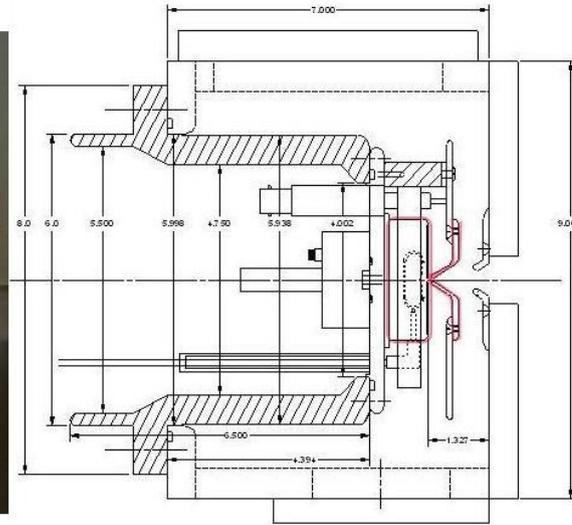
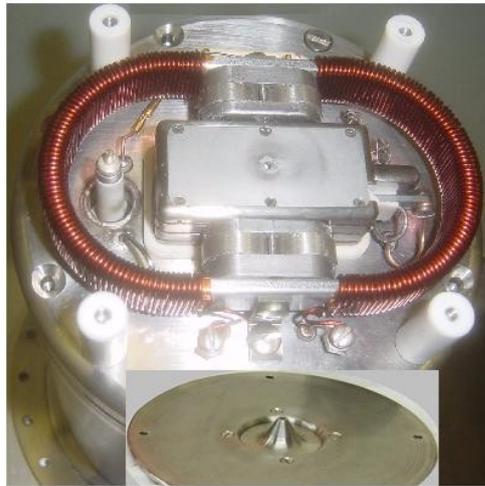


Pre-injector Upgrade Updates (01 Dec 2010 – 22 Dec 2010)

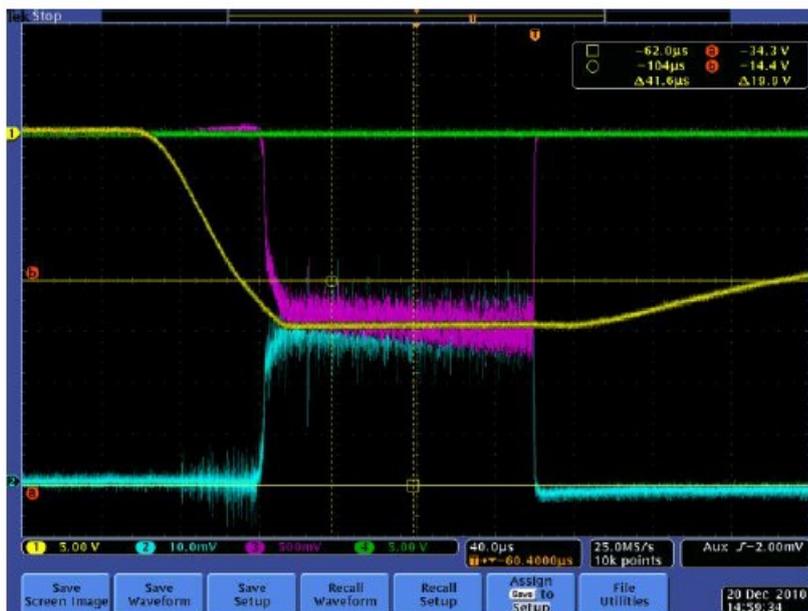
C.Y. Tan
22 Dec 2010

Source Status



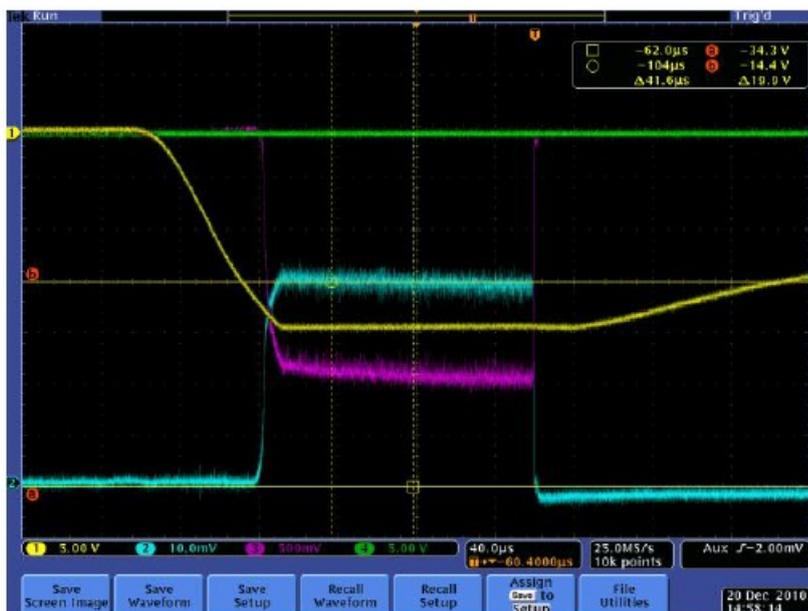
Device	Status	Comments
Source is returned to HINS	Drawings being made	Cube is procured.
Source	Improvements to gas pressure	Better beam quality, less noisy. Thanks to J. Alessi.

All source parameters remained the same for both of these pics except for the gas valve PW. This clearly shows the dependence on gas pressure and that there is an ideal pressure to run at.



Arc I= 22A
Beam I= 29mA
Beam noise on flattop= 8mA
Gas valve PW=188μs

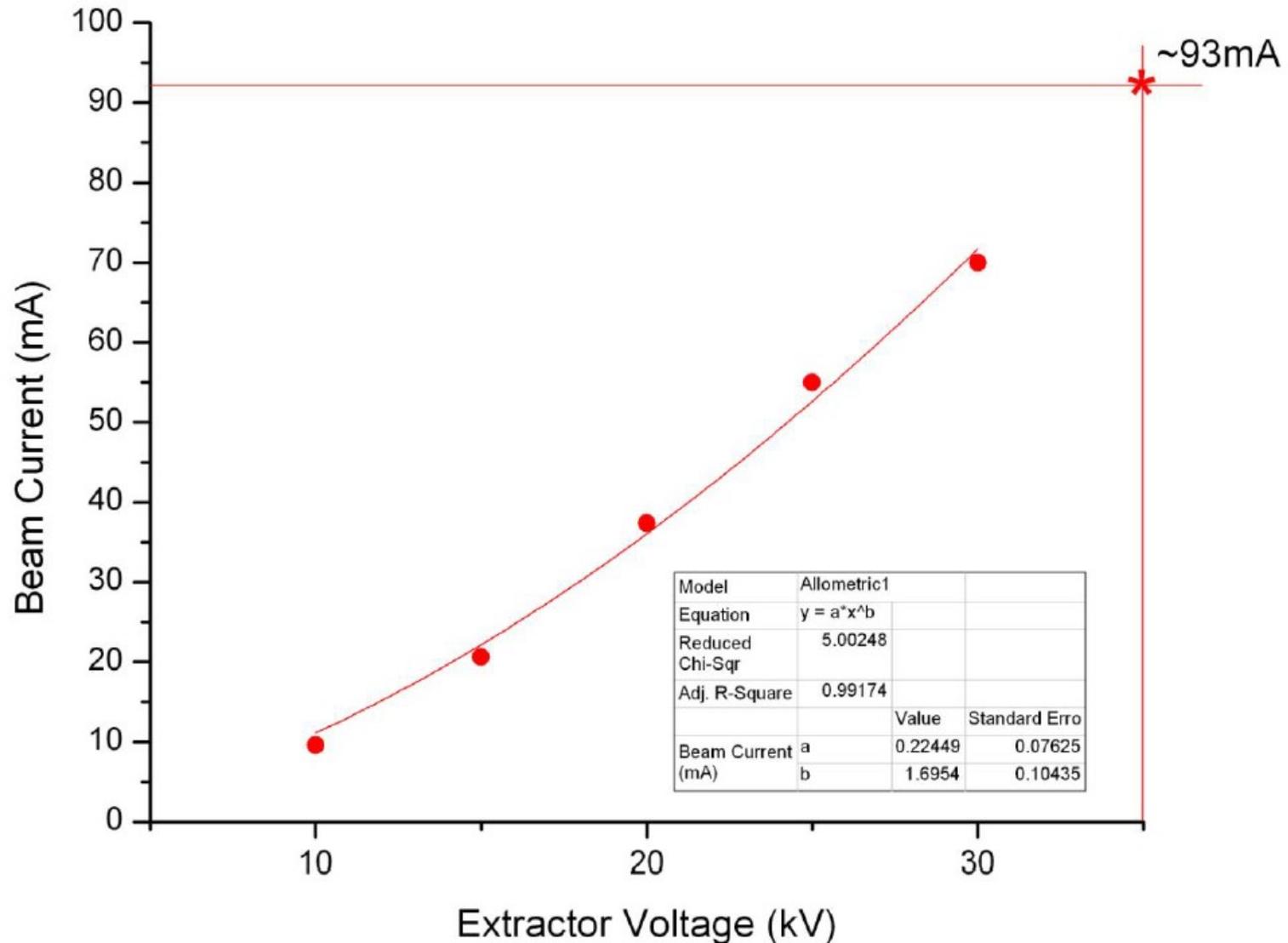
No scope averaging!



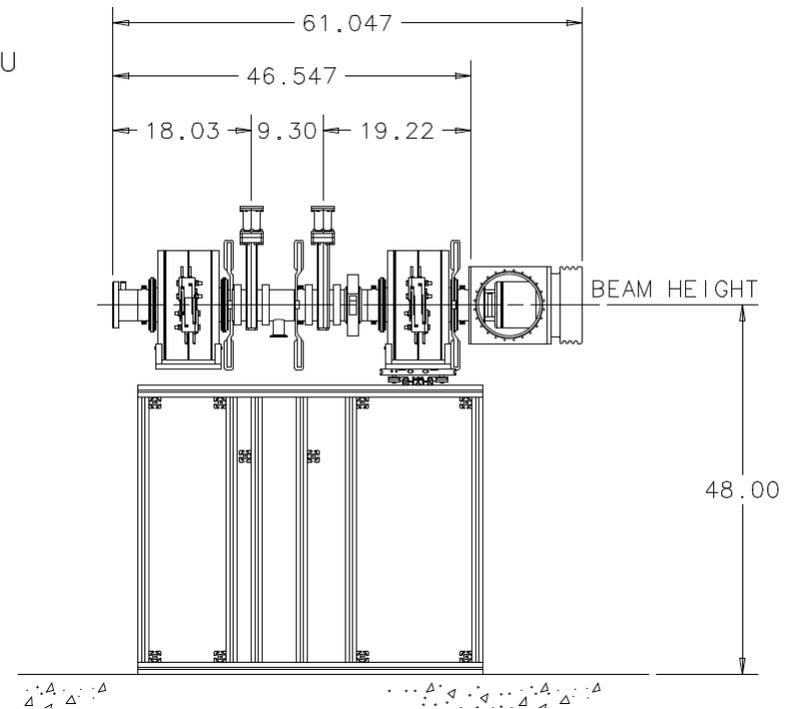
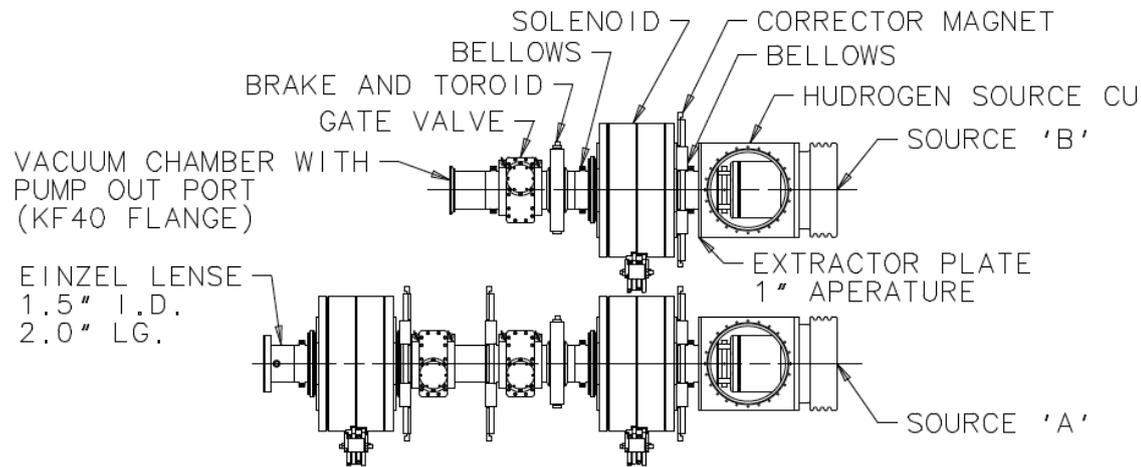
Arc I=17A
Beam I= 38mA
Beam noise on flattop= 2.8mA
Gas valve PW=156μs

Here is the beam I vs the arc I for the source when it was running well. I had to extrapolate to 35kV at that time since we were having extraction problems. So this data was taken when the magnetic field was better centered on the source.

Data with ARCI = 22A



LEBT Status



Status

Comments

Correctors are being built	Milhaus will be building them
Toroids	Bill is still deciding
Einzel lens tests are done	TD will start drawings for chopper

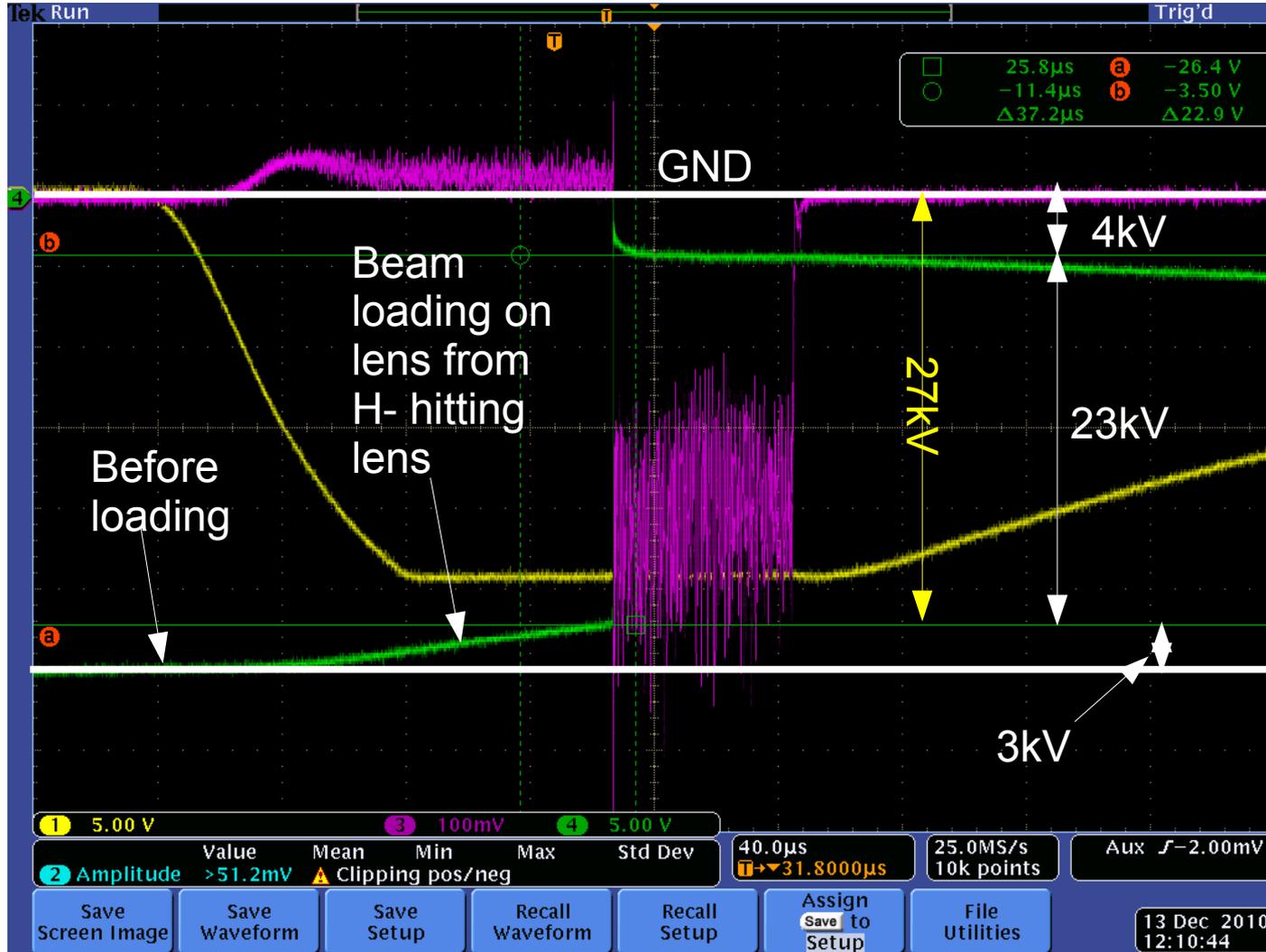
Bad pressure flattens out the beam



Good pressure 1e-6 torr.

Bad pressure: 1e-4 torr

Chopper Pulse (Green trace)



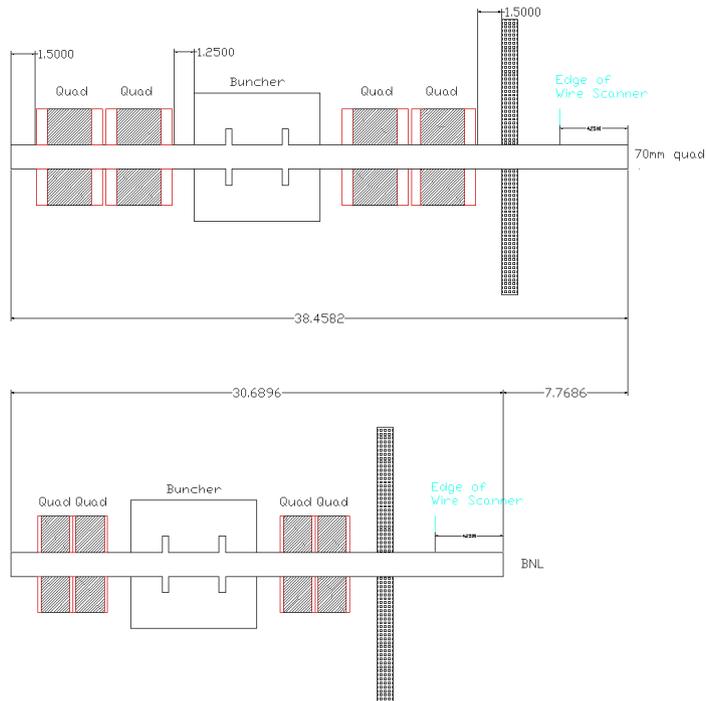
24kV on extractor (yellow).

Beam is stopped (yellow arrows) when 27kV (w.r.t gnd) is applied.

This is consistent with simulations.

3kV from “beam loading”. When pulser sets lens to ground to let beam through, “GND” is 4kV offset because of 50Ω resistor in the pulser circuit???

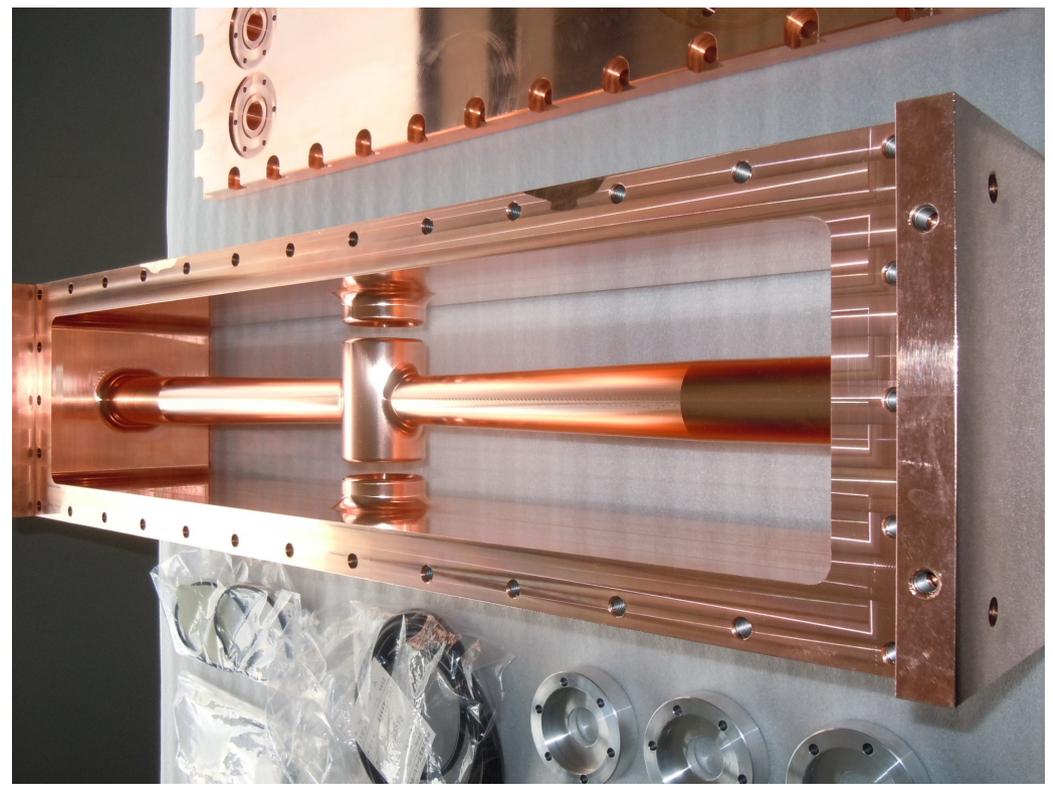
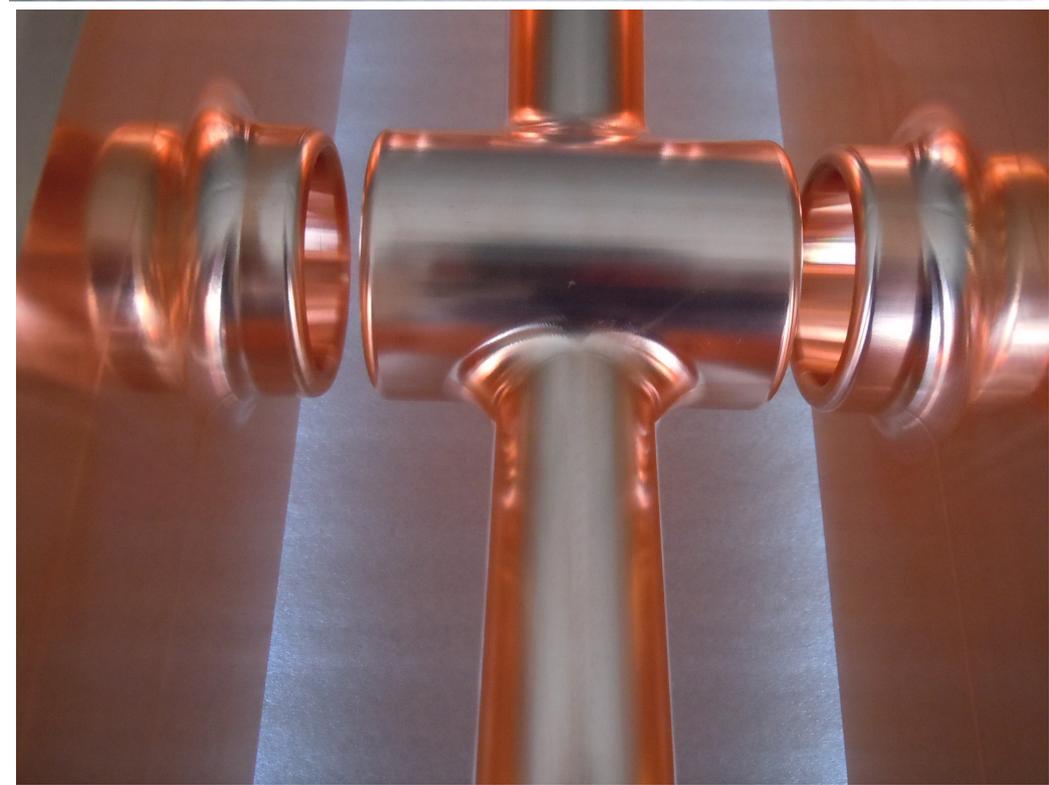
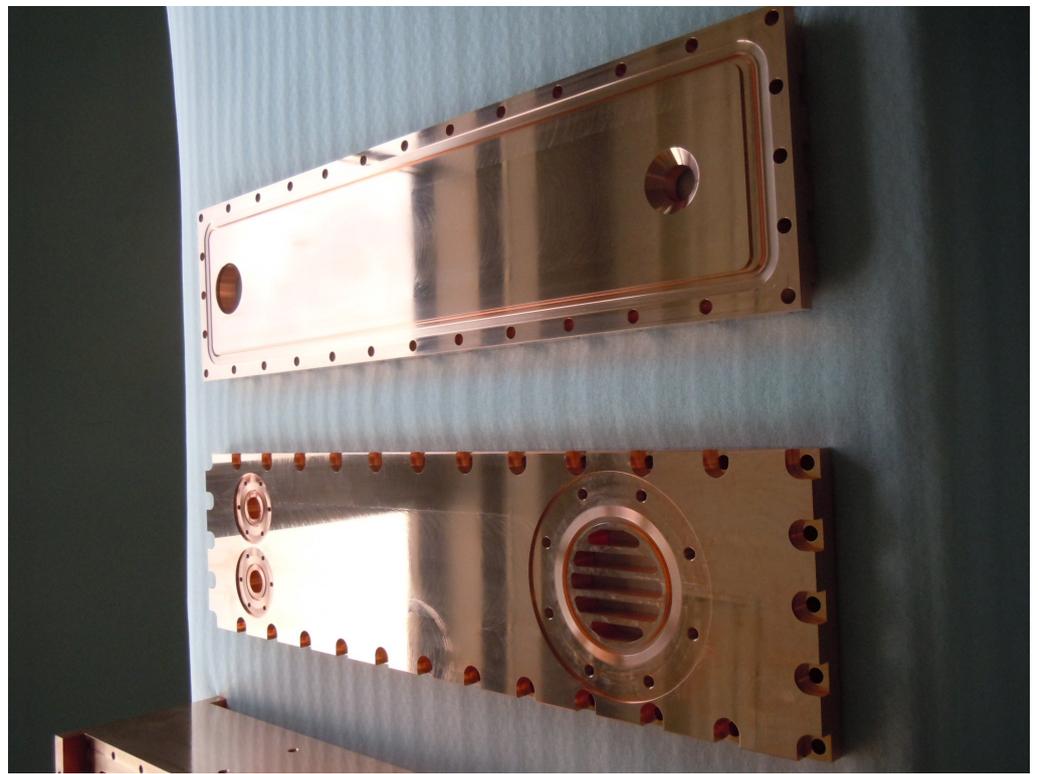
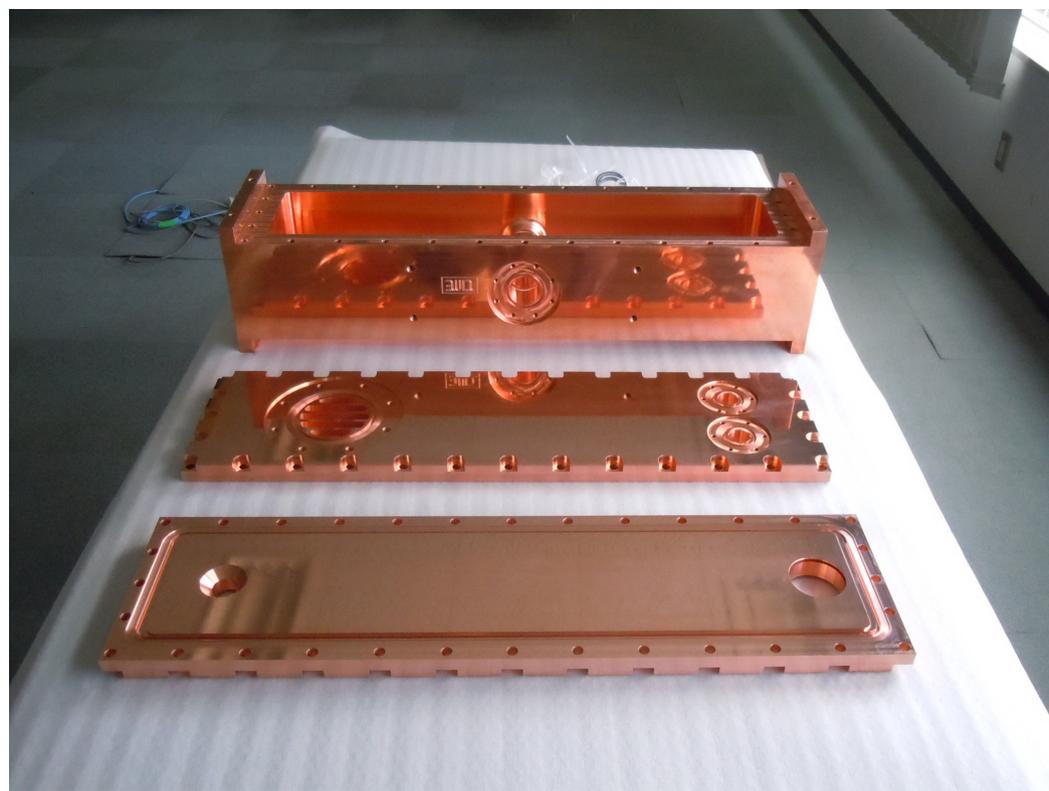
MEBT Status



FNAL old style

FNAL new style

Quads	TD designing shorter quads with correctors which run at DC and water cooled. Advantage is that there will be no laminations.	Preliminary design will be ready in January. Can a beam pipe be placed inside the quads?
Buncher	TIME has finished machining buncher	Problems with transit time factor. See next slide.
Power for quads	Specs to follow	Quads being redone.
Power for buncher		Use present buncher supply in the line.
Connection to Tank	Remove large flange of Tank1	



Buncher

- BNL found that the new buncher is not working as well as the old buncher
 - Suspicion is that the transit time factor is incorrect.
 - Added grids to lower the transit time factor. **Old buncher has grids.** See pictures.
 - Changes the resonant frequency.
 - Need addition of tuning blocks. (See pictures)
- **Tests with beam done as of 18 Dec.**
 - Request has been made to Deepak to show us graphs of the buncher performance with beam.

Grids in buncher

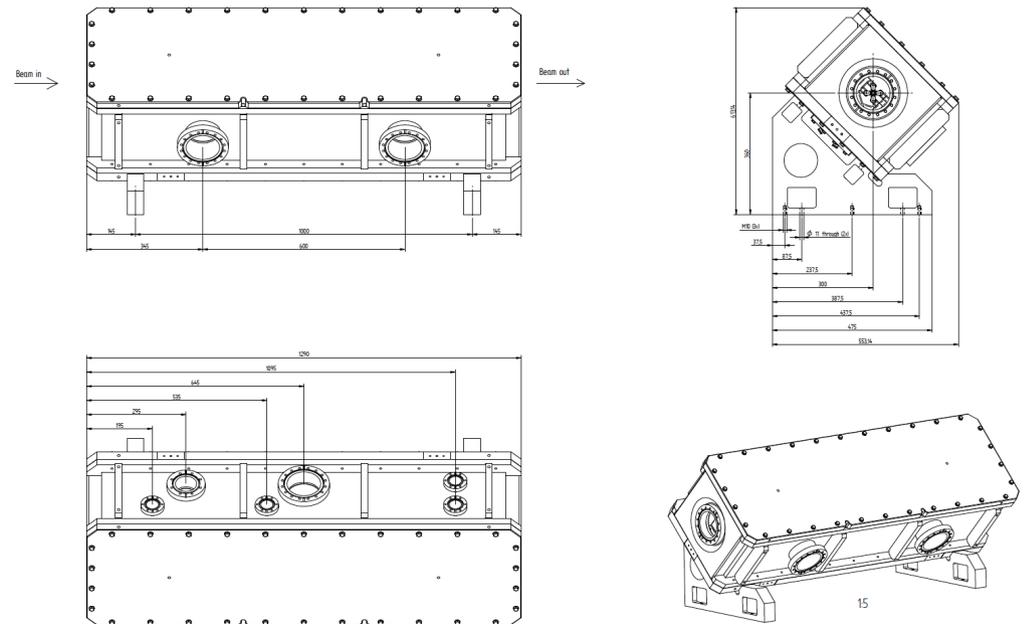


MEBT Quads (BNL)

- Spoke to Masahiro on 15 Nov
 - 45mm will be tested before end of the year.
 - Similar 70mm quads installed in EBIS
 - All hollow conductors
 - 5Hz, 100-200us pulse, 70T/m (~800A)
 - Temperature rise is minimal for flow rate of 1 litre/s.

RFQ Status

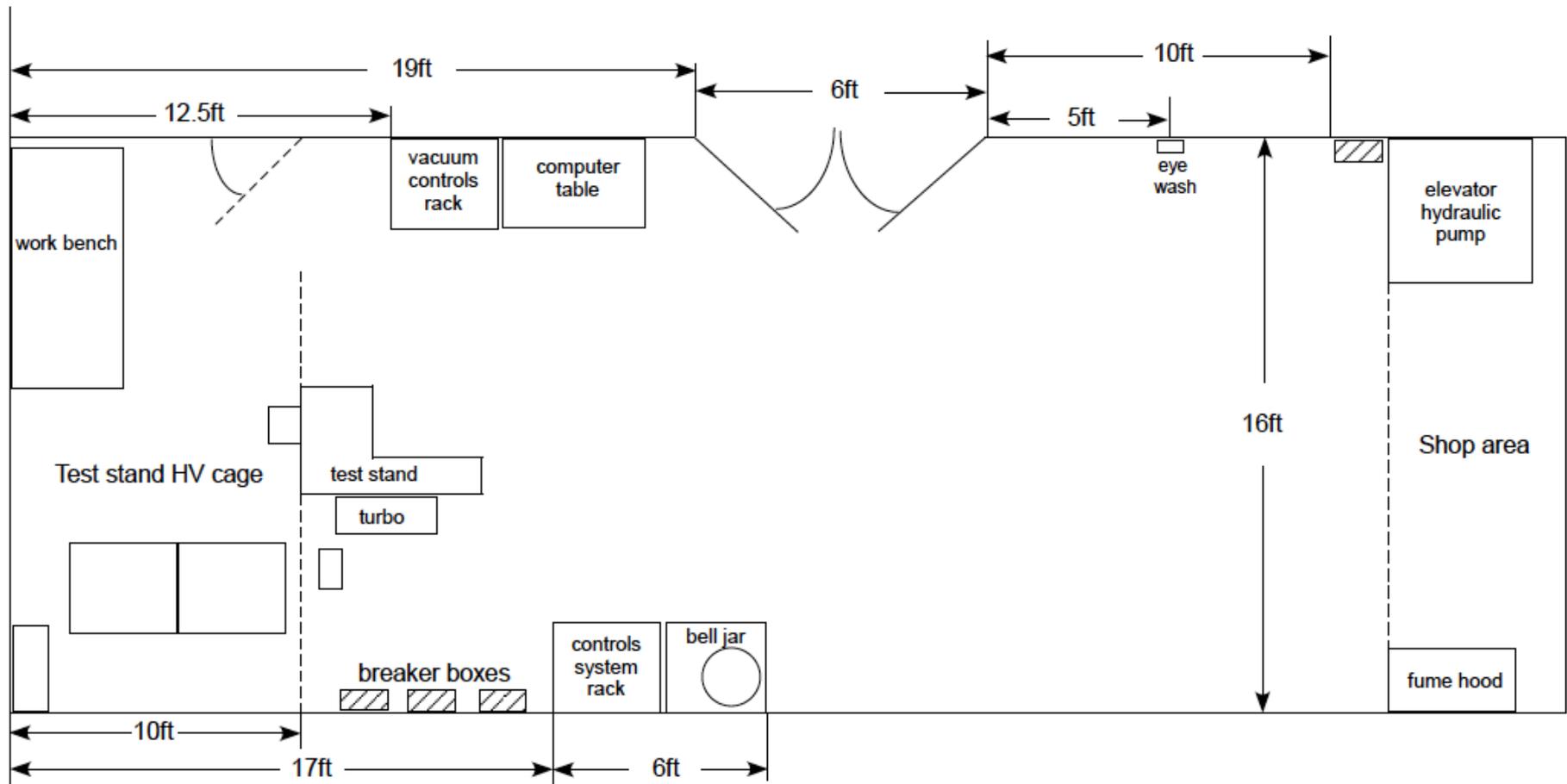
- No new info.



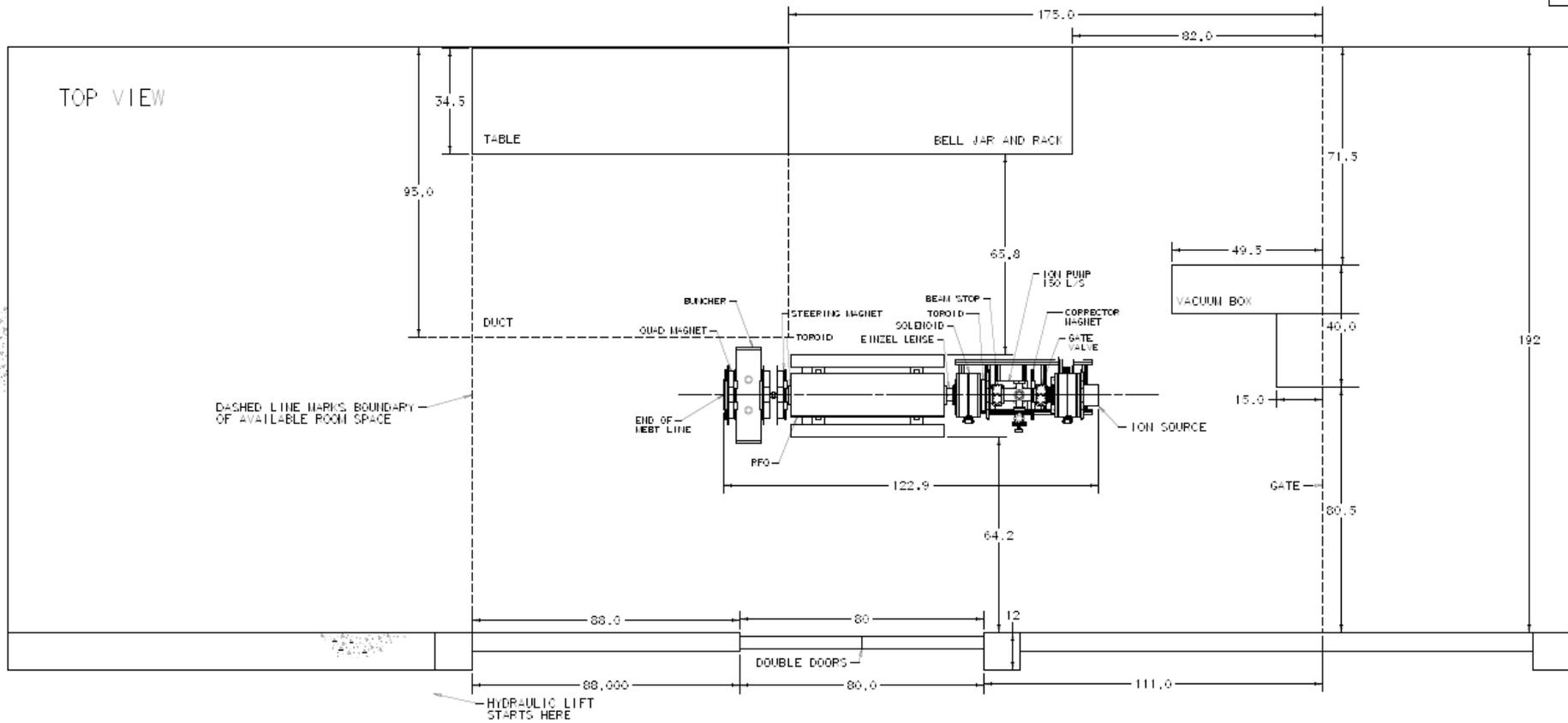
Test Stand

- Room has been cleaned up.
 - Beam line layout in progress
 - Water – Bob Slazak
 - Electrical – Jim Ranson
- Need to test LEBT before RFQ connection
 - Wires, toroids at the end of the LEBT, same position as the RFQ.
- Design diagnostic line.
- Drawings from Schempp are sufficient to build table.

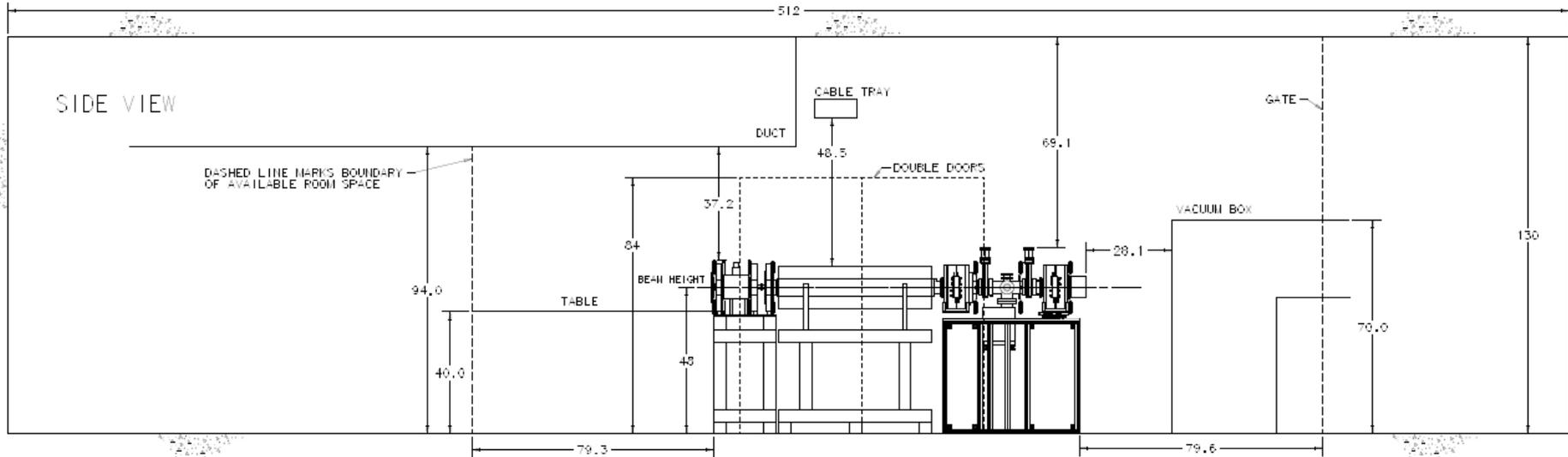
Test Area



TOP VIEW

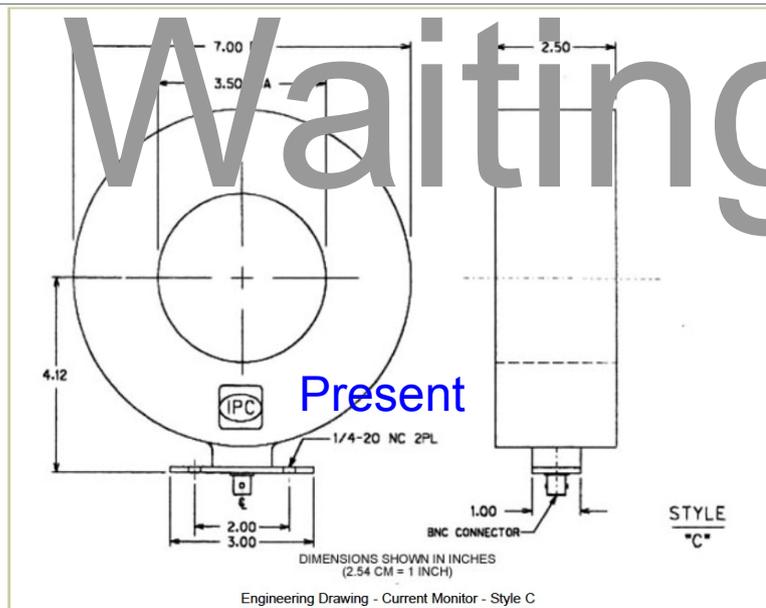


SIDE VIEW



Instrumentation

- Toroids clamp on
 - 1.5" over 3" flange toroids (7810)



AC Applications

Model Number	Output Sensitivity Volts/Amp	Hole Dia. inch	Max. Peak Current kA	Max. RMS Current A	Low Frequency 3 dB Point Hz	High Frequency 3 dB Point MHz	Saturation Peak A/Hz As
CM-100-C	1	3.5	0.5	30	30	20	0.08

Model Number	Output Sensitivity Volts/ Amp	Hole Diameter inch	Max. Peak Current kA	Droop %/ms	Usable Risetime Nano-seconds	Saturation No Bias jdt As	Saturation With Bias jdt As
CM-100-C	1	3.5	0.5	20	17.5	0.008	0.025

- sensitivity of 1V/A d.f. 1V/A
- Rise time 50 ns (same as non clamp on, 2x slower than present)
- Length 1.25"
- 6" toroids (7655)
 - 0.1V/A
 - Rise time 100 ns.
 - Length 1.5" (2.5x or 3x shorter than non clamp on)

Safety

- When can the beam line layout in test area be done?

RFQ reminders

- Schempp is vendor
 - Make sure that the vanes are cleaned! See ISIS email.
 - Some cleaning details supplied by ISIS.
 - Review and verify on site mechanical design and construction (already in contract).

Controls

