

# Final Hack: Team Turret

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# 1 Features

## 1.1 Rotating Platform

The user controls the rotation of the platform via joystick. Under the hood, a motor with a protected H-bridge turns the platform, while two potentiometers serve as the control system to link the user and platform.

## 1.2 Rubber Band Gun

Much like a standard rubber band gun, the firing mechanism is a rotating wheel, except ours is controlled by a button on the joystick that turns a motor. Initially, the rubber band is held in loaded position by the wheel's rotational inertia. At button-press, the motor rotates, overcoming the wheel's inertia and firing the rubber band.

## 2 Schematics

### 2.1 Table Motor

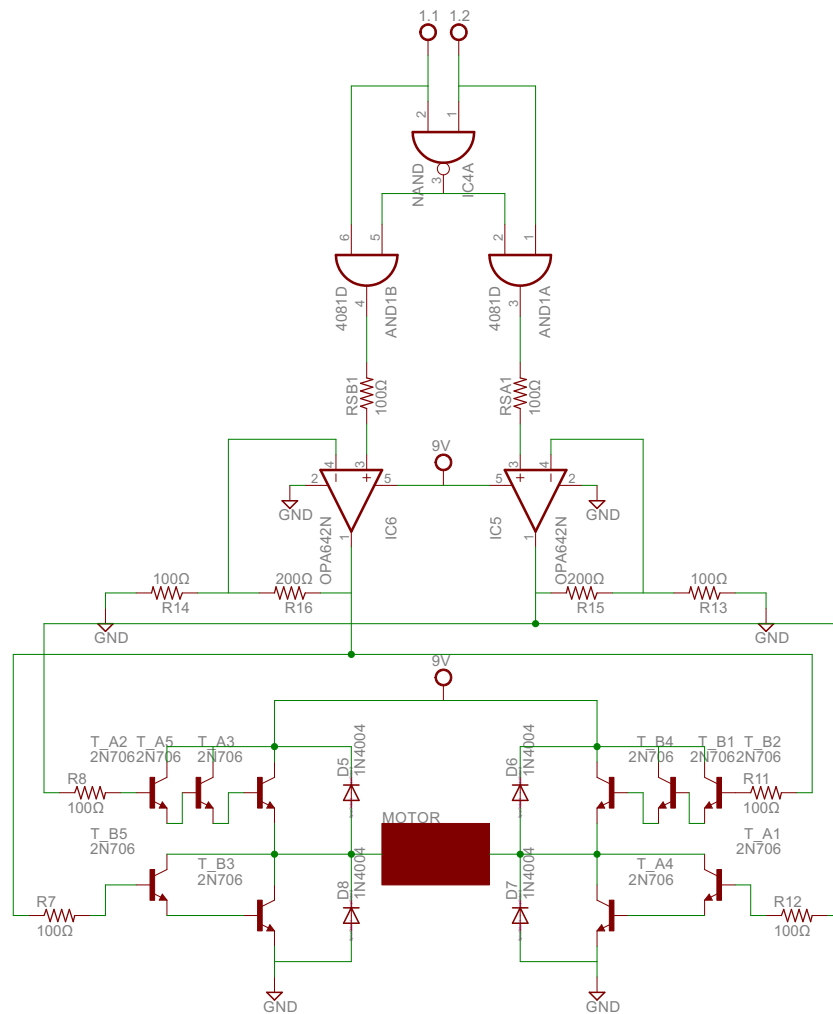


Figure 1: Table Motor Control

The motor control consists of an H-bridge (bottom half) for rotation in both directions. The motor is protected from double-input by logic gates (top half). The amplifiers are solely for voltage amplification. The axle of the motor points vertically.

## 2.2 Potentiometers

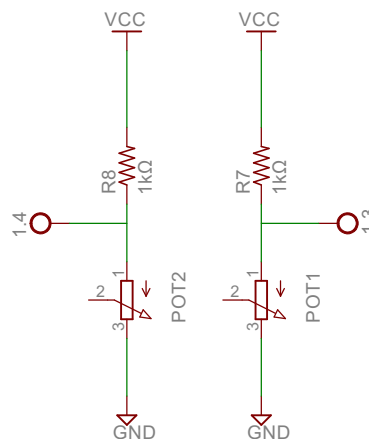


Figure 2: Potentiometers

The MSP will `analogRead` the voltage between the resistor and the potentiometer to determine the rotation of the potentiometer. That in turn will be used as input for PID control to match the two potentiometers. SOMEONE PLEASE EXPLAIN TO ME WHY L<sup>A</sup>T<sub>E</sub>X IS BEING EVIL AND ADDING RANDOM WHITE SPACE AROUND MY IMAGES

## 2.3 Firing Motor

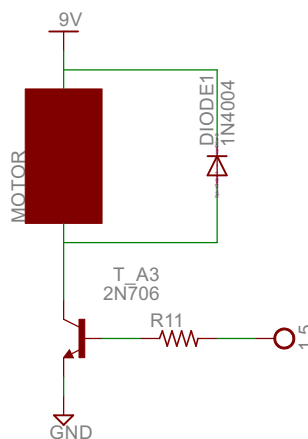


Figure 3: Firing Motor

## 2.4 Firing Button

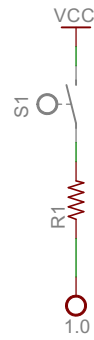


Figure 4: Firing Button

\*silent scream of fury at the off-center images\* The MSP will digitalRead the voltage to determine if the button has been pressed.

### 3 Code

asdfjkl