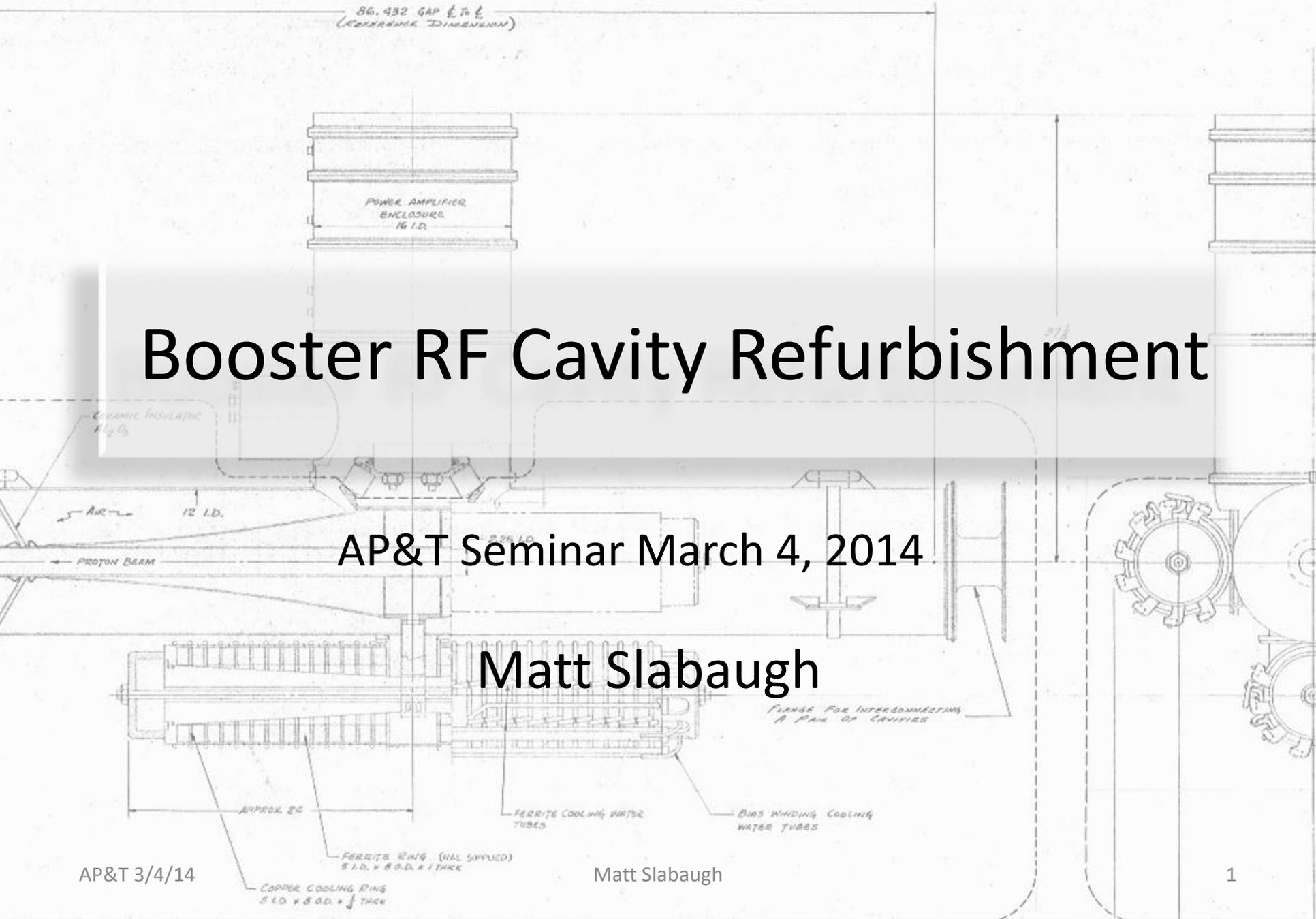


Booster RF Cavity Refurbishment

AP&T Seminar March 4, 2014

Matt Slabaugh



Topics

Refurbishment

- Background/Introduction
 - Cavity refurbishment
 - Tuner refurbishment
- Future
 - New tuners
 - New (old) cavity
- Summary

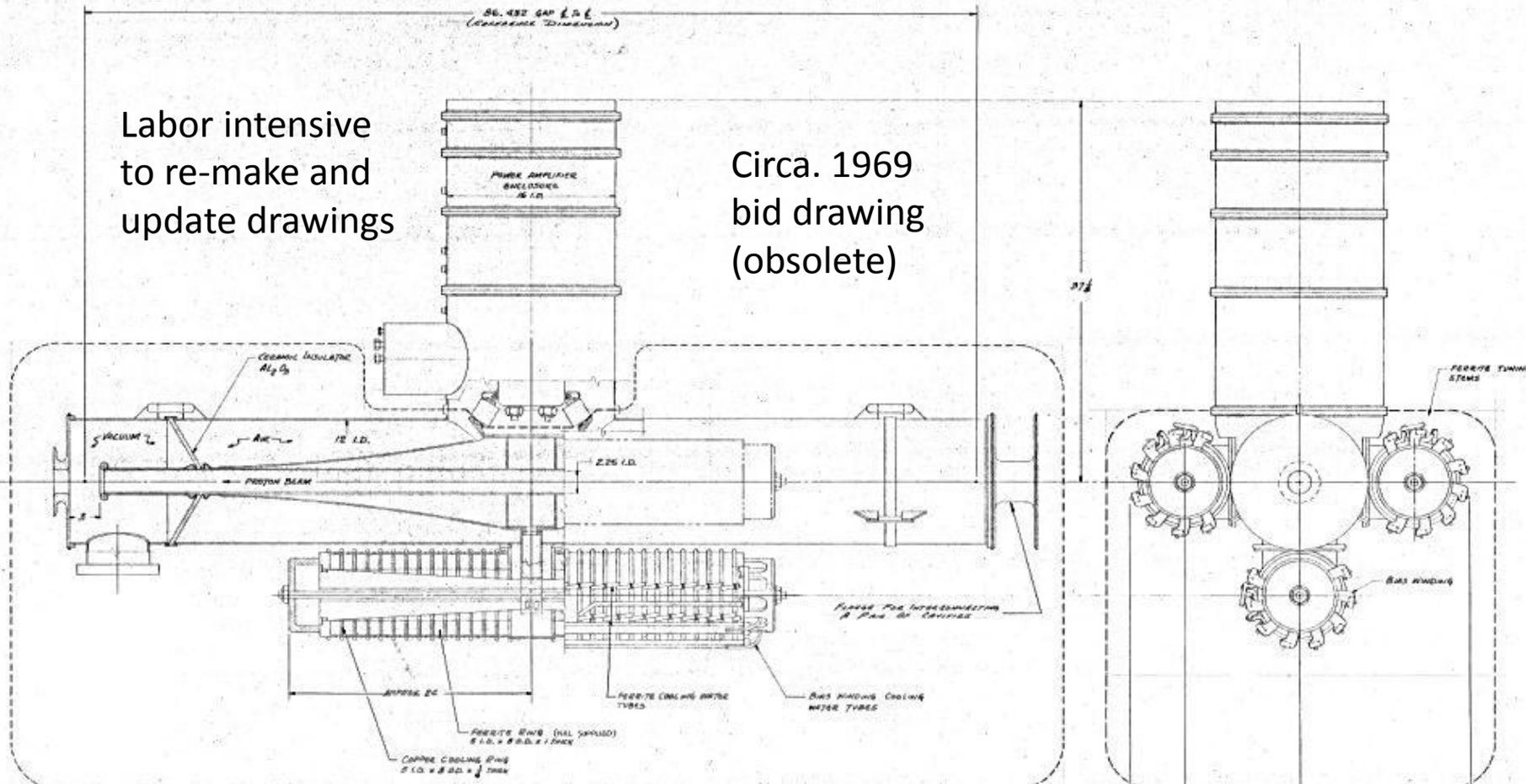


86.432 GAP E.D.E.
(CORROSION DIMENSION)

Background

Labor intensive
to re-make and
update drawings

Circa. 1969
bid drawing
(obsolete)



Cavity refurbishment



Vacuum

- Fragile!
- ALARA



Water



Contact

Cavity refurbishment

Vacuum

- Less frequent, but potentially more time consuming
- Occasional ceramic leak
- Mostly cracked “pie tin” or bad bellows
 - Exploring a prototype flange to replace the old design
 - Possibly integrate into refurbishment of all cavities



Cavity refurbishment

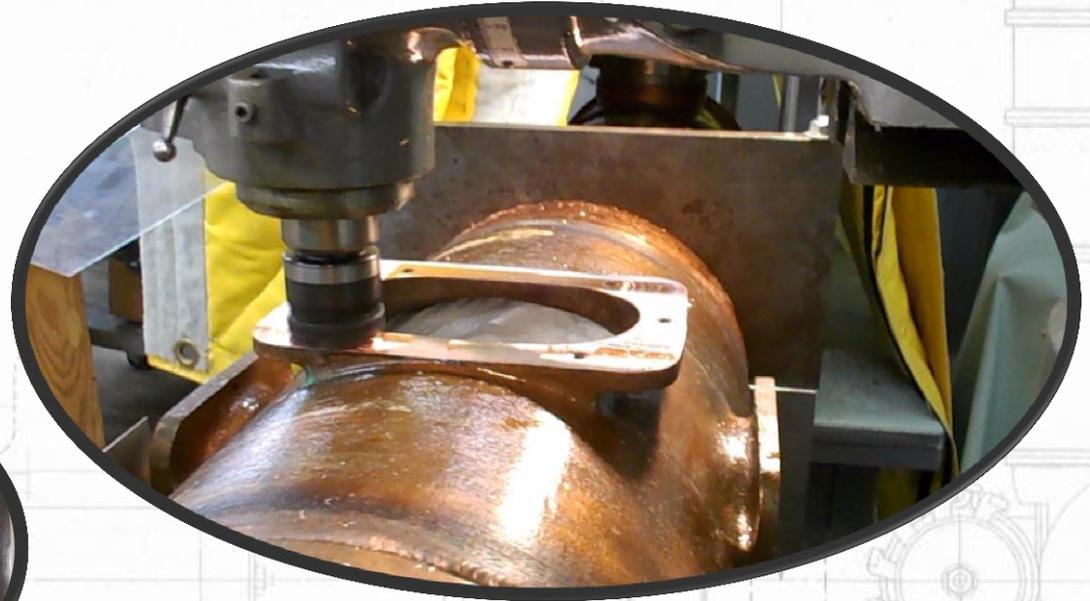
Contact

- “Good enough” isn’t anymore
- RF requires 100% surface continuity



NOTE: Most cavities are Class 2, some Class 3. Co-operative effort with TD Machine shop improves quality, reduces time and distance (dose). ~ 7 days → 2 days

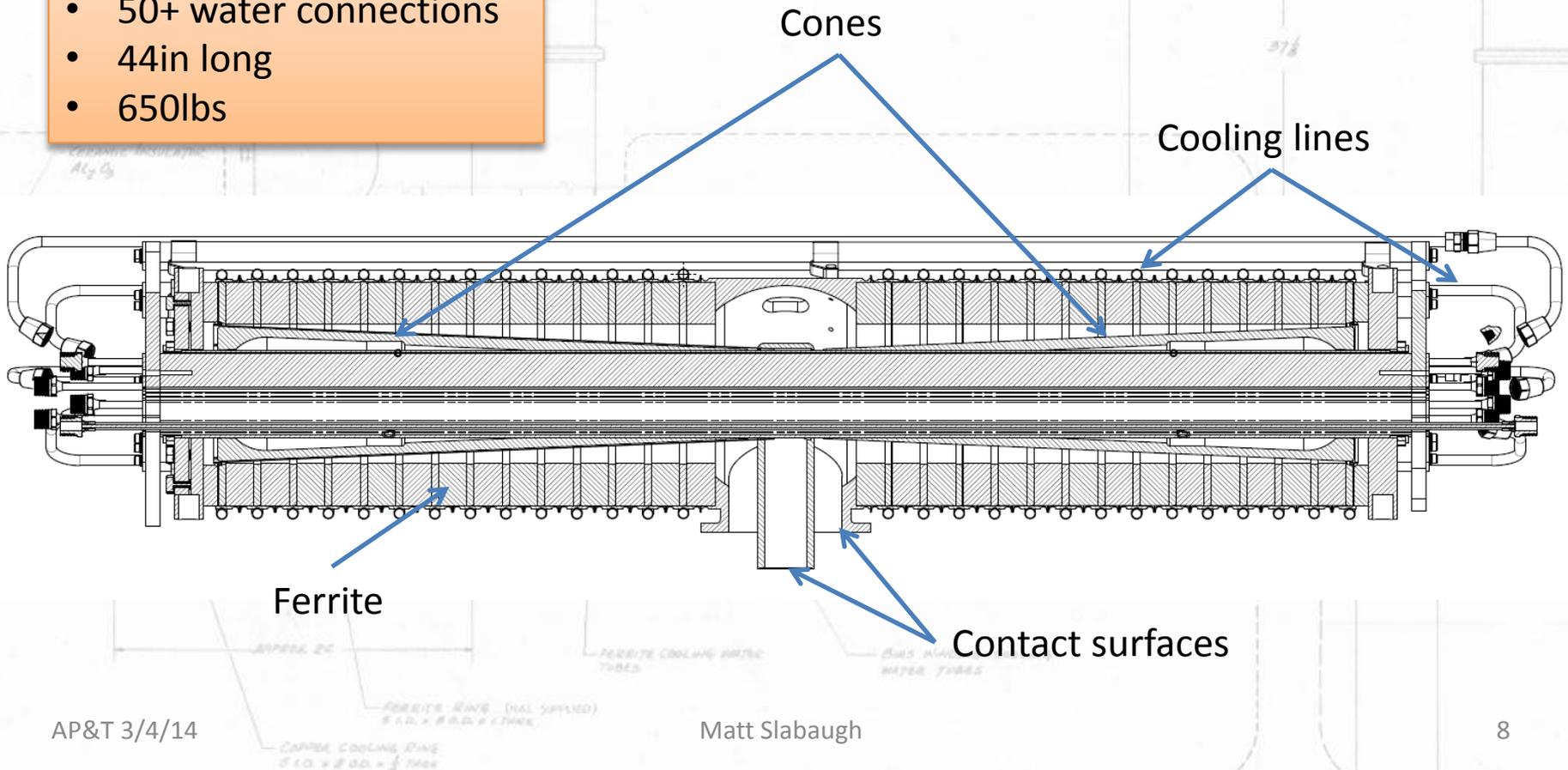
Cavity refurbishment



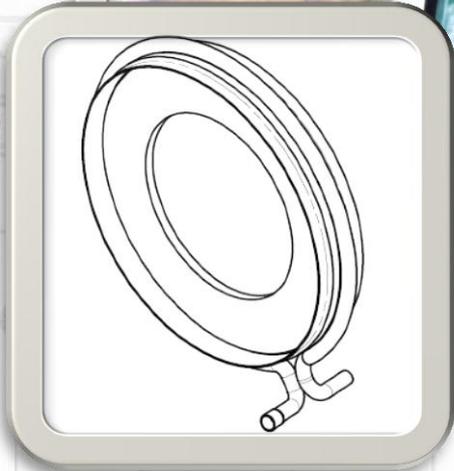
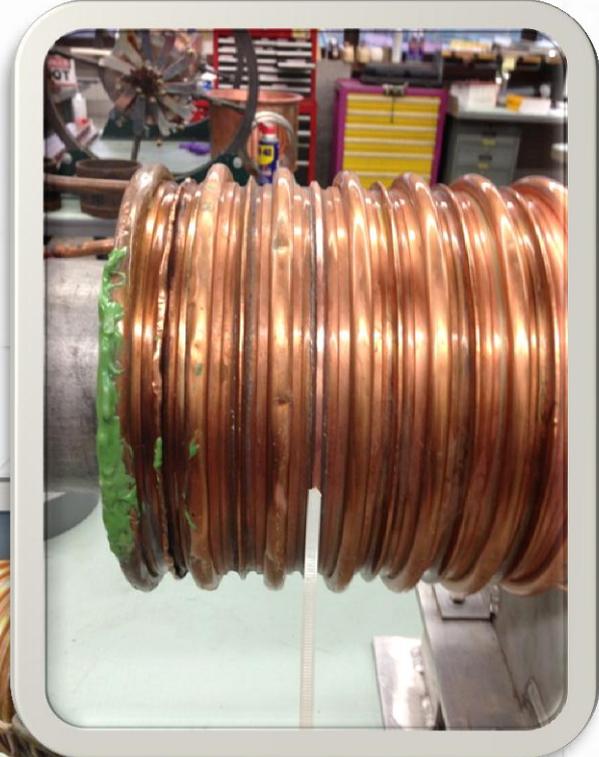
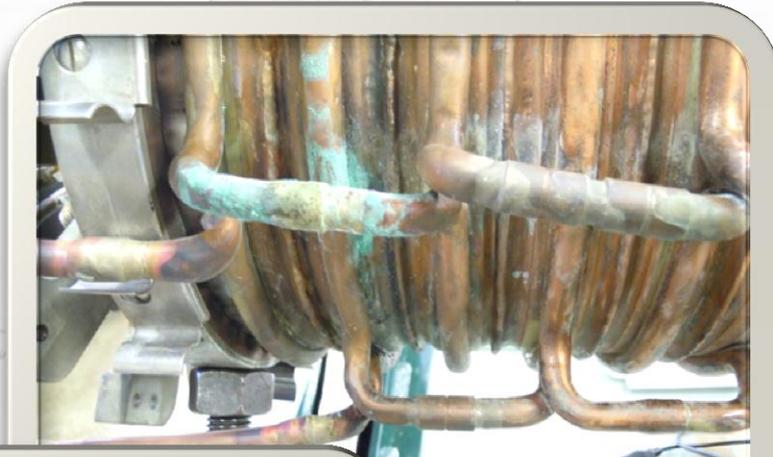
Tuner refurbishment

Each tuner:

- 500+ pieces
- 150ft+ tubing
- 50+ water connections
- 44in long
- 650lbs

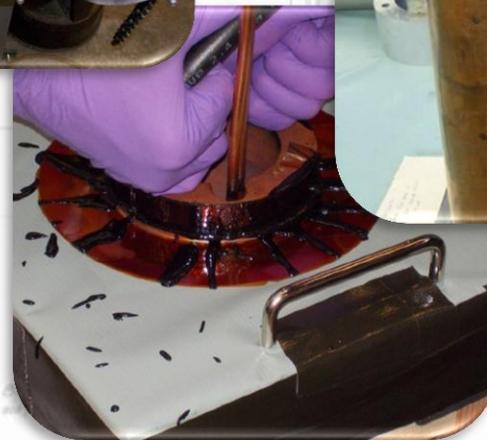
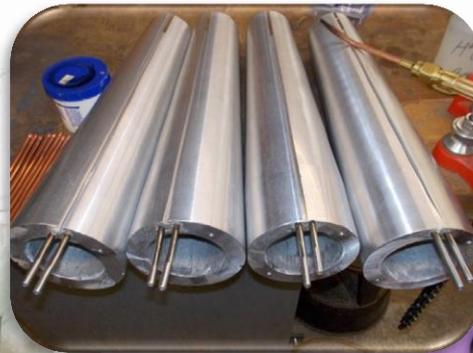


Tuner refurbishment



Tuner refurbishment

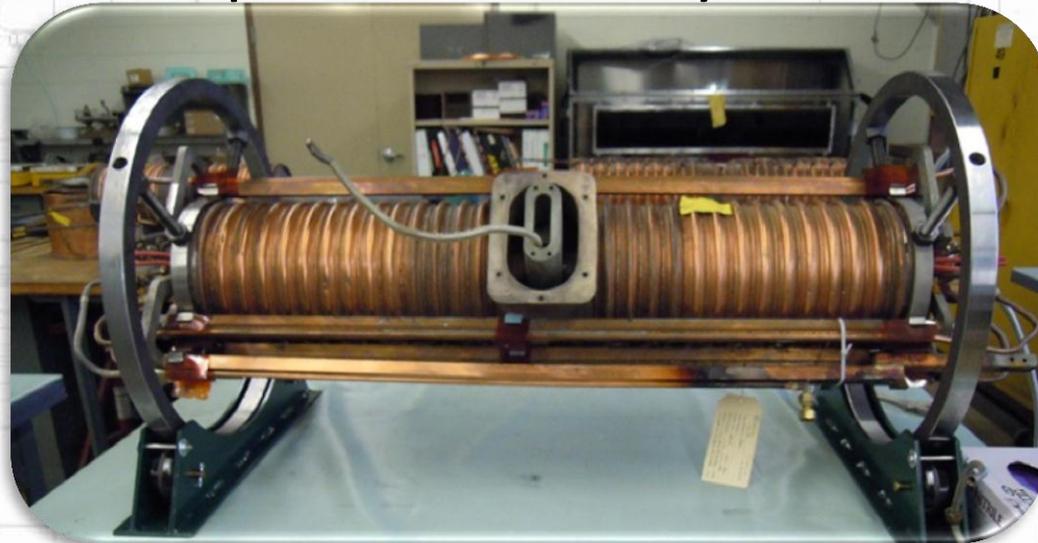
Cones-
10 step process
TD supporting work
New aluminum cones in progress



Tuner refurbishment

Tuner re-build time:

- 1 week/tuner to re-build X 3
- 1 week for cones
- ~4 weeks for tuner portion of cavity turn-around



Refurbishment

Putting it all together- how long??

Cavity work: 2-4 weeks

Tuner work: 4 weeks

Tuner installation: 1+ week

RF testing: 1+ week

Potential delays: vacuum and water complications

Typical turn-around:

10-12 weeks / cavity



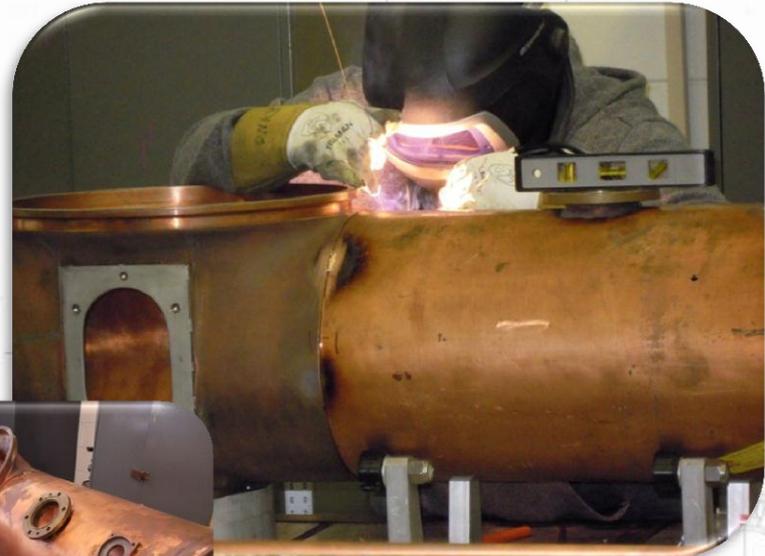
New Tuners

- Sub-assembly work in early 2014
 - Built at IB2
 - Most parts procured for 20 tuners
 - Inspected/stocked at IB4
 - Technicians in training
- **Waiting for high-mu ferrite**



New (old) cavity

- Cavity built from leftovers and rejects- Frankenstein!
- Long process- two years+
- Good experience, hasn't been done since 1970's



Summary

- 10 cavities done
- 2 cavities *re*-done
- 30+ tuners re-built
- 20 new tuners, most parts procured
- 1 spare cavity built
- Manpower
 - 2 AD mechanical techs (contract)
 - 2 AD mechanical techs (regular, MI shared)
 - More promised....