

Switch Box

Body:

The Switch Box was my first engineering project, inspired by an old mail box bought from the “127 Yard Sale” AKA “The World’s Longest Yard Sale” (690 miles) extending to 6 states; Michigan, Ohio, Kentucky, Tennessee, Georgia, and Alabama. The mail box was a simple open/close box with no utility other than storing mail. With little background on soldering and circuitry, the main research was focused on switches, parallel circuitry and servo motors; All working together to make a gag box which opens with a switch and closes itself with a finger, while preserving battery when unused.

Components:

- ❖ 3 Pin NC/NO momentary micro switch.
- ❖ DPDT toggle switch
- ❖ 3’ Conductive Wire
- ❖ Nano Servo Motor
- ❖ AAA Battery holder
- ❖ Box
- ❖ Plastic finger
- ❖ Balsa wood



parallel vs. series connectivity. Also getting a deeper understanding on different types of switches, what defines the use of a certain switch depending on application. This project also increased awareness on component management, based on the dimensional parameters of the rigid box.

Functionality:

The intention of this box was to better understand how circuits work; how electricity behaves depending on



How It Works:

Once finished, the user simply flips the switch and a mechanical finger opens the box from the inside and flips the switch down, reversing the current of the motor and retracting the finger back into its original state.



The wiring set up was conducted to conserve energy from the batteries over time. The DPDT toggle switch is connected to the momentary switch where IF the momentary switch is pressed (box lid lays on top of it) there will be no current passing through the system, meaning the circuit is “open” allowing no electricity to flow, thus, conserving the power of the system.



(wire connections between the battery holder, toggle switch, servo motor and momentary switch is made.)

Steps:

1. *User flips switch*



2. Power is conducted to servo motor



5. Finger falls back to original state.

(momentary switch is Closed with lid and shuts system power off)



3. Finger opens box & begins cycle



(Servo Motor)

(Plastic Finger)

(Toggle switch)



(Momentary Switch)

4. Finger flips toggle switch back to OFF

(notice momentary switch on the right is open, allowing electricity flow through system)

