Reva Scharf

Caitlin Manes

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EC 450

HW6 Write Up

Our design for homework 6 involves using a photoresistor to play varying frequencies on a speaker. The master gets the analog input from the photoresistor, converts it to a digital value using the ADC, and sends it to the slave using SPI. To get the full value, the master sends two bytes using a union. The slave receives these two bytes from the master and uses it to play a frequency on a speaker. The range of values for the photoresistor is mapped to the range of half periods that produce playable frequencies in the TACCR0 register.

The only limitation on our design is that the slave must be started before the master. This is because we send two bytes, the order the slave receives them in matters, so the slave must be up and running before the master starts sending data in an effort to keep the data uncorrupted. However, because we send both bytes of data, we enable the full use of the photoresistor’s range. Below is a schematic of our design.

