

# Fermilab 21cm Morocco Site Evaluation Status

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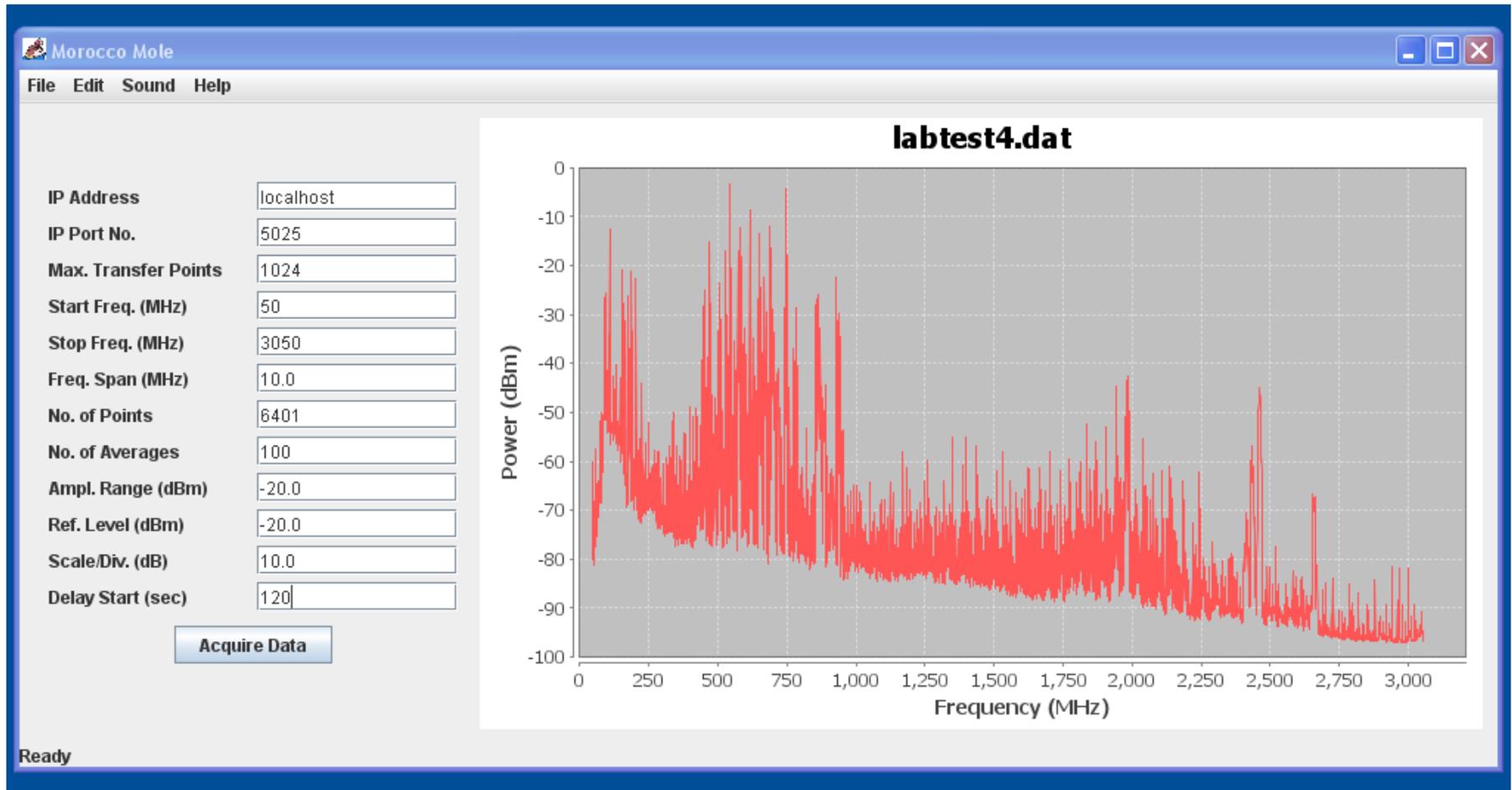
# Setup Components

- Antennas
  - Broadband Discone antenna (150-1300 MHz)
  - Log Periodic Antenna (150-1500 MHz)
  - PC board log periodics 0.9-2.0 GHz, 2-10 GHz
  - Telescoping mast up to 5 meters in height with portable stand
  - 30 meters of flexible heliax coaxial cable
- Amplifiers
  - <1dB NF
  - >40dB Gain
  - 500-1000 MHz, 1-2 GHz, 2-4 GHz
  - 15V and 4.7V power supply and regulators included

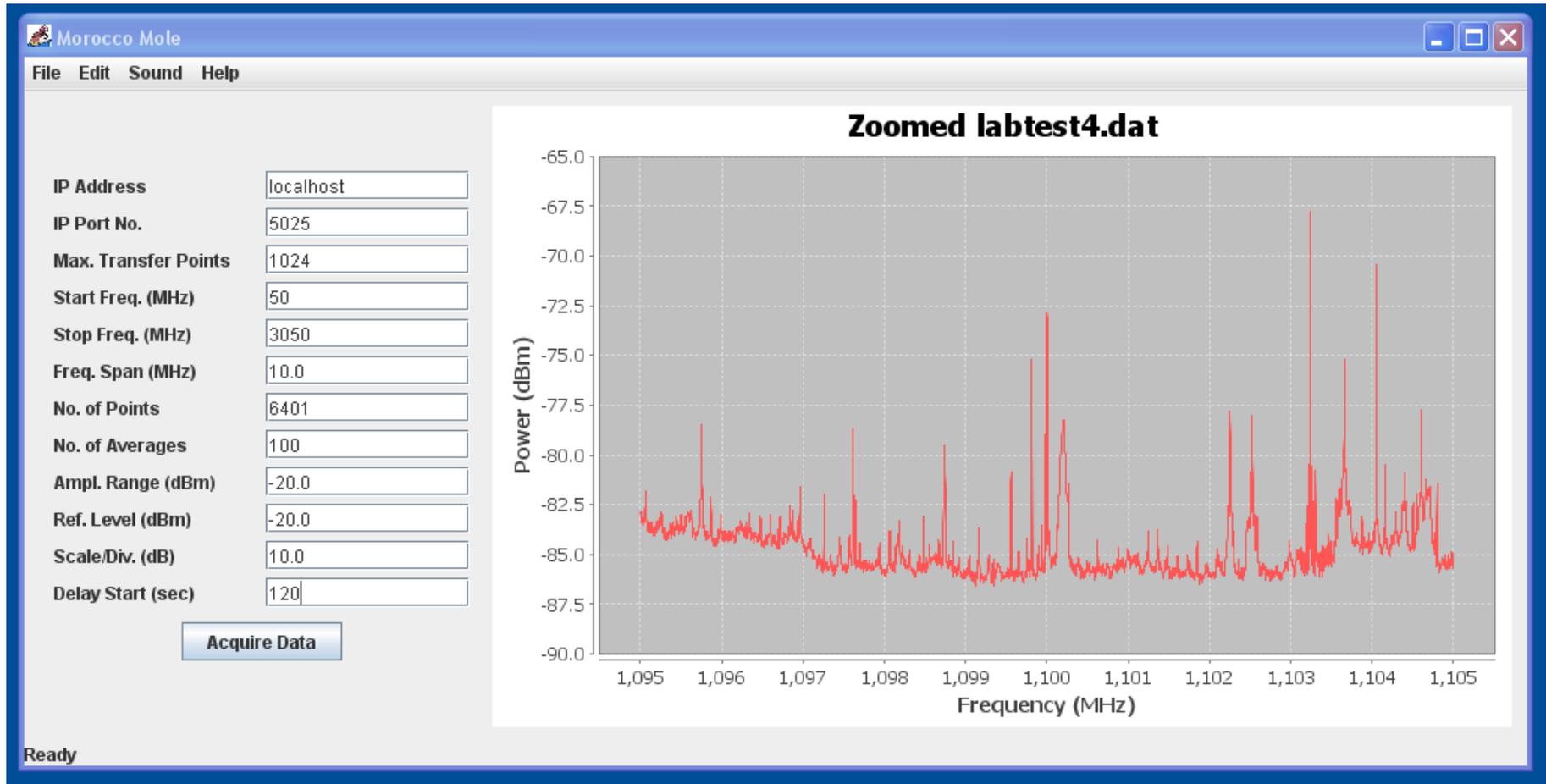
# Setup Components

- Data Acquisition
  - Agilent 9020 MXA signal analyzer with vector signal and swept spectrum analysis
  - On board data Acquisition program
  - Program features
    - Audio status, Graphical Status, Peak hold large sweep display, zoomable display
    - Acquisition Rate  $\sim 3$  sec/ GHz-Sweep for a resolution Bandwidth of 6 kHz (need to check this again)
    - 1GHz of bandwidth at 6 kHz resolution bandwidth requires 640kB of storage. (MXA has over 10GB of spare storage space)

# Agilent MXA On-board Data Acquisition Program



# Agilent MXA On-board Data Acquisition Program



# Power Source

- Honda 4 cycle gasoline power generator
  - Can supply 900Watts of Power
  - MXA and amplifiers consume < 180Watts of Power
  - 8 hours of operation at 200 Watts require 2 liters of gasoline (need to test this)

# RFI Shielding

- MXA and Generator will be inside double walled Ronco™ Shield bags
- Power cord between the generator and the MXA consists of RG8 coaxial pair with shields tied together and RFI filter at both ends of the cord.
- Shield bags will be grounded together with low distributed low inductance
- Antenna will be over 30 meters away from power generator
- Amplifier will be mounted on the antenna mast

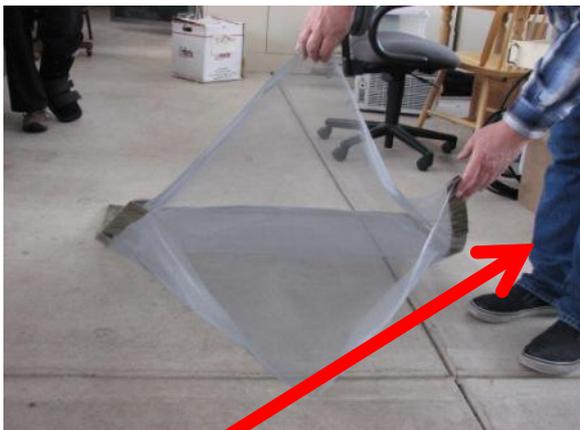
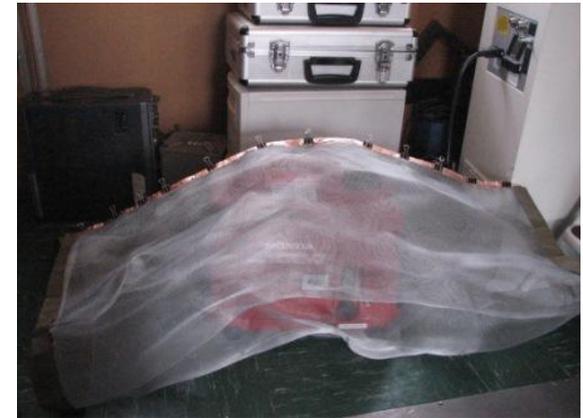
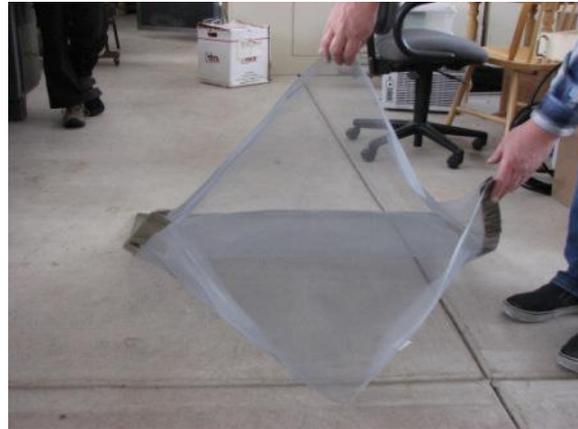
# Gasoline Generator RFI

- Configuration
  - Measurements made inside a screen room
  - Discone antenna connected to a 40dB gain, 1db NF amplifier . Amplifier bandwidth 500 – 1000 MHz bandwidth
  - Antenna placed 1 meter away from generator
  - Made with Agilent Vector signal analyzer with a 10 MHz instantaneous bandwidth, a resolution bandwidth of 6.25 kHz, 1000 averages at three frequencies with low external RFI (476, 727, 1020 MHz)
- Measurements
  - Generator on with no screen bag
  - Generator on with screen bag
  - Generator off with screen bag

# Generator RFI Test



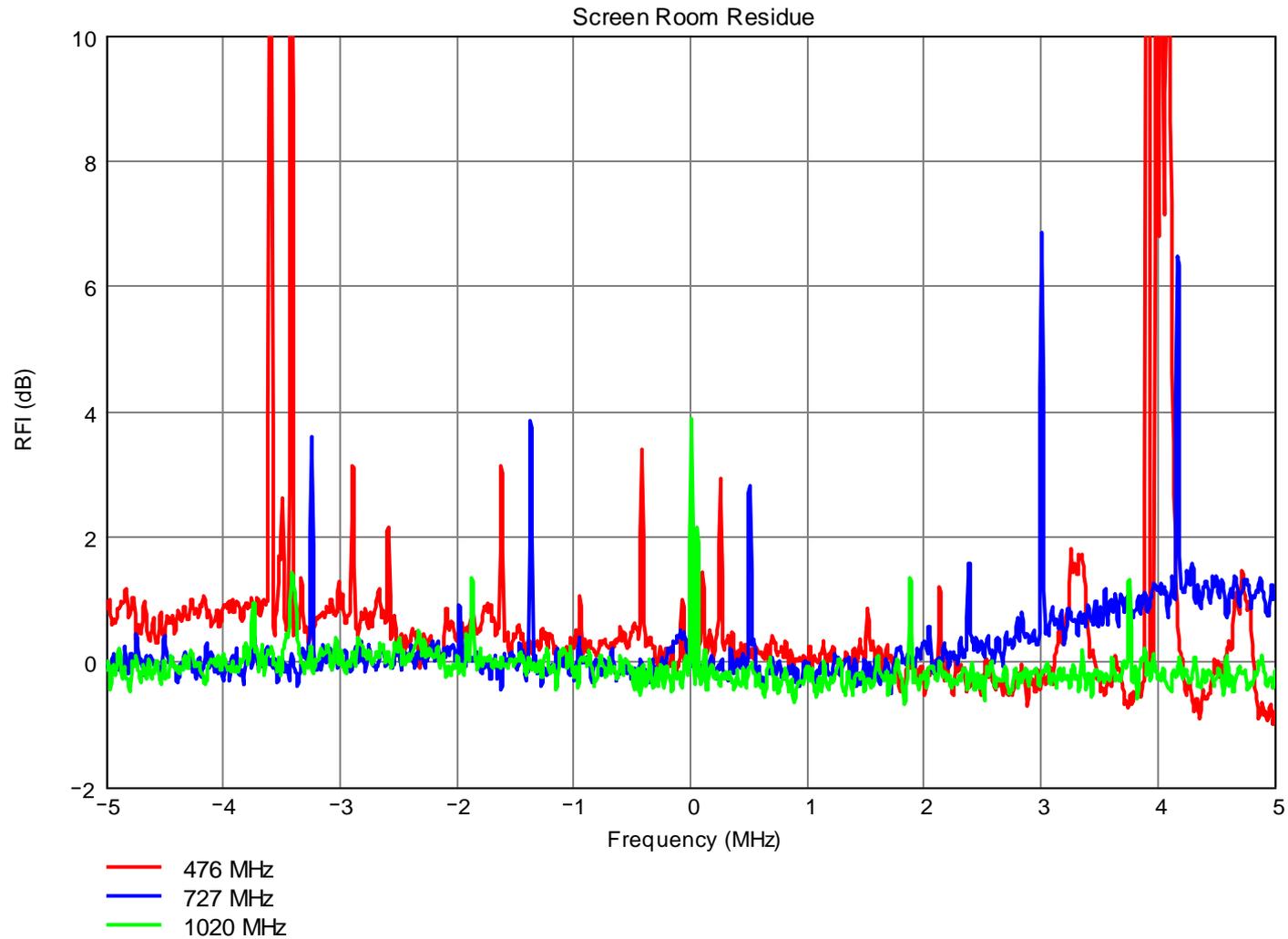
# Ronco Screen Bag\*



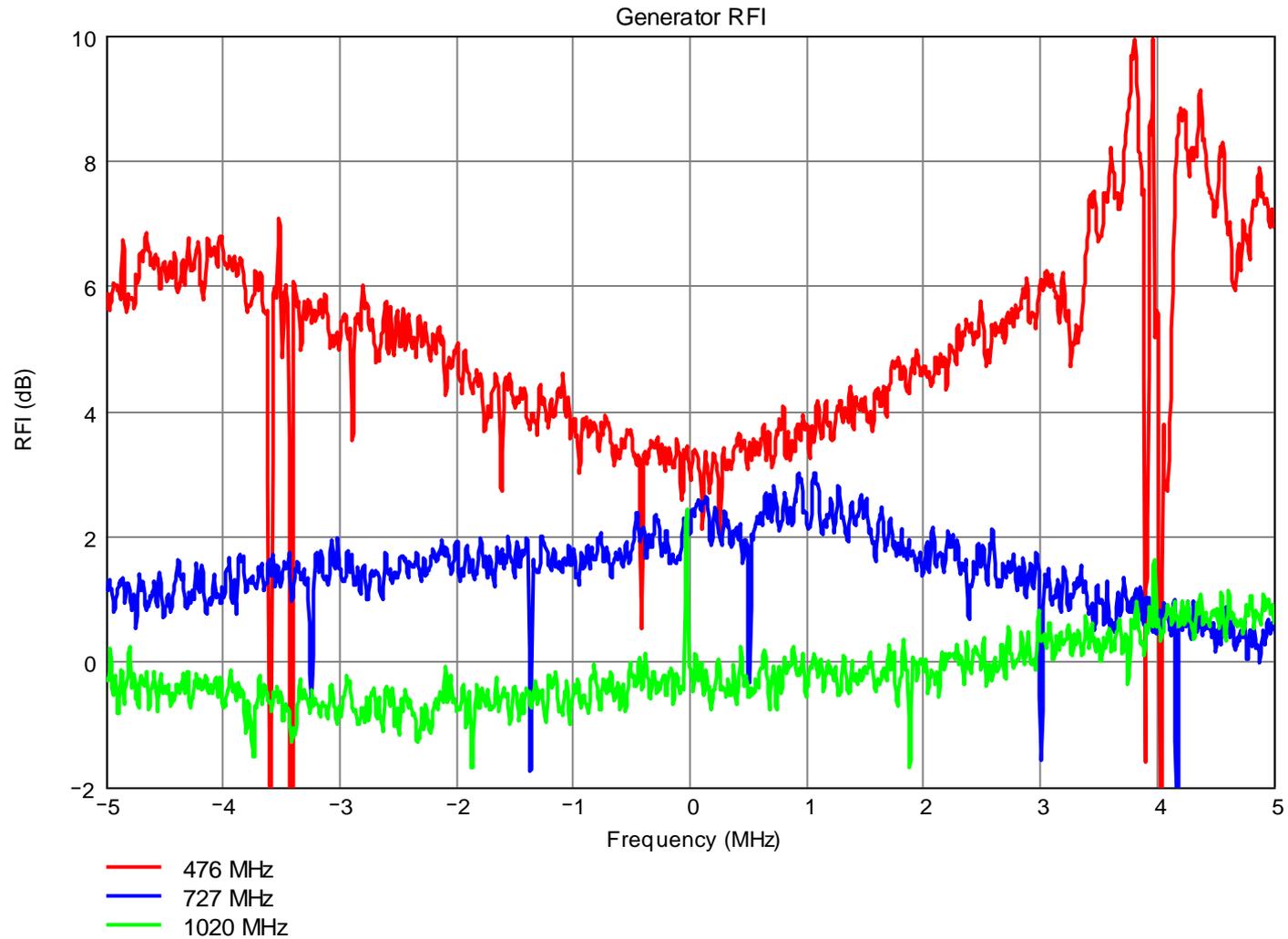
\*Technician not included

If ordered TODAY!

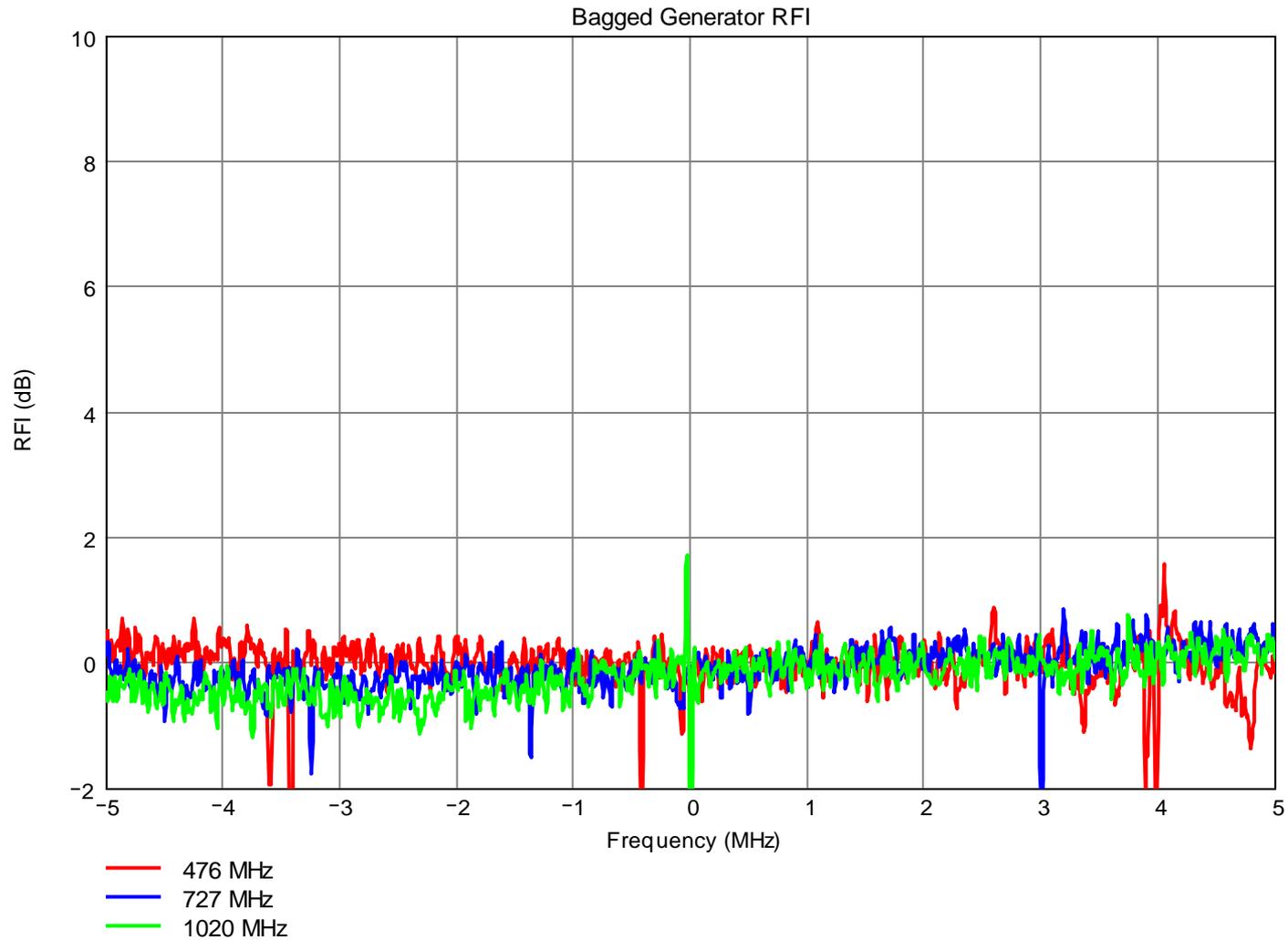
# Screen Room Environment



# Unshielded Generator RFI



# Shielded Generator RFI



# Site Candidates

# Site Candidates



# Candidates



# Site Candidates



# Site 1



# Site 2



# Site 3



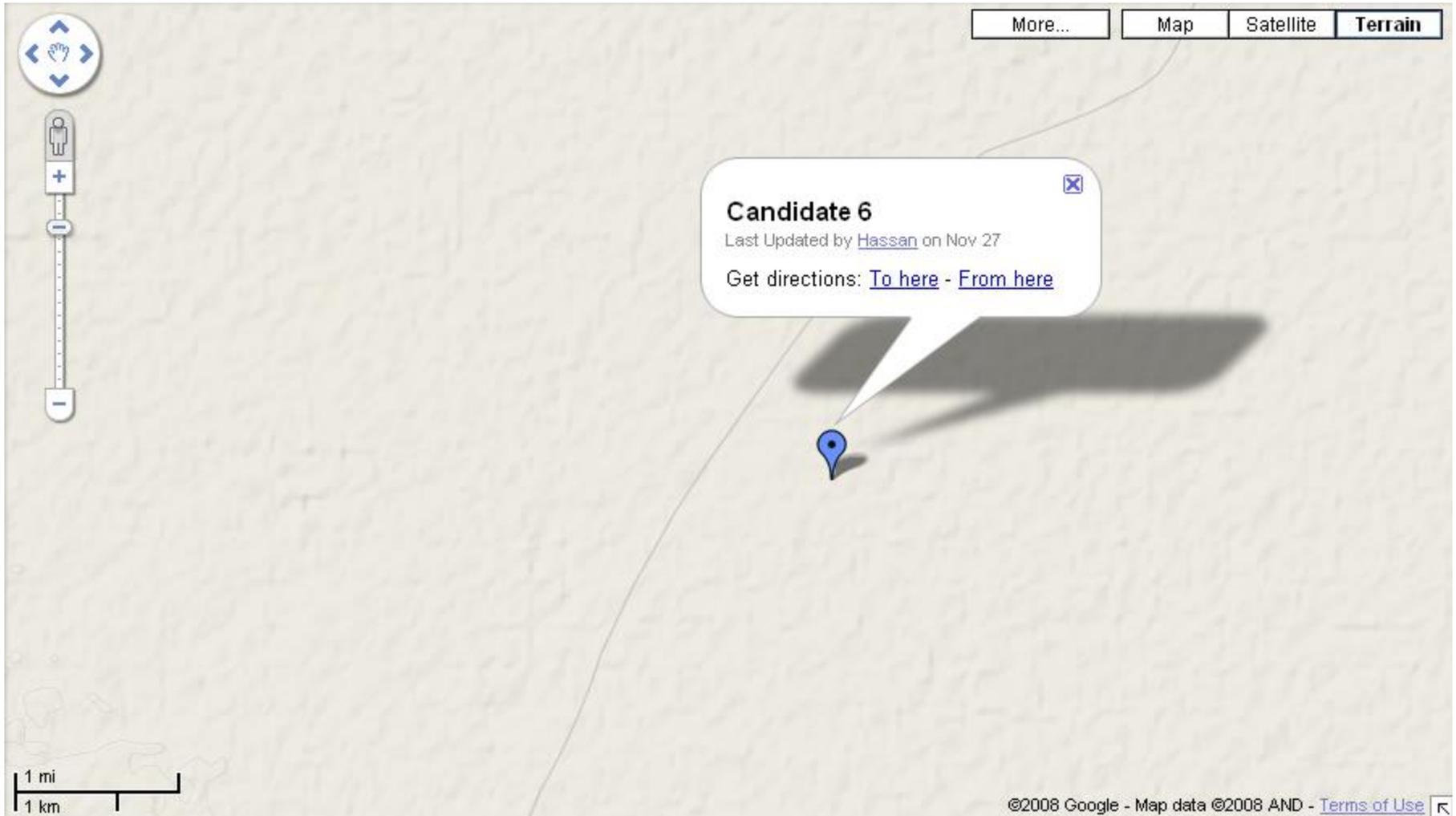
# Site 4



# Site 5



# Site 6



# Site 7



# Site 8

