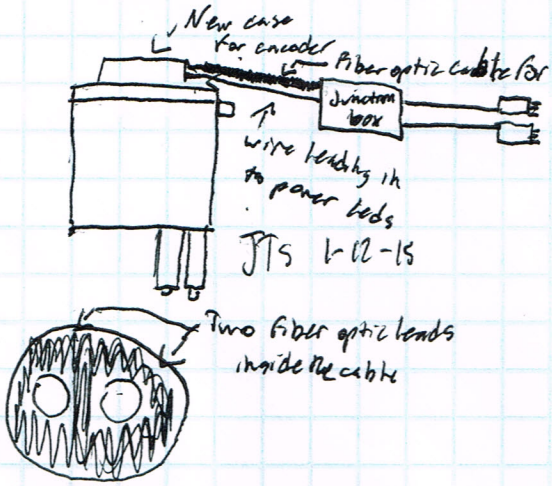
Integrated Quadrature Encoder

1-12-15

Morale:

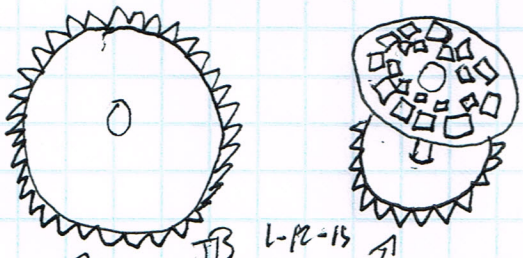
- After many JTS failures with the Current IMEs due to melting, static, and problems with gear replacement, We have decided to remake them with several improvements towards accuracy and reliability. The problem with just using the large red encoders is that they are bulky and often get in the way of certain designs, as we have dealt with numerous times this year. Our solution is simple: combine the best of both designs and add some improvements. First make the encoders integrated, but build them like a quad-encoder rather than an IME. IMEs attempt to use electronic communications beside an electrical noise generator (the motor it is trying to encode), which results in errors resulting from the random noise on the I2C transmitting wires).
  First you only change the case and one gear, not including the modded axle for the IME.
  Next you change JTS where the light is recieved from. Using fiber optic cable, you can move the photoresistors which convert the light to highs and lows outside the motor and away from the motor to eliminate the noises as shown by the diagram below.

Diagram 1: Fiber Optic transmission of light.



After the fiber optic leads reach a junction box several inches down the cable, they are converted into electric signals using photoresistors. After the Photoresistors, a JTS simple low pass filter using a capacitor filters all high frequency noise off of the signal, and a toroid on the cable filters even more noise, resulting in a clear signal ready for the cortex to read.

Diagram 2: New gear replacement



Designer: [signature] 1-12-15

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