**Member Name(s):** Jared Allen

**Project:** PCB Rover Controller

**System Objective:**

Remote operate rover in two modes, standard tank drive and assisted drive (to allow non-experienced users drive the rover) and do so without connection to base station software.

**System Requirements & Parameters:**

* ESP connection to rover
* LCD to display important data such as speed
* Assisted driving mode for non-experienced drivers to use.
* Two joysticks, one for velocity and another for direction.
* Battery operated with decent lifetime

9/21/19

* Design choices
  + ESP8266 NodeMCU is going to be the main controller for the entire controller.
    - Note enough analogue in ports, so analogue to digital ICs required
    - Allows for the least amount of room to be used on the board
  + 16x2 LCD with I2C is currently the choice of screen
    - Will use more power than OLED screen
    - I2C will only require 2 GPIO ports on nodeMCU
* Decisions made
  + The decision was made to not use any microcontroller with ESP connection due to spacing and configuration issues.
* Progress made
  + Power system designed in schematic using 7805 voltage regulator. 9V battery brought down to 5V output.

9/27/19

* Design choices
  + The PCF8574 IC was selected as the I2C bus for the LCD screen. If the use of digital ports does not become a problem, an I2C connection may not be used to save on complexity.
  + NodeMCU symbol was given a re-design to be less cluttered in terms of the pins.
* Decisions made
  + The decision was made to set up the LCD screen connection with an I2C bus through a PCF8574.
* Progress made
  + PCF8574 set up mostly completed and interfaced with LCD screen.
  + NodeMCU symbol updated and completed
  + Power supply on schematic was reorganized to look better in schematic

9/28/19

* Design choices
  + The decision was made to use Sparkfun 2-axis joysticks.
  + Jumper will need to be added to switch between easy drive and tank drive with joysticks
* Decisions made
  + Sparkfun joysticks
* Progress made
  + Finalized all connections between I2C bus and LCD screen. Including connections to NodeMCU
  + Power symbol changed throughout schematic for consistency
  + Joystick footprint imported from Eagle

10/5/19

* Design choices
  + Multiplexer connected with Joysticks was removed and replaced with MCP3008 ADC
* Decisions made
  + MCP3008 ADC added. Both Joysticks (3 analog outputs each) are attached to the 8 channel ADC. The ADC used 4 GPIO pins (D5-D8) on the nodeMCU.
  + Power LED indicator will be added
  + Possible additional LED indicators will be added
  + Momentary Push Buttons will be added to the controller to act as future programmable hotkeys. The Joysticks can also each be pressed down to represent a button. (6 total push buttons)
* Progress made
  + All connections between the joysticks, ADC, and esp should be completed.
  + All critical components (Joysticks, ESP, Power, and LCD) have been added.
    - Excluding the ability to switch between Safe Drive and Tank Drive, and a power switch.