Arcade Game Machine

MANUFACTURING TECHNOLOGY II

Report

A Project by:

Kacper Gluszczak

Harshit Verma

Assumptions

Flip Flop circuit works like a digital blinker. It has two stable states, like how light can be either on or off. It alters its state in response to incoming signals and maintains that state until another signal arrives. In digital systems, flip-flops are used to store and control binary data. They function as digital electronics' building blocks, enabling memory storage and sequential logic in devices such as computers.

We will use a Flip Flop Circuit to build a Blinker. Our Circuit should light up 2 bulbs one by one and repeat the process until the power source is attached to it.

Additive manufacturing, often known as 3D printing, is a method of making objects by layering materials on top of one another. It allows for the fabrication of complicated shapes and structures using digital blueprints, providing variety, customization, and the opportunity for waste reduction in manufacturing processes.

We will use Additive manufacturing (3D Printing) to create a model which will be hollow and contain the Blinker Circuit. We will Cover the Circuit by Laser-Cutting the Plexi Glass into a desired shape to fit in our 3D-Printed Shell.

Electronic circuit

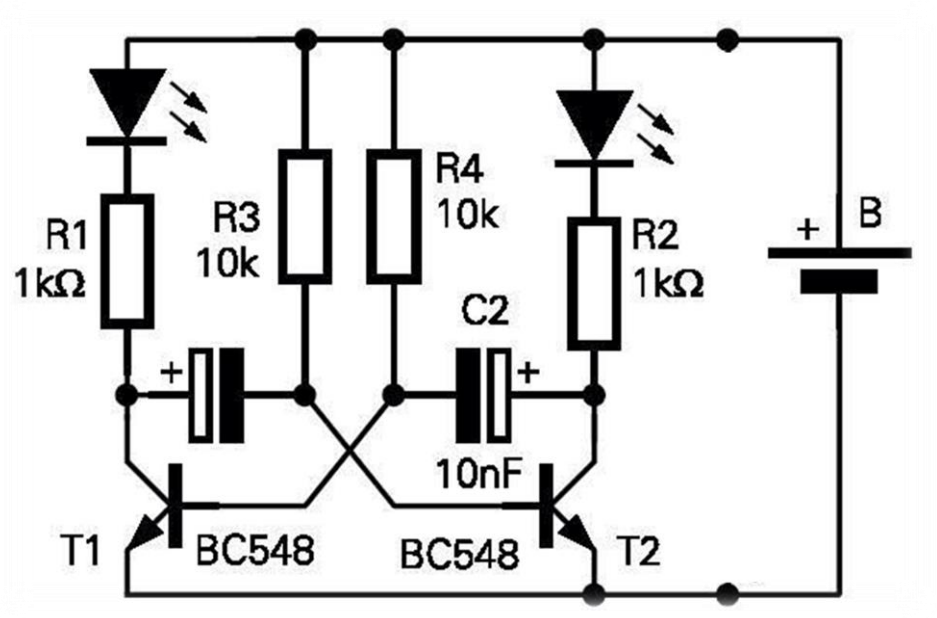

Figure 0-1. Electronic Schematic

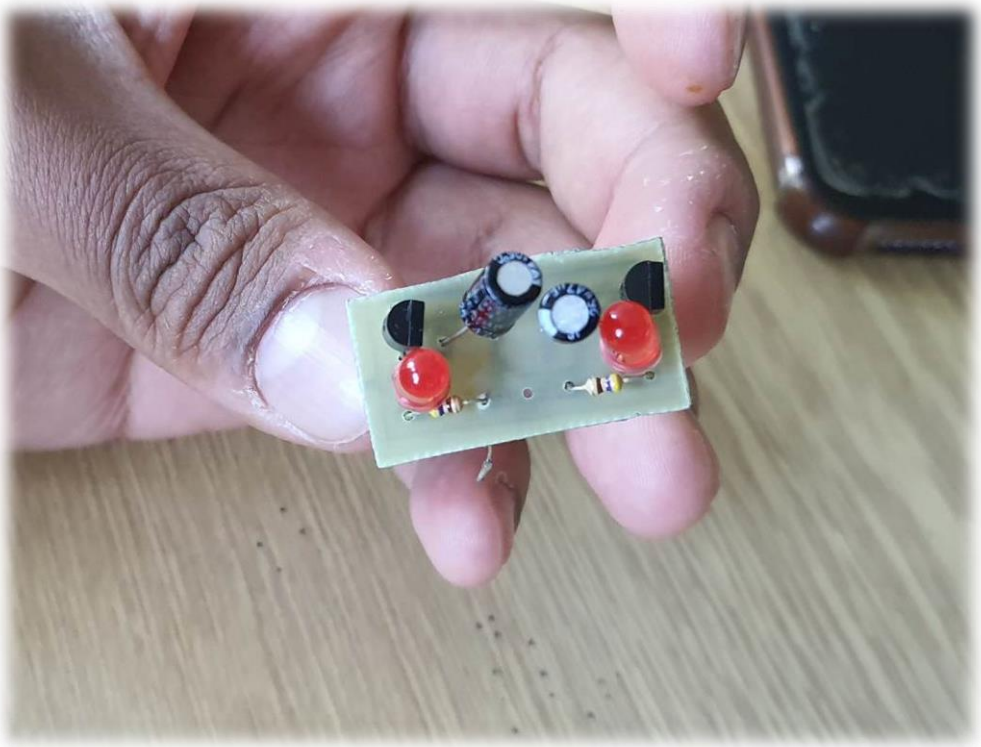

Figure 0-2. PCB Circuit

Casing Design

We decided to create an Arcade Game-themed Blinker. It will be made from two 3D-printed shells that will be superglued together to form the body of the arcade game and plexiglass that will serve as a screen for the arcade game.

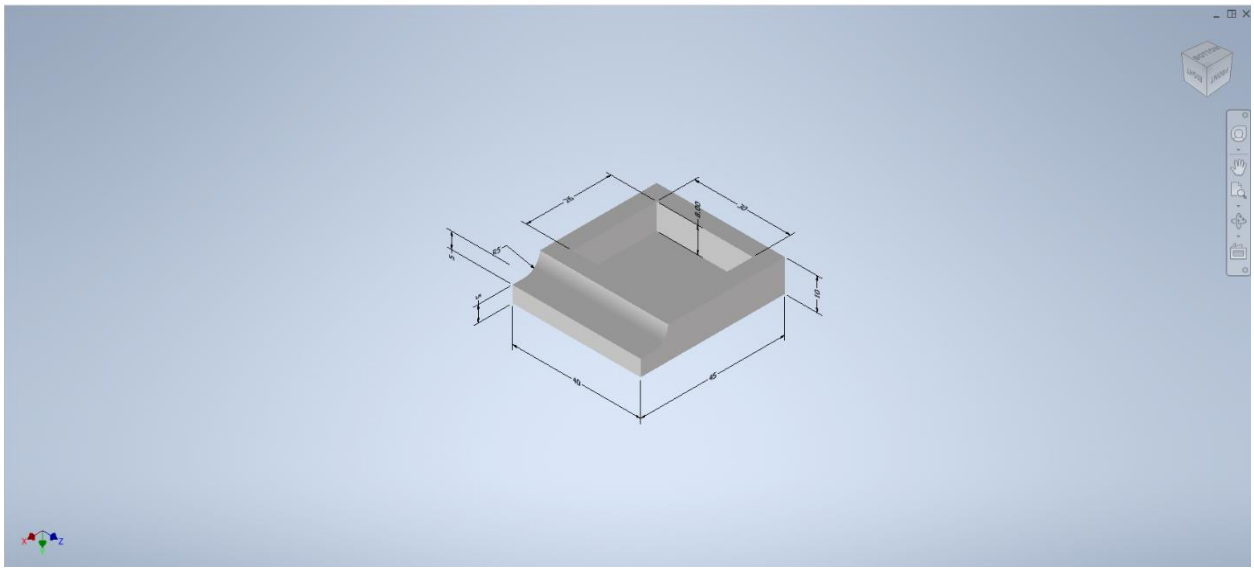

Figure 0-1. Top Half of the Model

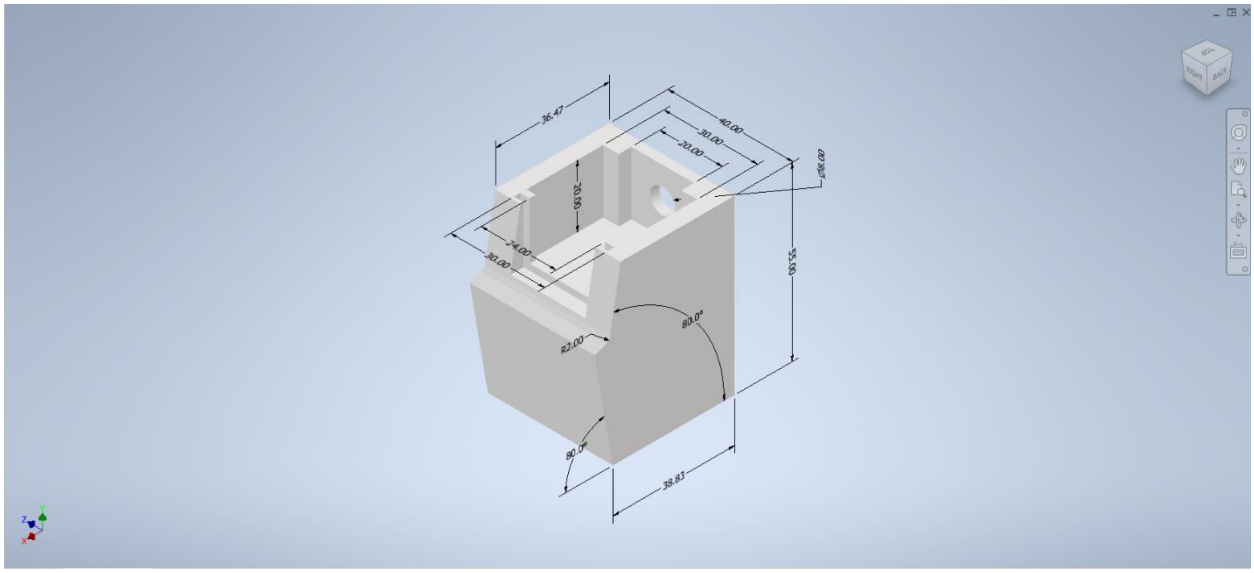

Figure 2. Bottom Half of the Model

Execution

1. We cut the PCB Circuit from the Outlines.
2. We drill holes in the PCB Circuit.
3. Following the Schematic, we solder the Elements to the Circuit.
4. We leave long wires for the batteries to be connected.
5. We Design the Project and generate stl. Files for the same.
6. We provide them for 3D printing at the faculty.
7. We maintain the appropriate conditions for the part to be printed correctly.
8. Also, we cut a Plexi with appropriate dimensions.
9. We Super glue the circuit and the parts together.

Figure 6. Drilling the PCB Circuit

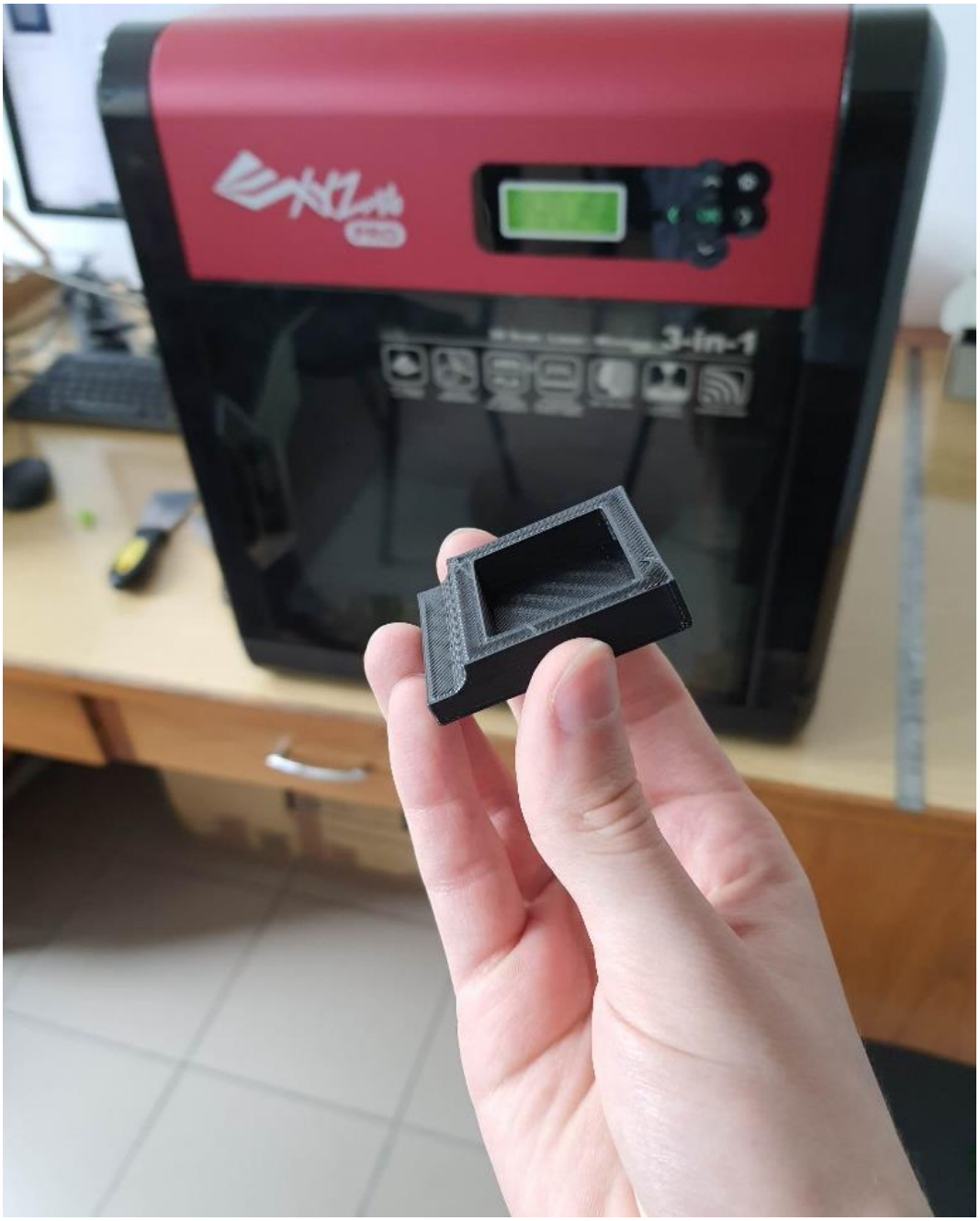

Figure 3. 3D-Printed Top part

Figure 4. 3D-Printed Bottom Part

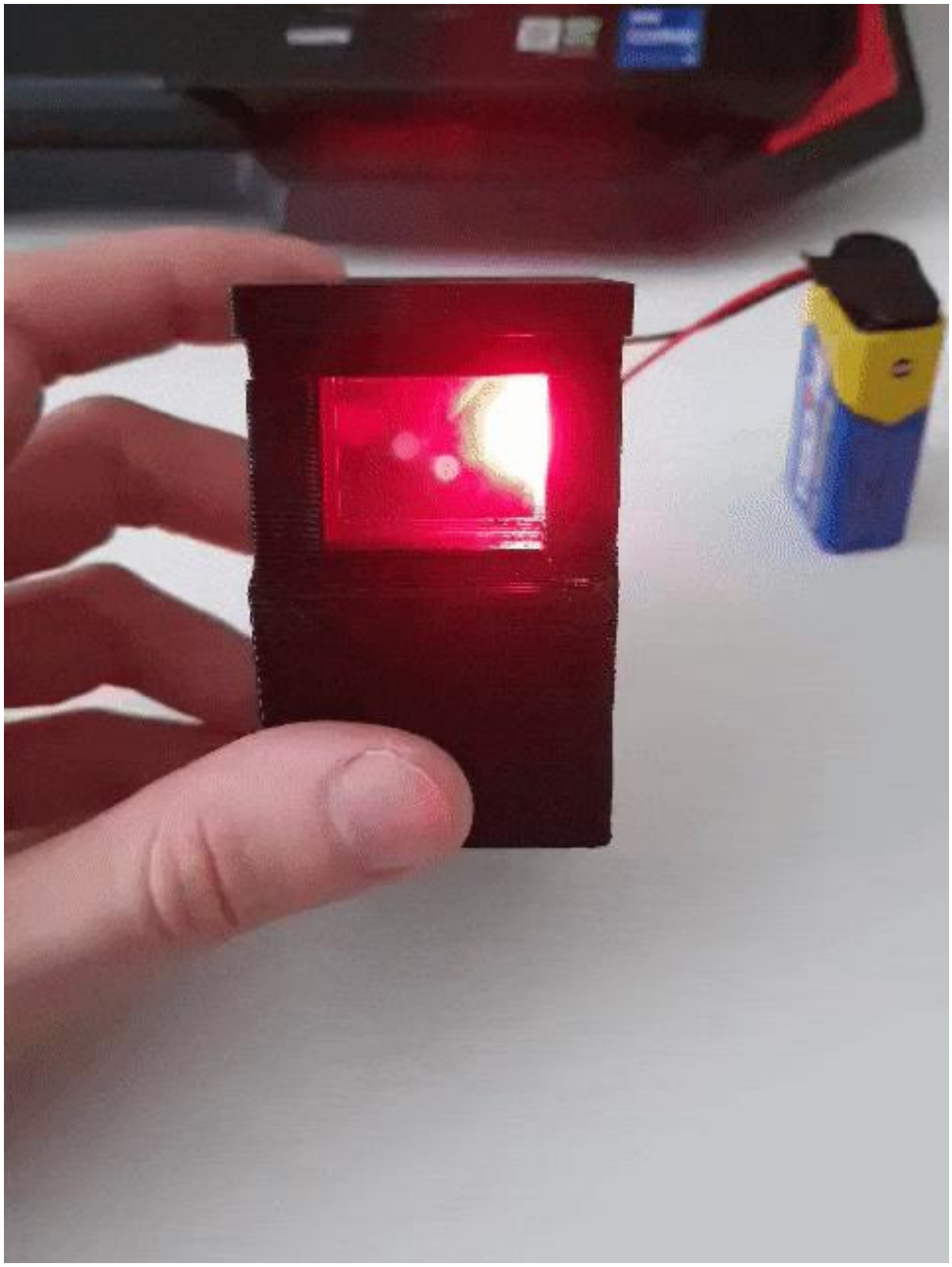

Figure 5. Arcade machine themed Blinker

Conclusions

- To construct an Arcade Game-themed Blinker, the project successfully merged Flip Flop circuits, additive manufacturing (3D printing), and laser cutting.
- By progressively lighting two bulbs, the Flip Flop circuit created the blinking effect. A hollow model was created using additive manufacturing, and an aesthetically pleasing screen was created using laser cutting on plexiglass.
- This project demonstrates the use of many technologies to produce an interactive and visually appealing electronic device.