

Methods of Voltage Amplification for Magnetostrictive Energy Harvesters

PRESENTER:
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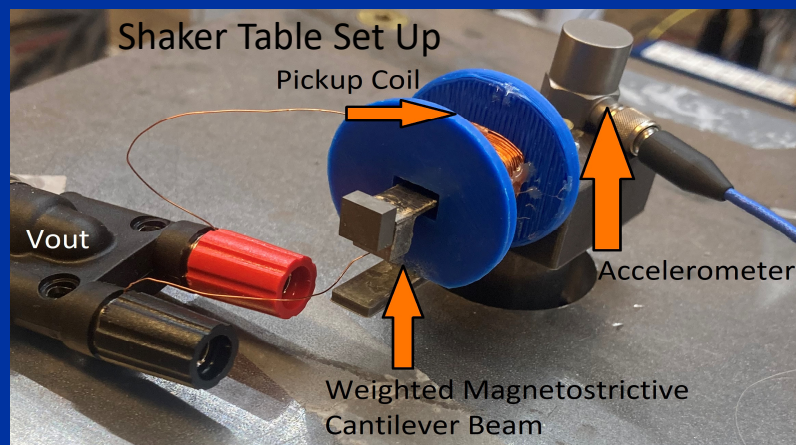
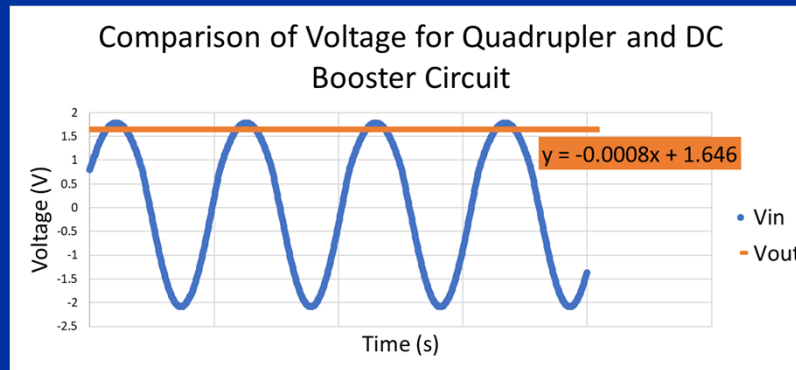
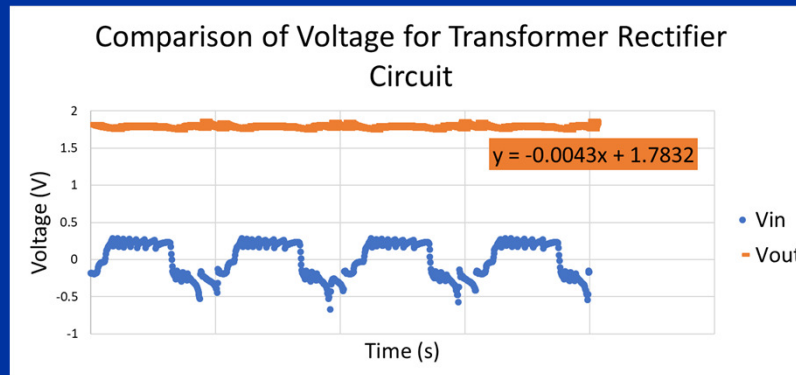
BACKGROUND

Energy Harvesting is the closest humanity can get to free energy. It uses vibrations to create electrical voltage which can supply power to sensors, batteries, and the grid.

METHODS

1. Tens of millivolts AC from pickup coil
2. Try transformer and rectifier chip
3. Transformer impedance too high
4. Try Voltage multiplier and DC Booster
5. Diode voltage drop too high.

Magnetostrictive Harvesters must be large to be effective.

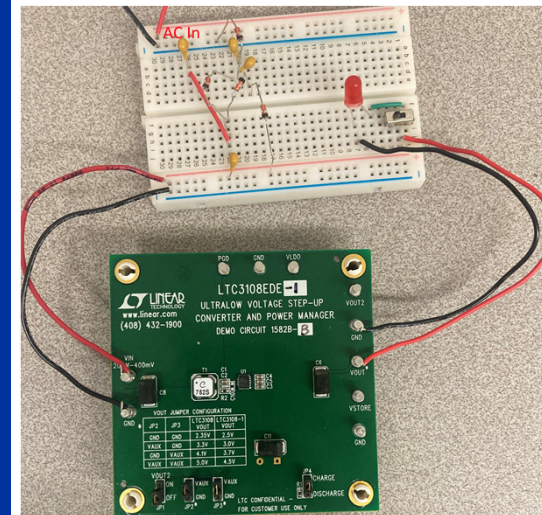


Additional Information

- Loading the output with a 2V LED significantly increased the required input voltage
- One amp of current was able to be harvested from the beam on the shaker table without a load
- The multiplier circuit is a Cockcroft Walton generator circuit
- The market rectifier chip requires over a 2V AC input to activate because it was designed for high voltage piezoelectric harvesters

Further Research

- Circuit Improvements
 - Lower voltage drop diodes
 - Lower impedance transformer
- Beam Improvements
 - Longer and thicker beam
 - Larger coil with more turns



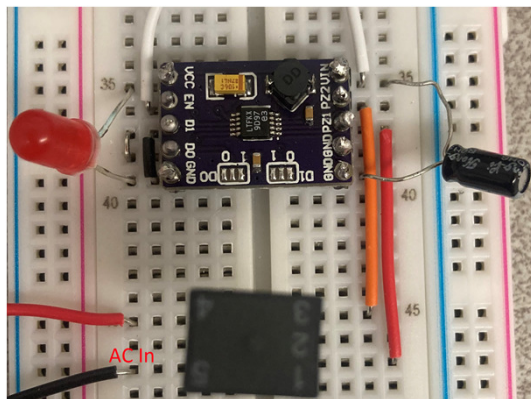
Multiplier Booster Circuit

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Transformer Rectifier Circuit

CONCLUSIONS

Though useful DC voltage was unable to be obtained when powered through the current beam and pickup coil, a 2V LED was able to be lit using a function generator at input voltages achievable with larger beams and coils.