

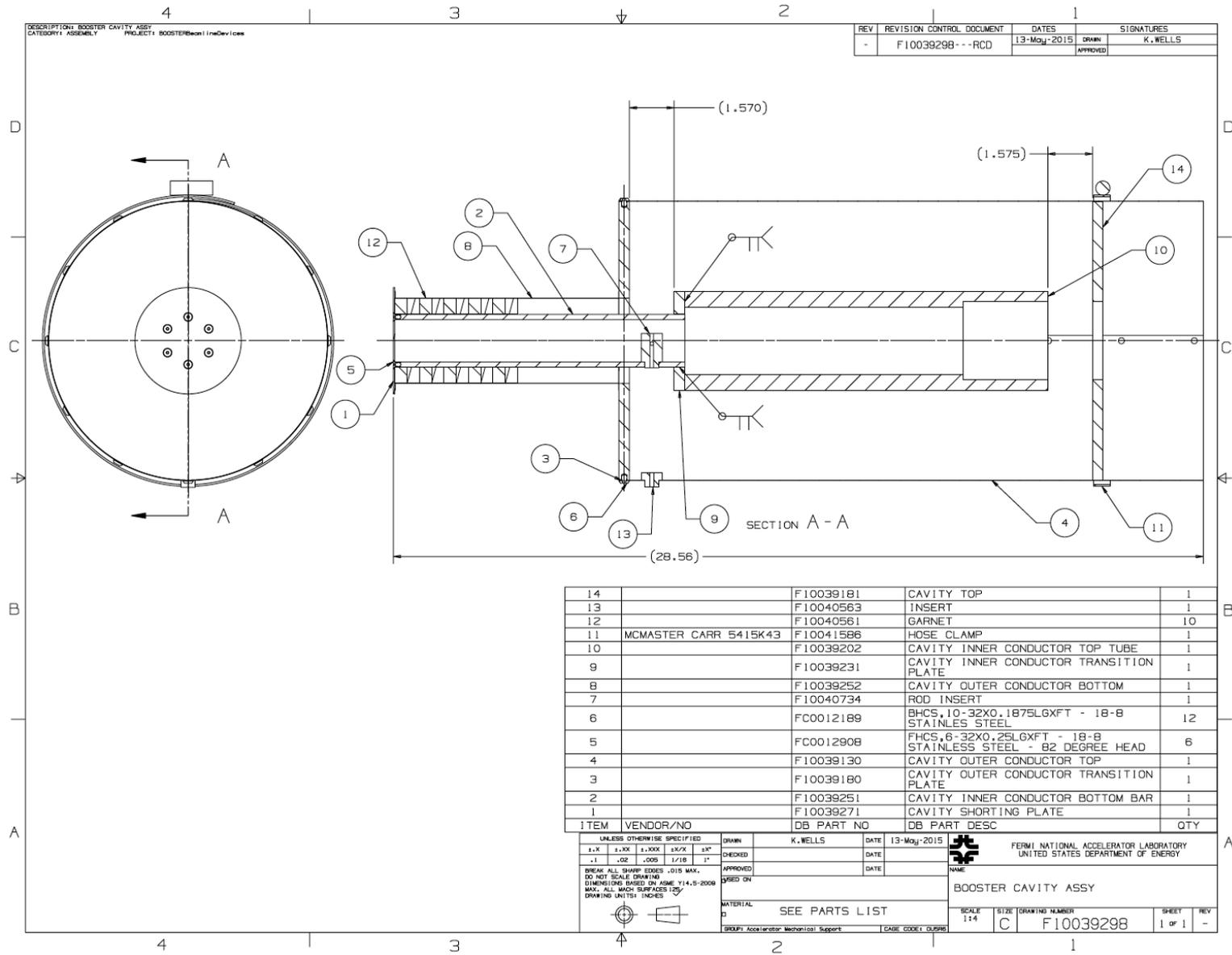
Status of project

C.Y. Tan
21 May 2015

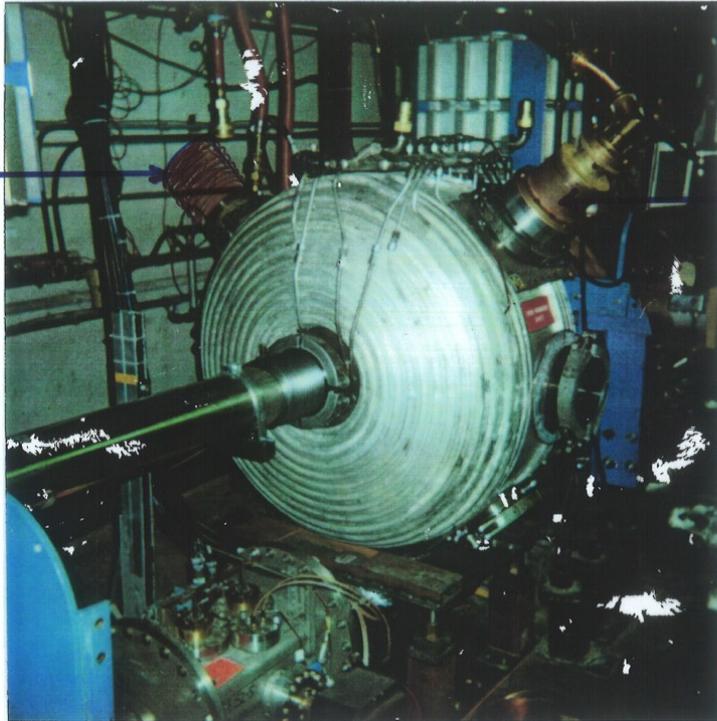
Who's doing what

- Gennady
 - CST simulations to make sure that our cavity doesn't overheat
- TianHuan (LBNL)
 - Ace3P simulations to check our simulations.
- Iouri
 - Finish measurement of AL800 properties.
- Robyn
 - Finish mock cavity with Kevin
 - Finish anode resonator with Matt
- Tan
 - Exploring a more reasonable voltage ramp that helps beam cross transition besides working at injection.
 - ESME simulations (roped in Chandra to help), and Mathematica calculations.
 - 8 kW PA amplifiers. (already sent out for quote)
 - Werlatone specs. (power divider)
- Ding
 - RF window for cavities.
- Joe
 - Making sure we aren't going off into the deep end.

Mock cavity



3rd harmonic cavity



Pill box cavity from CERN. Used in Main Ring in the 1990s.

It does fit in the tunnel.

Tuning range 60 kHz.

Resonates at 159 MHz.

Gap voltage 300 kV @ ~6 kW power

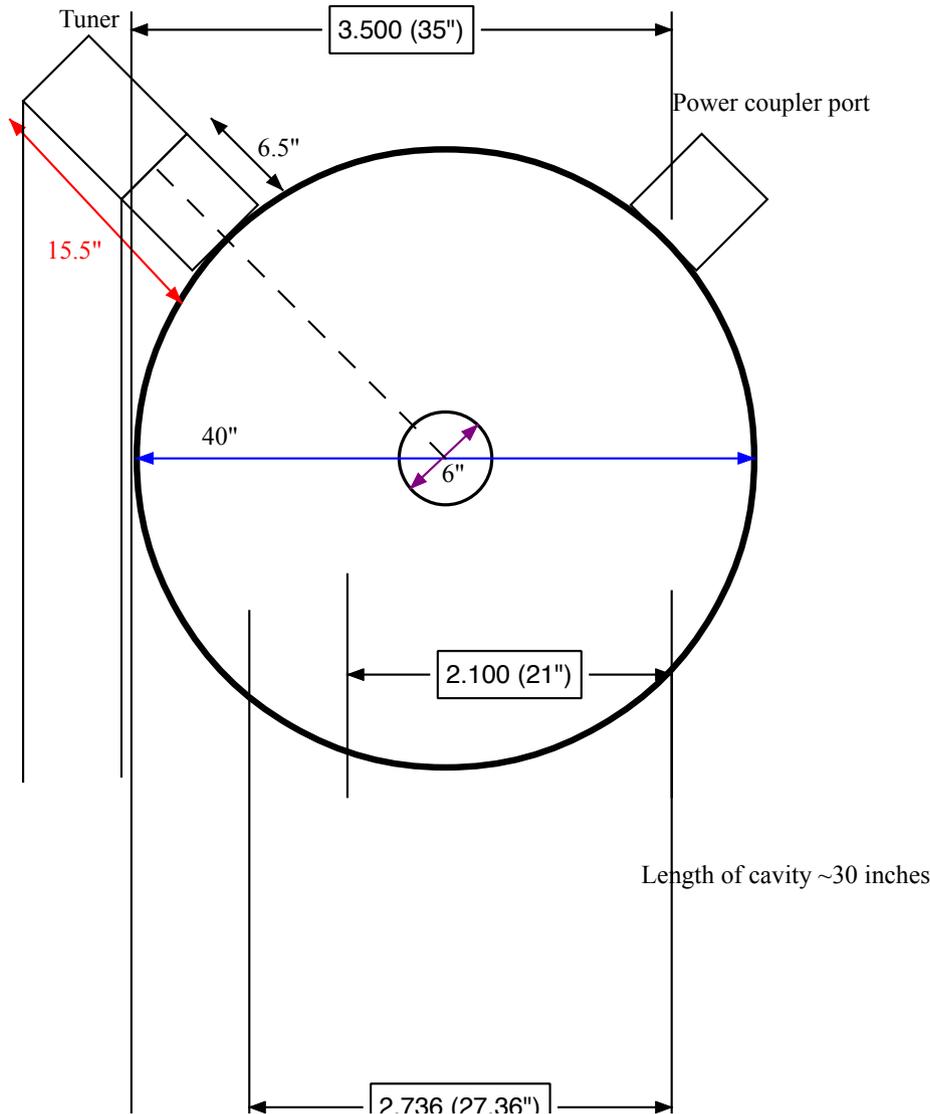
$Q=36000!!!!$

Originally designed for 0.5 Hz, 10 ms pulse width.

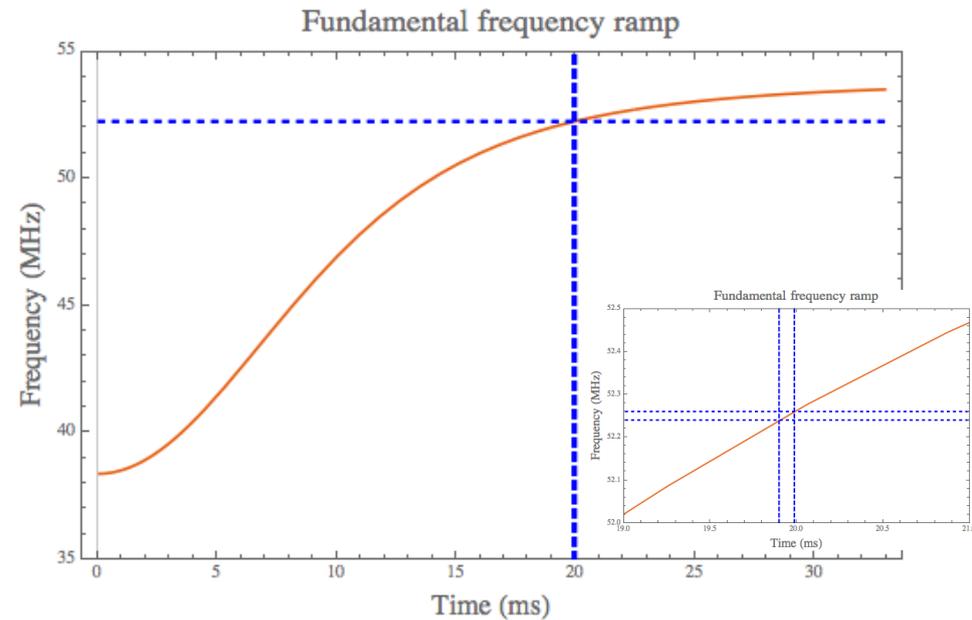
Joe, Chandra and I are exploring whether this is usable in Booster:

- Need to know modes
- 15 Hz compatible?
- This is an extremely high Q structure $1/e$ time is $2Q/(\omega_0) = 73 \mu\text{s}$
- **Q might be too high for this work!**

3rd harmonic dimensions (approx)



Should fit in Booster tunnel. But must redesign tuner.



Only has +/- 30 kHz swing at 3rd harmonic, which is only 88 μ s in the Booster ramp! Need at least +/- 200 kHz swing (+/- 300 μ s).

This number is comparable to the damping time of the cavity (72 μ s)