Construction of the Lightbox Toy

Jessica Vanam
Cornell University
Ithaca, NY
jv345@cornell.edu

INTRODUCTION

The Lightbox is a Jack-in-the-Box controlled by an LED hue- and brightness-matching game. When turned on, the LED blinks two colors. Both are a mix of red and blue, and the brighter color is the "desired" color. The joystick controls the dimmer color--the x-axis controls the brightness of the red, and the y-axis controls the brightness of the blue; up and right make the lights brighter, and down and left make them dimmer. The light continuously flashes between the two colors, and when the gamer matches the two colors the LED shines green and the servo is activated.

CONSTRUCTION

The body of the prototype is (predictably) a box, laser cut from acrylic and assembled with epoxy glue and tape. The box has holes laser cut in the face for the heads of the joystick and the LED to stick out, and has a platform inside for the pan-tilt to sit on. The back of the box has a holes for wires to connect the components to the breadboard with the microcontroller.

Functional Components

There are three active components of the Lightbox:

1. Mini Pan-Tilt Servo
2. RGB LED
3. Joystick

The Pan-Tilt is a combination of two servos--one allows for a panning motion, the other for a tilt. For this project, I only needed the tilt. The LED is a standard RGB LED, and the joystick is essentially a configuration of two potentiometers.

The breadboard arrangement (Figure 1) and schematic (Figure 2) are included; both images were created with Fritzing.

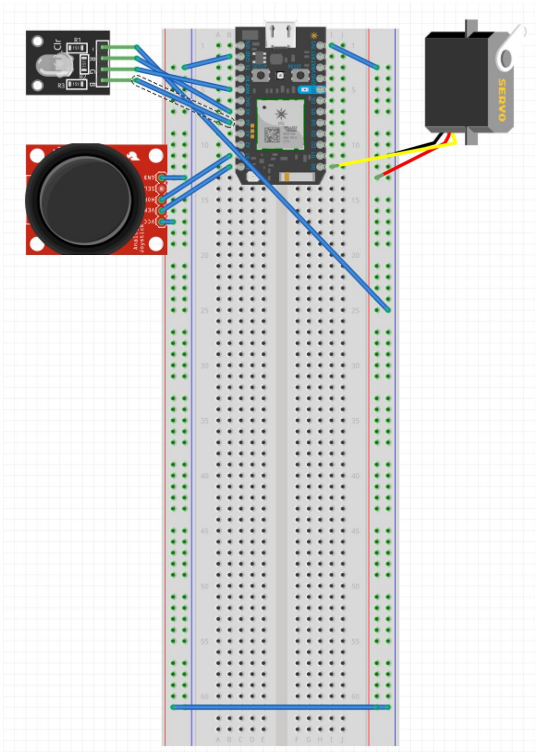

Figure 1. Fritzing breadboard diagram of the Lightbox

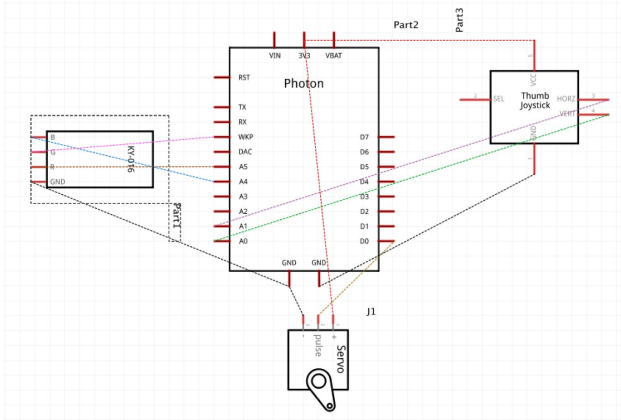

Figure 2. Fritzing schematic of the Lightbox