



WTM Sense

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ESE 205 - Introduction to Engineering Design



DESCRIPTION AND OBJECTIVES

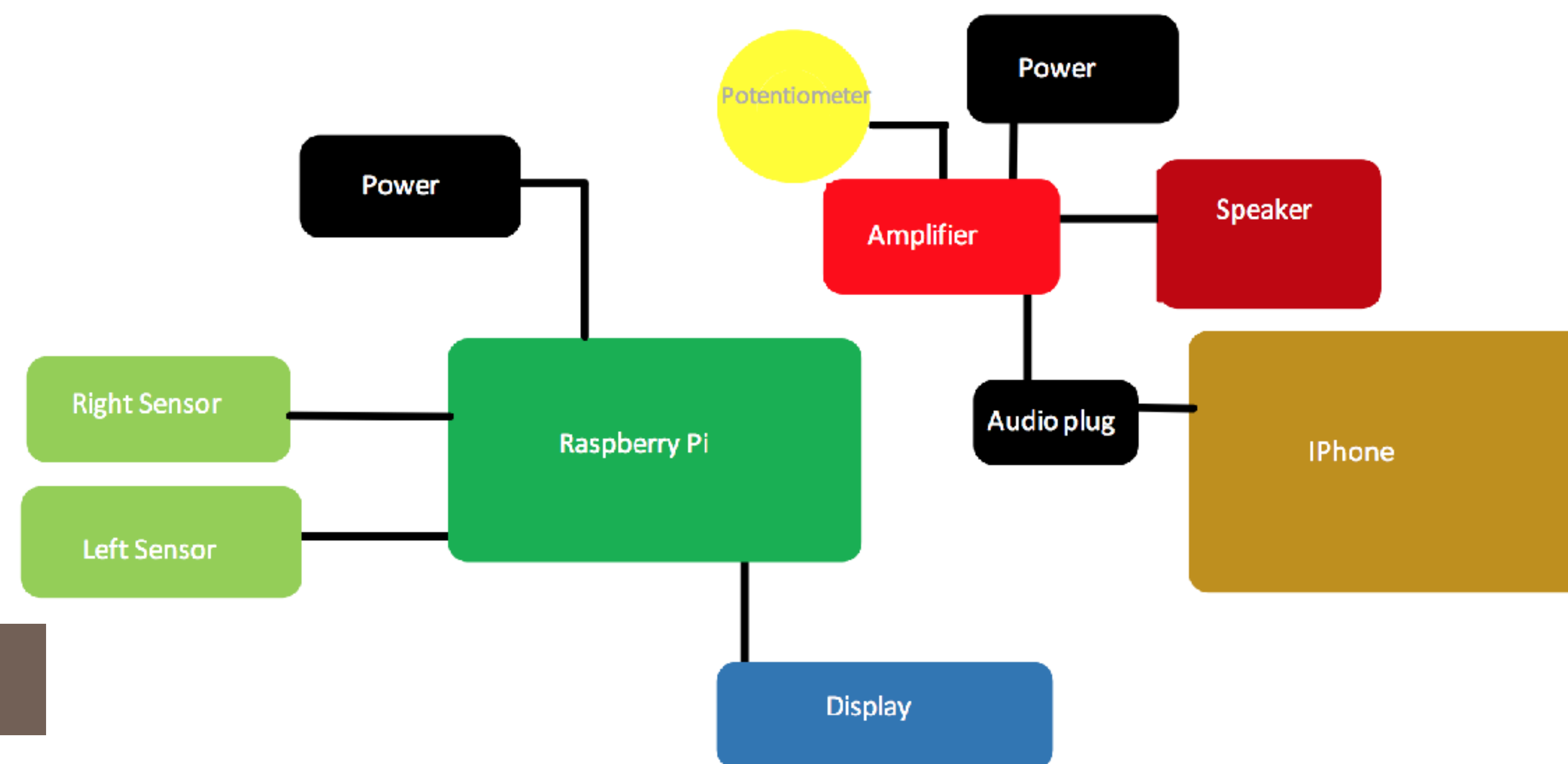
- We designed and constructed a docking station specific for an iPhone6 to amplify music, and show the time and weather.
- Our objective was to create a docking station that would both play music, its basic function, and in addition use two sensors to flip the display between the time and the weather. This easy access to time and especially weather from hovering one's hand over the sensor would be much more simple and quicker than clicking buttons on a phone or computer.
- We spent a total of \$69.89 on our project.

3D DESIGN WITH CIRCUIT INSIDE

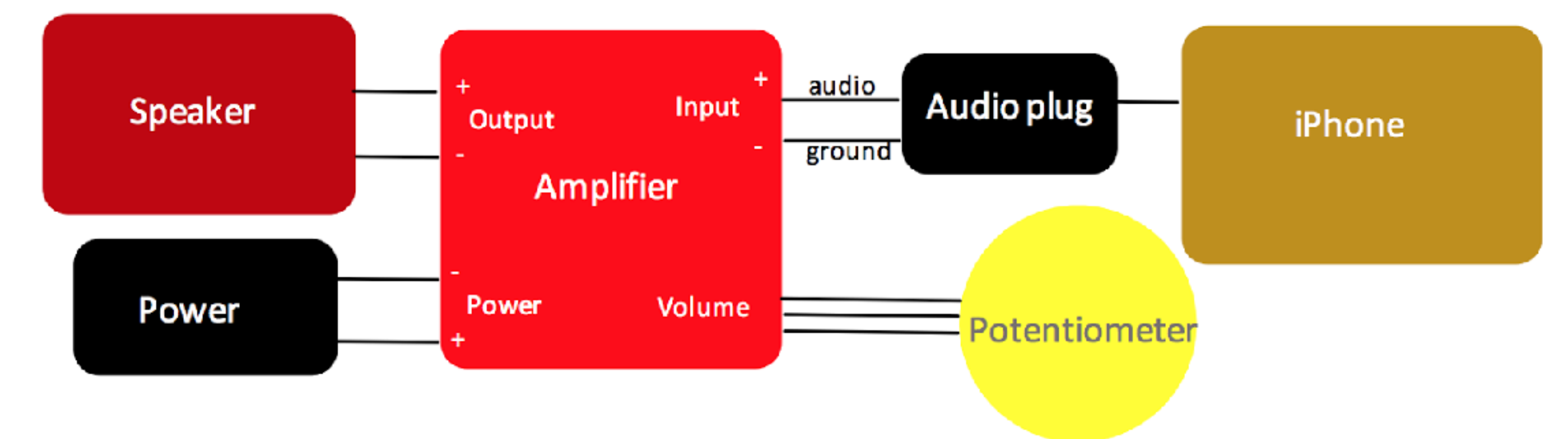
- We designed the case and base of our dock in Fusion 360. We coded our sensors, display, and amplifier on the Raspberry Pi and presented them through an LCD display and speaker, using ultrasonic sensors to control the screen.



CIRCUIT DIAGRAM

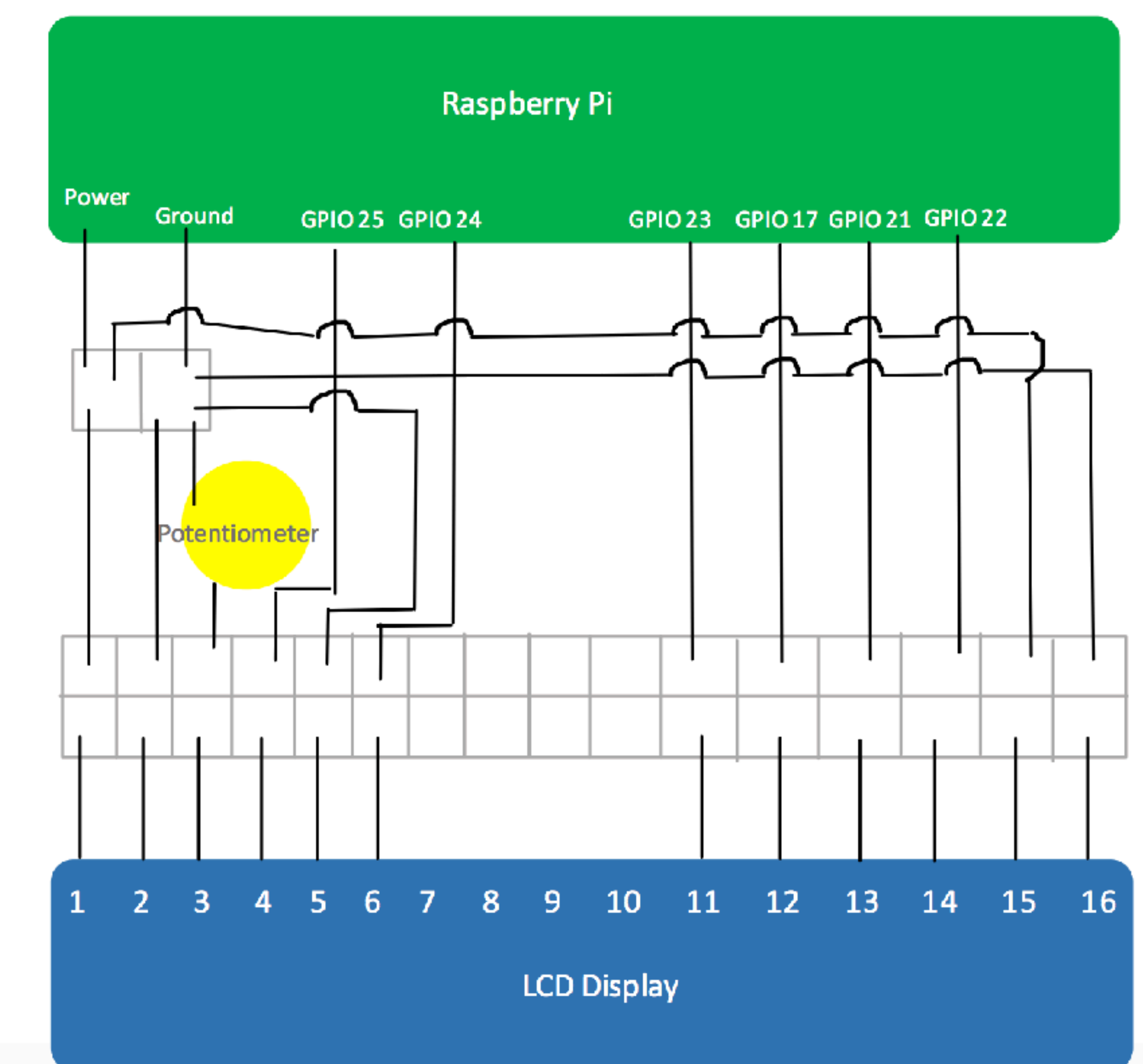


AMPLIFIER CIRCUIT DIAGRAM



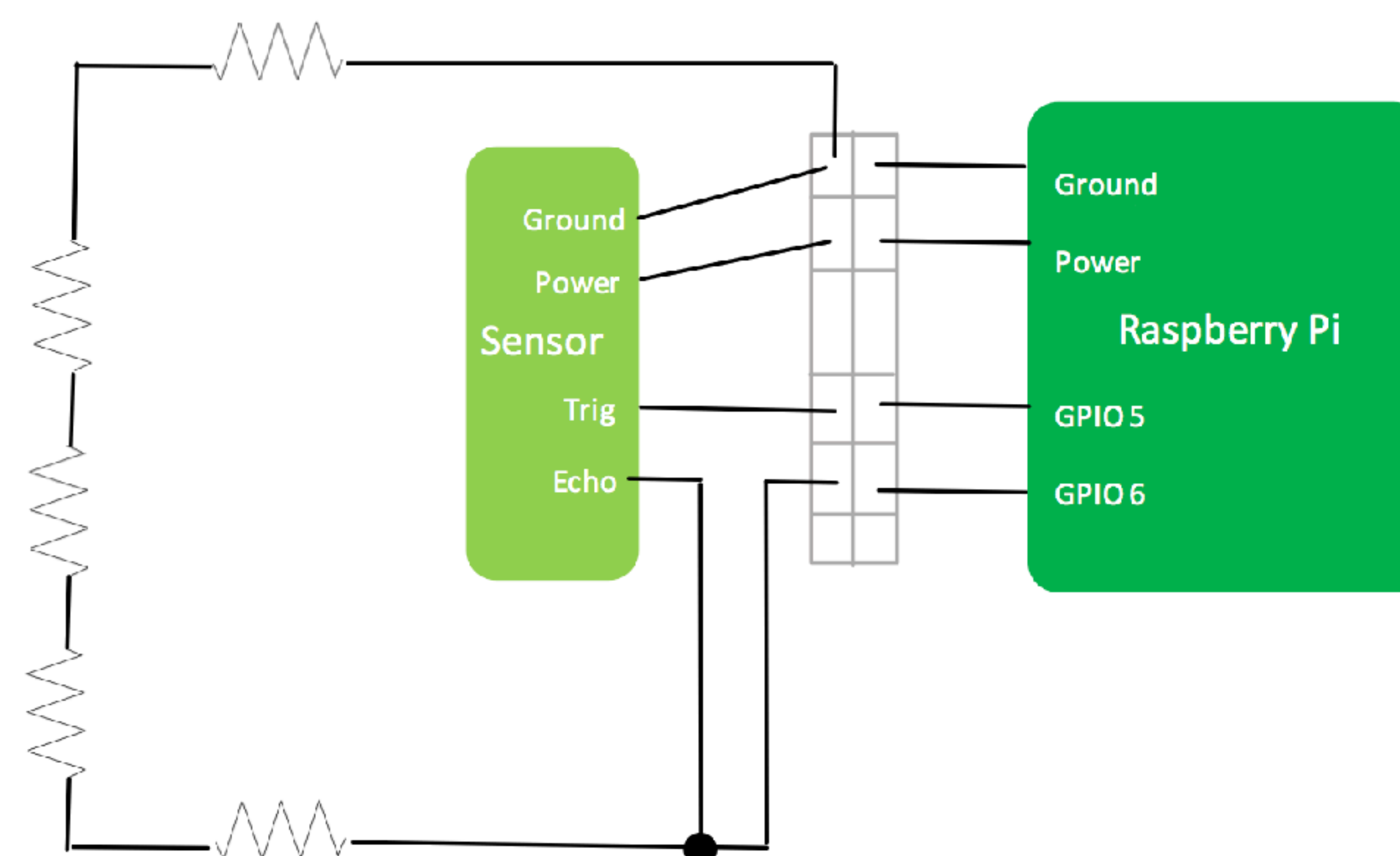
- This diagram looks closely at the amplifier and exactly how each wire is connected to control the volume of the music.

LCD DISPLAY CIRCUIT DIAGRAM



- This diagram shows how each wire connects the Raspberry Pi to the LCD display. Each wire is connected at the back of the breadboard by soldering them together.

SENSOR CIRCUIT DIAGRAM



- This shows the connection from a sensor to the Raspberry Pi through our prototype board. Each of the two sensors is set up the same way with one switching to display the weather and the other to display the time.

CODES MODIFIED

Weather and Clock

- <http://www.rototron.info/raspberry-pi-international-weather-clock/>
- Sensors
- <https://tutorials-raspberrypi.com/raspberry-pi-ultrasonic-sensor-hc-sr04/>
- <https://www.modmypi.com/blog/hc-sr04-ultrasonic-range-sensor-on-the-raspberry-pi>

CHALLENGES AND SOLUTIONS

- The Raspberry Pi was not able to meet the minimum system requirements for running the Leap Motion, thus we switched our project to be designed with Ultrasonic Sensors.
- The dock is meant to include more features than a normal dock sold today. The benefits are the easy access to the time and weather with a simple swipe of the hand.