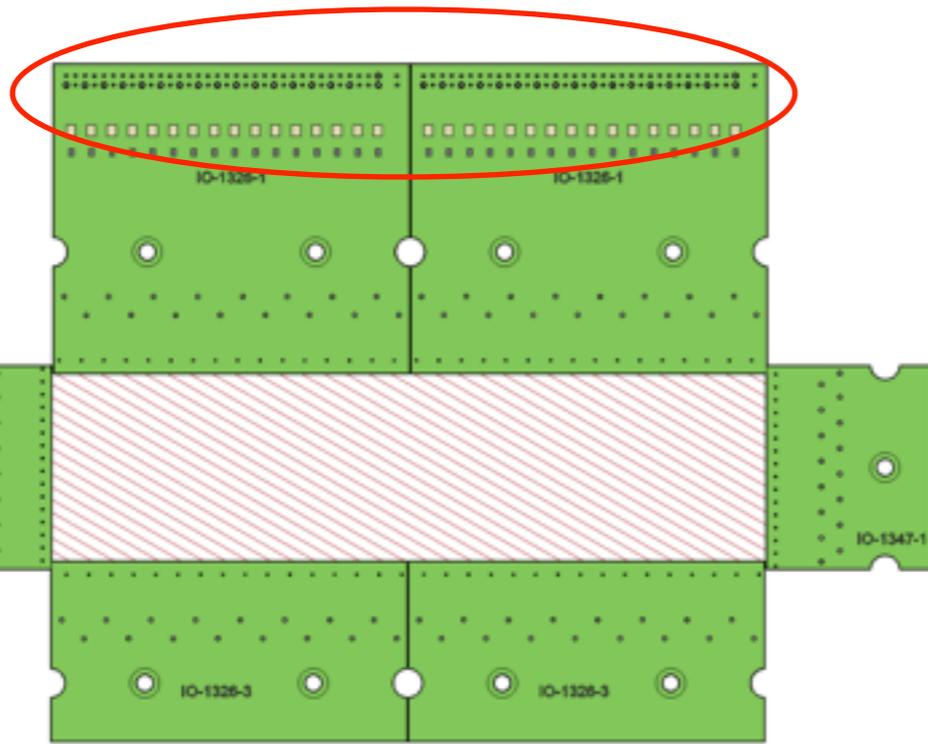
Yale

- 66 boards of constant length wires, plus 42 in each corner.
- 16 wires per board, so $(66+42+42)*16 = 2400$ wires in the U/V planes

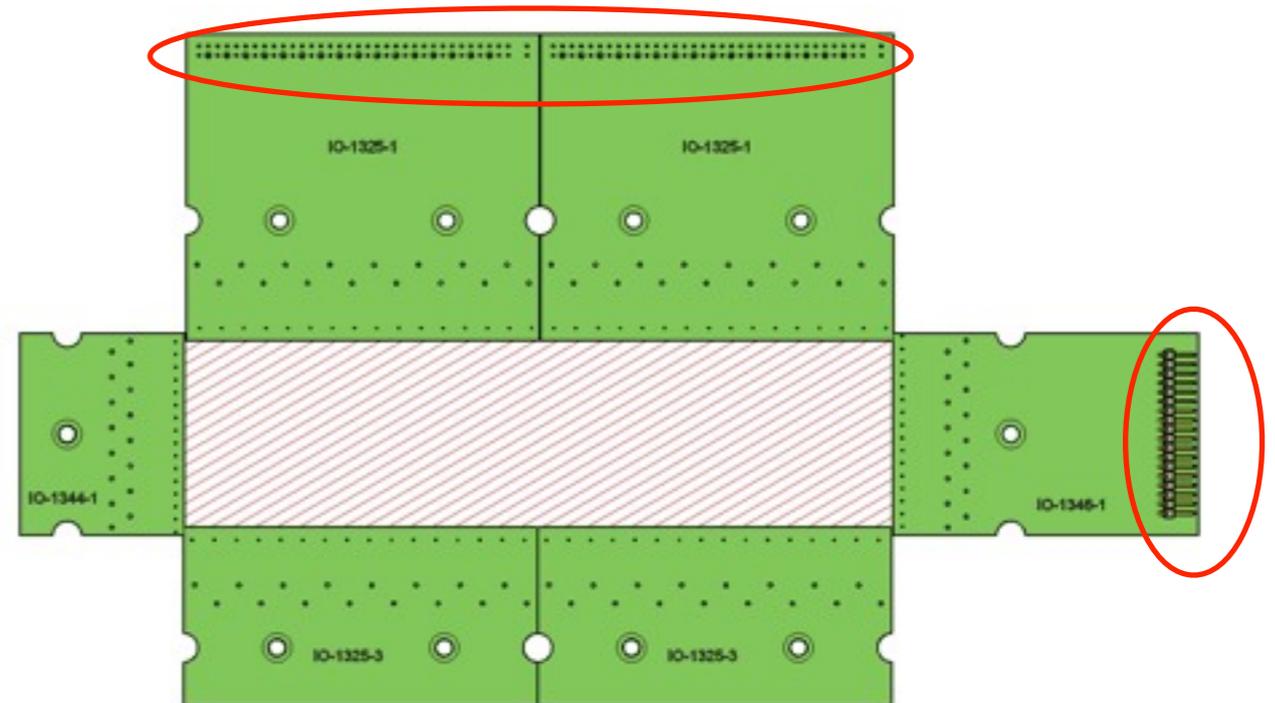
We made both angled planes at Yale plus a few spare boards, for a total of 4992 wires (312 boards)

Wire Boards

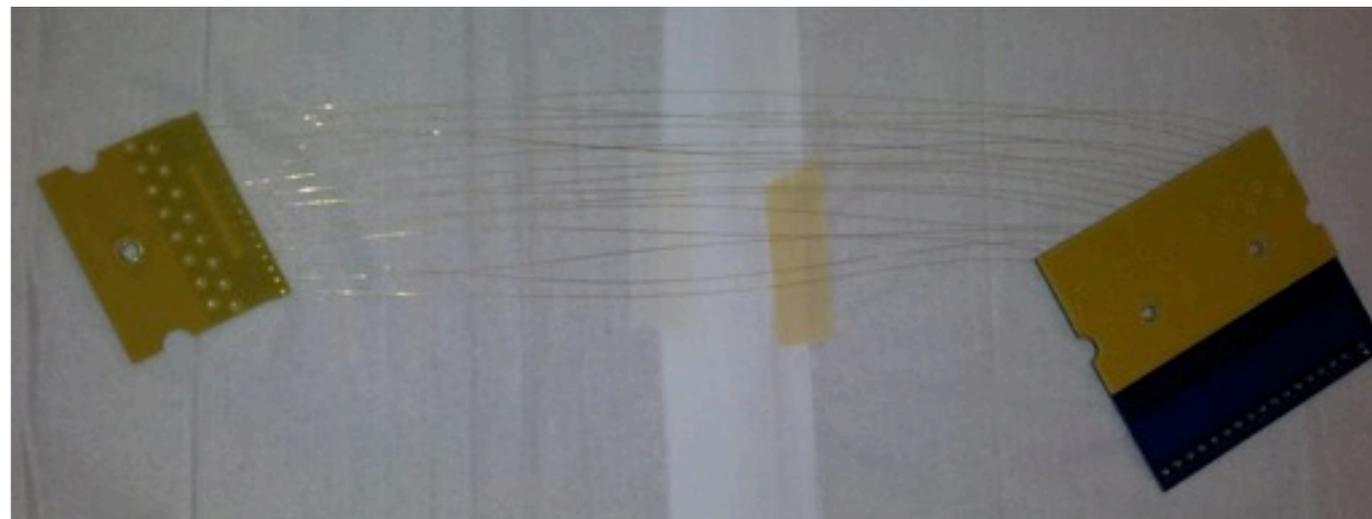
“V” Plane



“U” Plane



Readout electronics



3rd shortest board for the top/left U plane corner
(it's upside down, unfortunately)

About the wires



A stainless steel practice wire

The detector wires are 150 microns in diameter, stainless steel core with a copper and then gold coating

- Each wire is wound 6 times around at an angle of 50°
- The detector will place the wires under 700g of tension, so we stress test each wire (individually) at 2.5kg to verify its strength
- The completed wire boards are also stressed.

Winding Machines

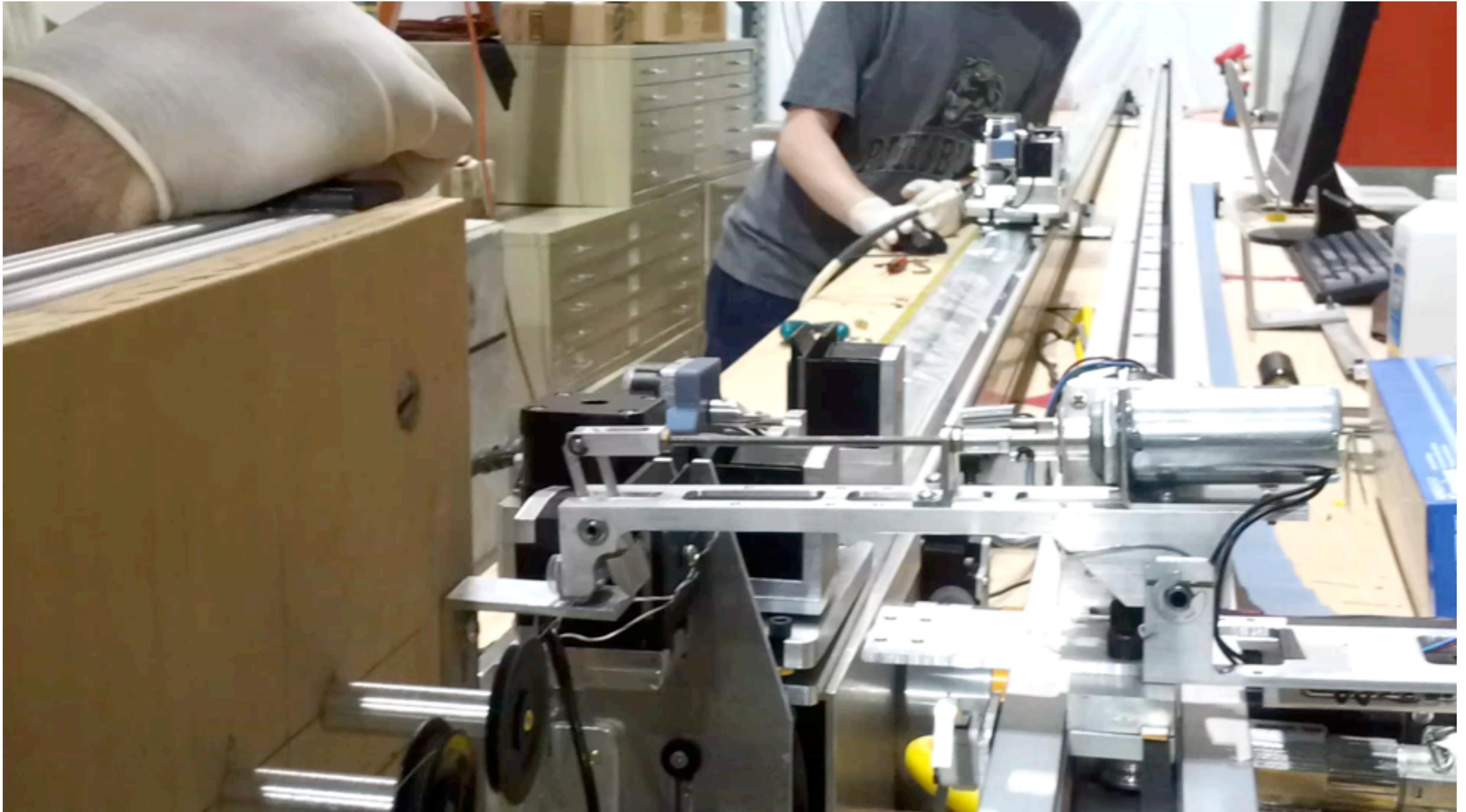


Syracuse and Yale each had machines to wind wires, designed and built with a lot of guidance by Bo Yu (Brookhaven)

Yale Machine

*For info on the Syracuse winding experience, see talks by Jonathan Asaadi or Mitch Soderberg (docdb 1930, 1959, 1941)

The Machine in Action



(This is a video in the .ppt file, but a picture in the .pdf file)

Wire Board Assembly Procedure

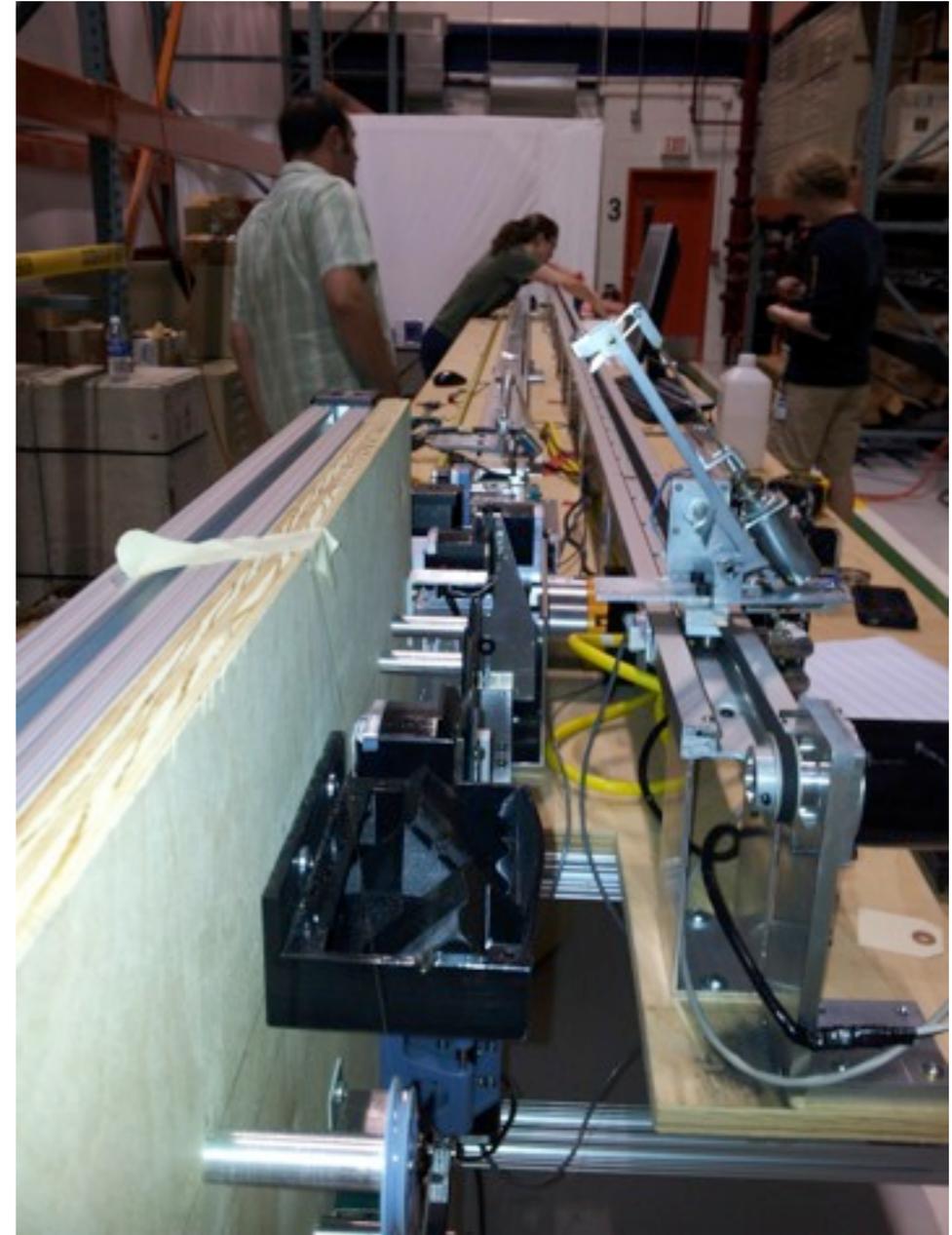
1. String 16 wires of appropriate length.
2. Test each wire individually at 2.5 kg of tension for 10 minutes
3. Assemble the wires onto a wire board, which is then pressed shut to secure the wires in place
4. Test the entire wire board at $\sim 30\text{kg}$ of tension, which is well about the working load inside the TPC
5. Store the wire boards for shipping



Boards stored and ready to be packed for shipping

Current Status

- After 5 weeks of 12+ hours per day, 6 to 7 days a week, the Yale team finished all but the final 3 boards in each corner.
- The wires and the Yale winding machine have both been shipped to FNAL, the wires are awaiting installation.
- The machine is running in D0 and the shortest boards except for the very final corner will be finished next week!
- Thanks to Ellen, Ryan, Thomas, Christina and others for helping at FNAL!



The machine in its current home

The Yale Winding Team



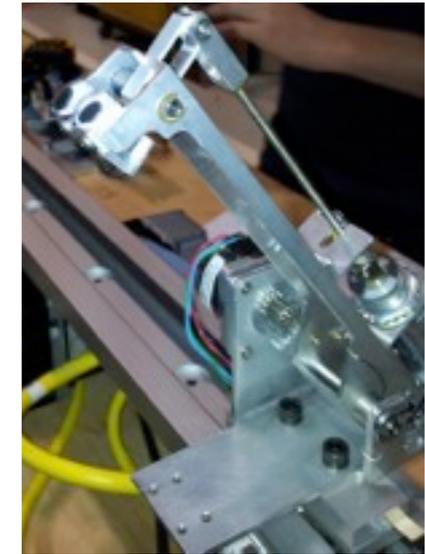
Our fearless leader,
Roxanne Guenette
(with “Gary”)



Kinga hard at work



Andrzej supervising



“Gary” our mascot (and
also our wire layer!)



The Champagne Finish! From left, Andrzej, Roxanne,
Tom (our wonderful technician), Corey, Christina

Not pictured but not forgotten: Ben Elder, Flavio Cavanna, Ornella Palamara, Ryan Grosso

TPC Assembly

In the meantime, I've been kept busy scrubbing, washing, soaking and otherwise cleaning TPC parts, as well as wrapping (to keep clean) and transporting them



Assembly Status

Still waiting for crucial parts to arrive from manufacturers!

Everything is either cleaned or being cleaned, and the construction site is prepared and inside a positive pressure tent.

For a (mostly) current assembly update, see docdb 2093 by Jen Raaf

The End

Thanks to Thomas Strauss and Roxanne Guenette for a lot of great pictures and the video!