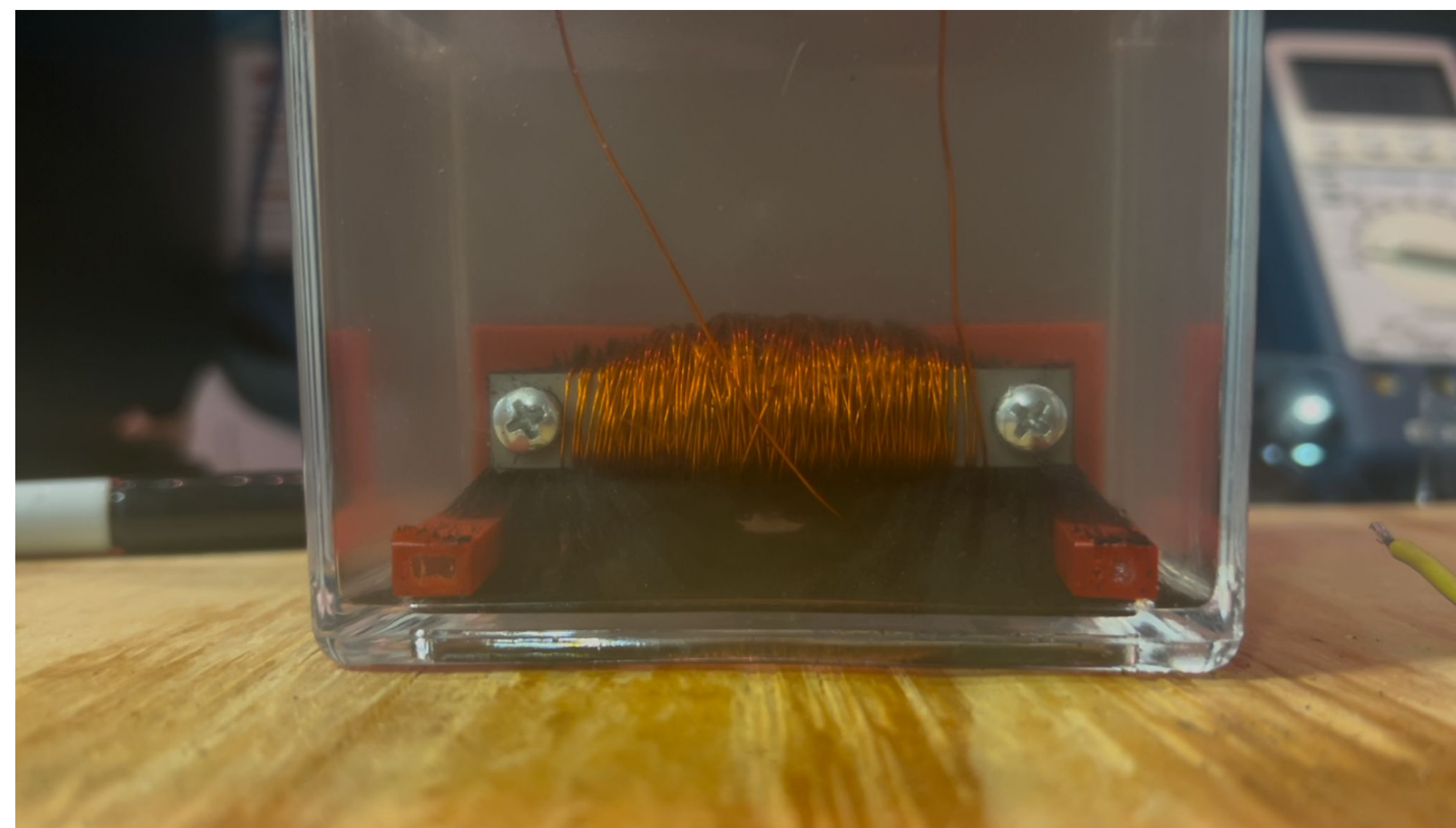


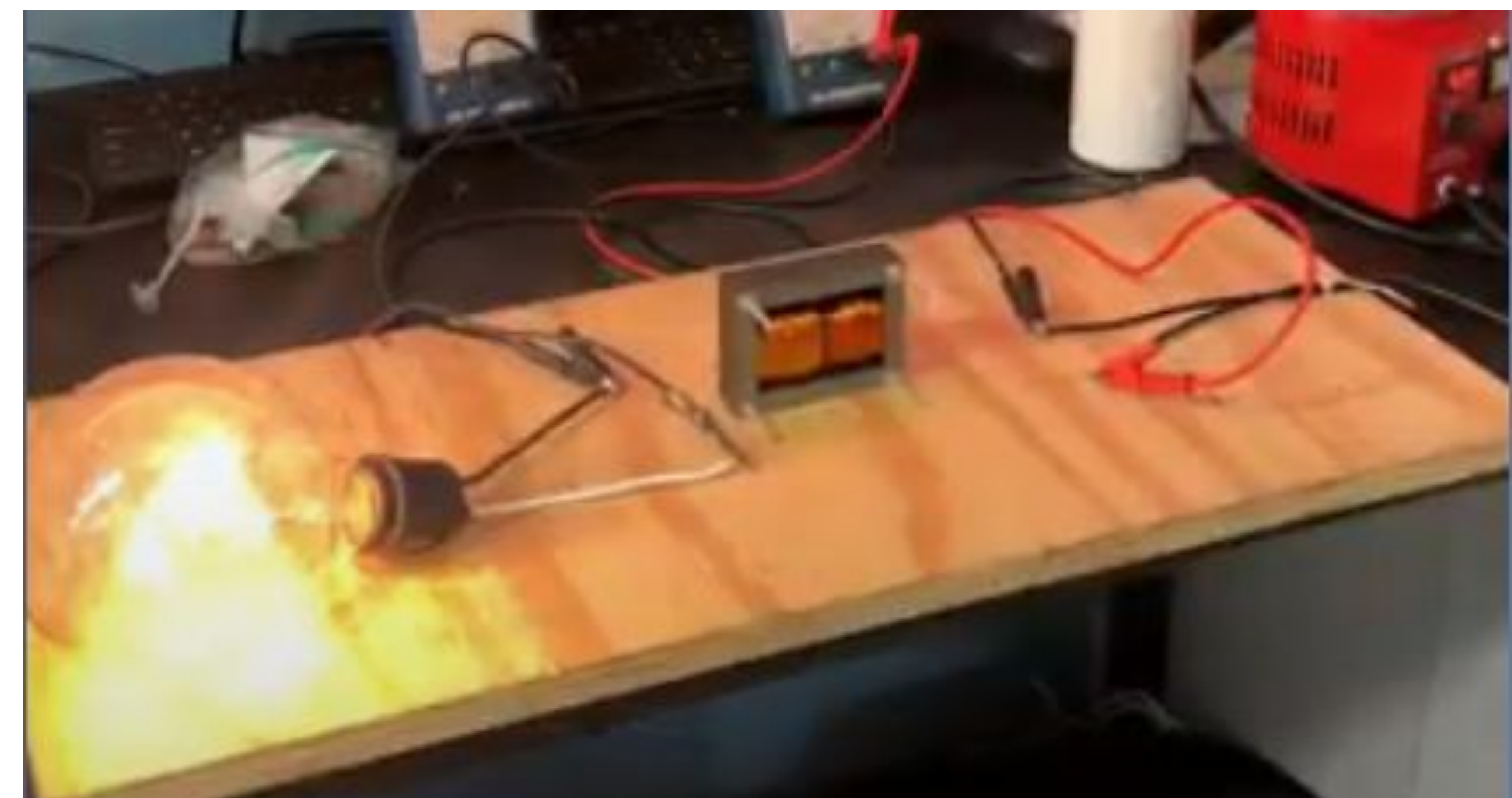
Team 47 - Powertronics

The Power Transformer and Its Role in Demonstrating Power Electronics for Educational Purposes



Electromagnetic Field Demonstration

The purpose of this demonstration was to visually display the magnetic fields produced by an electromagnet in a three dimensional way. This was accomplished with some silicon steel sheets, mineral oil, a tub, some magnetic wire, and iron shavings. As shown in the image above the iron shavings attract to the field of the electromagnet when it is energized, forming a concentric circle (the shape of the magnetic field).



Power Transformer Coupling Demonstration

The purpose of developing this demonstration was to visually display the effect of gap reluctance and magnetic field coupling. This was accomplished with two sets of silicon steel E cores, magnetic wire, and a lightbulb. By displacing the secondary side of the transformer, it can be observed that the light bulb dims. Once the secondary side is displaced such that the fields decouple, energy is no longer transferred from the primary to the secondary and the light bulb turns off.