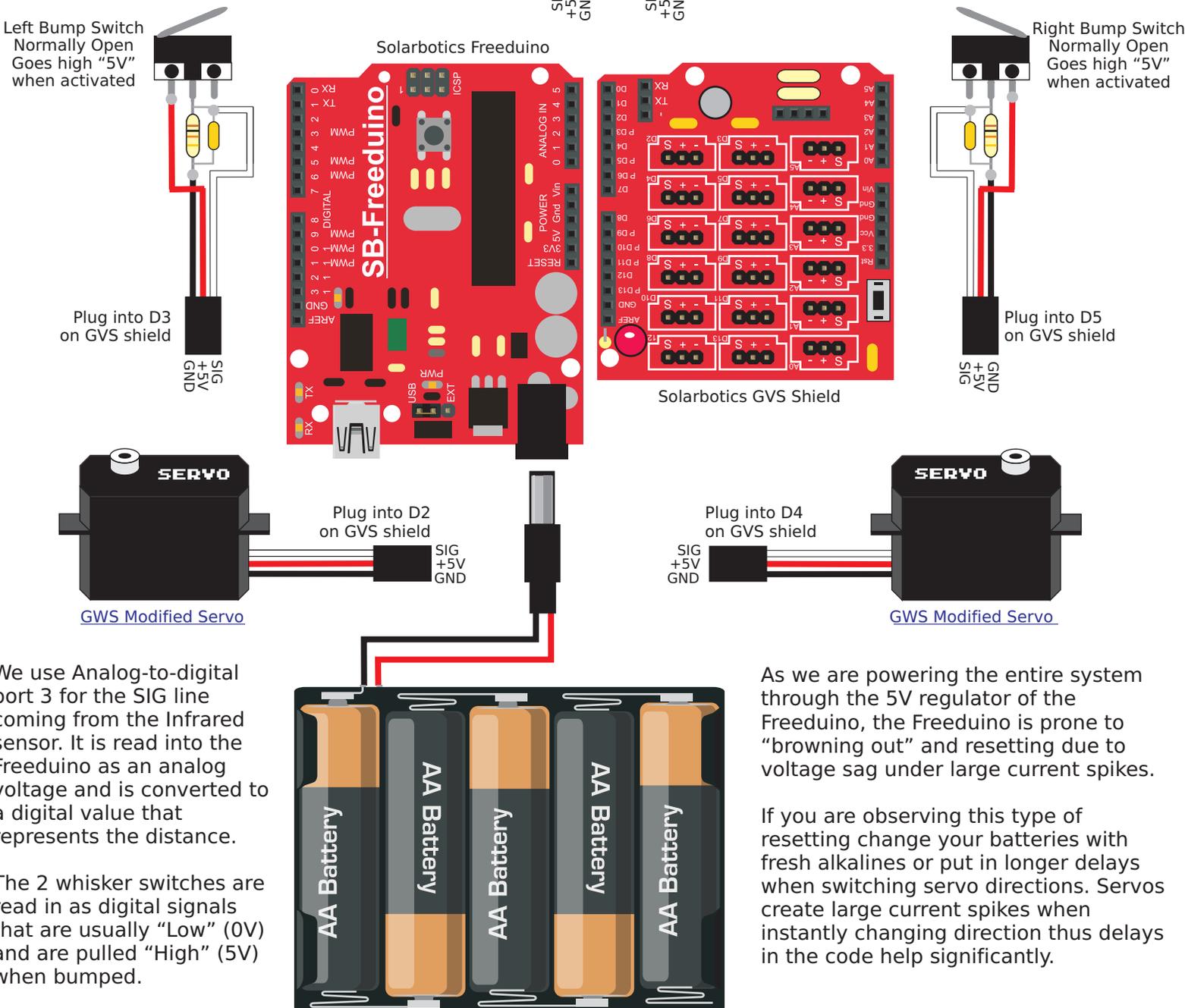


PRINCIPLE OF DESIGN

Our example [DragonTail Deluxe](#) was designed using the following components and wired as shown:

The [SB-Freeduino](#) is the brains of this outfit. The muscle is provided by the electronics inside the servos, and those electronics are controlled by servo pulses coming from the Freeduino through the [GVS shield](#). The GVS shield mounts directly to the Freeduino and interfaces all the sensors and servos to the Freeduino. Everything is powered from the Freeduino's 5V regulator, which is sourced by the 5 cell battery pack.

The [Sharp GP2Y0A02](#) Infrared analog distance sensor is mounted on the microservo output arm (use your adhesive of choice - we used hot glue), and is used as a panning sensor for obstacle avoidance. This sensor is also powered from the Freeduino's regulated 5V line.



We use Analog-to-digital port 3 for the SIG line coming from the Infrared sensor. It is read into the Freeduino as an analog voltage and is converted to a digital value that represents the distance.

The 2 whisker switches are read in as digital signals that are usually "Low" (0V) and are pulled "High" (5V) when bumped.

As we are powering the entire system through the 5V regulator of the Freeduino, the Freeduino is prone to "browning out" and resetting due to voltage sag under large current spikes.

If you are observing this type of resetting change your batteries with fresh alkalines or put in longer delays when switching servo directions. Servos create large current spikes when instantly changing direction thus delays in the code help significantly.