Instrumentation upgrades / improvements

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Items

- Possible new tagger hodoscope addition: Glasgow
- Tagger microscope improvement: UConn
- Pair spectrometer: JLab
- TPOL upgrade: ASU and JLab

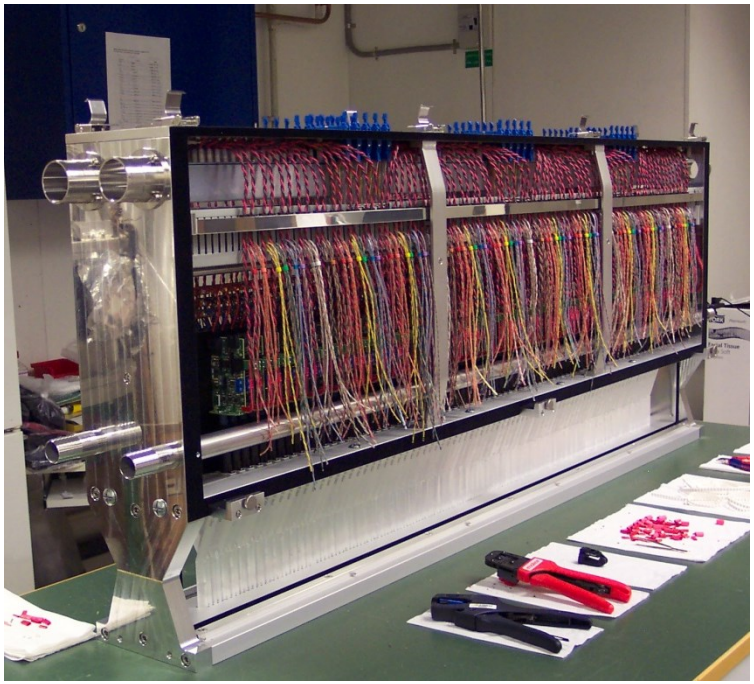
Possible new hodoscope addition

- Glasgow is investigating the possibility of an additional hodoscope
- To be placed in the "sampled" region behind current hodoscope (parasitic)
- Would allow coherent peak to be moved to lower energies (between 1/3 to 1/2 E_{e-} instead of 3/4 E_{e-})

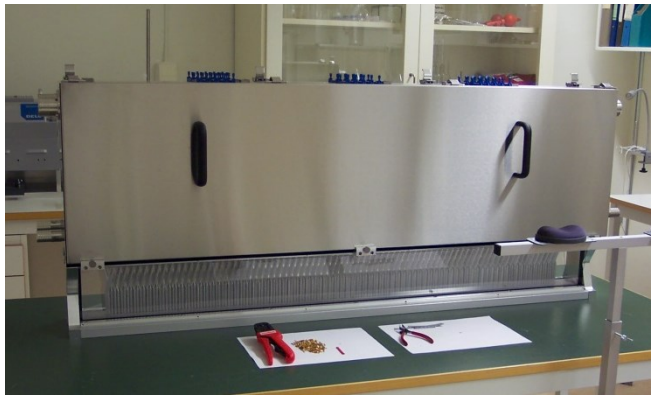
MAXLab Hodoscope

Donated by Kevin Fissum, Lund. To be tested by Ken Livingston

Channels	160
Dimensions	100x20x3mm
PMTs	Hamamatsu 11mm
Timing	Σ < 150 ps
Rate Limit	1MHz
Outputs	ECL, Analog (Custom boards)



- Built for MAXLab tagger, never used
- To be shipped to Test Lab soon.
- For tests, alternative coh. peak position ...
- Many questions, no documentation!
- HV – in discussion
  - MaxLab use CAEN A1392 (48ch)
  - Can do “part exchange”
  - Need a few slots in a MainFrame.

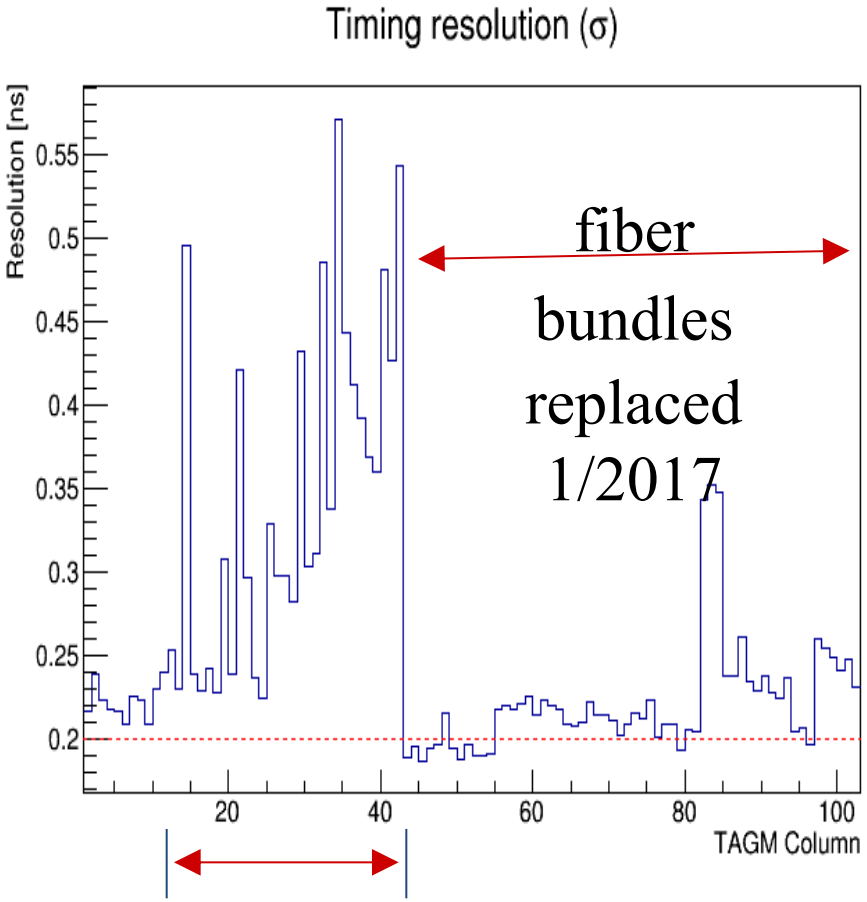


University of Glasgow

TAGM upgrade - motivation

- improved fab process devised and perfected by James McIntyre
- he was successful in recovering close to the expected light yield
- time resolution now at/near design goal (chan 81-84 from noisy preamp)
- first 2 bundles from original set (columns 1-12) seem ok
- plan to construct 5 new fiber bundles (150 fibers) during summer, 2017

(based on data taken in Spring 2017)



5 new bundles needed to complete upgrade

University of Connecticut

TAGM upgrade - plans

- James is on leave (health reasons) until Fall, 2017
- undergraduate worker hired for summer 2017 to do the fabrication
  a) procedures have already been worked out and documented
  b) end-to-end instrumentation used last time is still in place
  c) James is is still available for consultation when needed
- goals for summer 2017
  a) complete 7 bundles, take best 5
  b) do light yield checking early and often
  c) may be done in time for installation before Fall run, probably not until 1/2018

Status of the Pair Spectrometer

- Stable operation of the PS / PSC counters during the run in Spring 2017

- Initial calibration of the PS acceptance using runs with the TAC

Plans for summer:

- Replace thermal pads (electronics) for the high-granularity counters, repair a couple of bad channels
  - Detector Arm B moved to F117

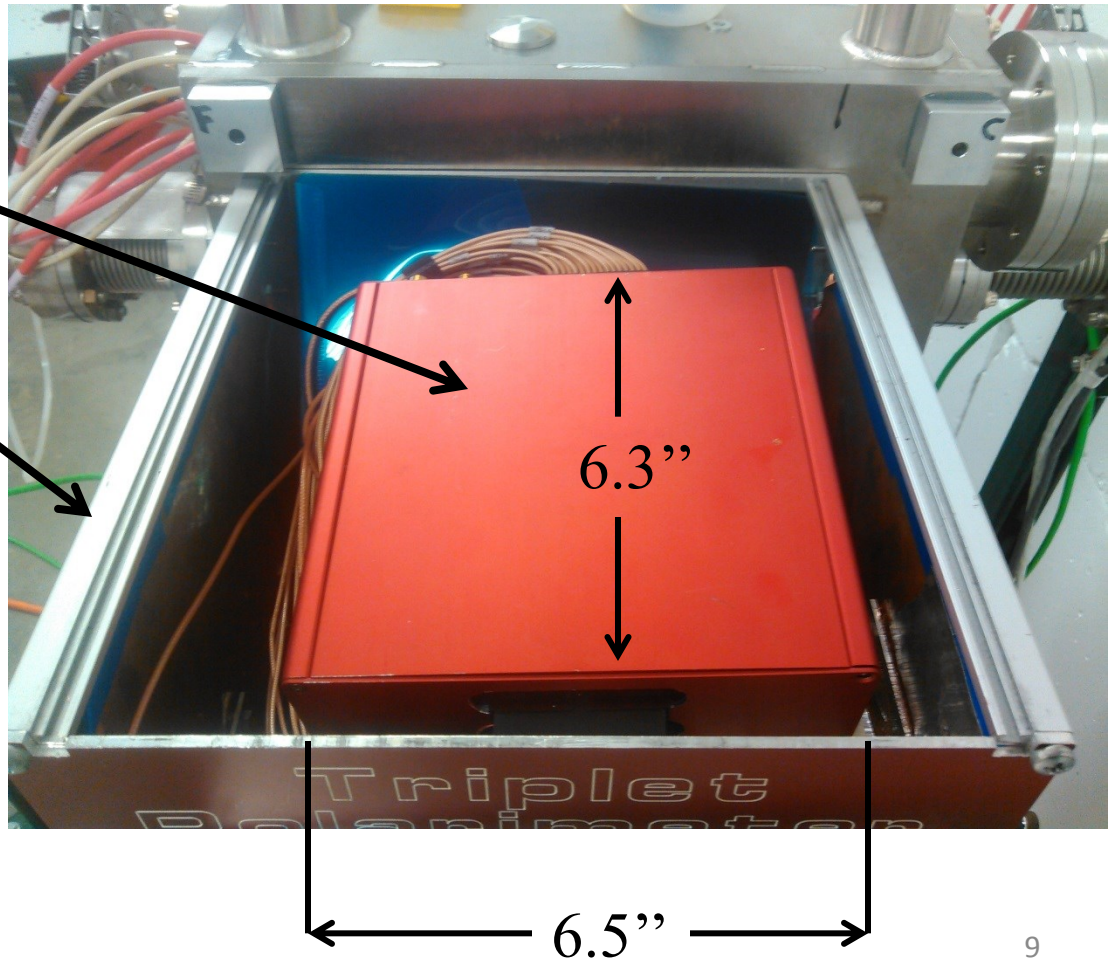
- Refine determination of the PS acceptance and energy scale
  - update magnetic field map generated with TOSCA (A. Glamazdin), compare with the field measurements
  - implement the field map to Geant
  - finish analysis of the TAC data, final implementation of the PS acceptance
  - refine energy scale calibration: compare MC with data (fit to the energy endpoint)

TPOL upgrade

- Currently instrumenting only the sector side of the silicon strip detector (SSD)
- Upgrade will allow the ring side of SSD to be read out
- Will need to find space for an additional two filter boards
- Want to place all filter boards within the distribution box
- Will need to modify the distribution box

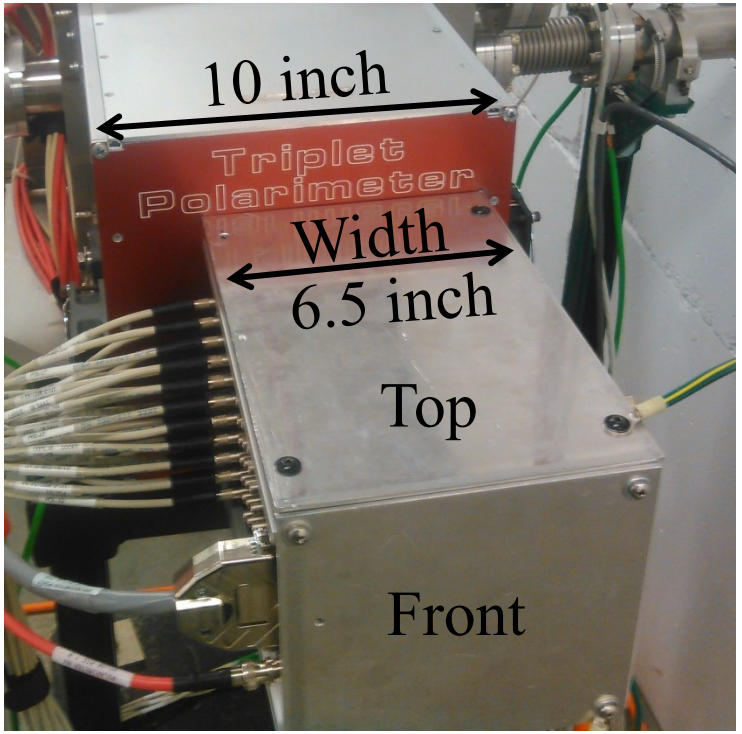
Current location of filter boards

- Box containing two filter boards
- Preamp enclosure
- Filter box dimensions: 6.3in x 6.5in x 2.1in



Change to distribution box

- Increase the width of the distribution box to 12 inches
- Will require new front, top, and bottom distribution-box panels
- Current design has no back panel. The new design will require the addition of a back panel

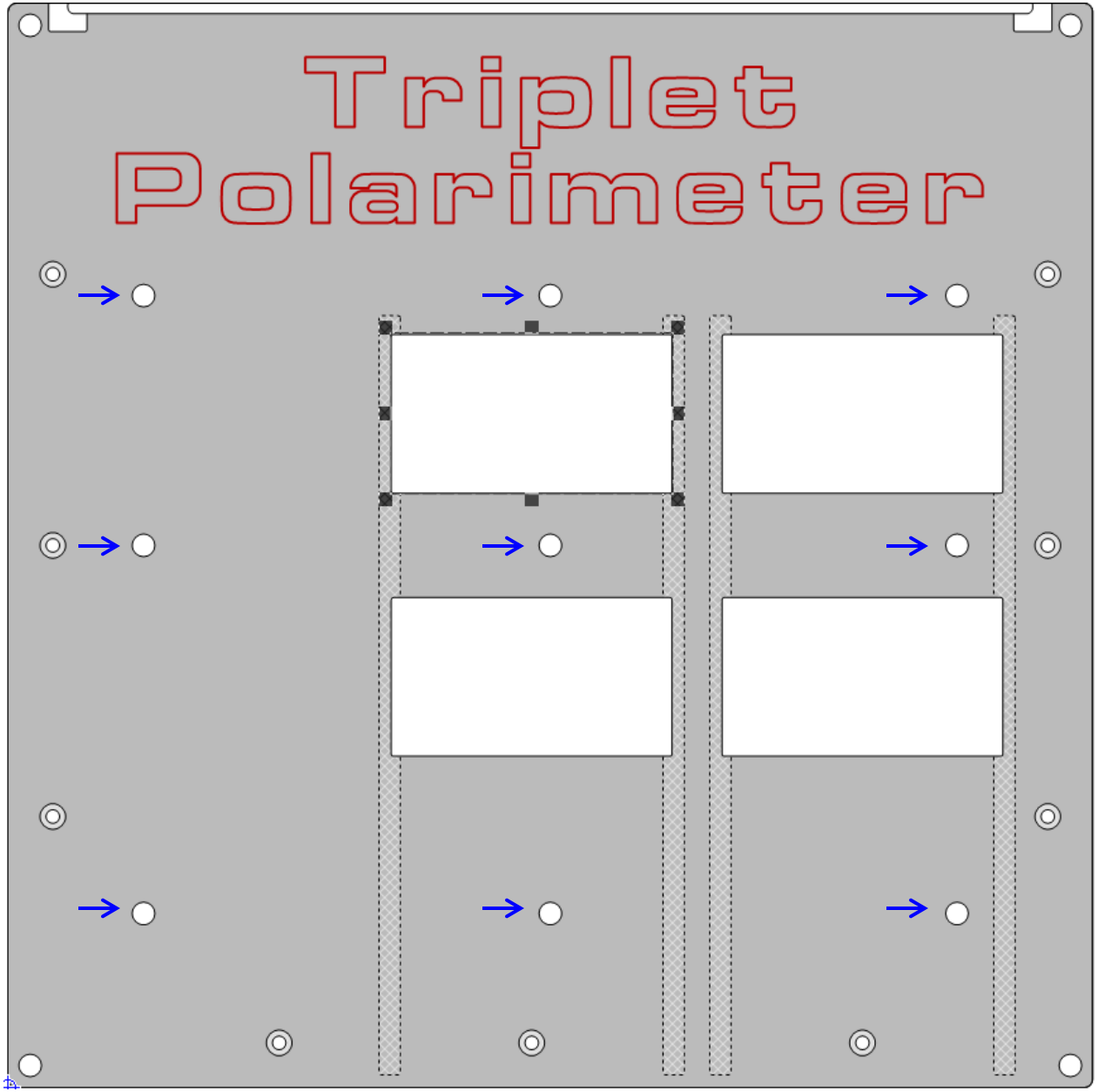


- The rails will be outside the preamp-enclosure front-panel (in red)
- The new back panel of the distribution box will have to be bolted to the preamp enclosure front panel

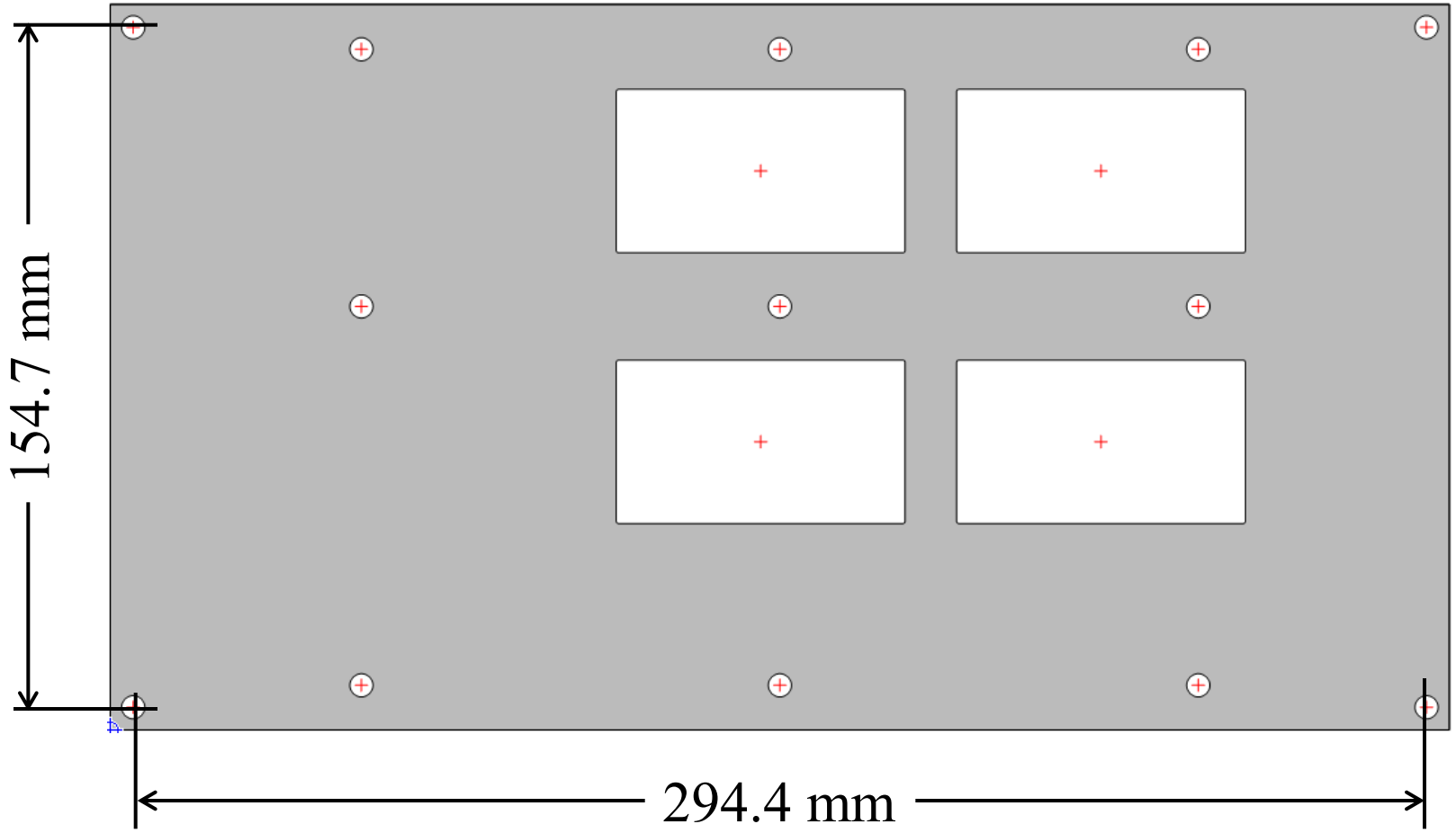
ASU

New enclosure front panel

- New holes for attaching distribution box (arrows)
- Raw aluminum instead of anodized for better electrical connection to the preamps

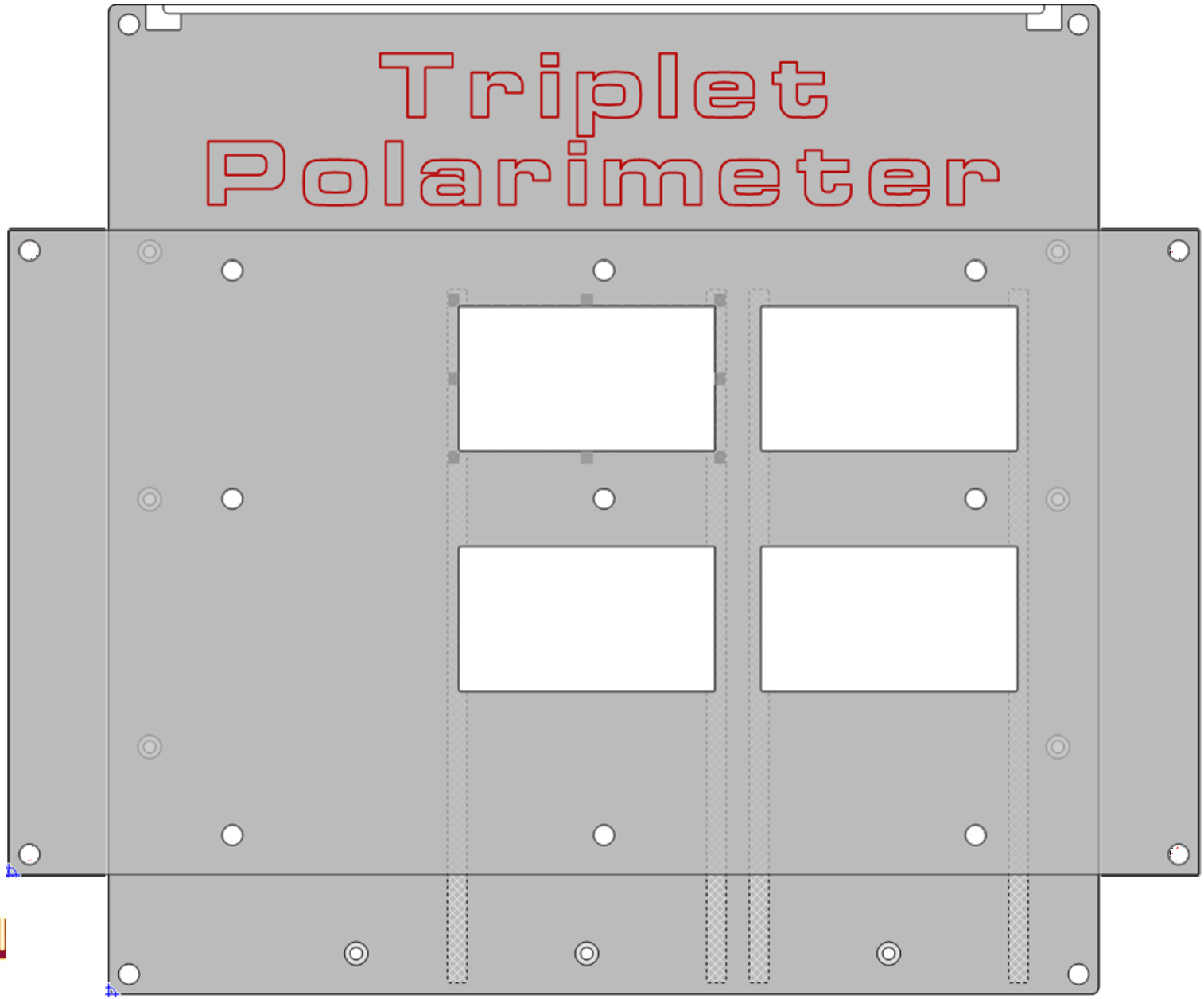


Back panel for distribution box



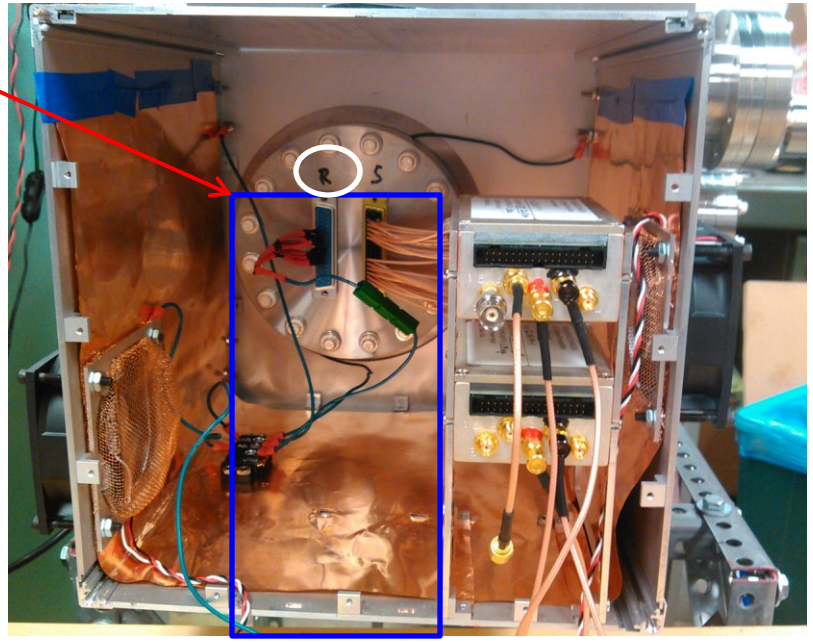
Vertical distance between mounting holes for the rails should be the same as previous design (154.7 mm)
Horizontal distance between the rail mounting holes will change from 154.7 mm to 294.4 mm

Panels aligned



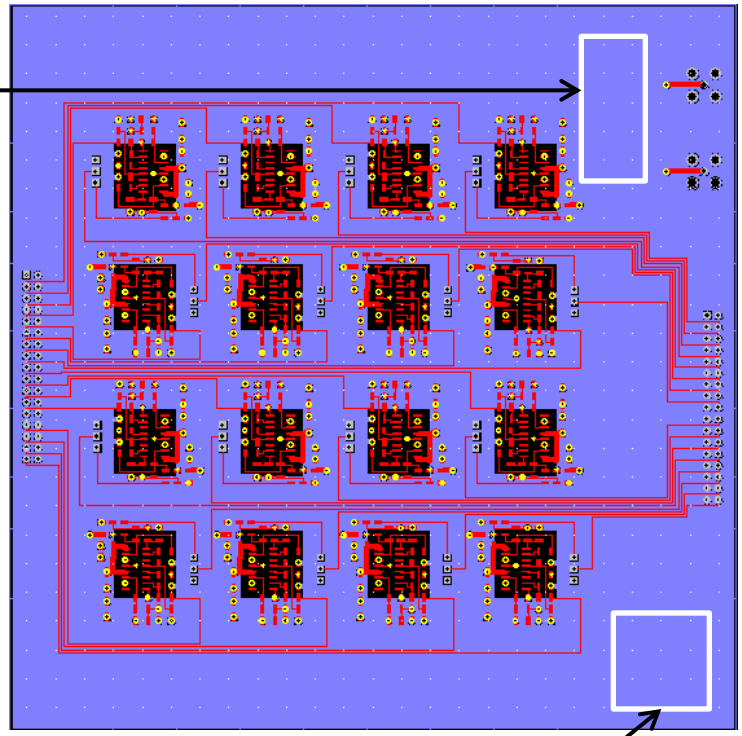
Preamps

- We have obtained the remaining three Swan preamp boxes (two boxes for ring side and one box as a spare along with a few extra spare preamp hybrid boards)
- Two preamp boxes will be installed in this location
- The cables running from the output flange (marked as “R”) to the ring-side preamp boxes have been assembled
- The stand offs for the ring-side preamp boxes have been manufactured and are at ASU



Modified filter board

Removed the voltage regulators from this location



- The original design had voltage regulators that could not provide enough current
- We installed auxiliary regulators for 3 of the 4 low voltages with the remaining low voltage non-regulated
- Turns out, we can operate without the regulators
- Ground pad was just a BAD idea. We did not use it in the current setup

Removed ground pad from this location

Division of labor

- JLab:
  - Obtain new top, front and bottom panels for the distribution box (Nick is working on this)
  - New filter boards (including spares) are being built by the electronics group

- ASU:
  - Provided new PCB layout for the filter boards
  - Obtain the back panel for the distribution box, and new front panel for the preamp enclosure
  - Upgrade the TPOL during this summer

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