Discovery Space’s Plasma Exhibit: Results

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The project we were tasked with by Discovery Space and Dr. Sven Bilen, our sponsors, was an exhibit that can teach the visitors of Discovery Space about Plasma, attract attention, be safe to handle and easily troubleshooted and fixed.

We came up with a multi-parted exhibit that included a plasma speaker that can play music when it is given an audio signal through an AUX cord. The other part of the project is a Cathode Ray Tube (CRT) which will create a beam of charged particles, this beam can propagate differently when you introduce a magnet to it. While playing music will grab the attention of the people visiting Discovery Space, the learning aspect of how plasma is created might be lost. The CRT will clarify what plasma is made up of and how it interacts with other objects in our life.

The final exhibit was a wooden case with Plexiglass which will protect the museum goers from coming in direct contact with the exhibit, but still interact with it through the included peripherals. Those include a magnet that is brought down, and when that occurs the beam from the CRT is bent. The other is a CD player that feeds music into the speaker, the audio signal will change the intensity of the plasma that is getting discharged this will compress the air around the plasma speaker which will create a soundwave that'll be interpreted as sound by humans.

Lastly, durability and repairability of the project was important for our sponsors, because they would want the exhibit to last for a long time. First, most of the perishable parts of the plasma speaker can be easily found on website that sell electrical components, all of the parts used in the speaker were laid out in a document with the exact specifications. In order to find whether a component is not working there are steps provided to troubleshoot. One of the most perishable parts, the Integrated Circuit (IC) chip was installed on a socket. This means that when the IC stops working you can easily remove it without the need to desolder. Except for the fuses and the IC, all other parts of the project desoldering is a necessity. Provided in the report are needed materials to de/re-soldering components in a circuit board, with a tutorial on how to properly complete the process.