Challenge #1
Motor Circuit Building

Due Tuesday, April 14

On February 2, 2020 Occidental College hosted the Second Technical Workshop. During the Motor Building Workshop, most of the schools brought all the parts of their motor circuit and with the help of the Oxy students tried to build a working motor circuit. To build the circuit you used the schematic diagram which we provided for you.

Don't worry if you have not been in Solar Cup before or did not attend this breakout session, you can find the information about the motor circuit in the Solar Cup Tech Manual that is on the MWD Solar Cup webpage: http://www.mwdh2o.com/inthecommunity/education-programs/Pages/Solar-Cup.aspx

For this challenge, we have slightly changed the schematic and removed all the descriptions of what the parts are. We have also created a list of parts that may or may not go on the schematic.

This is a two part challenge:

1. **Create a one sentence description for items that belong on the schematic**
    a. Review the list of 26 components on page two.
    b. Select 17 of the components that you believe belong on the schematic
    c. Write a one sentence description for those 17 components.
    d. The remaining nine items listed are made up names or items that don't belong in the schematic, you do not have to write a description for those items.
2. **Label the schematic rectangles.**
    a. Figure out where the component goes on the schematic
    b. Using the red letter from the list on page two, write the letter in the blank rectangle on the schematic.
    c. If you don't have a printer, you can create a list. Match the red letter from the component list on page two to the red number of the rectangle on the schematic where that item belongs.

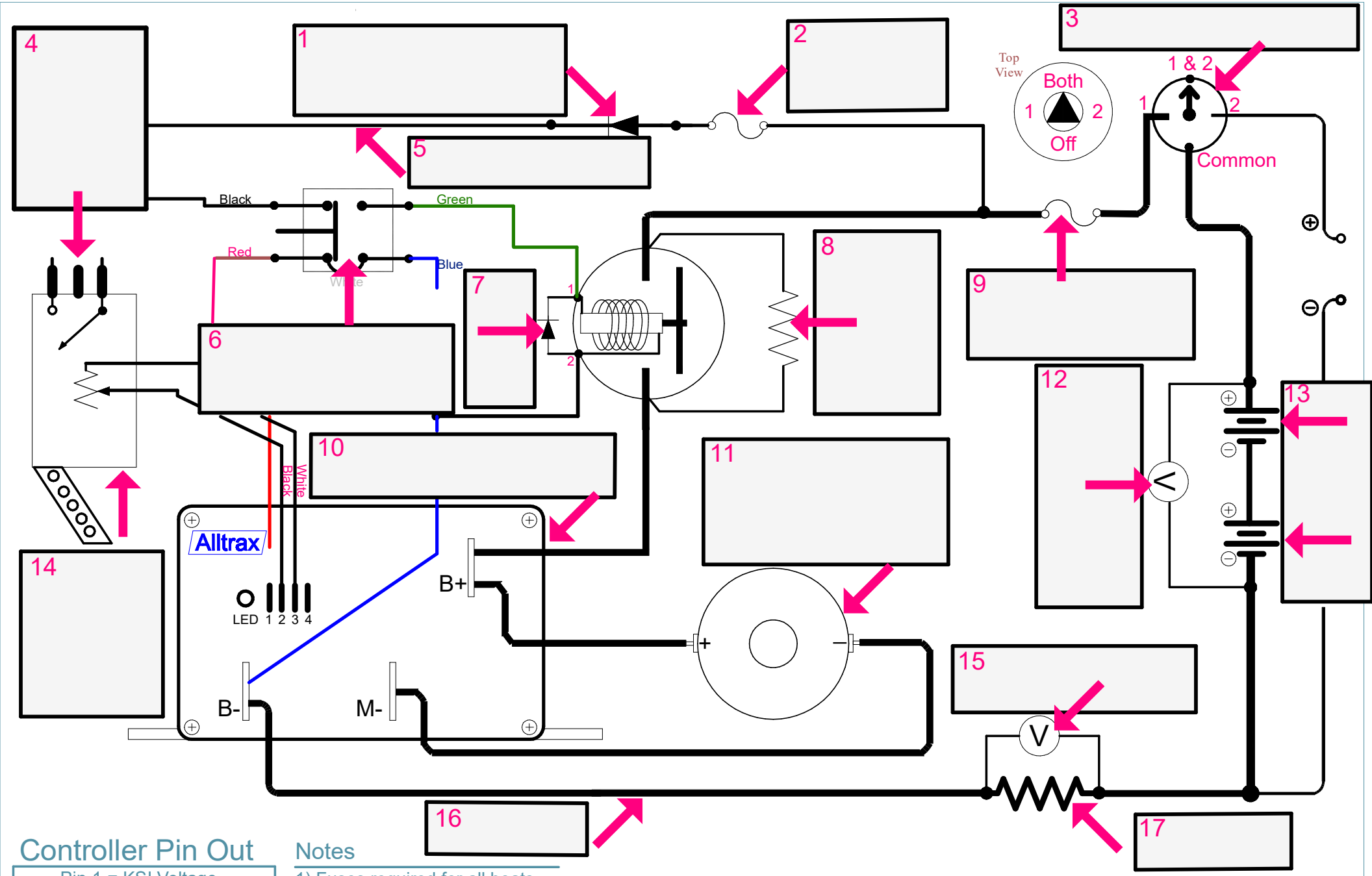
The schematics will be scored similar to how we score the events at the races. The best response will receive 100 points and everyone else will receive a lesser score. The tie breaker will be the quality of the short descriptions you give.

Responses can be emailed to Julie Miller Kalbacher at jamiller@mwdh2o.com Make sure to include your name and school name on your responses.

Good luck with this challenge and with all of your school work.

Challenge #1
List of Components

A. A/B Switch
B. High Current Fuse
C. Volume Control
D. Low Current Wire
E. Batteries
F. Bypass Resistor
G. Kill Switch
H. DC Framus
I. Motor Contactor
J. Throttle
K. Voltmeter
L. Streaming Filter
M. Diode
N. Shunt Resistor
O. Throttle Interlock Switch
P. Solenoid
Q. High Current Wire
R. Dog Dish
S. Bowsprit
T. Low current fuse
U. Motor
V. AC Framus
W. Motor Controller
X. Pre-Charge Resistor
Y. Rectifier
Z. Current Meter



Controller Pin Out

Pin 1 = KSI Voltage
Pin 2 = Throttle
Pin 3 = Throttle
Pin 4 = NC
B+ = Battery Positive
B- = Battery Negative
M- = Motor Minus

Notes

1) Fuses required for all boats
2) Diode required across coils
3) Pre-Charge resistor required
4) Kill switch required
5) Foot switch is normally open
6) YOU MUST refer to the ALLTRAX manual for up to date information

Revision History

Rev	Date	Description

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Department: Solar Cup - 2020
Part Number: Brushed PM Motor
Drawing: Solar Cup Electrical Schematic_2020.dwg
REV E
Drawn By: CO
DATE 03/20/20
SHEET 1 OF 1