Encoder Info

** Plastic guides are now available (and strongly suggested) to help align the sensors. Ask the staff to get one, and please return it when you're done. **

Encoder Kit Contents and Assembly

- 2 encoder boards
- 2 1uF capacitors (surface mount, smaller brown one, white strip). Solder these in C1 on each board.
- 2 10uF capacitors (surface mount, larger brown one, clear strip) in C2.
- 4 220ohm resistors (surface mount, labeled 2200) in R1 and R2.
- 12 10K resistors (small surface mount components in a strip, labeled 1002) in R3-R8.
- 2 TLC352 comparators (8-pin chip) in U1. Make sure that pin 1 (nearest the dot) is in the square hole on the board, nearest the printed notch.
- 8 QSC114 phototransistors (smaller, black lens) in Q1-Q3. Make sure that the flat side matches the drawing on the board, and that the shorter lead is in the square hole. These should be put in as far in as they go, and **as straight as you can get them**.
- 4 QED123 IR LEDs (larger, clear lens) in LED1 and LED2. Again, check the flat side and the lead length for orientation. These must also be flush against the board and **as straight as you can get them**.
- 4 bolts, spacers, and nuts. Use the spacers to attach the encoder 3/4" from the motor mount, extending towards the wheel. Use the two middle holes at the top of the motor mount, and orient the encoder so that the phototransistors and LEDs are above the screws, and point at the wheel. The arc traced out by the phototransistors should match the arc of the wheel.
- 2 acrylic pattern mounts. Press these into the wheels, but be careful not to break them. They will likely fit on only one side. (if they have slight burn marks on a side, that one should face away from the wheel)

Plastic guides are available to help align the phototransistors and LEDs. To use them, first insert the components in the board, paying attention to orientation. Then, slide the plastic guide over them. Try both sides; one is easier to insert and remove. Solder the components, and remove the guide. Remember to return it to one of the staff.

Solder a 5-wide ribbon cable into the connector on the *back* of each board, and assemble the connector on the other end with male header. Pay attention to the ground wire (the square hole, labeled GND, backwards by mistake) for orientation when plugging it in, and mark the wire near the connector if necessary. Put hot glue around the joint of the cable and board- without this, it may break after flexing a few times.

Print and attach the encoder pattern. This provides 18 ticks per revolution. If you need higher resolution, you may experiment with the triple-res version. However, be warned that your component alignment must be extremely accurate for this to work reliably.

Screw the wheels on so that they are as close as possible to the encoders, while not scraping against them. Finally, when connecting the encoders, make sure that the ground wires are going to the "-" pins on the orcboard.

** Be sure to test your encoders to make sure they not only work, but are reliable. Phototransistor or LED alignment errors can cause them to miss some pattern marks.