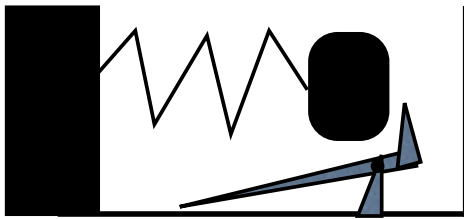




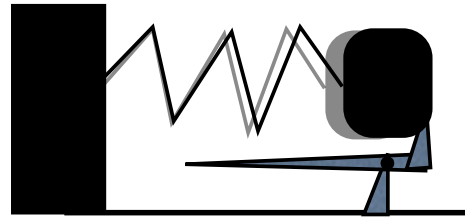
Stroboscopic Measurements

▶ Stretching the spring a repeatable amount

When hanging masses from the spring, or spinning the rotor to stretch the spring, you want to have it stretch just to the point it triggers the “flag” as shown



spring not stretched far enough (flag untripped)



spring stretched far enough (flag tripped)

▶ Measuring rotor rotation frequency by matching it to that of a strobe light

When the strobe light frequency matches an integer multiple of the rotor rotation rate the image of the rotor will seem to freeze. The highest strobe frequency at which this happens is when the rotor and strobe frequencies are equal. Careful: when the strobe frequency is half the rotor frequency the image may almost look frozen. Why?

stroboscopic image of rotor	frequency of rotor rotation
	$f_{\text{rotor}} < \frac{1}{2}f_{\text{strobe}}$
	$f_{\text{rotor}} = \frac{1}{2}f_{\text{strobe}}$
	$\frac{1}{2}f_{\text{strobe}} < f_{\text{rotor}} < f_{\text{strobe}}$
	$f_{\text{rotor}} = f_{\text{strobe}}$
	$f_{\text{strobe}} < f_{\text{rotor}} < 2f_{\text{strobe}}$
	$f_{\text{rotor}} = 2f_{\text{strobe}}$
	$f_{\text{rotor}} > 2f_{\text{strobe}}$