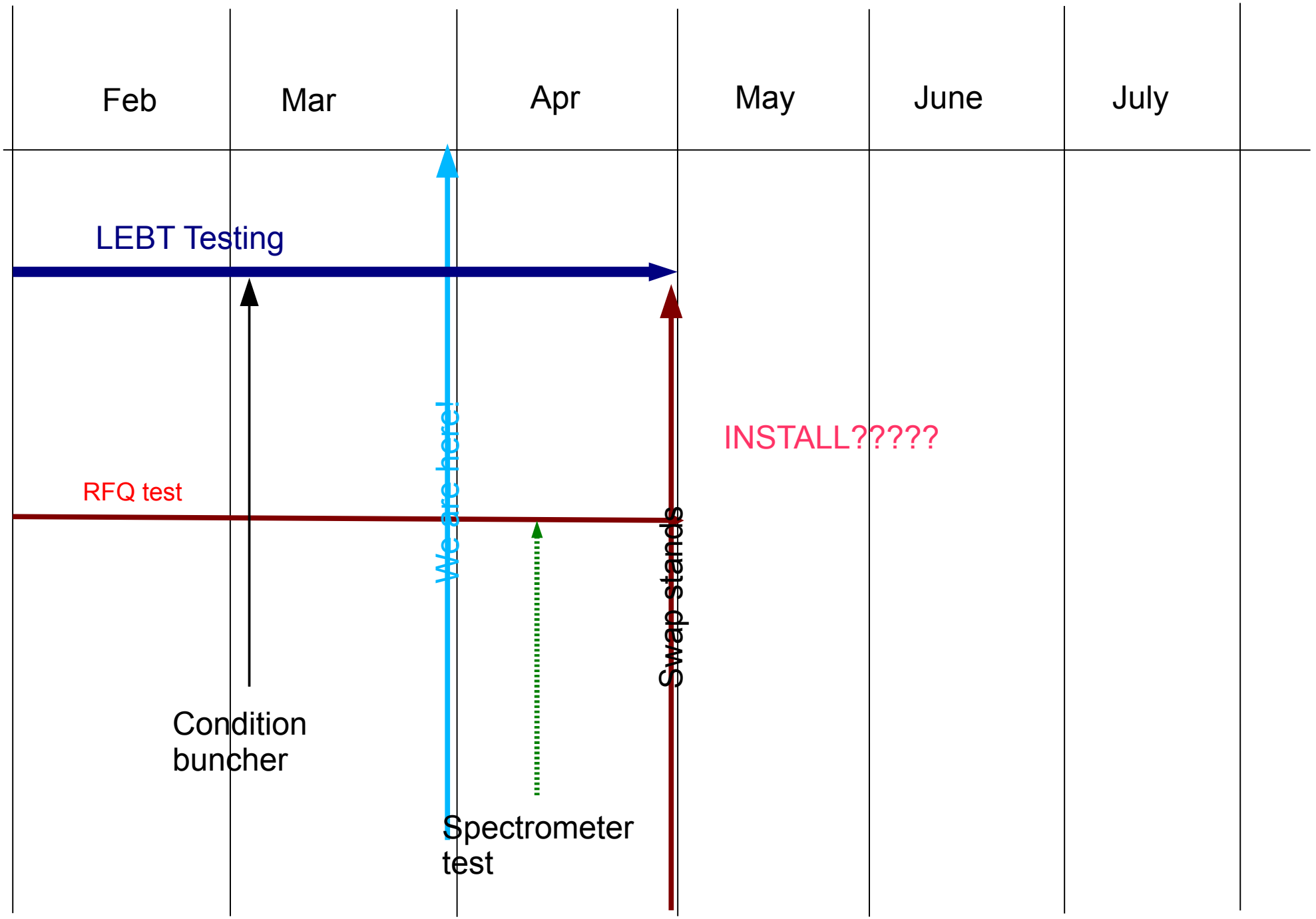
Pre-injector Upgrade Updates (14 Mar 2012 – 28 Mar 2012)

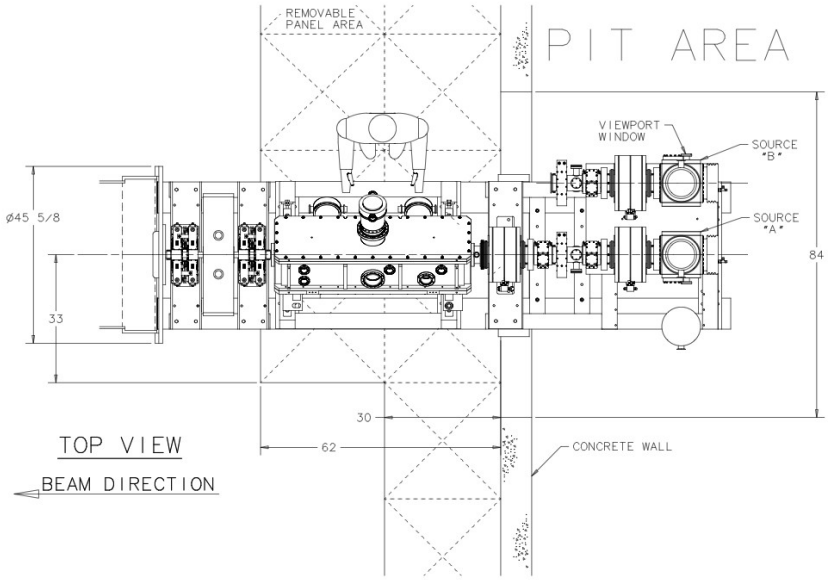
C.Y. Tan
28 Mar 2012

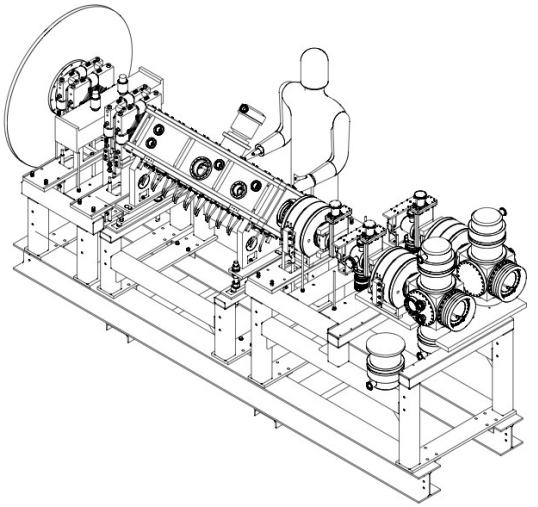

Feb
Mar
Apr
May
June
July
LEBT Testing
RFQ test
We are here!
Swap stands
INSTALL?????
Condition buncher
Spectrometer test

Plans

- TOF with wires replacing buttons.
- Spectrometer energy measurements.

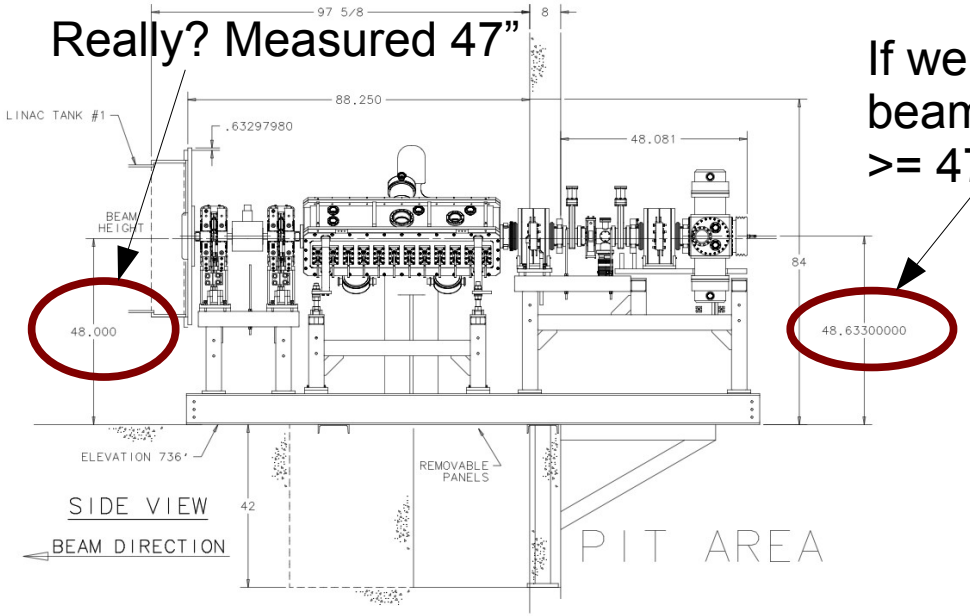
REV	DESCRIPTION	DRAWN	DATE
		APPROVED	DATE

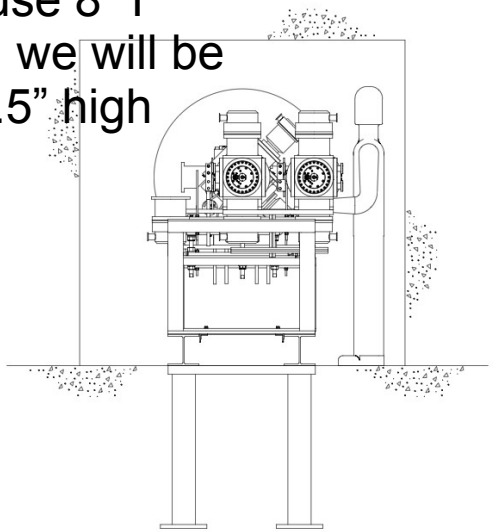




Really? Measured 47”

If we use 8” I beam, we will be >= 47.5” high





PREACCELERATOR PRELIMINARY LAYOUT

APRIL 27, 2011

UNLESS OTHERWISE SPECIFIED	ORIGINATOR	
	DRAWN	
± ± ±	CHECKED	
1. BREAK ALL SHARP EDGES MAX.	APPROVED	
2. DO NOT SCALE DRAWING. 3. DIMENSIONS BASED UPON ASME Y14.5M-1994. 4. MAX. ALL MACH. SURFACES	USED ON	
5. DRAWING UNITS: U.S. INCH	MATERIAL	

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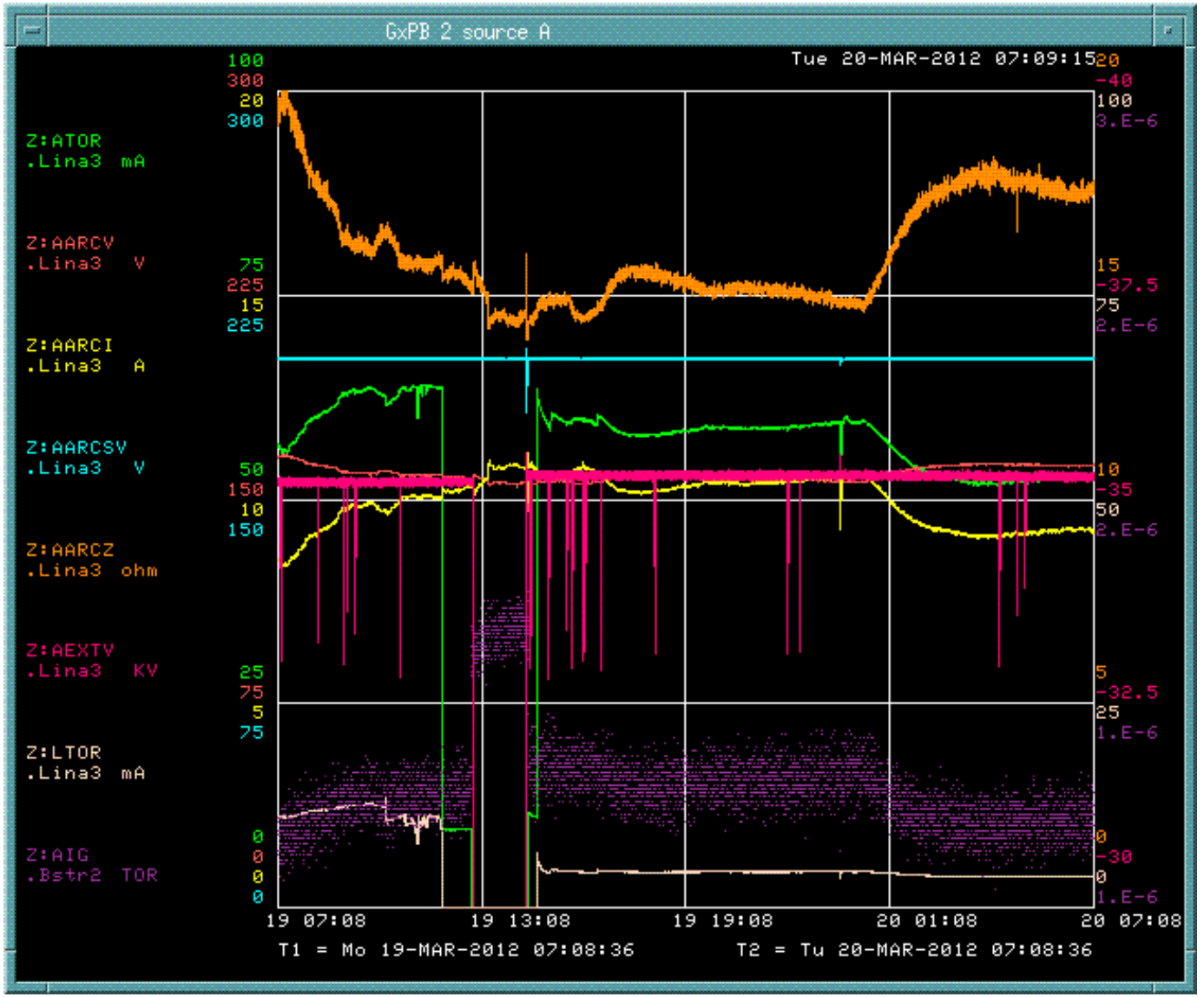
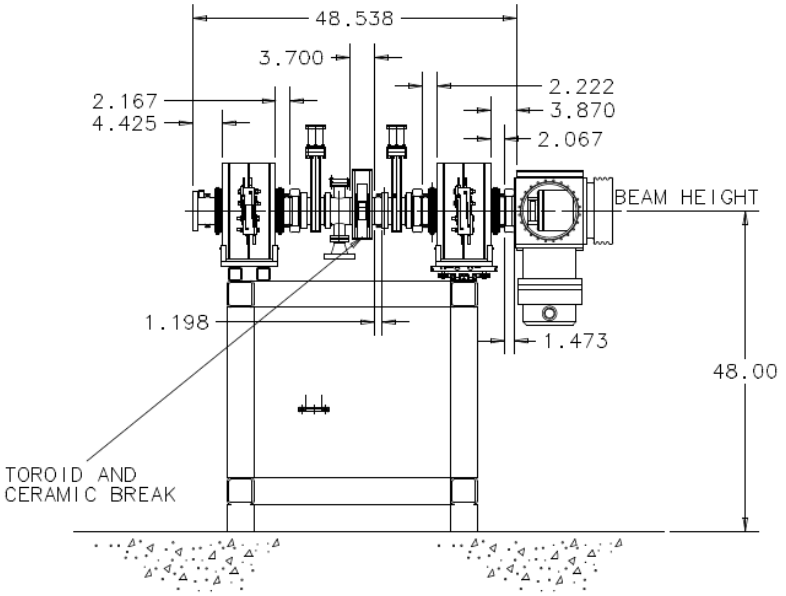
SCALE	DRAWING NUMBER	SHEET	REV
	. — —	1 OF 1	
CREATED WITH :		GROUP :	

Created: 10:31:09 on 28-06-11 (D-M-Y) By: mkielar State: 1-INITIAL

New source behaves much better

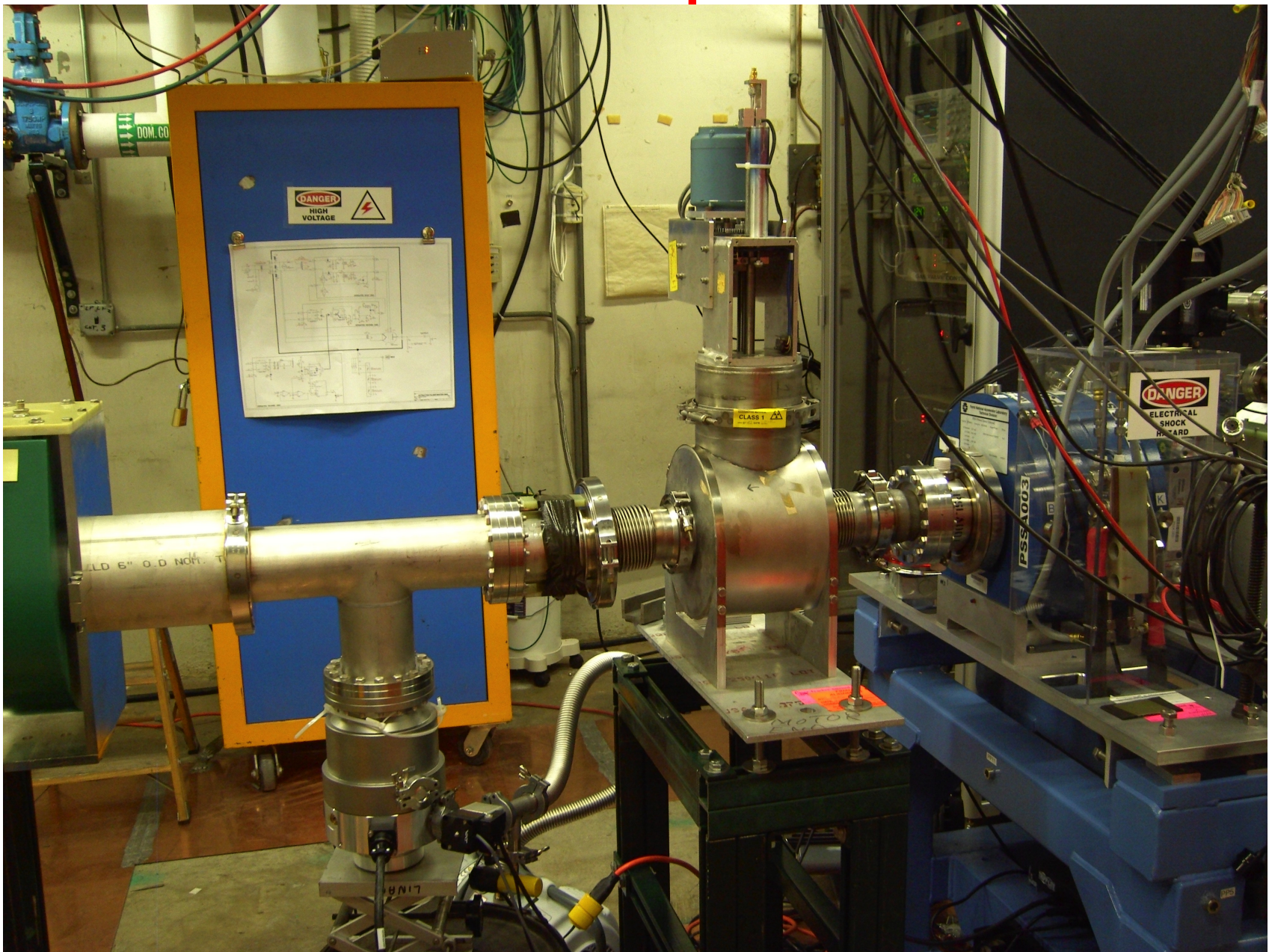


LEBT Status

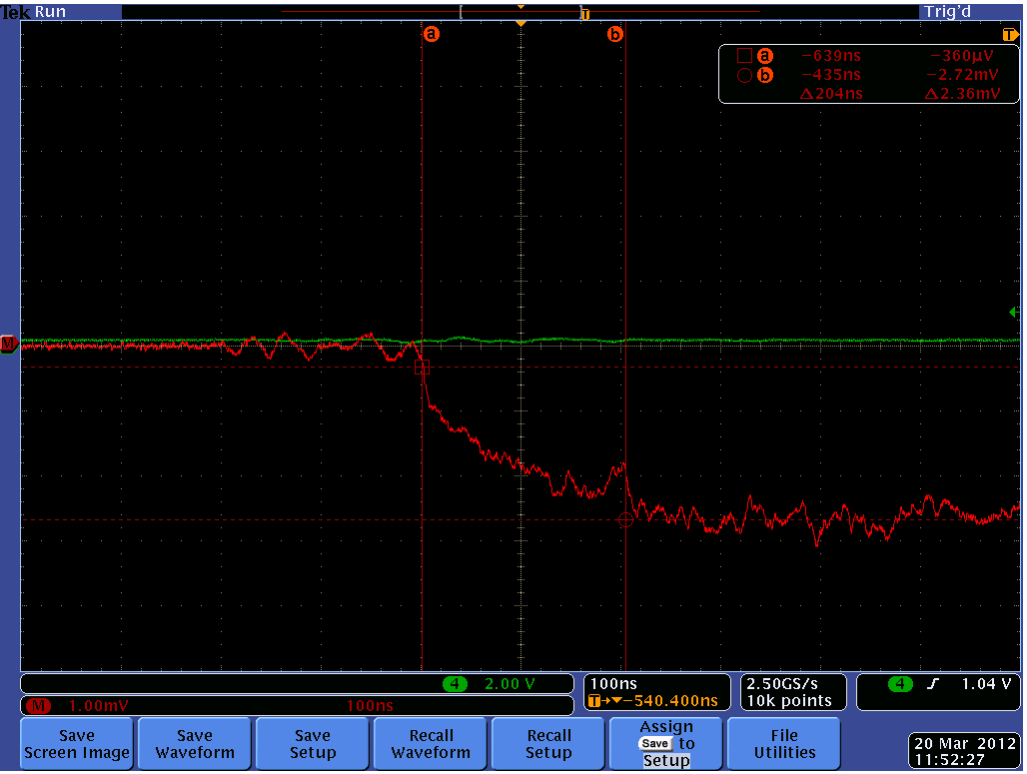


Device	Status	Comments
New slide	being designed	6 weeks to delivery. End of April?

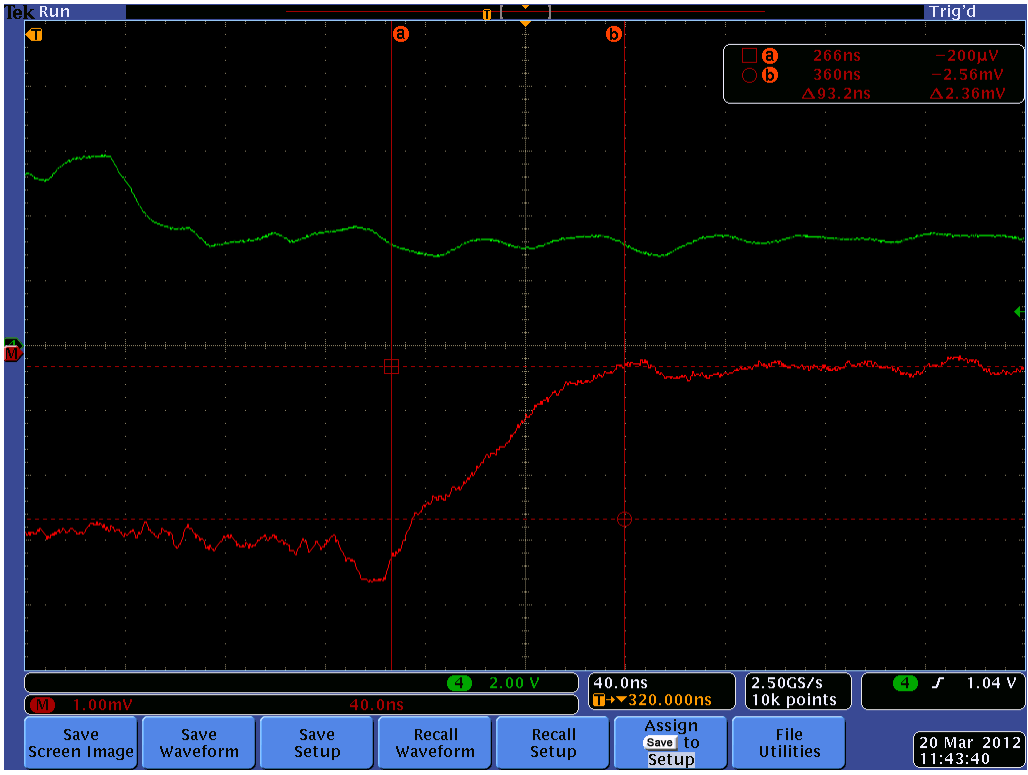
LEBT with Einzel lens and Faraday Cup



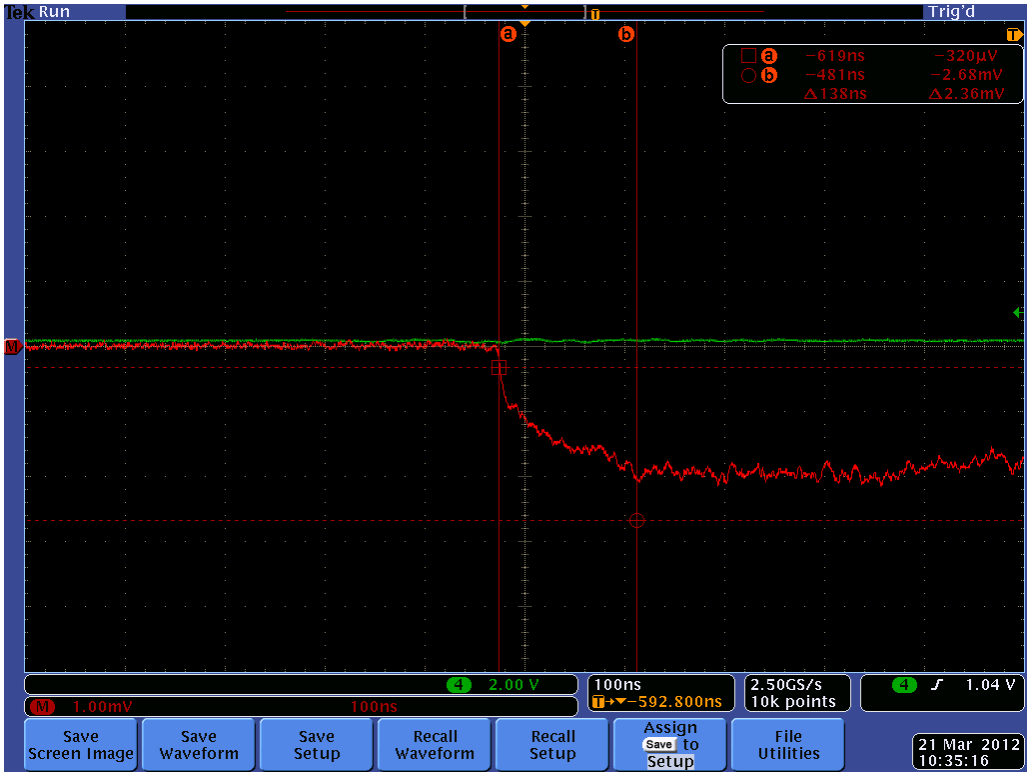
Chopper rise and fall times with 500Ω resistor



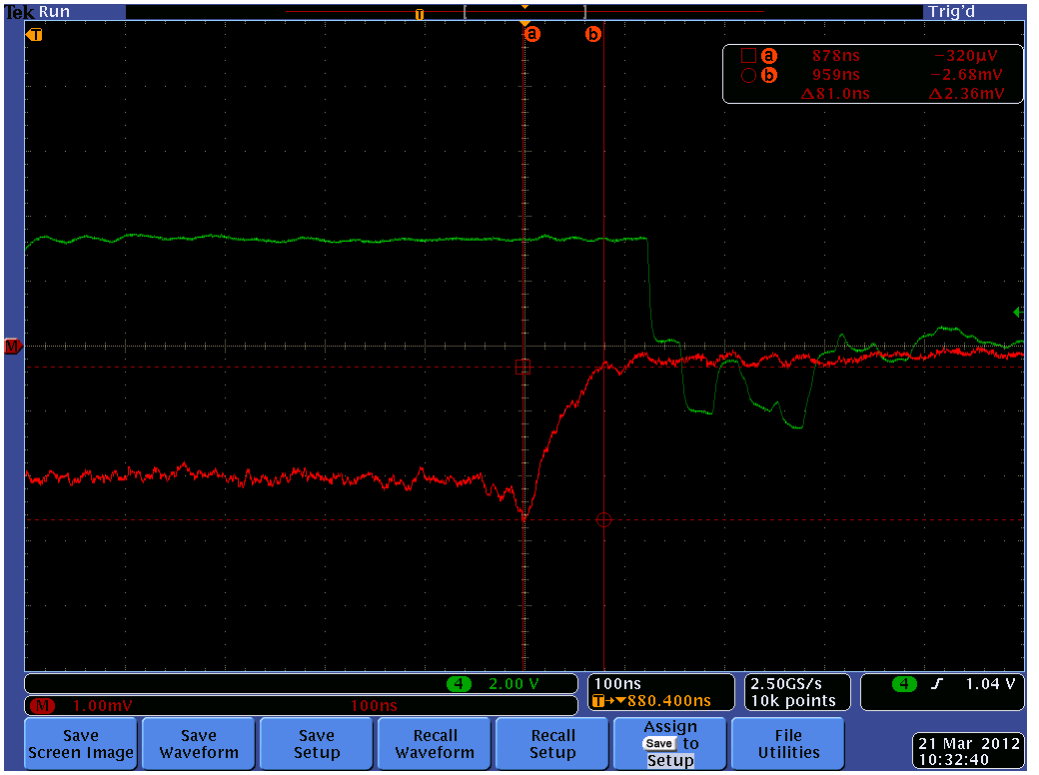
Background subtracted. 16 Averages.
~200 ns rise and 93 ns fall times.



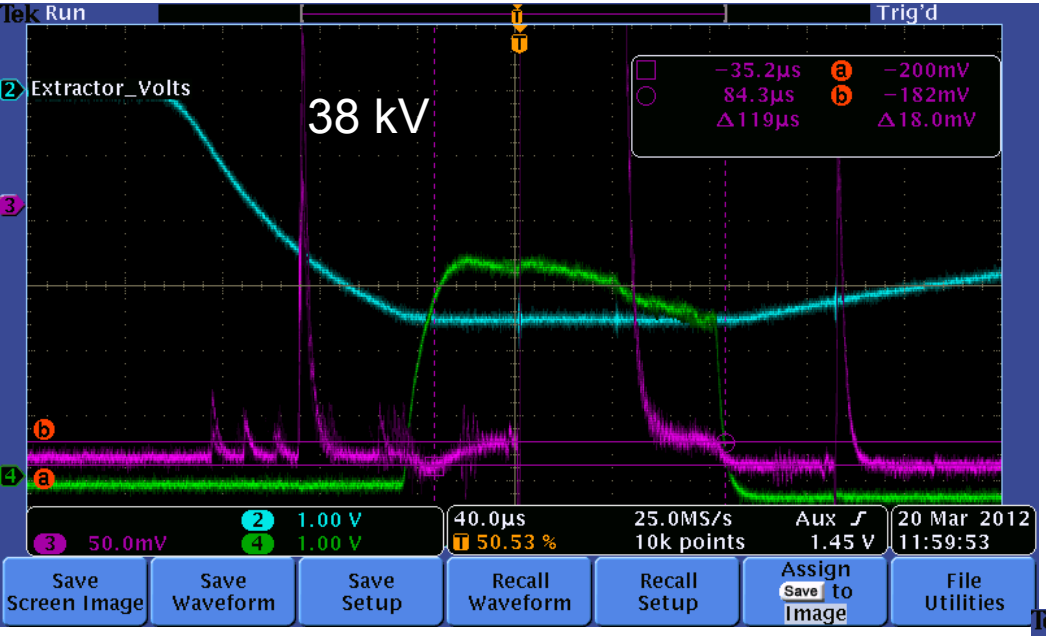
Chopper rise and fall times with 250Ω resistor

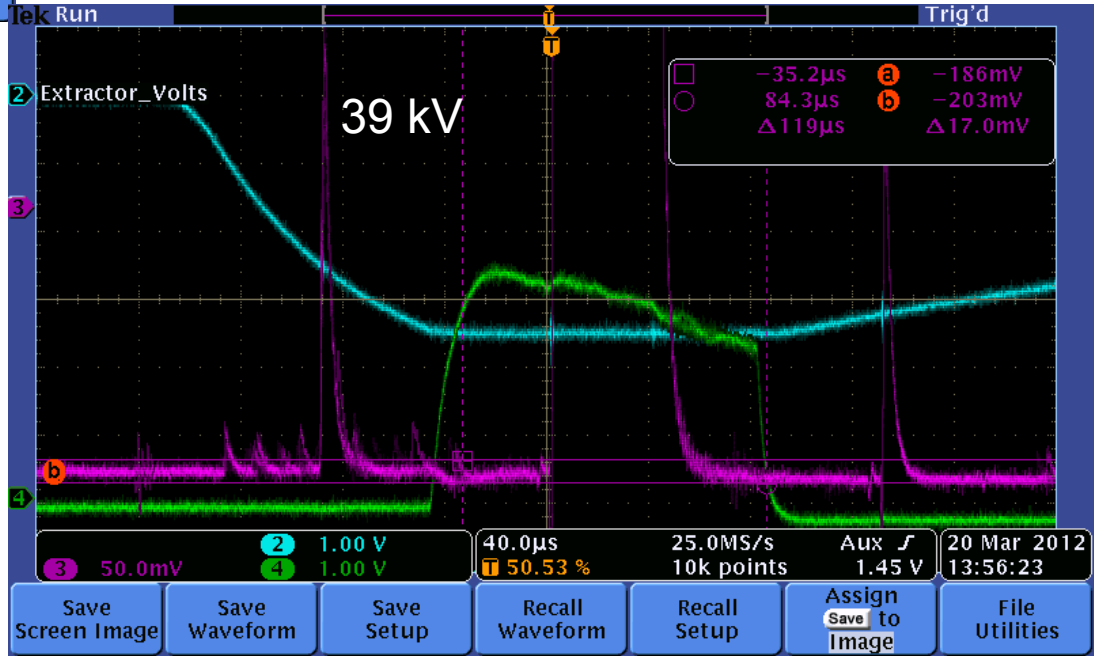


Rise: ~130 ns.
Fall~81 ns.

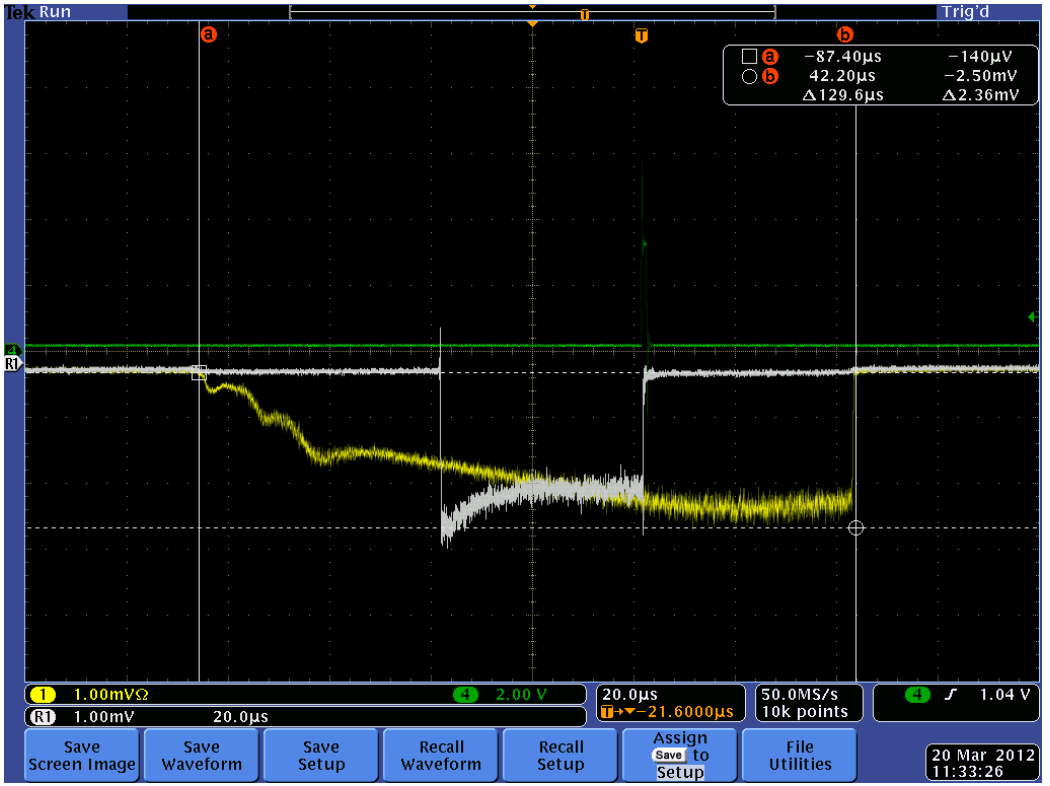


Stop voltage on Einzel lens



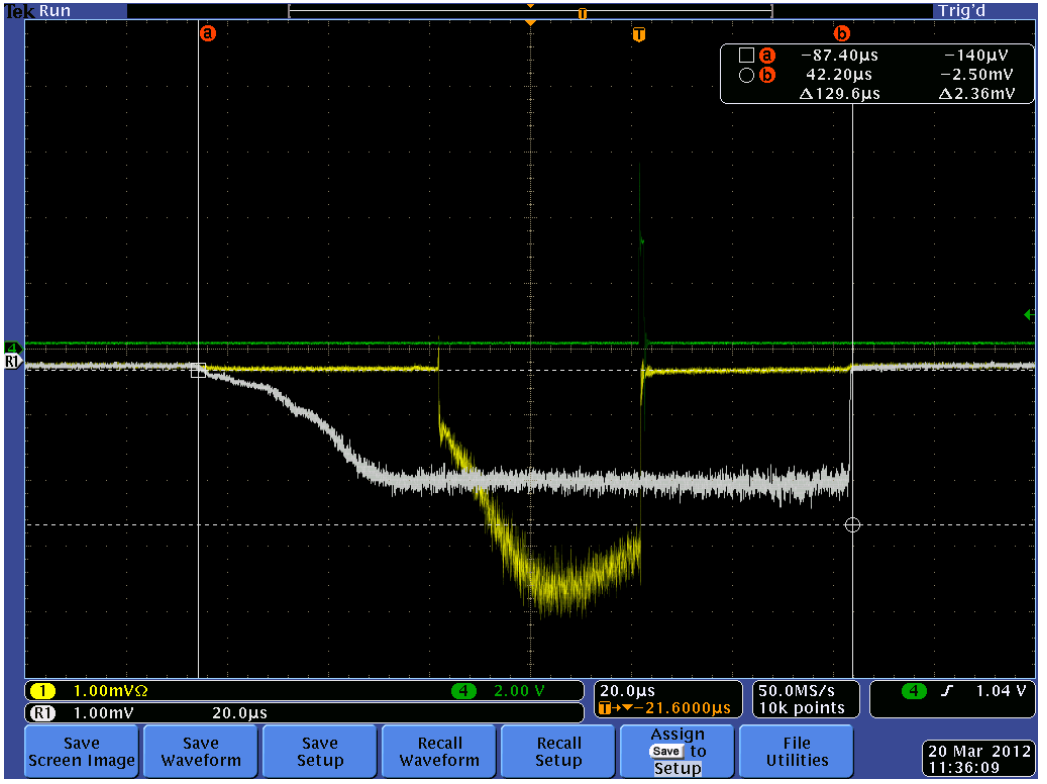


Weird shape of beam on Faraday Cup

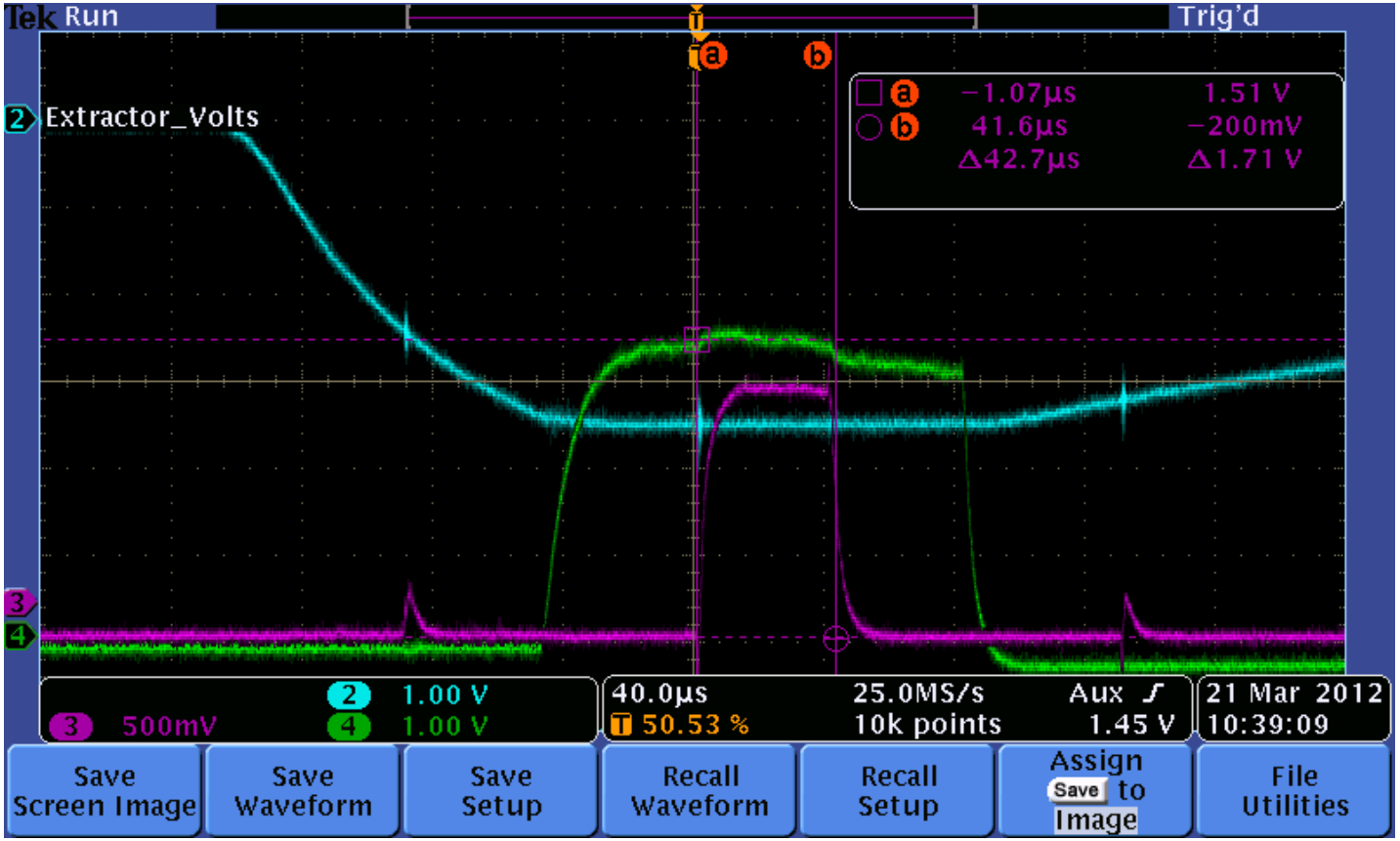


Rise time of non chopped beam ~ 30 µs.

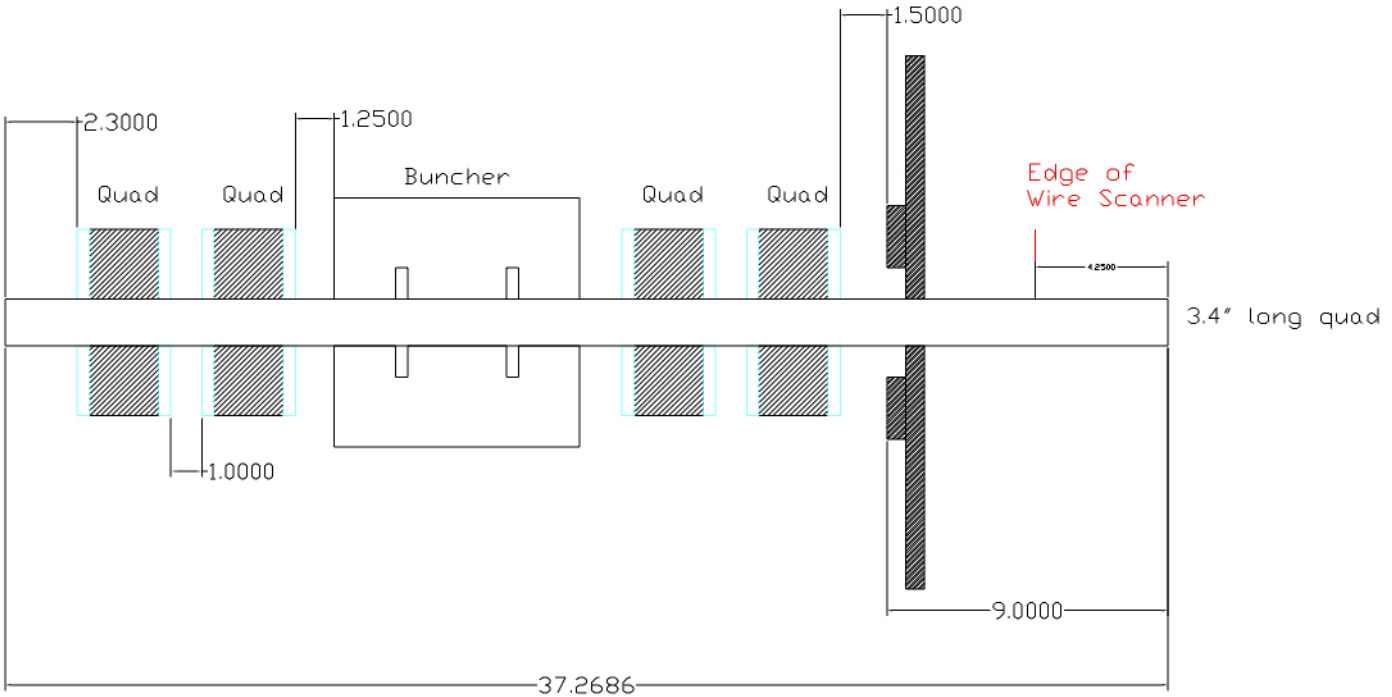
Shape of pulse on Faraday cup can be changed by moving the Faraday cup.



Toroid shape looks ok



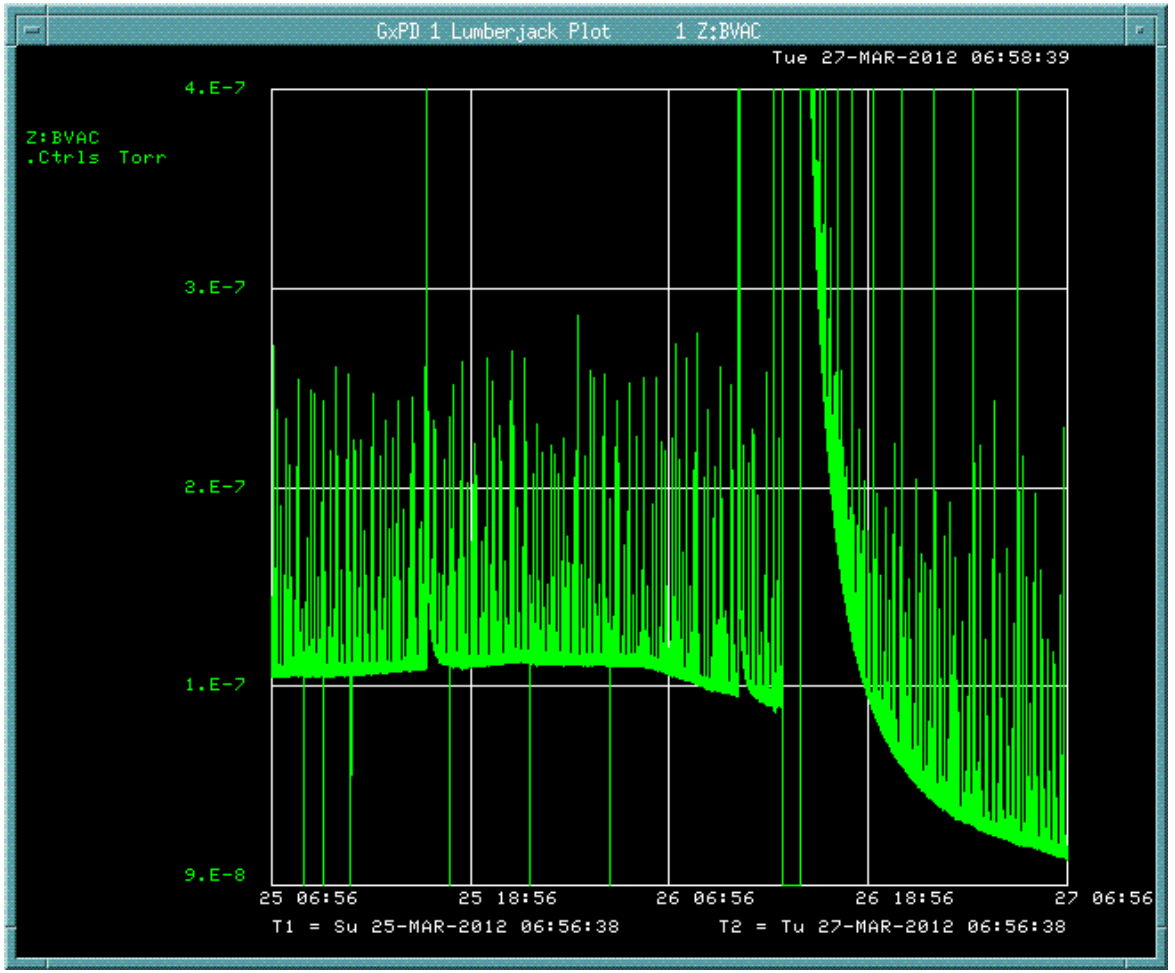
MEBT Status



Device	Status	Comments
MEBT Stand	Being designed	Another 2 more weeks (13 Mar)
Quad doublets	Being paired and tested	Field measurements to be redone for 1st pair (#5, #6) after alignment . 2nd pair being measured.
Buncher	ion pump replaced with turbo	spikes still there

Are we buying PA for buncher?
Ion pump, controller gauging status?

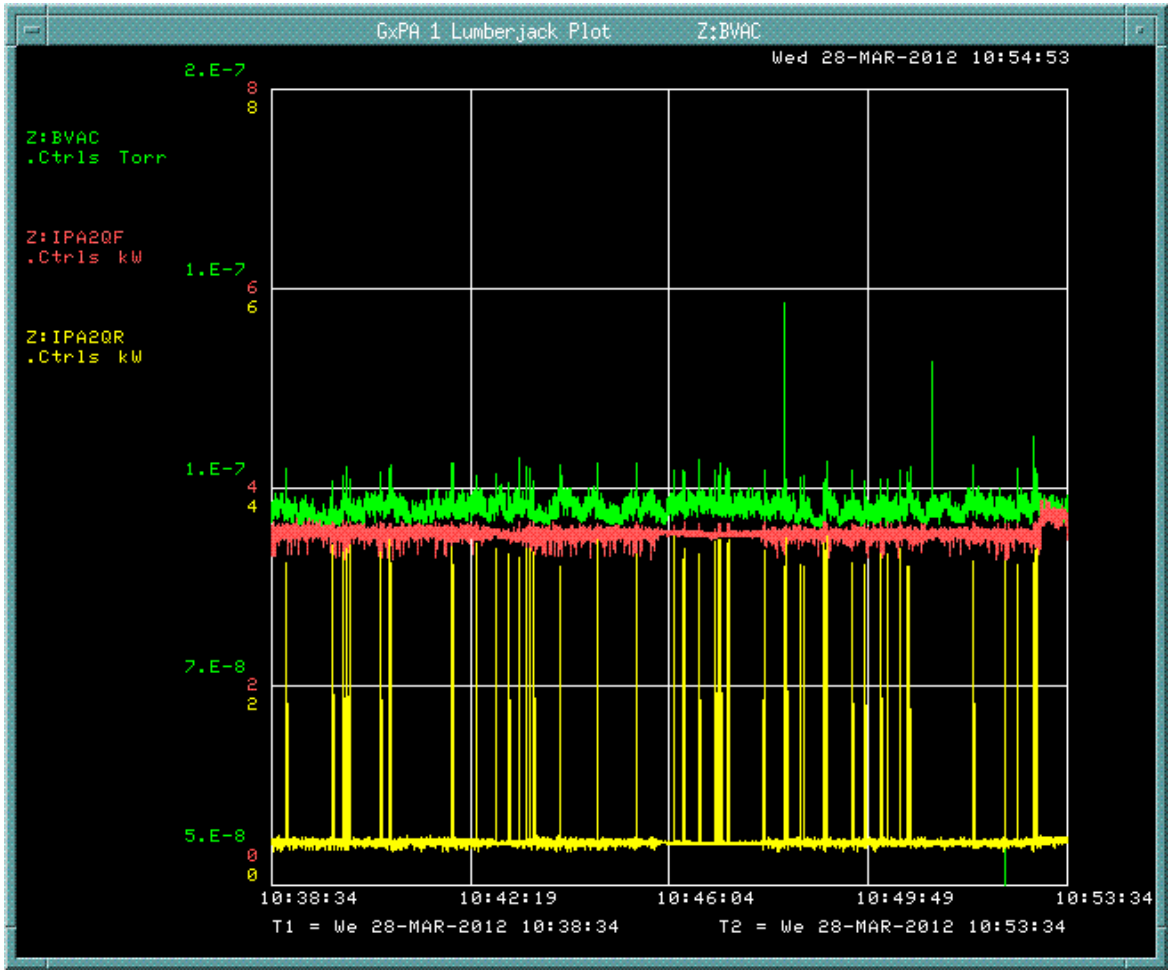
Spikey buncher vacuum



Vacuum is better with turbo than ion pump.

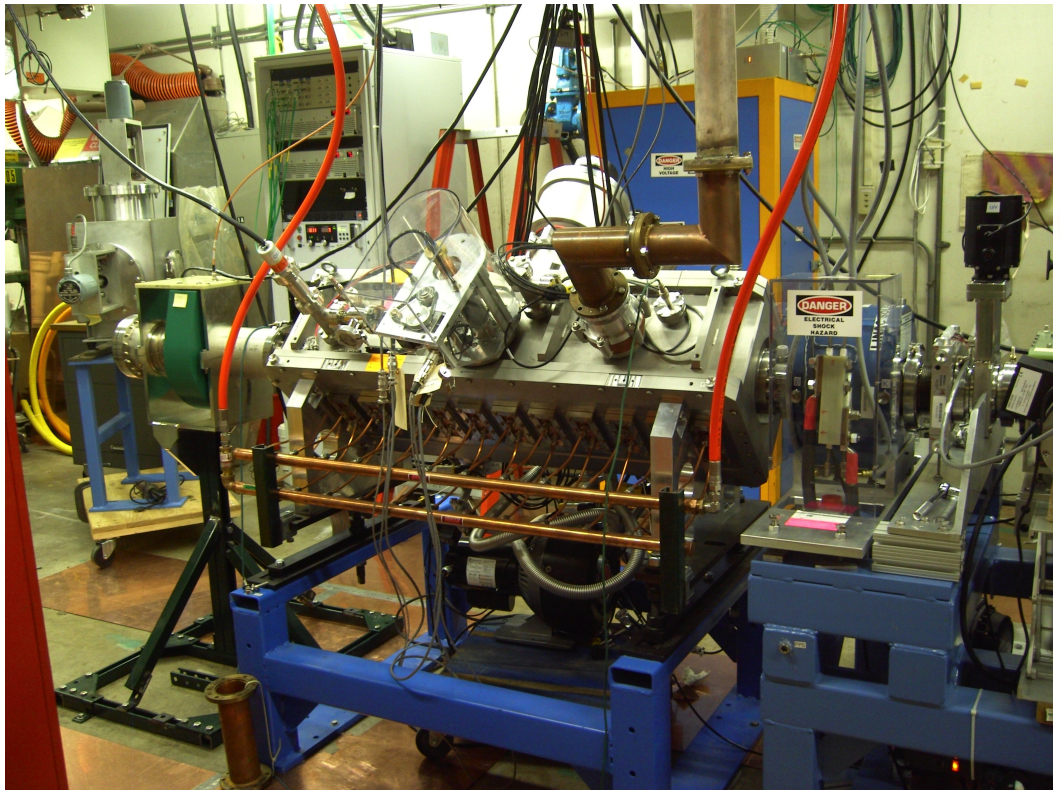
RF conditioning continues. Seems to be multipacting.

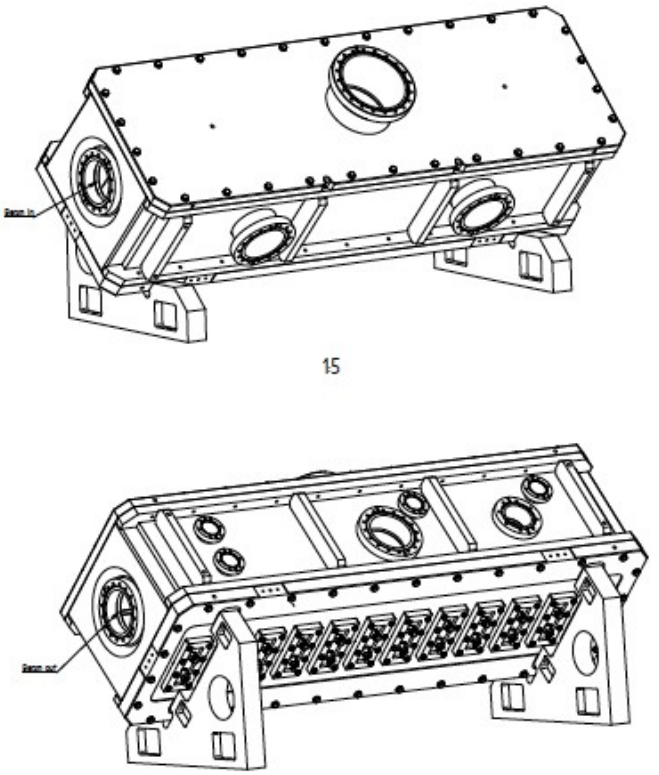
RF conditioning



There is some vacuum activity when there is high reflected power, but the jumps are quite small. So is this really in the buncher?

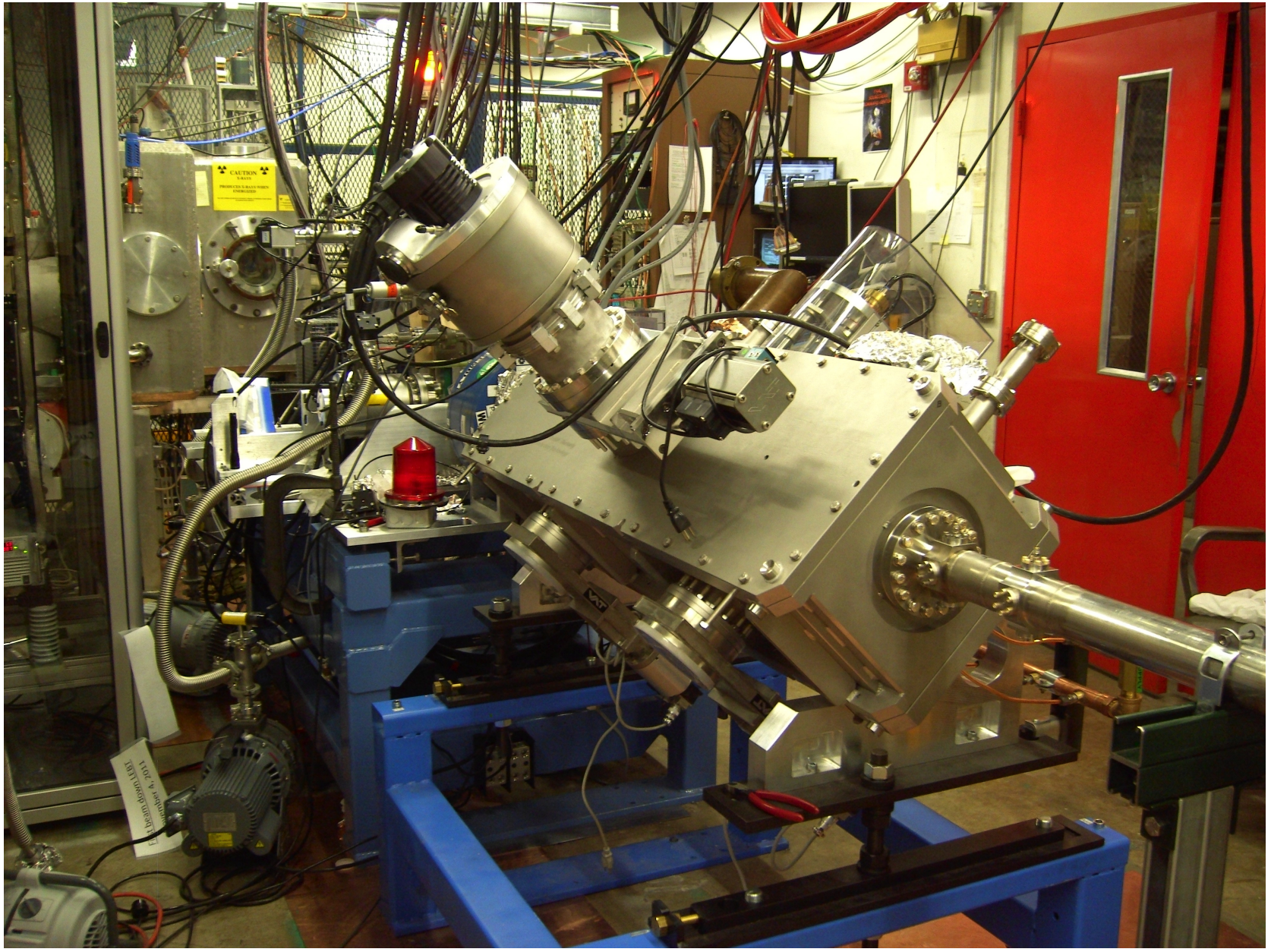
RFQ Status



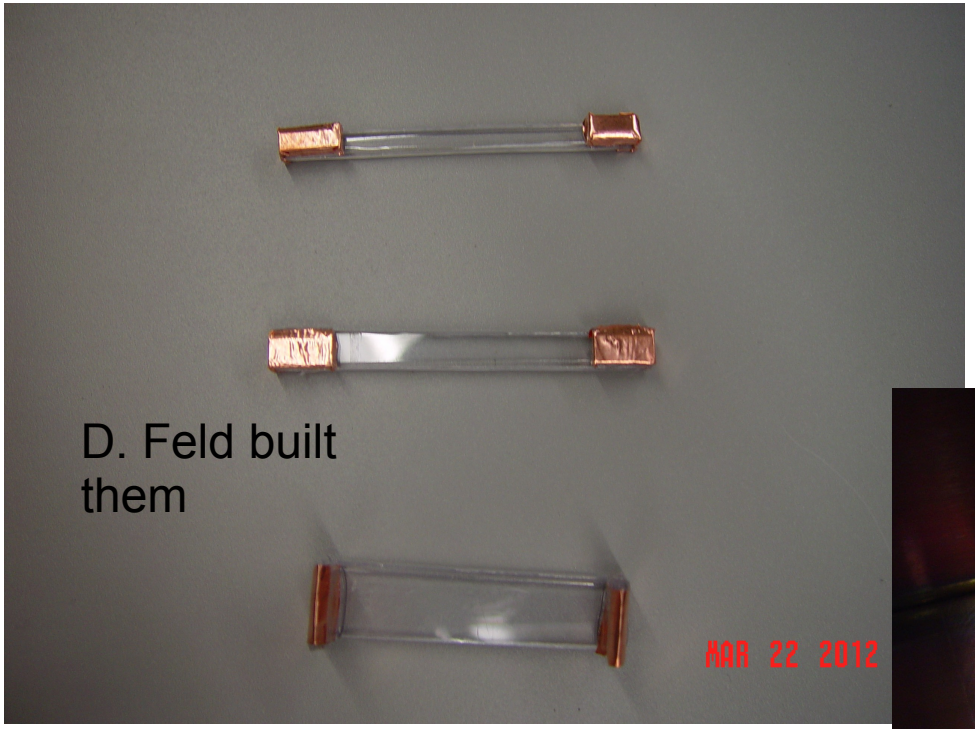


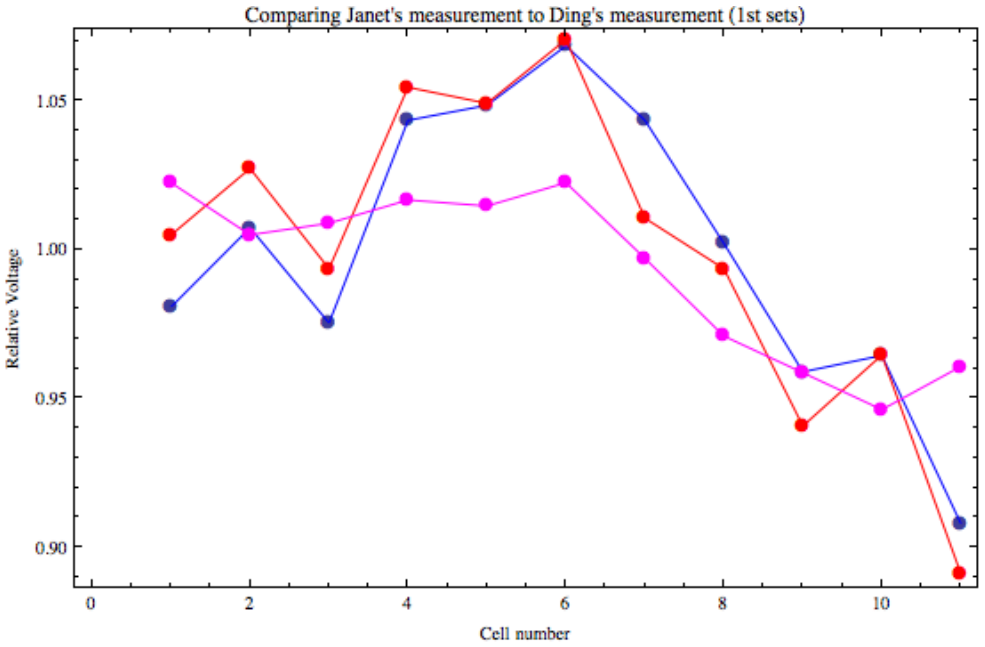
Device	Status	Comments
PLL work	Continues …	
RFQ	added gate valves	1000 L/s pump is back
RFQ	Field flatness remeasured	

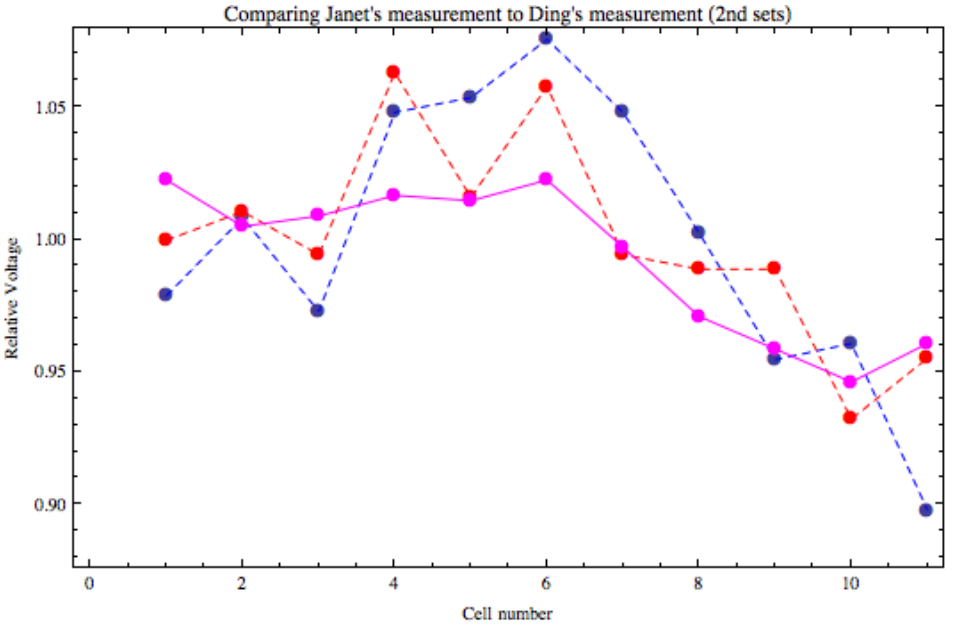
Vacuum valves added to RFQ

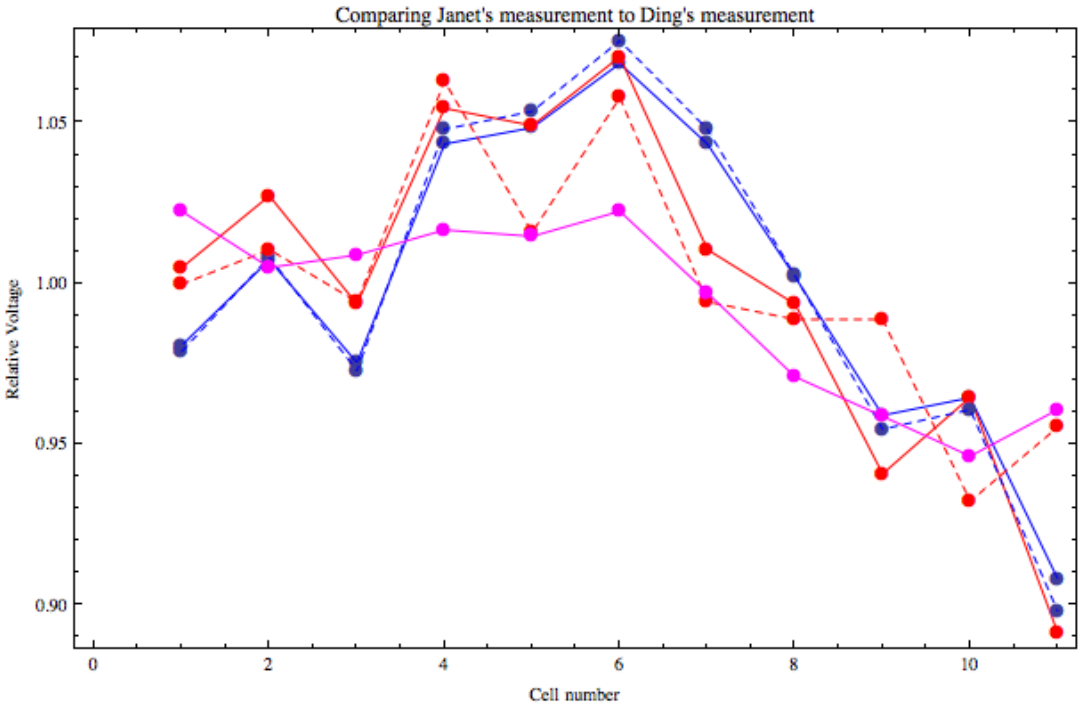


Field perturbation device









Relative voltage defined w.r.t. mean voltage in each measurement.

$$\sqrt{\Delta f / f_0} \propto E \propto V$$

Although shape is similar, max to min variation is ~15% compared to ~5% originally.

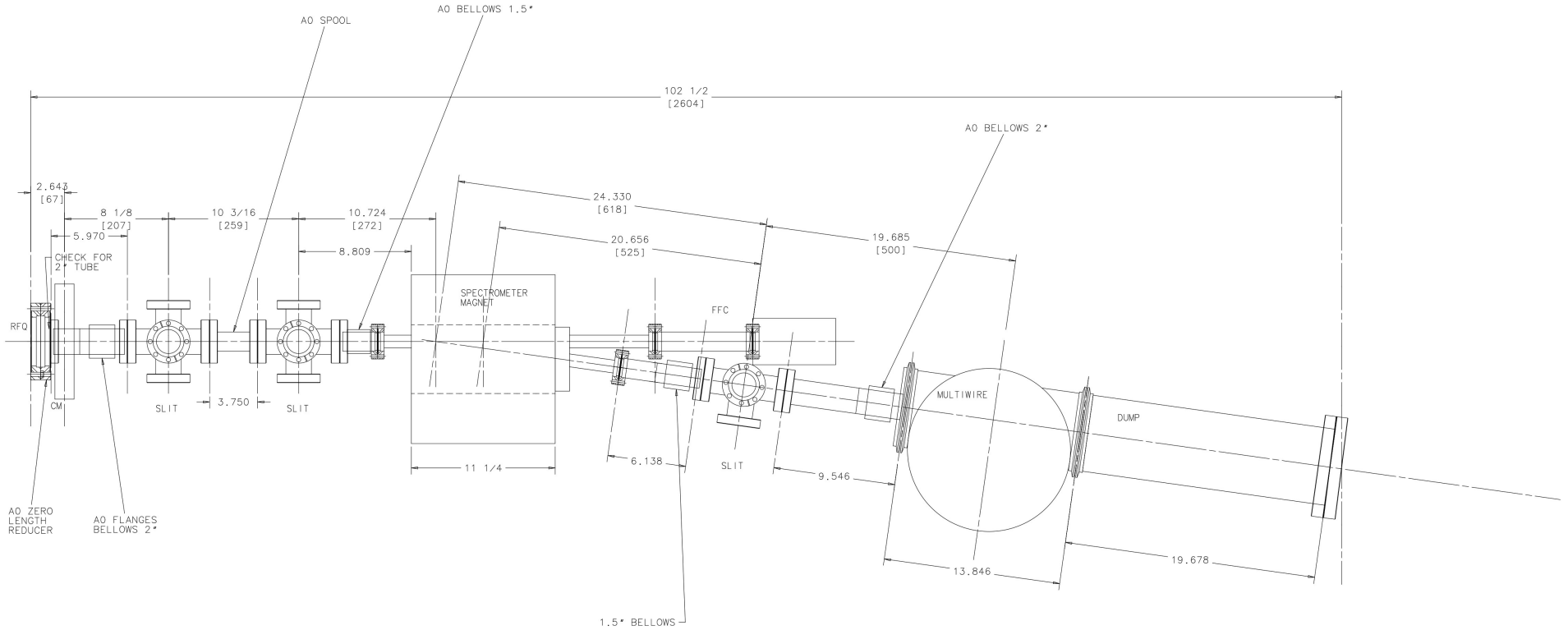
Perturbation device different?

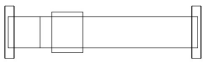
Test area, test stand and instrumentation

Device	Status	Comments
spectrometer	dipole B dl field measured.	

Spectrometer layout

REV	DESCRIPTION		DRAWN	DATE
			APPROVED	DATE





UNLESS OTHERWISE SPECIFIED	ORIGINATOR		
	DRAWN		
± ± ±	CHECKED		
1. BREAK ALL SHARP EDGES MAX. 2. DO NOT SCALE DRAWING. 3. DIMENSIONS BASED UPON 4. MAX. ALL MACH. SURFACES 5. DRAWING UNITS:	APPROVED		
	USED ON		
	MATERIAL		

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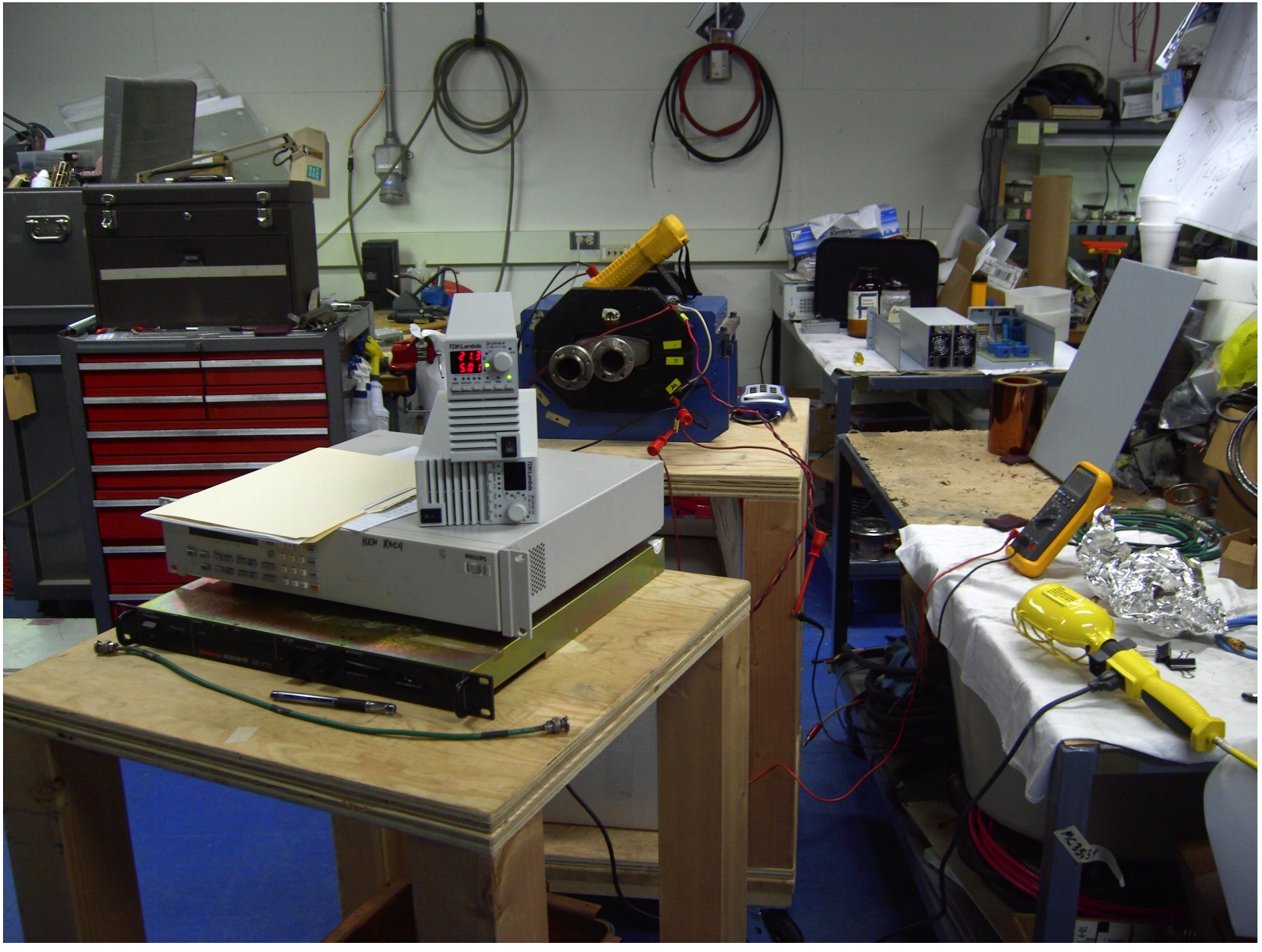
SCALE	DRAWING NUMBER	SHEET	REV
	. — —	1 OF 1	
CREATED WITH :		GROUP:	

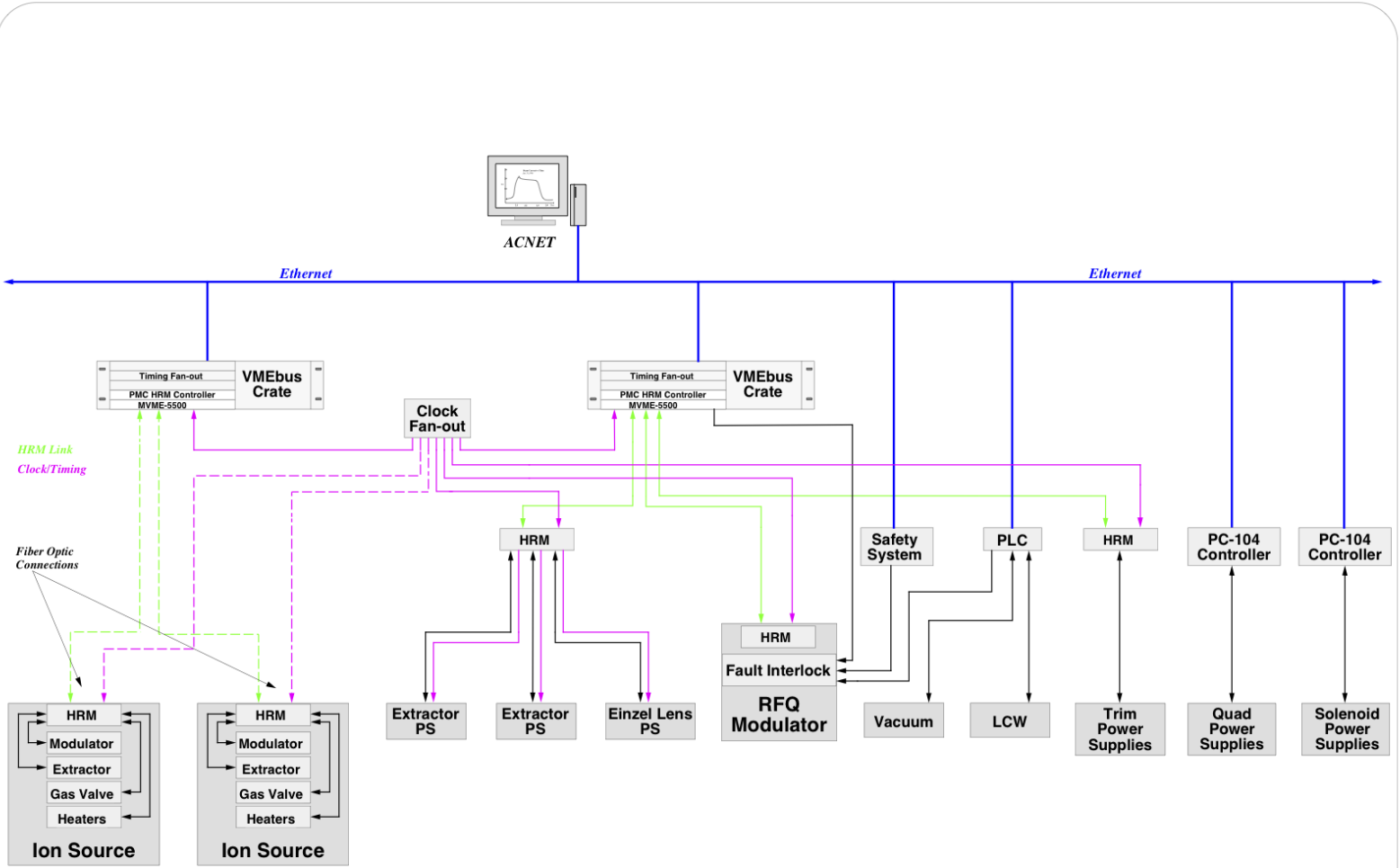
Created: 16:02:02 on 23-03-12 (D-M-Y) By: kduel State: NONE

7 power supplies later ...



Slits and actuator

Controls



Linac RFQ Upgrade Controls Block Diagram

Controls

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Safety