EE 400D

Electrical Engineering Design Seminar and Project

How to Calibrate Servos

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How to Center Servos:

This document will illustrate how to calibrate servos using the Arduino Mega 2560 microcontroller. These sets of instructions were used with the calibration of the servos used in the biped robot ROFI. The Arduino program implements a simple code that centers a single servo at a time. The program was used to center each servo before starting to build ROFI and it was also used during the build as well. There is no need for an external power supply with the use of the following program. A computer supplies enough power to the Arduino.   Also, it is important to note that one needs to unplug the USB cable before he or she change servos so that the servo connection pins aren't shorted together.

1. Materials Needed:
    - Arduino Mega 2560
    - 12 Servos (ROFI)
    - USB Cable
    - Arduino IDE Software installed on computer
    - Servo Centering Program
    - Jumper Wires
2. Instructions:
    - Arduino IDE can be downloaded from the following link
    - http://arduino.cc/en/Guide/HomePage
    - Choose appropriate software for your computer
    - Connect the Mega board via the USB Cable
    - Install the USB drivers to enable your computer to recognize the Arduino device.
    - Open the Arduino IDE application that you downloaded on your computer
    - Select the Mega 2560 from the drop down menu "Tools/Board"
    - Download the center servo source file from http://www.projectbiped.com/prototypes/rofi/programs/center-servo
    - Upload the program to your Arduino Mega board
3. Wiring:
    - Make the following connections
        i. Black/Brown wire: GND/Ground Pin
        ii. Red wire: Vin Pin
        iii. Orange/Yellow wire: digital pin 8 (PWM)
    - Please reference the following figure. Figure can be found http://www.projectbiped.com/prototypes/rofi/programs/center-servo
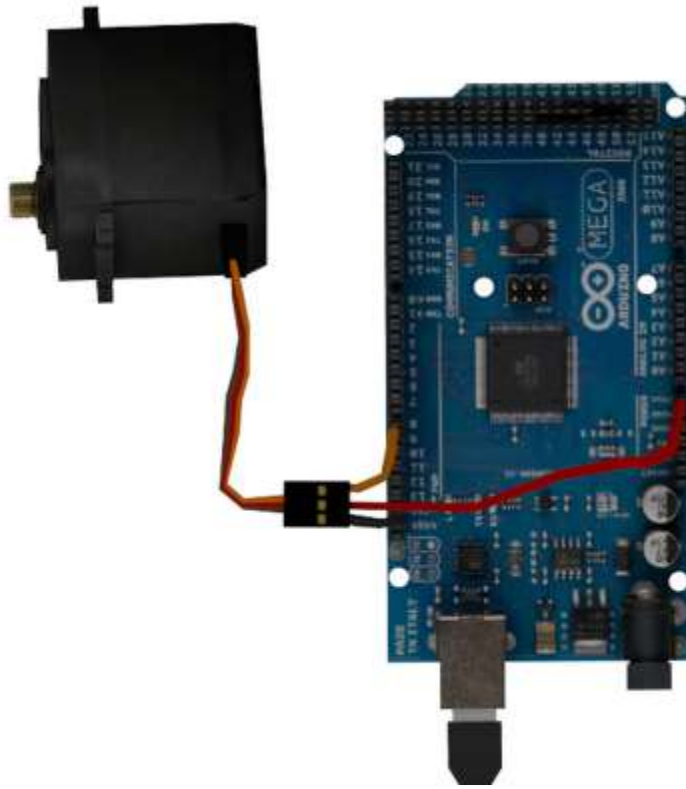
Figure 1 – Wiring Servo (Project biped Rofi 2012).

4. After wiring the servo to the Arduino board, plug the board into your computer with a USB cable. The servo should stop moving once it has been centered.
5. Jonathan Dowdall, the inventor of the biped Robot, ROFI, created the free software used to center the servos. Here is the source code that can be downloaded from his website given above.

```
#include <Servo.h>
Servo myservo;    // create servo object to control a servo
                  // a maximum of eight servo objects can be created
int pos = 0;      // variable to store the servo position
void setup()
{
  myservo.attach(8); // attaches the servo on pin 9 to the servo object
}
void loop()
{
  myservo.write(90); // tell servo to go to the home position
}
```

References/Comments:

1. http://www.projectbiped.com/prototypes/rofi/programs/center-servo
2. http://arduino.cc/en/Guide/HomePage