*Projects and Stuff*

Accel

Project Log

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# 2012/10/03

This evening I created the initial git repository, and began sketching out initial plans.

I’ll be using Google Sketchup to build most components in this project.

Initial notes:

Ring Radius: 500 mm

Ring Diameter: 1000 mm

(Ring dimensions are drawn to the center of the tube)

Ring Segment central angle: 18 degrees

Total Segments: 20

Ring Segment Arc Length (at center of tube): ~157.0796326794897 mm

Ring Total Circumference: ~3141.592653589793 mm

Tube diameter: 27.4 mm

Tube Thickness: 5.0 mm

Remember to include on each segment:

- Wire guides

- Sensor mountings (LED/magnetic/etc)

- Assembly (3-4 screw posts/holes at each tube end)

- Stand mounts for securing to a surface (closer to surface = better)

Also consider foam dampers at mount points, and a heavy base is best

Consider placing a cheap ADC or Schmitt Trigger along with each sensor to get quick, accurate results back to the main board quickly.

Alternately, use a (Optical - Photo Detectors - Logic Output) as a simple and possibly cheaper solution.

The following math isn't 100% accurate, because I'm calculating it for the center of the tube, but it's near enough not to matter:

My magnet will be 1 inch in diameter, and 1 inch in length. 1 inch is equal to 25.4 mm

With a ring radius of 500 mm, a central angle of 2.91 degrees gives an arc length of 25.4 mm. Expanding with some basic trig, the segment height - essentially the additional tolerance needed in the tube radius to allow the magnet to pass smoothly - is 0.16 mm. For the sake of simplicity, and to provide just a bit of additional tolerance in case of manufacturing imperfections, I'll use an inner diameter of 27.4 mm, well beyond what should be required if everything were ideal. We'll use a wall thickness of 5 mm.