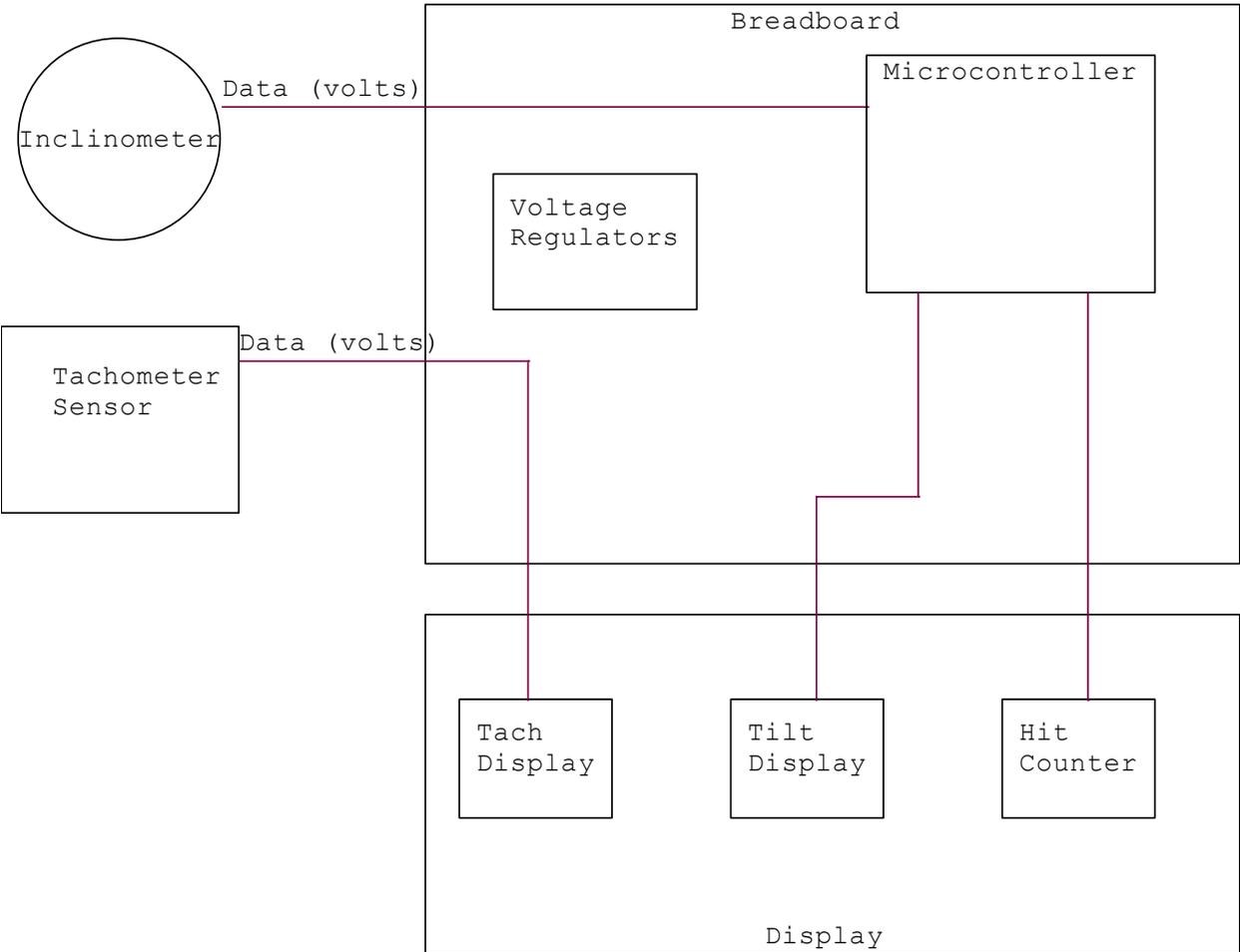


Electronic Display Concepts

Basic Concept:

The current concept revolves around the use of a microcontroller to direct the actions of the electronics within the display.



Explanation:

The two major parts that will be on the breadboards are the microcontroller and the voltage regulators. This microcontroller will be able to take multiple analog and digital inputs and output the correct response based upon coding that will need to be done. This code can be written in many different languages, based on the choice of microcontroller. The voltage regulators will be required to power each of the inputs and outputs with the correct voltage.

The first input is the inclinometer. This device returns a voltage proportional to the current angle of itself with relation to the ground. This device will be mounted on the bike, and require power from the breadboard in the exact same way as the previous bike. The signal from the inclinometer will be fed into the microcontroller. The microcontroller will send this voltage to the multimeter mounted in the display box similarly to the last design, however, the microcontroller will allow more control over the accuracy of the display. The hit counter will also be designed to run off of this data. When the input voltage hits a certain range corresponding to a fall, the hit counter will increment. The display for the hit counter will be two seven segment displays.

The second input is the tachometer. The tachometer itself will be mounted in the display box. Its sensor will be mounted on the flywheel, to determine the speed of the bike. The current tachometer uses a magnet in the sensor and may need to be replaced with one that uses light for example.

Advantages:

- Increased control over many of the displays.
- Reuses much of the previous bike's hardware.
- Moves parts of design from hardware to software, removing any physical decay problems.
- Software shift also allows refining of product much later in product development.
- Fully completed breadboard increases safety and stability of the display box.

Disadvantages:

- Possible interference between tachometer and magnetic brake.
- Software shift will likely require a robust program.
- Increased complexity compared to other designs.