



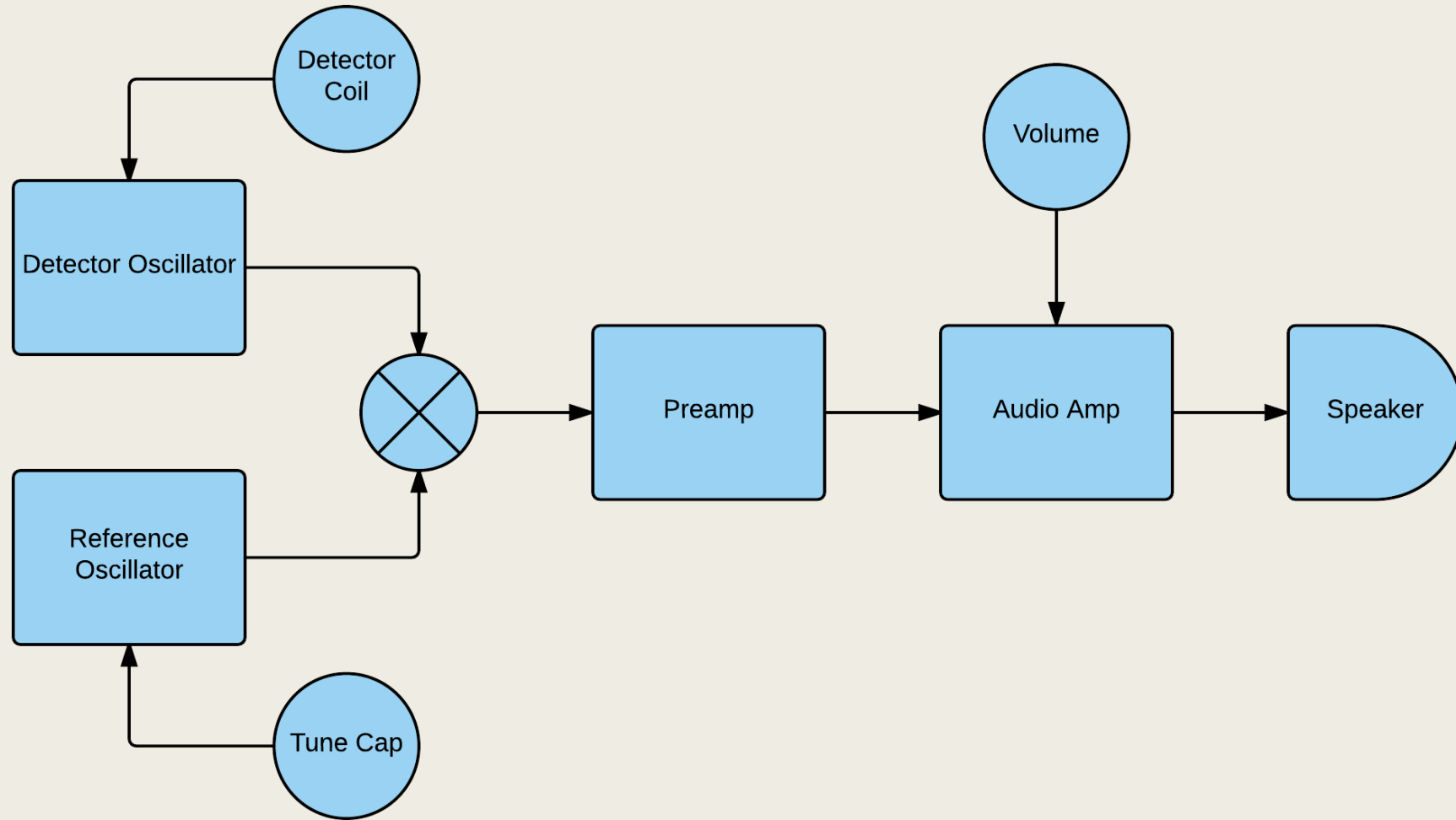
METAL DETECTOR

Ben Avellone
EEE3308 - EC1 Project

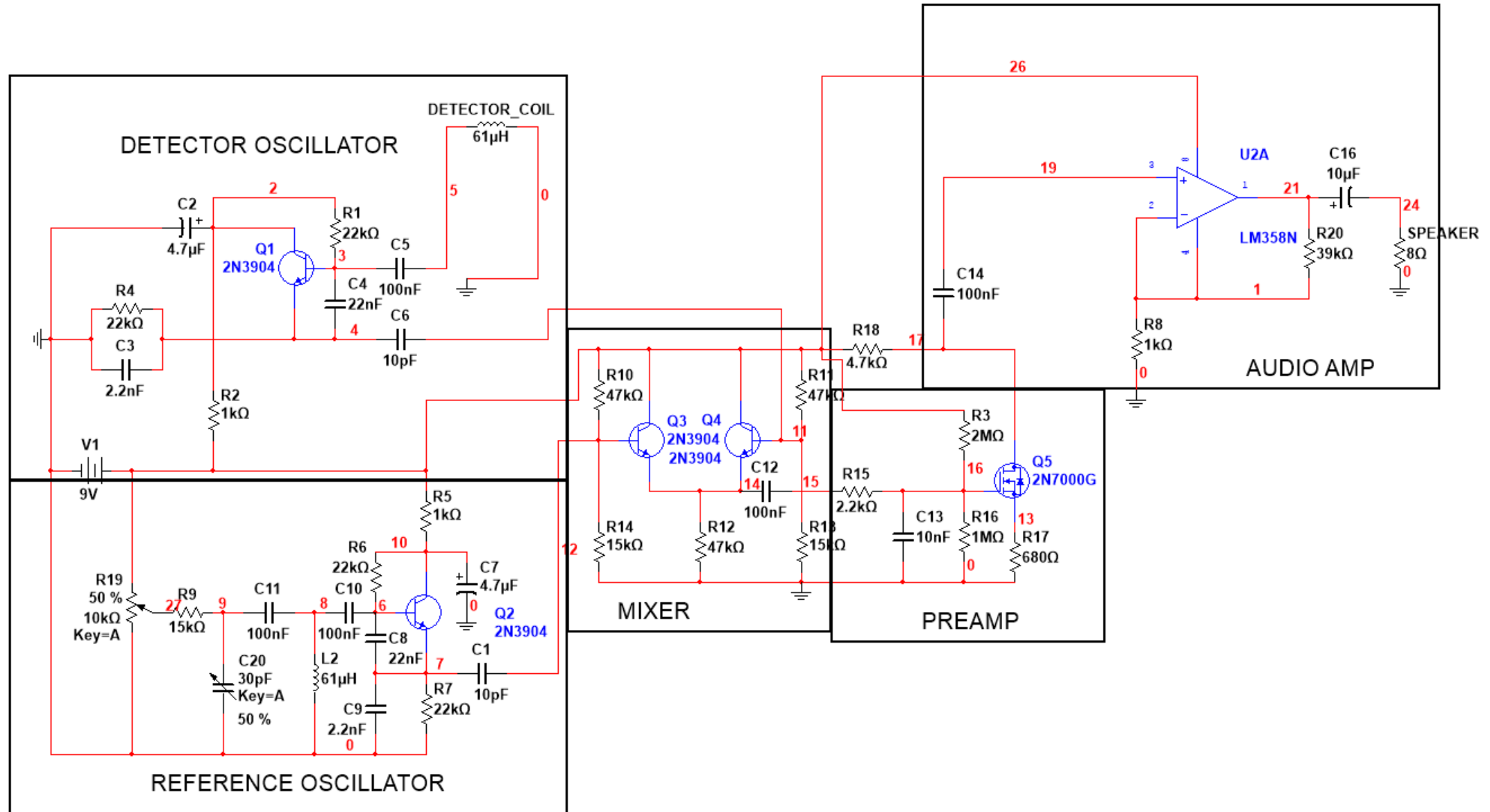
Overview

- Uses two (Colpitts) oscillators with the same resonant frequency
- When metal is placed near the detector coil, the resonant frequency for that oscillator changes
- Both oscillators output to a mixer which itself outputs the difference of the two signals
- Mixer output is fed through amplifiers and then to speaker for auditory feedback

Block Diagram



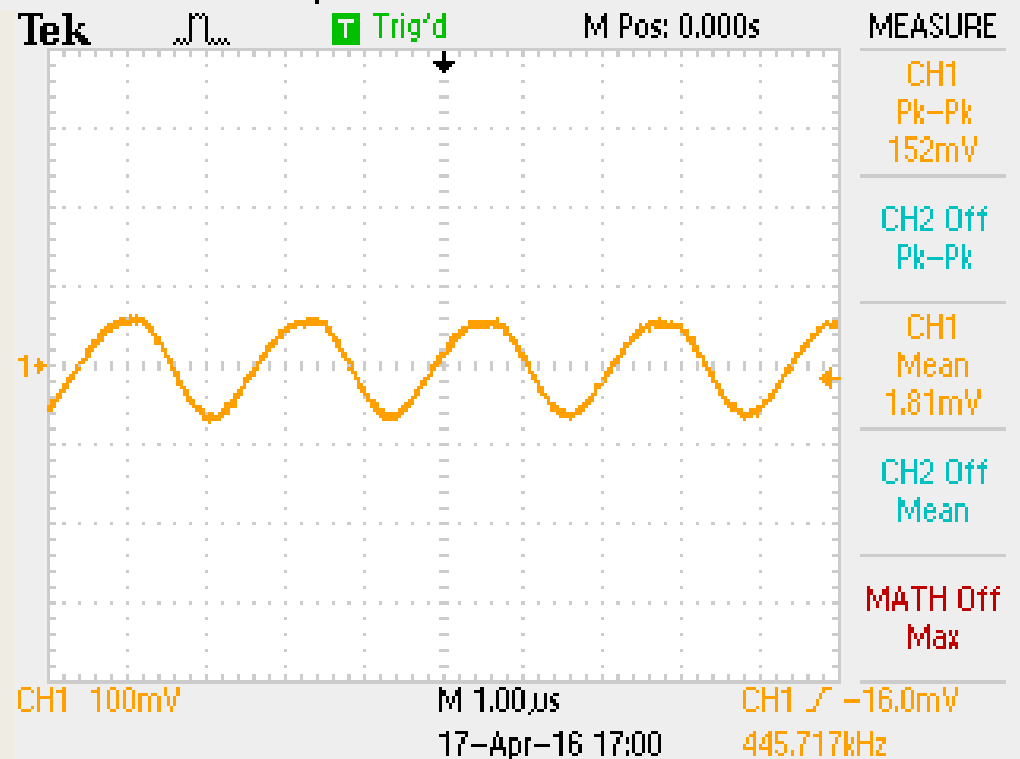
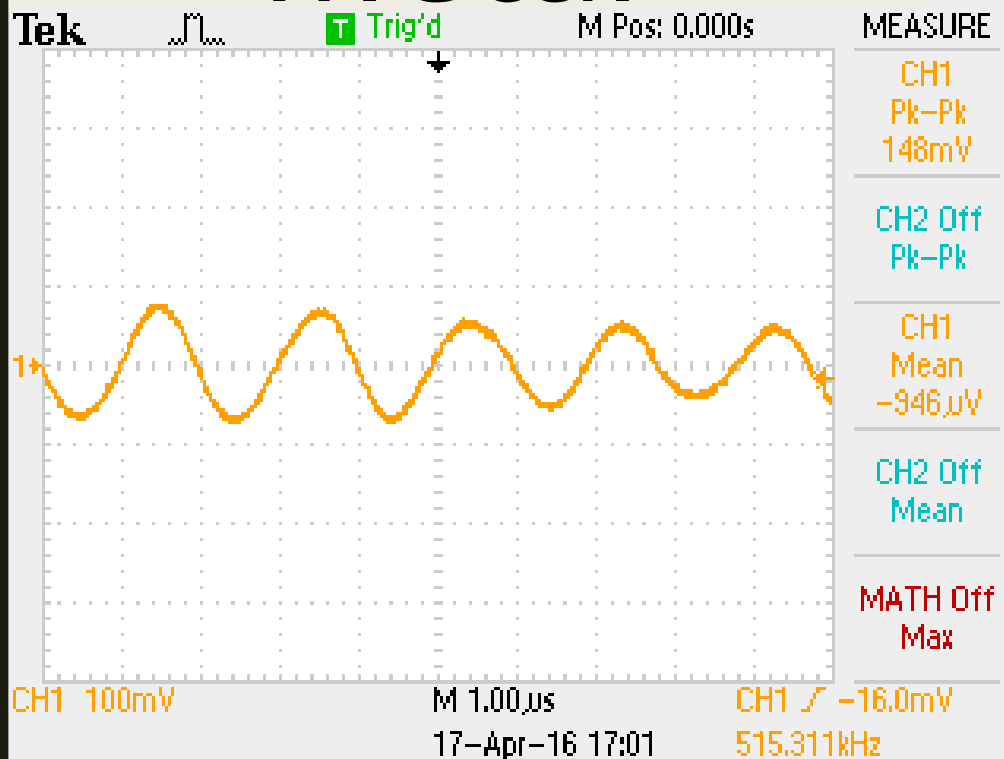
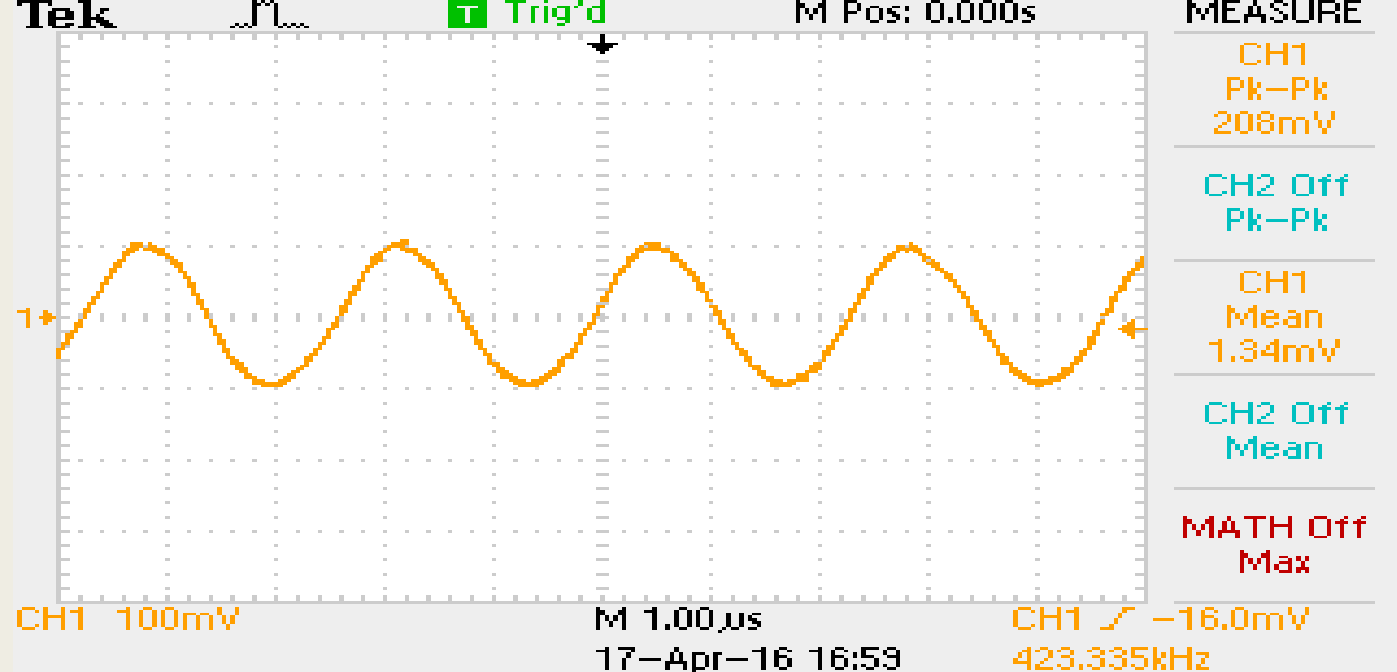
Circuit Design



Detector Coil

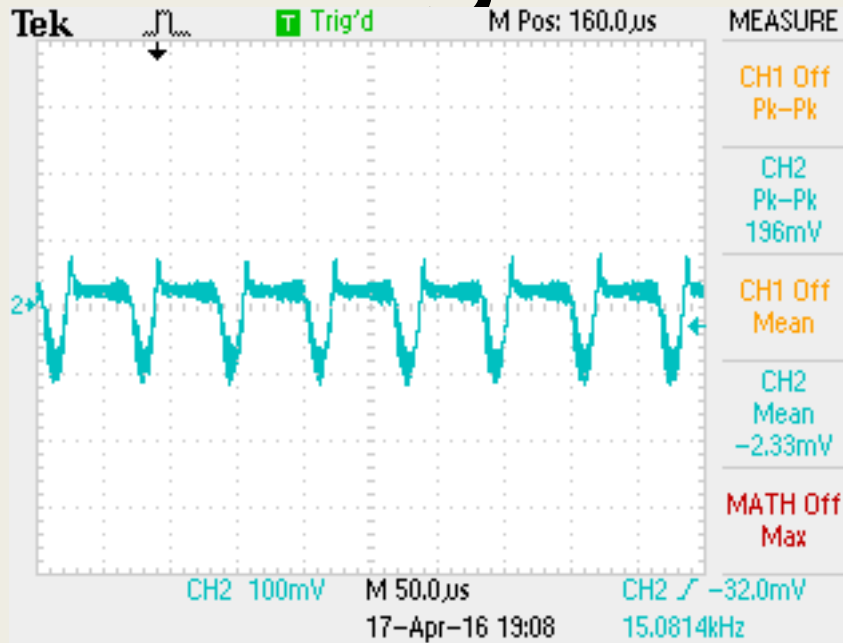
- The search coil detects the presence of metal
 - *When metal is brought near the coil, the inductance changes*
 - *The inductance change causes the resonant frequency to change*
- Circuit outputs to a speaker for auditory feedback
 - *Frequency changes can be heard*
 - *Presence of metal causes auditory changes in output*

Testing Presence of Metal

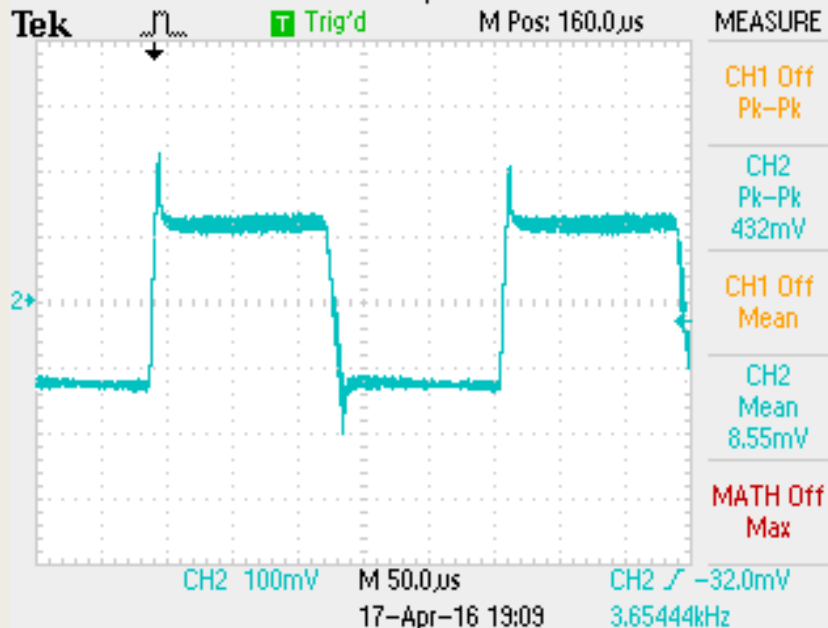


Testing Presence of Metal

With Bolt

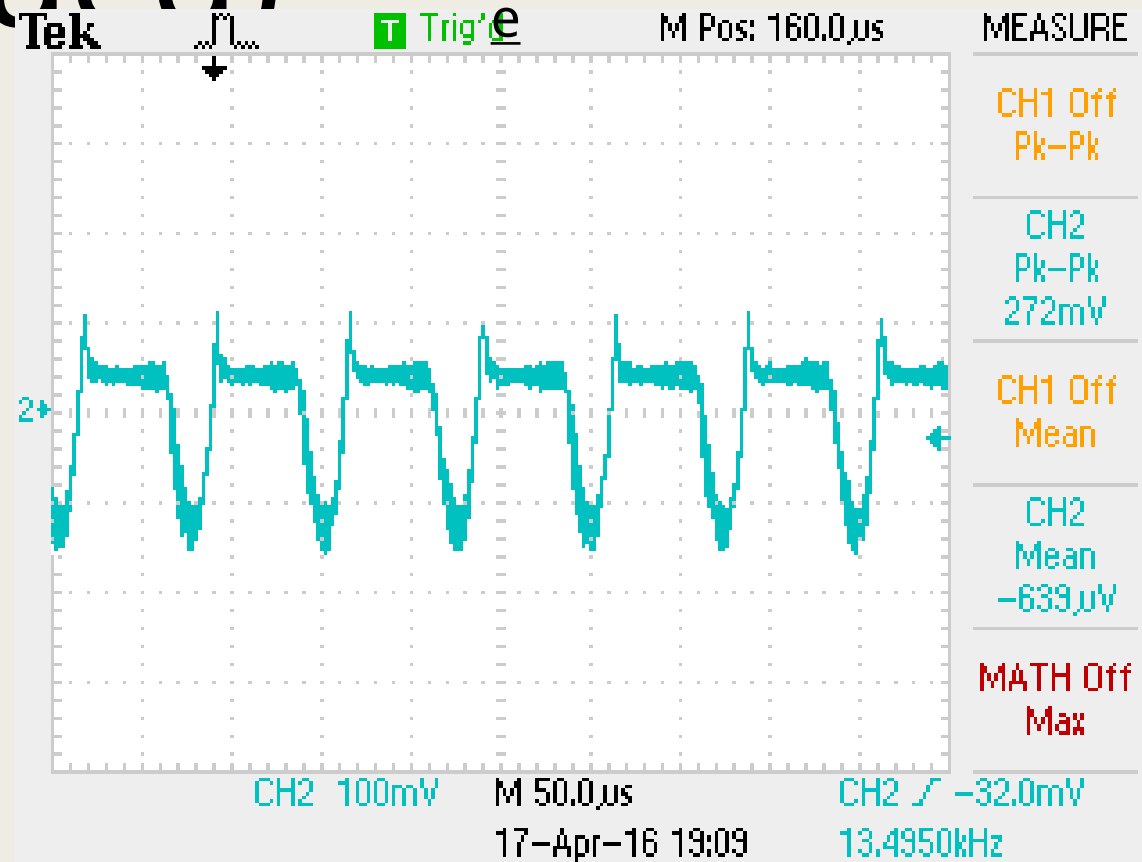


With Coil

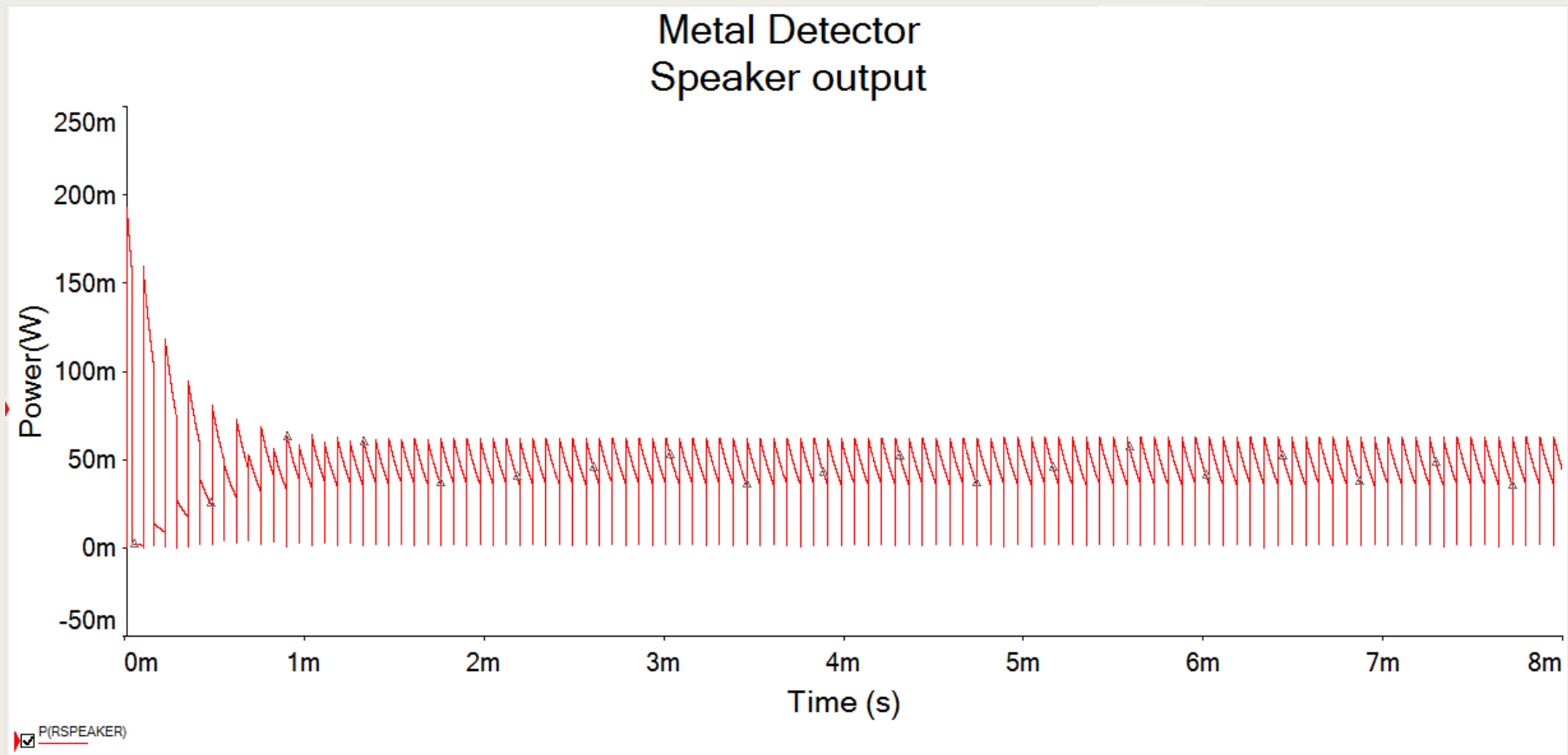


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Baselin



Speaker output



Demo

Questions?