



Muon Collaboration

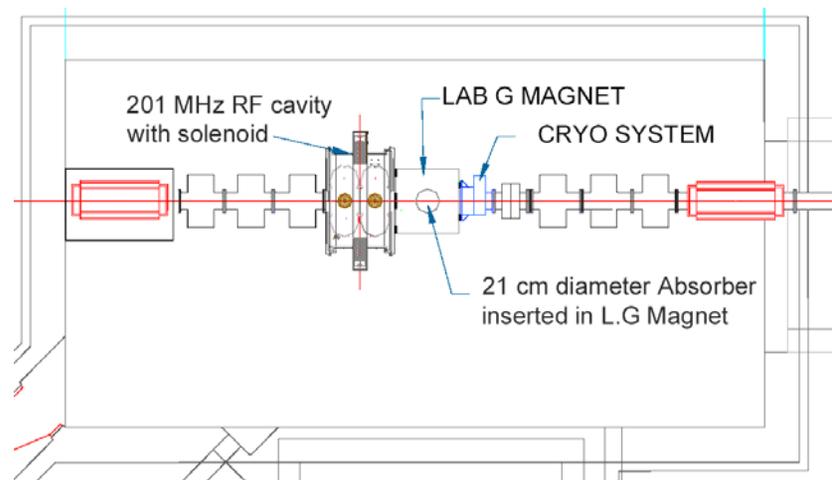
MuCool Test Area

400 MeV High-Intensity Proton Beam line

MuCool Test Area (MTA)



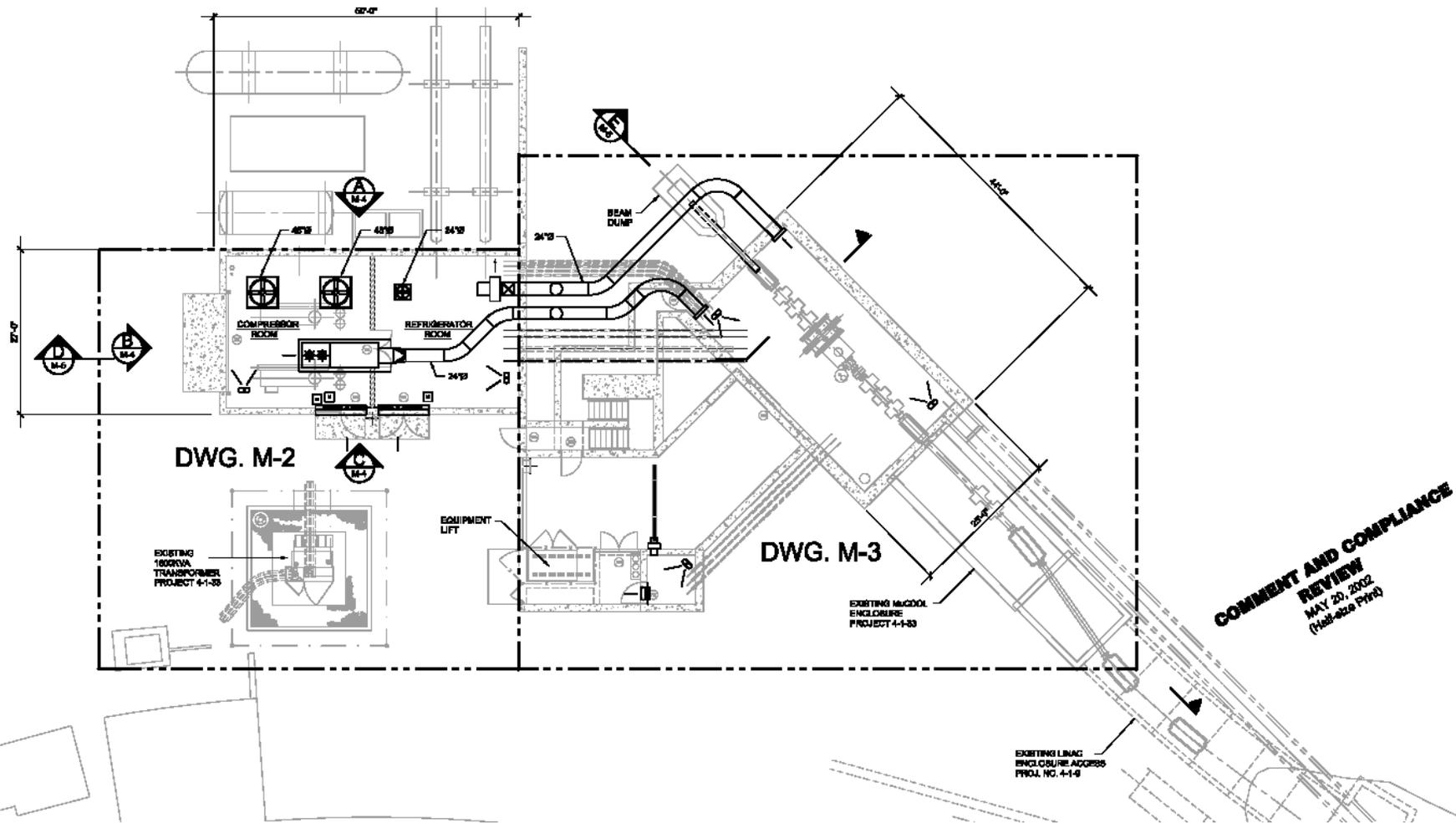
- Facility to test all components of cooling channel (not a test of ionization cooling)
 - ◆ At high beam power
 - ▲ Designed to accommodate full Linac Beam
 - ▲ 1.6×10^{13} p/pulse @15 Hz
 - 2.4×10^{14} p/s
 - ≈ 600 W into 35 cm LH₂ absorber @ 400 MeV
 - ◆ RF power from Linac (201 and 805 MHz test stands)
 - ▲ Waveguides pipe power to MTA





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MTA - Plan View



**COMMENT AND COMPLIANCE
REVIEW**
MAY 20, 2002
(Red-size Print)

MuCool Test Area (MTA)

- Construction of facility slightly ahead of schedule
- Beneficial occupancy is expected to be in mid September
- First Use
 - ◆ Convective LH_2 absorber tests
- 201 and 805 MHz RF testing towards end of FY 04
 - ◆ Installation of LH_2 and LHe systems in FY 04 depends on funding
- Beam to area in FY 06



Status as of May 20



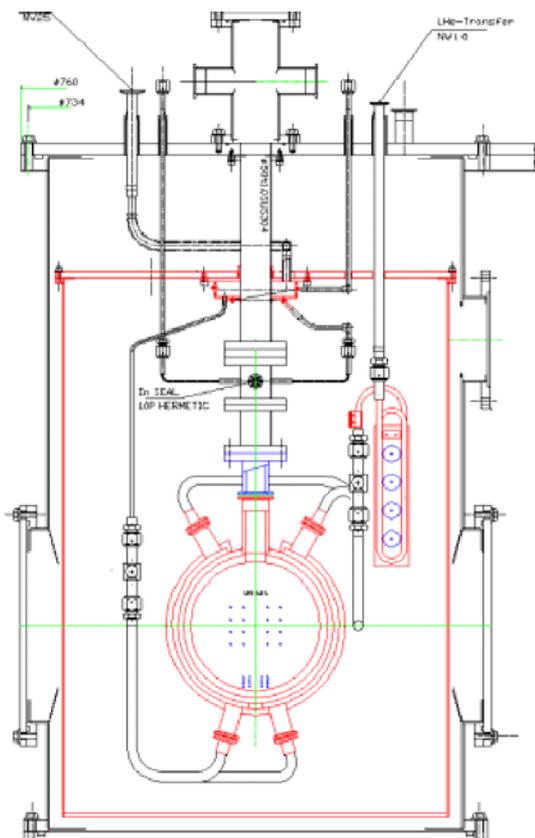
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MTA



MTA Near-Term Plans

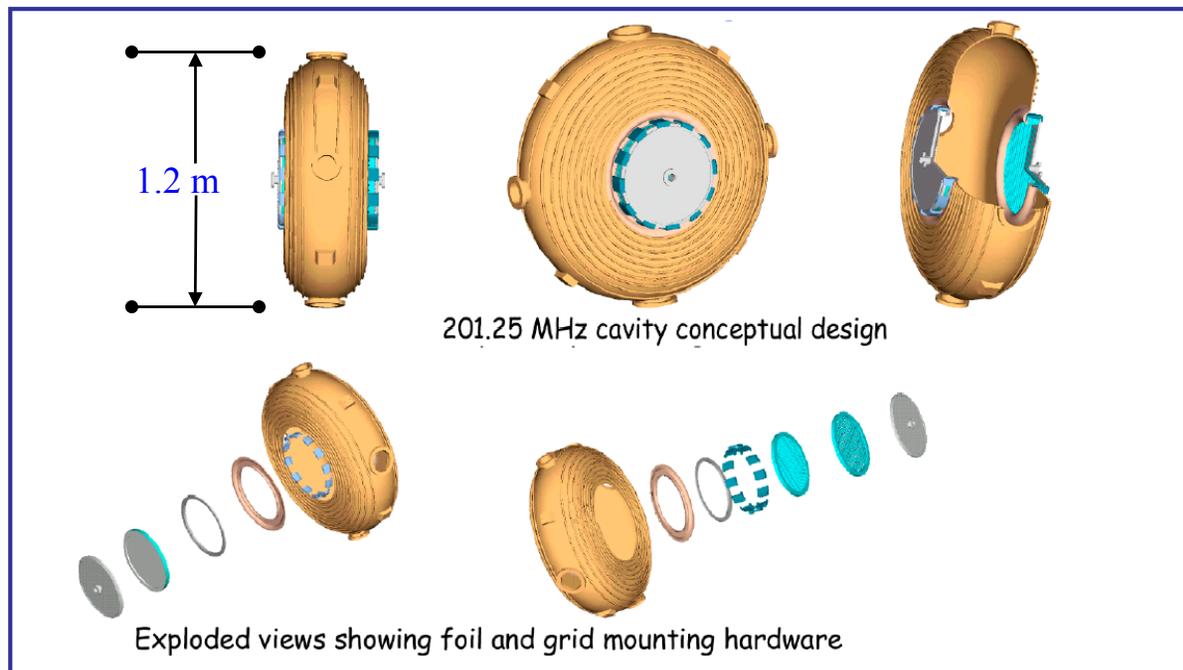
- First work in MTA to be test fill of LH₂ absorber (convective) that has been developed by our Japanese collaborators (KEK/Osaka)



MTA Plans This Coming Year

- In FY04

- ◆ Provide 201 & 805 MHz capability for MTA
- ◆ Provide as much of the cryo infrastructure as funding allows
- ◆ Bring first 201 MHz cavity to MTA for test
- ◆ Possibly move Lab G magnet to MTA for test with cavity
- ◆ Detailed beam line design, shielding assessment, and costing



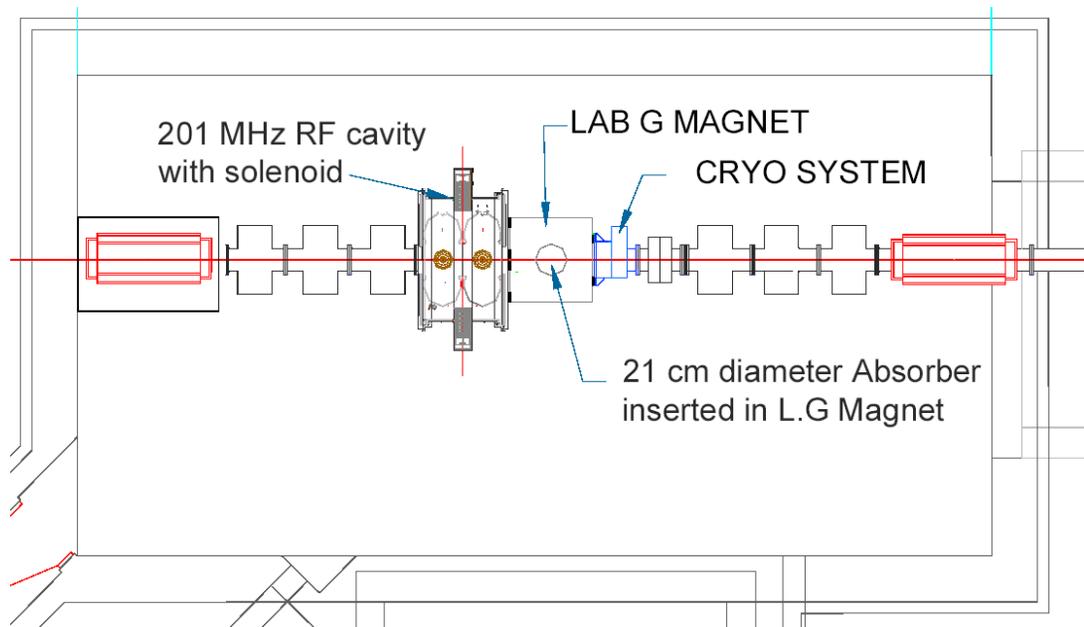


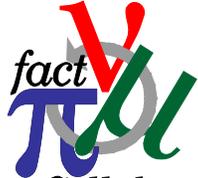
MTA Longer Term Plans

- In FY05
 - ◆ Complete MTA cryo (if needed)
 - ◆ Begin installation of 400 MeV beam line from Linac
 - ▲ This will depend on funding and the results of the full engineering design and shielding assessment
 - Current cost estimate for beam line components, associated hardware and installation is approximately \$700k
 - Additional shielding work will also be required at this time
- In FY06
 - ◆ Bring high intensity beam to MTA
 - ▲ Test complete set of cooling components in high intensity beam

MuCool and MICE

- Muon Ionization Cooling Experiment (MICE)
 - ◆ Demonstration of "Study II" cooling channel concept
- MuCool Collaboration interface to MICE
 - ◆ Detailed engineering
 - ▲ Full component design
 - ▲ Systems integration
 - ▲ Safety
 - ◆ RF cavity development, fabrication, and test
 - ◆ Absorber development, fabrication, and test
 - ◆ Development of beam line instrumentation
- High-intensity Beam Tests





MTA Long Term Program

- The MTA will provide a **UNIQUE** facility for testing accelerator and beam line components at very-high beam intensity and for beam characterization and physics studies
 - ◆ **RF**
 - ▲ Both Normal and SC
 - Beam based cavity impedance and wake field measurements
 - ▲ High Pressure H filled cavities operating at 77K
 - Outside User - Muon's Inc (DOE CRADA/STTR)
 - Would like to use MTA beam in FY 2005
 - Can supply some resources
 - ▲ Cryogenic Pulse Compressors
 - ◆ **Beam line instrumentation**
 - ▲ Beam Profile monitors (TeV IPM)
 - ▲ Beam Position monitors
 - ▲ Laser-driven bunch length measurement
 - ◆ **Kickers**
 - ◆ **Beam Physics (LANL, RAL, Univ. of New Mexico)**
 - ▲ Absolute momentum and momentum spread
 - Laser excited resonance technique
 - ▲ Beam loss mechanisms in H⁻ foil stripping
 - ◆ **Health and Medical Physics studies (LBNL, Loma Linda, Mass Gen UWis)**