

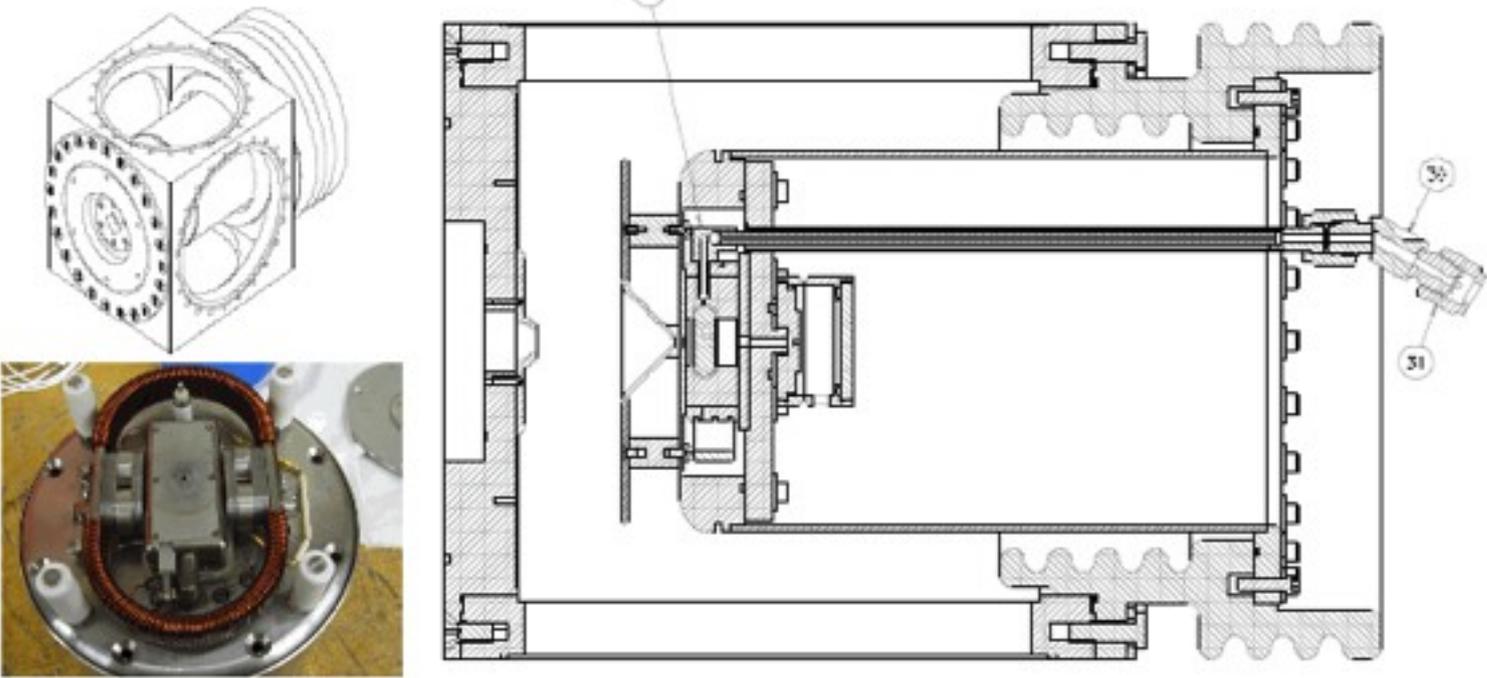
# Pre-injector Upgrade Updates (09 Feb 2011 – 02 Mar 2011)

C.Y. Tan  
02 Mar 2011

# Review and PAC paper

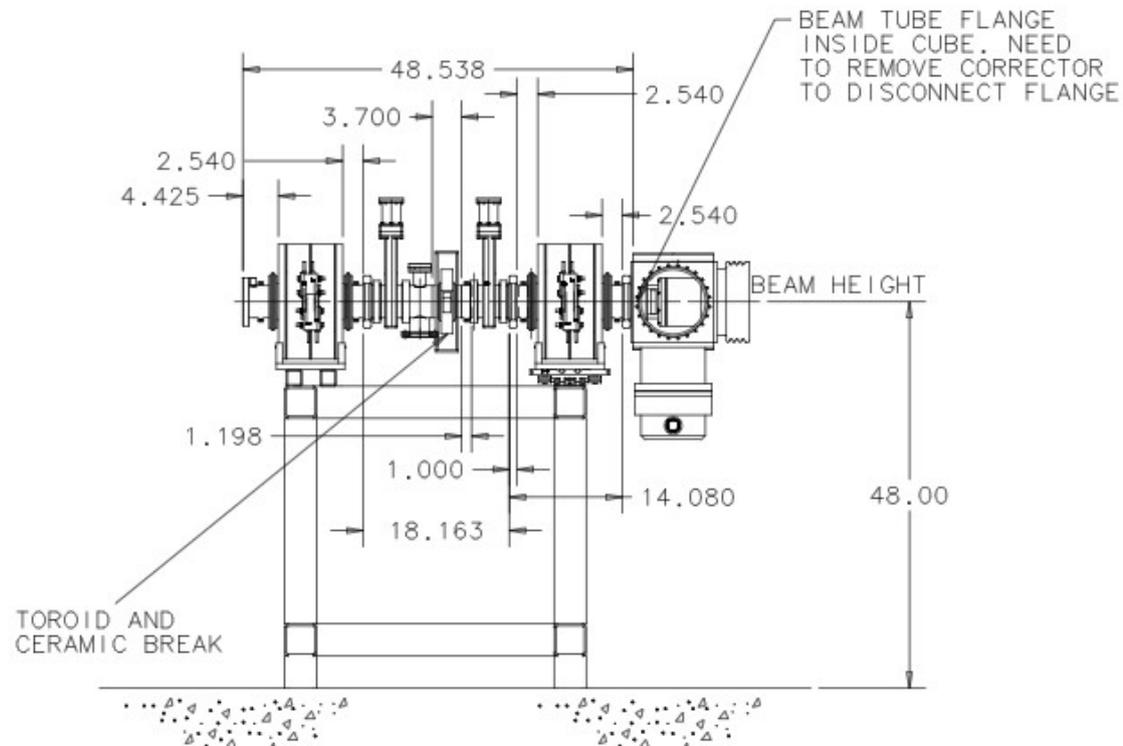
- Review will be at the end of March.
  - Please write your sections in the paper.
- PAC paper is due in March. I would like it done soon. First pass of paper and poster already written. Please review, add etc.

# Source Status



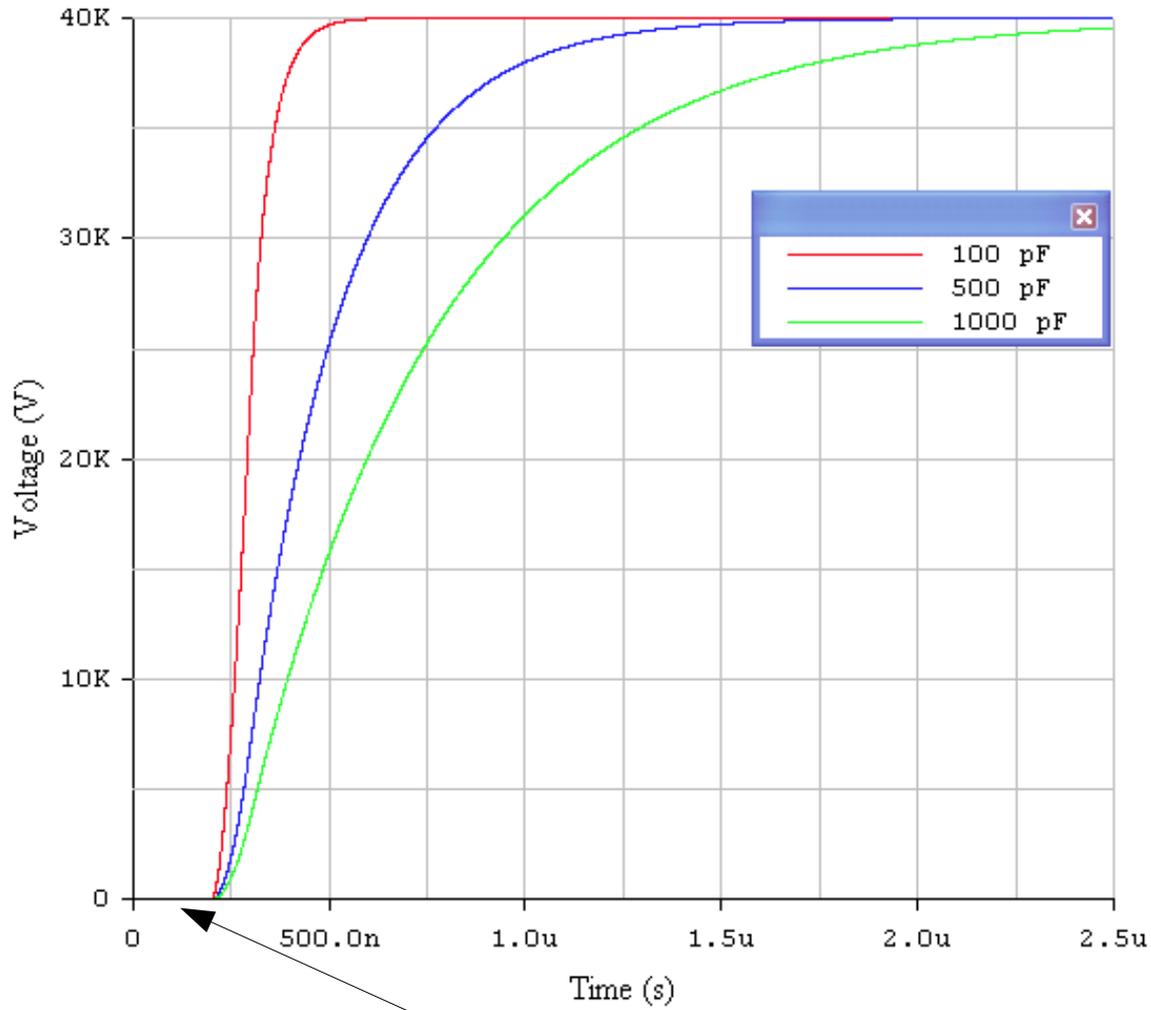
Device	Status	Comments
Source	Drawings nearly completed	Cube has been procured.

# LEBT Status



Device	Status	Comments
Einzel lens pulser	Have data from DTI	Too expensive! See next slide.
Einzel lens	Drawings complete.	Parts are being procured for 2 sets of lenses. Bids being sent out. 1 solenoid ready to be potted (23 Feb 2011). Potted by Friday (04 Mar 2011). 2 <sup>nd</sup> solenoid nearly completely assembled. Added one more solenoid to order (4 total) 01 March 2011.
Solenoids	Still being built	Position of correctors etc.
LEBT drawings	still being revised	

# DTI switch data



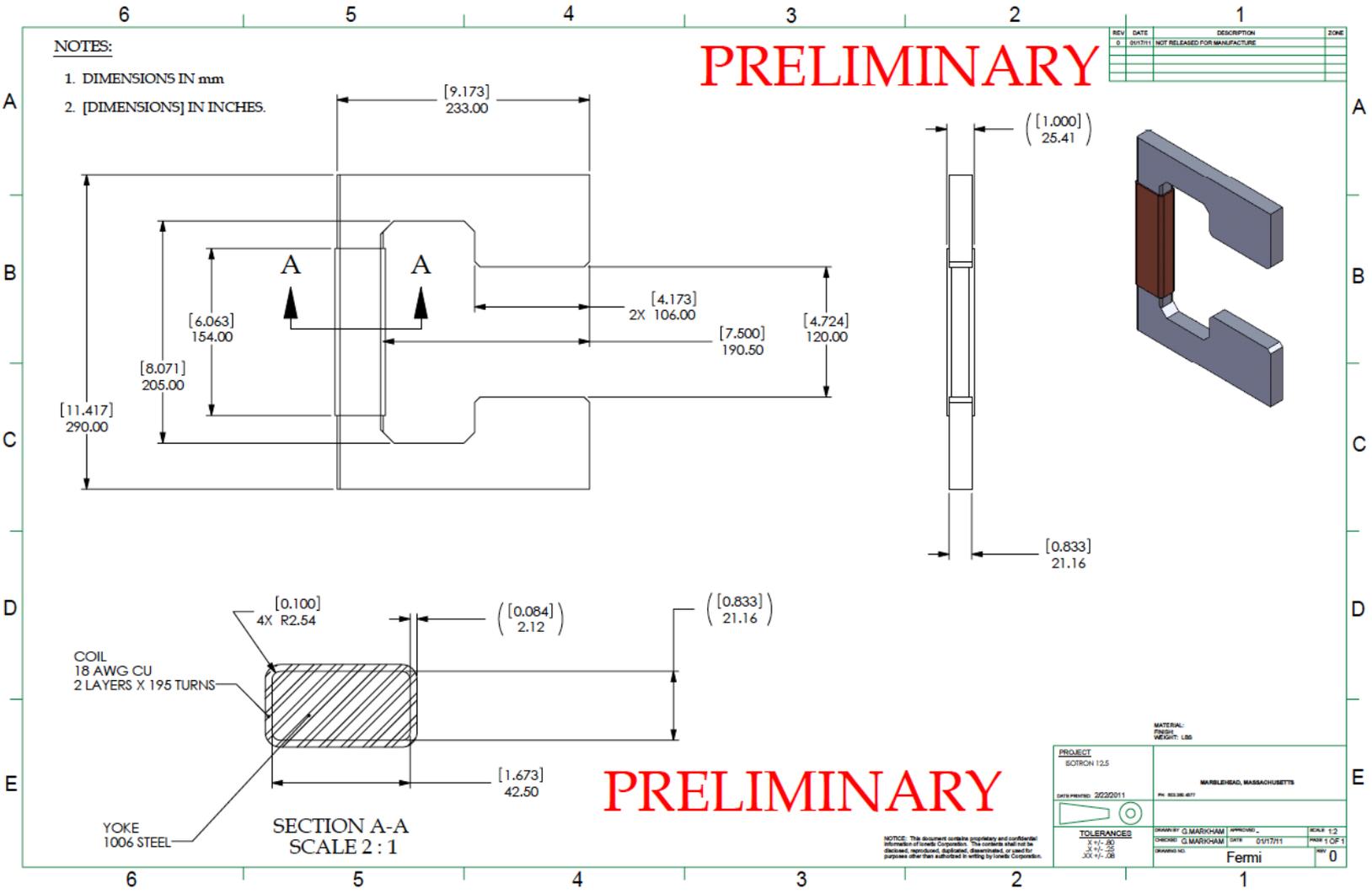
Note offset time?

From DTI (dated 10 Feb 2011):

We had our engineers review your Einzel Lens Mod requirements and have decided this would be straightforward for our switches.

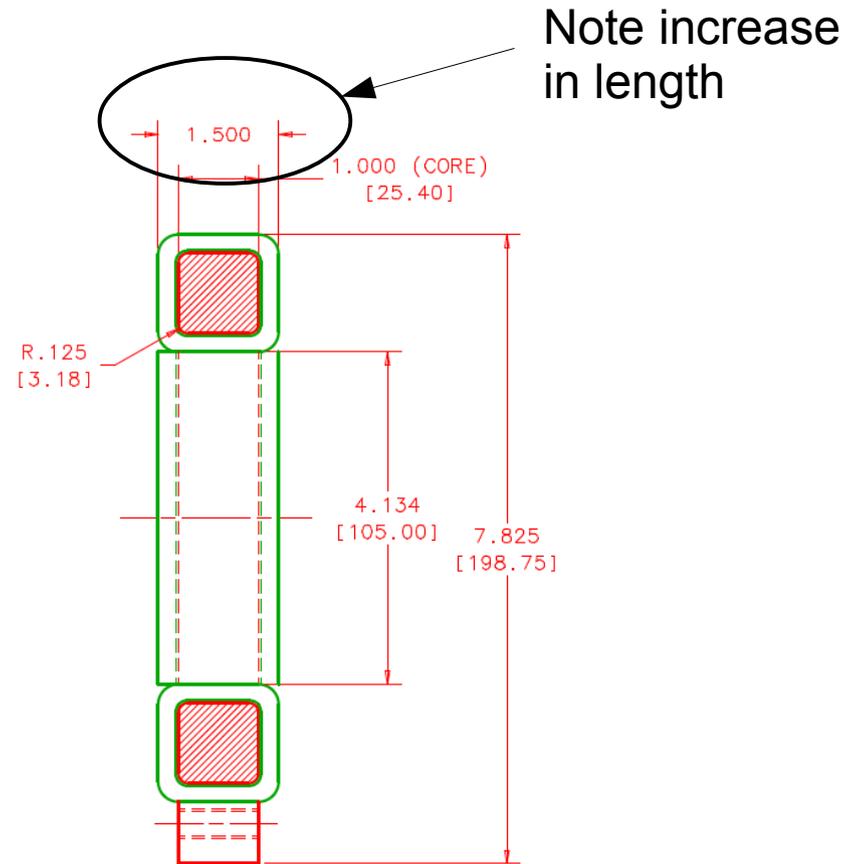
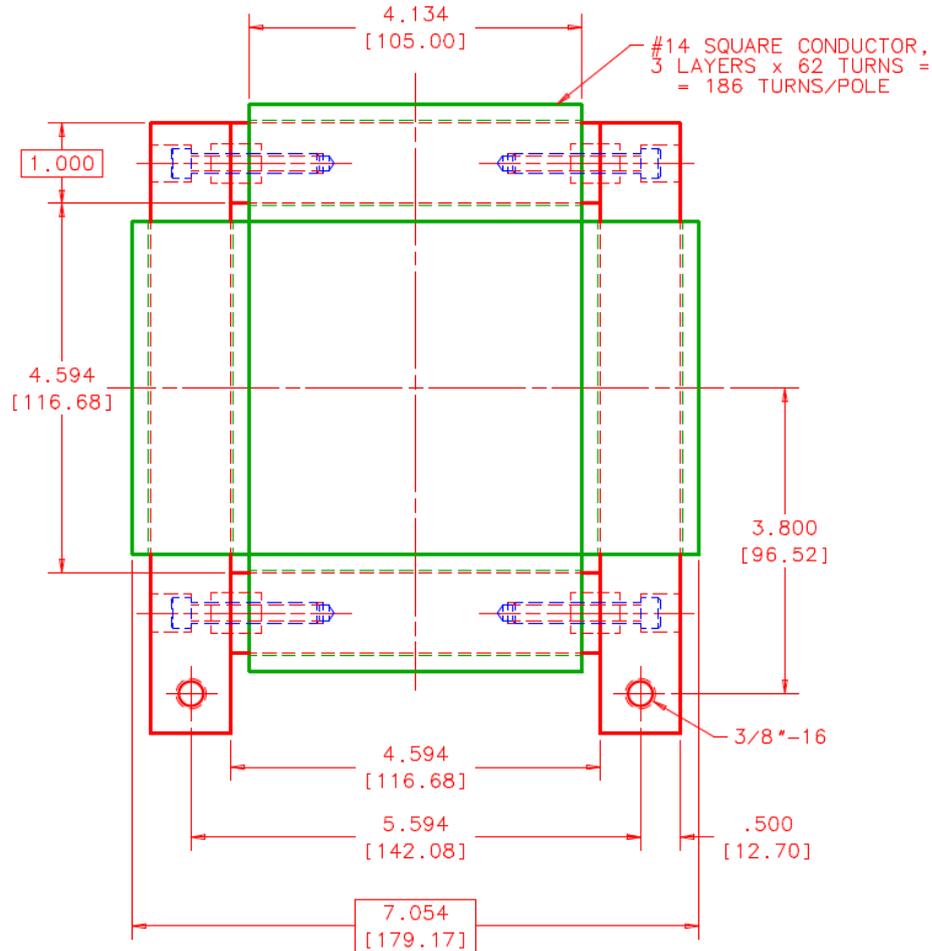
Unfortunately, switches cost \$75k each and we need two. Total cost is \$150k!!!! If 1 spare cost is about the same as RFQ!!!

# Correctors Screw up



Horz and vert not in 1 package and not window frame design!  
 Hopefully, can be fixed soon!  
 24 Mar 2010

# Redesign done at TD



# LEBT corrector positions

- The correctors cannot be too close to the solenoid iron
  - We are constrained by the length of the LEBT
  - If we have a distance of 2" between the solenoid and the corrector (iron to iron), Bdl is reduced by 28%. Therefore, original specification of 1° kick max is going to be 0.72° kick. (V. Kashikhin calculation 25 Feb email). **However, according to Vladimir's calculation, the design is capable of producing 7.2 gauss-m, and 28% decrease is 5.1 gauss m which is exactly what is spec'd.**

# RFQ Status

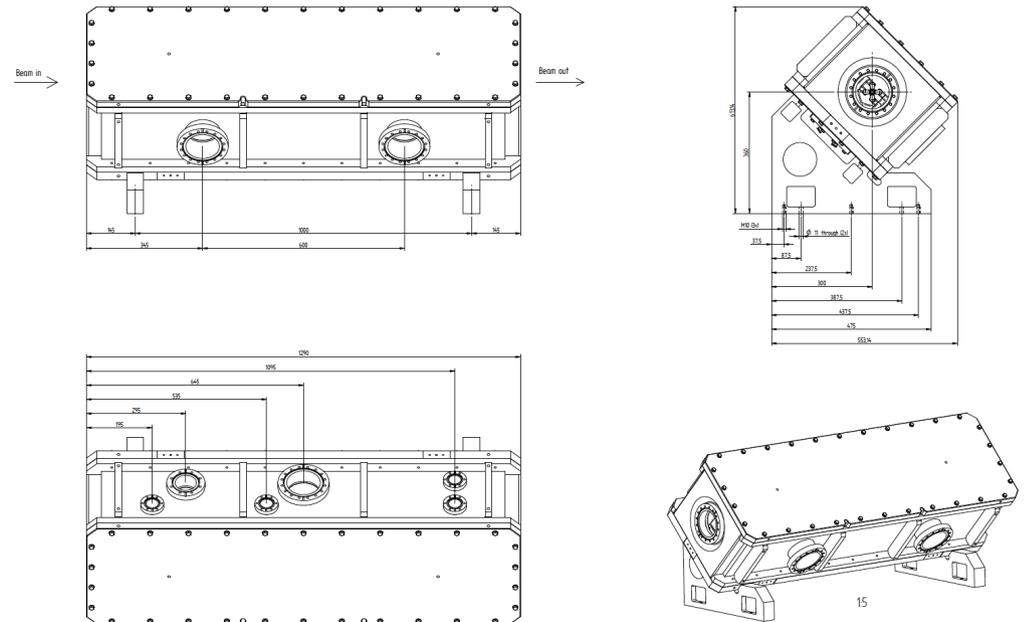
Mail from Schempp dated 15 Feb 2011:

I discussed with J. Häuser from the Kress company, our "machine shop" for the RFQs, and they are working on our RFQ, but I am afraid with some delays.

Tomorrow, Tuesday I will visit them and send you actual pictures and the last time schedule

They are still milling the stems and a short sample electrode.

I am afraid that the real electrodes will be not finished before the PAC conference last week of March



## Device

4816 PA

## Status

waiting for water  
waiting for power outlet

## Comments

1<sup>st</sup> week of March

# RFQ Machining Time Table

Timetable for FNAL RFQ:

KW: calendar week

KW 09 (28.02 -.. 04.03), KW 10 (07.03 -. 11.03.), KW 12 (21.03 -. 25.03.)

Milling of the electrode supports: up to 09 KW

Milling of stems until

Structure supports and electrodes

Tuning plates on the base plate. in week 10 assembly

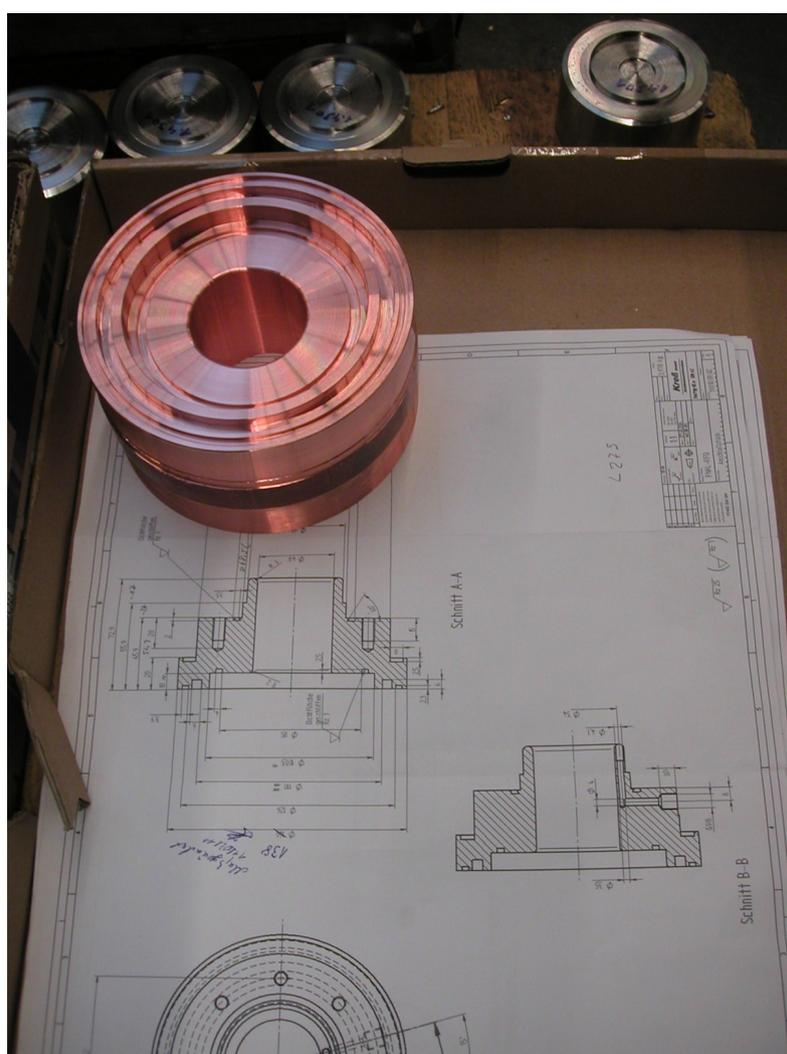
Milling of electrodes: in week 10 of Milling

Survey: in week 11 remeasuring

Super Tank: in week 12 (week before PAC) delivery (week before PAC)

Super RF coupling: in week 12 coupler with tank

Super plunger in week 14 (after PAC) tuner (4<sup>th</sup> April - 8<sup>th</sup> April)



Part of loop Ek(?)

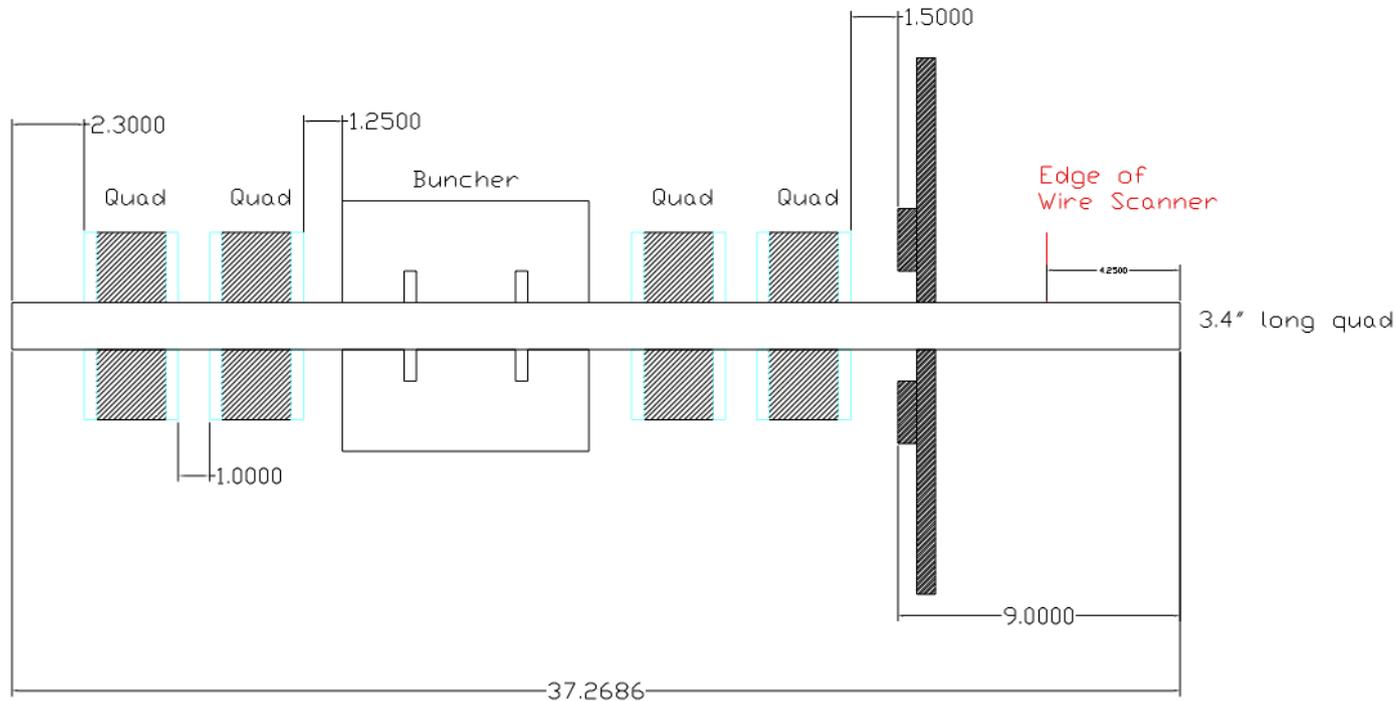


Tuning blocks

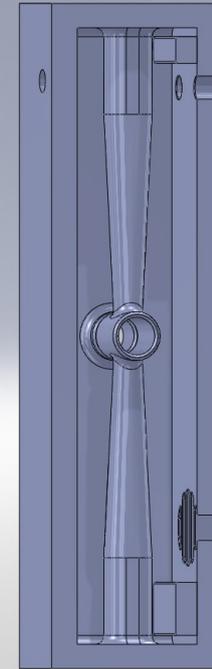
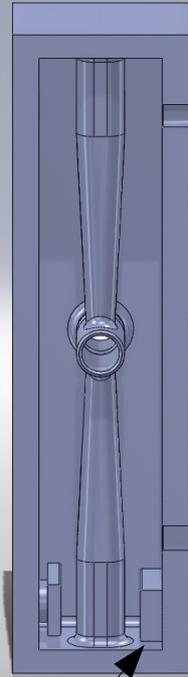


Test mill of an electrode (not final)

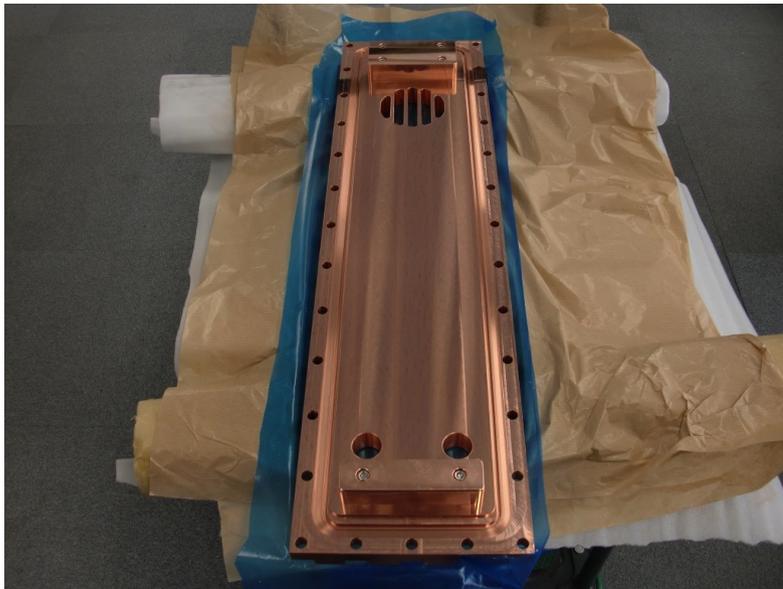
# MEBT Status



Quads	3D drawings will be completed soon.	Expect all drawings to be completed by the end of March.
Buncher	TIME has inserted grids into Buncher (30 Jan). Bead pull and other measurements complete (28 Feb)	Tuning blocks have been inserted. See next few slides.
Power for quads	Specs to follow	Quads being redone.
Power for buncher		Use present buncher supply in the line.

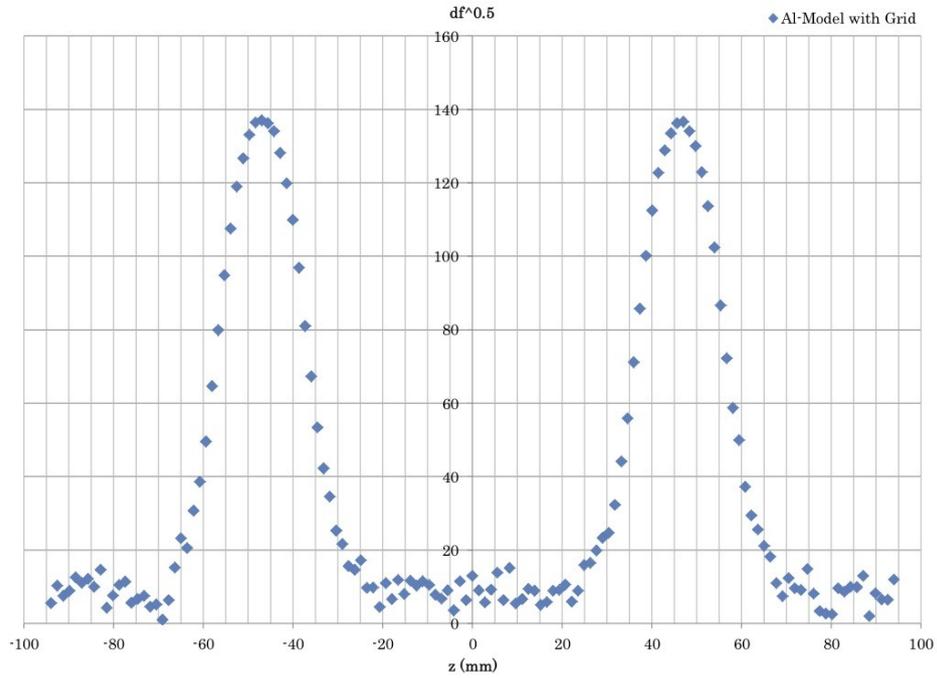


Tuning Blocks

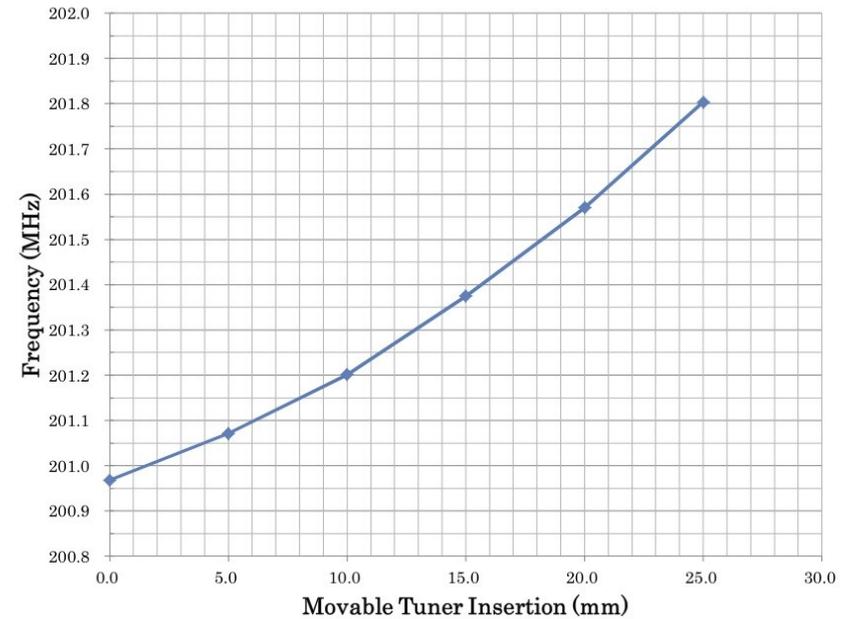


# Buncher measurements

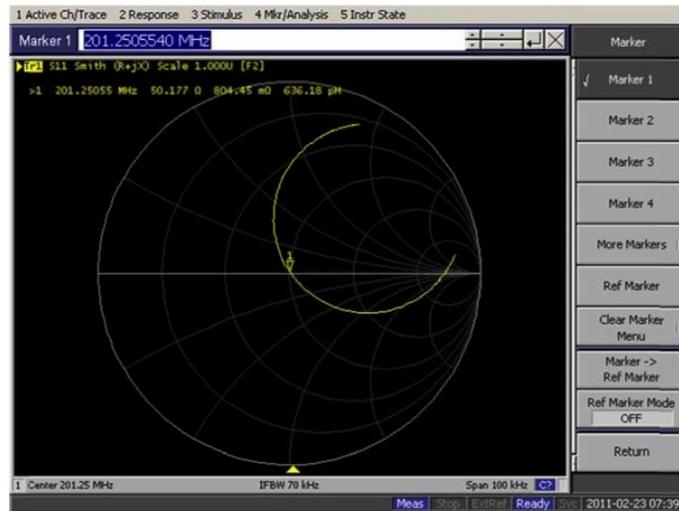
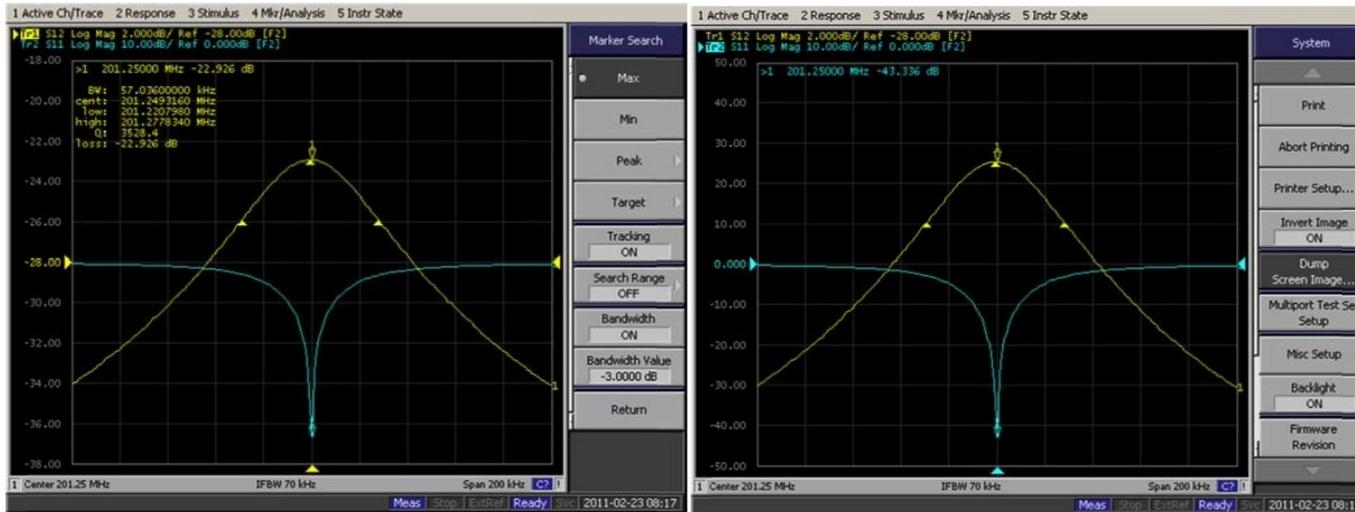
FNAL Buncher with Grids  
Feb. 25, 2011



Tuner (mm)	F (MHz)	Loaded Q
0.0	200.968	3560
5.0	201.072	3540
10.0	201.201	3520
15.0	201.375	3500
20.0	201.570	3480
25.0	201.803	3460

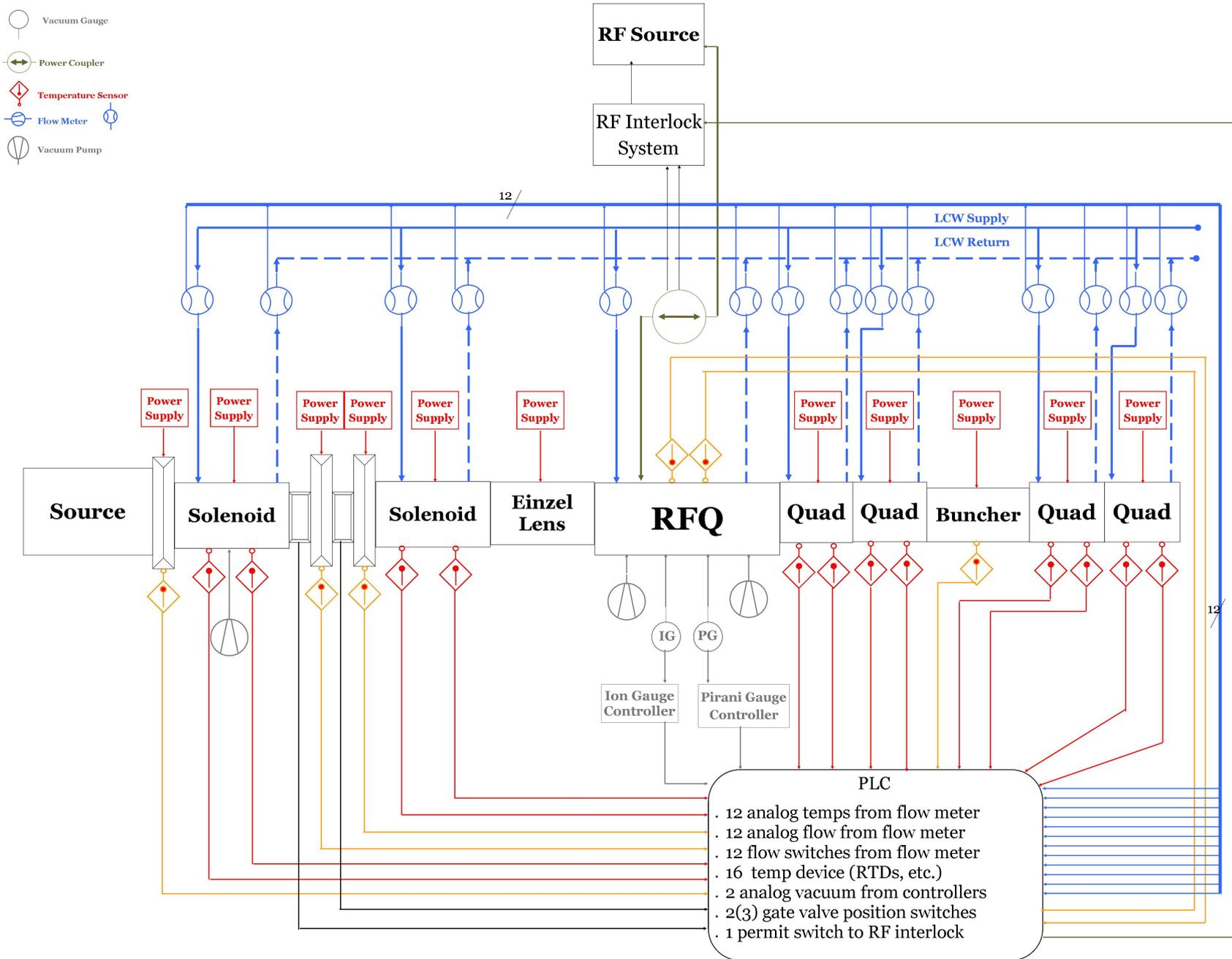


# More buncher measurements



$Q = 3500$   
 $S_{12} = -43\text{dB}$  at resonance  
Resonant freq = 201.25 MHz

# Controls



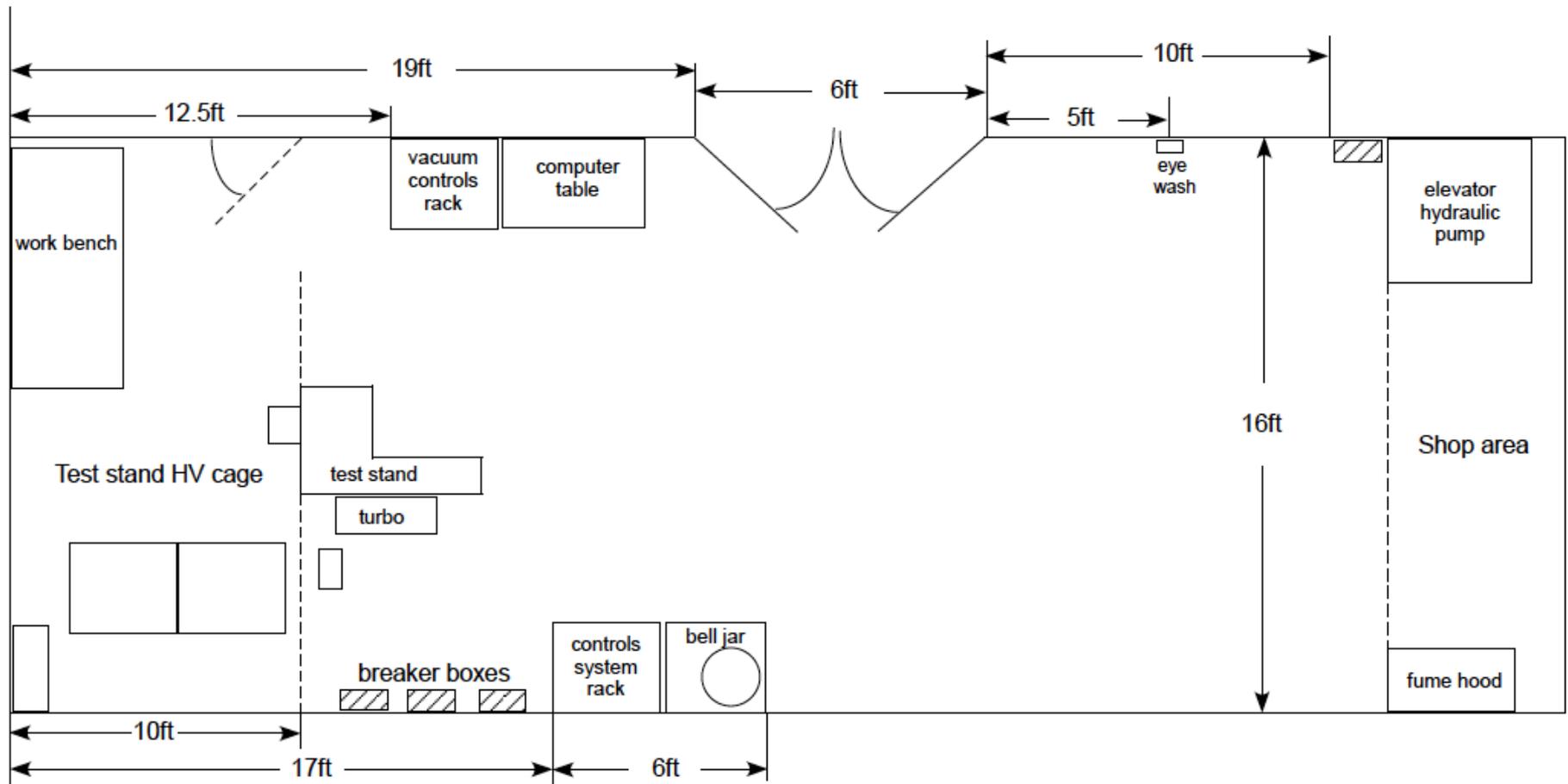
# LLRF (10 Feb Meeting)

- Fix RFQ phase
  - Tank 1 and buncher phases are adjustable.
  - Lock RFQ directly to 201.25MHz RF rather than divide from 805MHz.
- Some questions:
  - Details of the cavity bulk tuner.
  - RFQ freq as a function of temperature.
  - Vacuum monitoring of RFQ and what to do with sparks.
    - Inhibit 4616 or drive pulse?
    - Use klystron ns fault box?

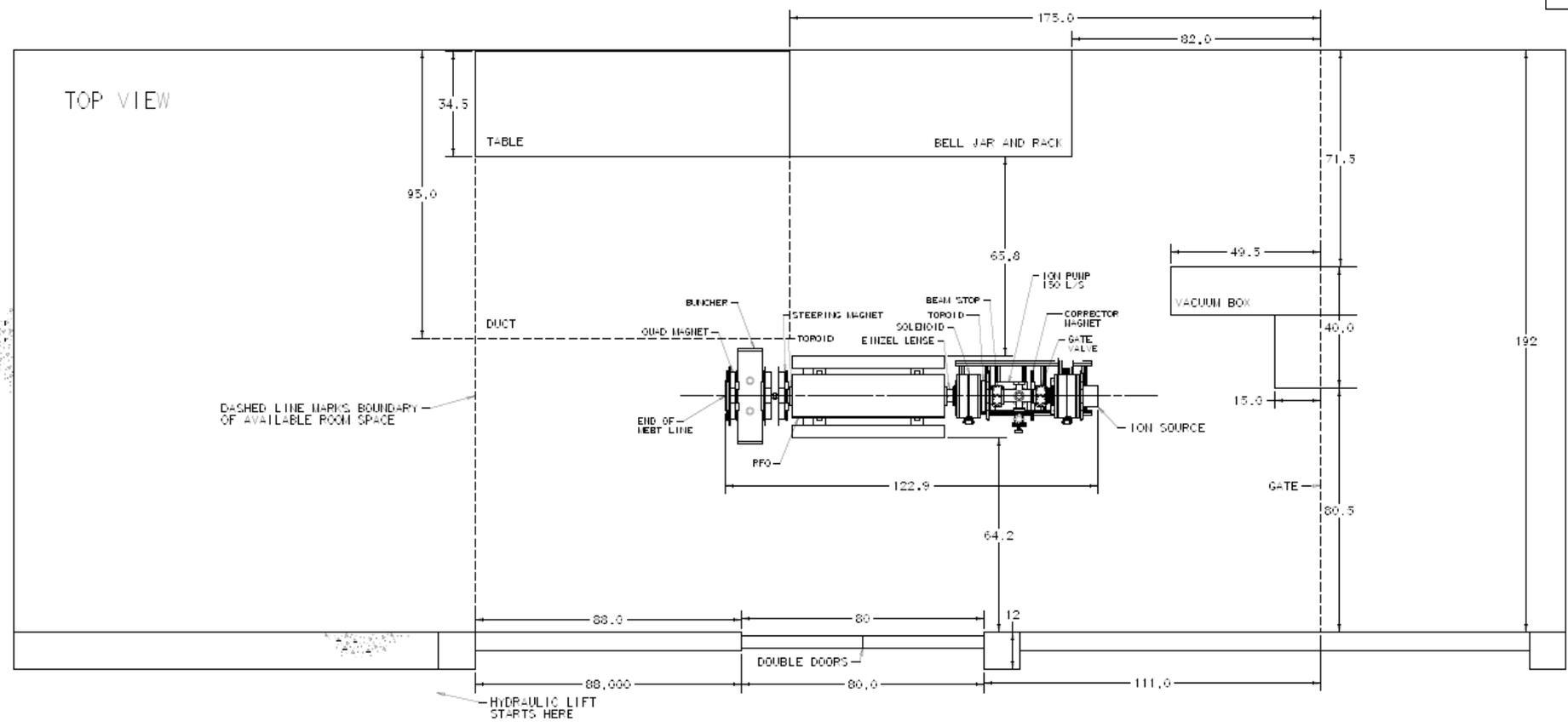
# Test Stand

- 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.

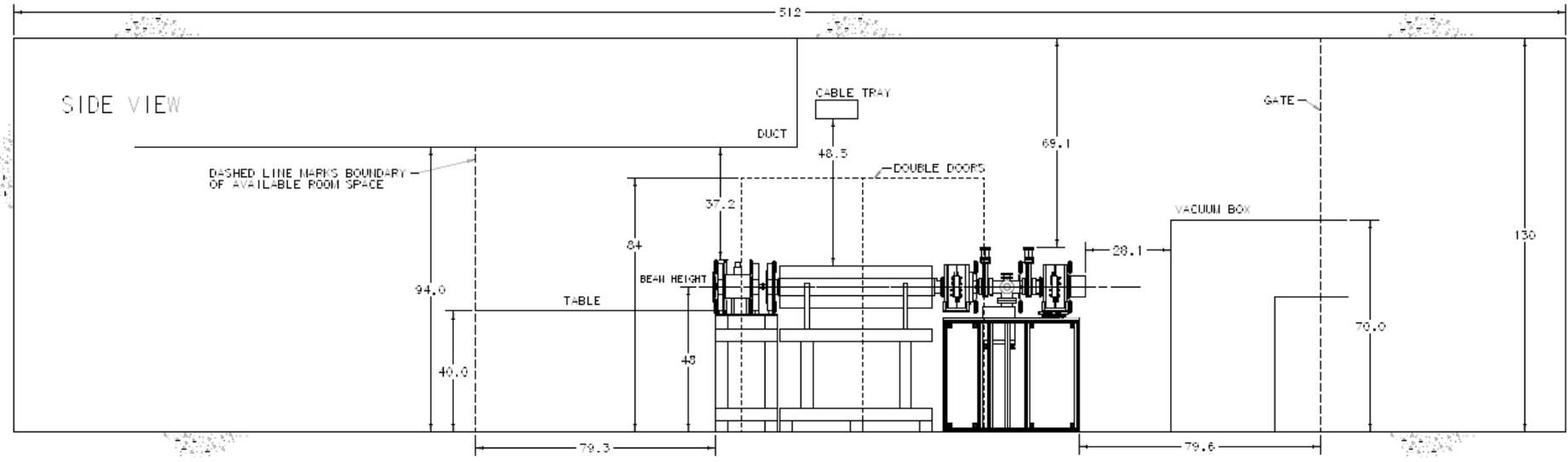
# Test Area



### TOP VIEW



### SIDE VIEW



# 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).