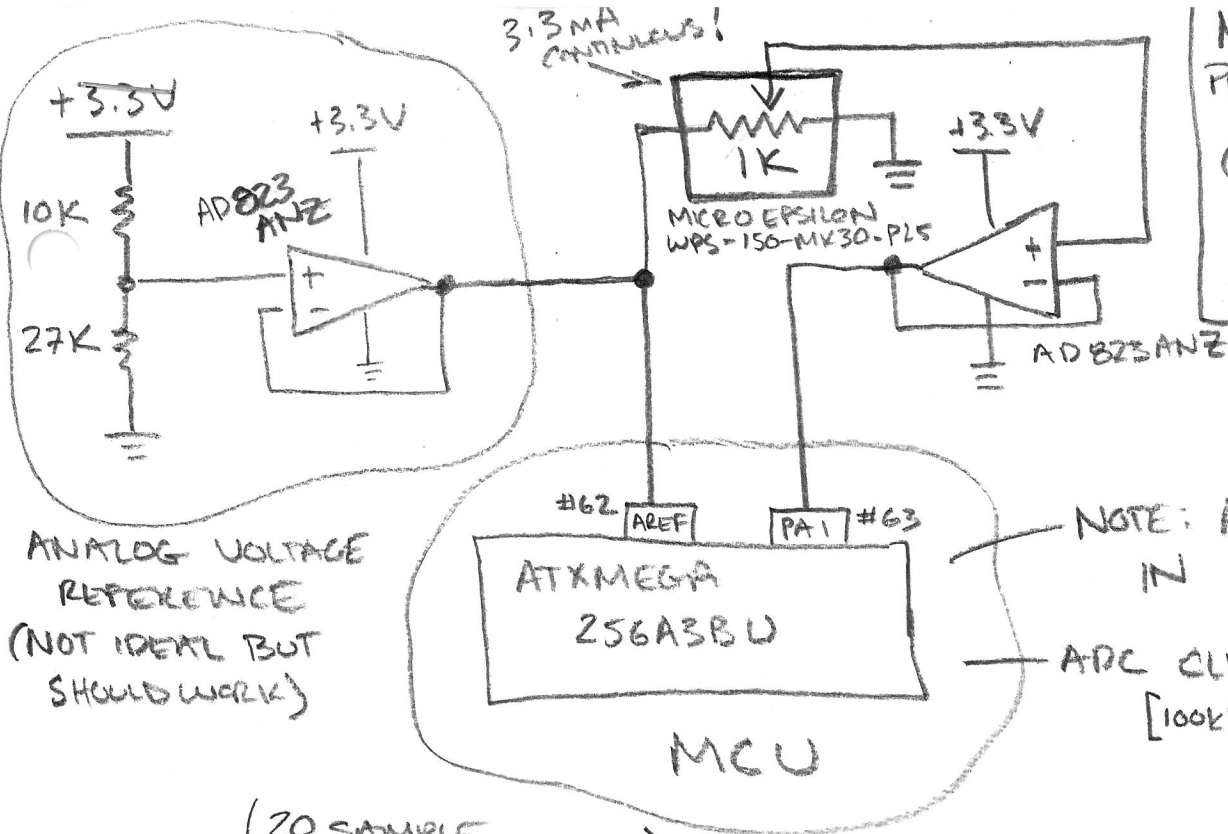


NOVEMBER 2018
PRESS SPEED
MONITOR
(STRING POT)
RENDER FOR
HANNAH
GROVER



(20 SAMPLE
MOVING AVERAGE)

$$\text{SPEED [in/sec]} = \left(\frac{\Delta \text{ADC COUNTS}}{\Delta t} \right) \cdot \left(\frac{5.9 \text{ in}}{(3873 \text{ COUNTS}) \Delta t} \right)$$

4095 - 222 OFFSETS DUE TO ~20mV
MARGIN FROM RAIL OF OP-AMP

$$\left[\begin{array}{l} \text{IF } \Delta t = 0.01 \text{ s, 1 COUNT} \rightarrow 0.15 \text{ in/s} \\ \text{IF } \Delta t = 1.00 \text{ s, 1 COUNT} \rightarrow 0.0015 \text{ in/s} \end{array} \right]$$

OPTIONS

- INCREASE $V_{CC} \rightarrow$ INCREASE AREF \rightarrow REDUCE EFFECT OF NOISE
- INCREASE ADC RESOLUTION (CURRENTLY 12-BIT)
- REDUCE STROKE OF STRING POT
- DECREASE SAMPLING FREQUENCY (INCREASE Δt)
- ENCODER (VS POT) TO REDUCE NOISE \rightarrow GLASS SCALE, ETC
- SWITCH TO VISION-BASED APPROACH? TOF / LASER RANGE FINDER?

NEW STRING POT
WPS-500-MK30-PI0
500MM \rightarrow
(MICRO EPSILON)

$$\left(\frac{19.69 \text{ in}}{3873 \text{ counts } 3 \text{ s}} \right) = \frac{1}{590.1}$$