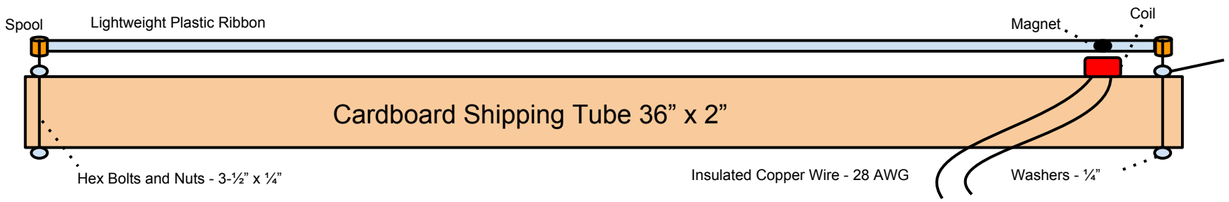
Windbelt Testing Fixture - Prototype Version #2



Need for lock nut or two nuts to keep washers adjacent to tube from spinning

Figure 1 - Side View - Standing Over Fan

Notes on construction -

- *Coil must have a minimum of 1000 windings using 28AWG copper insulated wire.*
- *½” Diameter Ferrite Toroid Core was used for the coil, placed as close as possible to the magnet.*
- *Magnets must be powerful (> 1 Tesla) and lightweight to reduce gravity’s effect on the ribbon.*
- *Drill holes into the cardboard tube to allow for passage of the hex bolt, and use washers and nuts to fix the bolts in place. Several holes should be drilled to test different belt lengths.*
- *The plastic ribbon should be lightweight and thinly cut, to about 2.6 cm in width.*
- *Spools size should allow for 2.6 cm ribbon to set in groove, and have ¼” openings for bolt.*
- *Washer should be placed at both sides of spool along with lock nut to hold spool in place.*
- The magnet should oscillate north to south along the length of the core (not the diameter). Ideally, this should be done at the ends of the core to create the greatest disruption in magnetic field (Faraday’s Law).

Toroid core shape may be needed instead of cylinder for lower profile against tube.

Other option would be to put the coil INSIDE the tube and use a larger magnet.

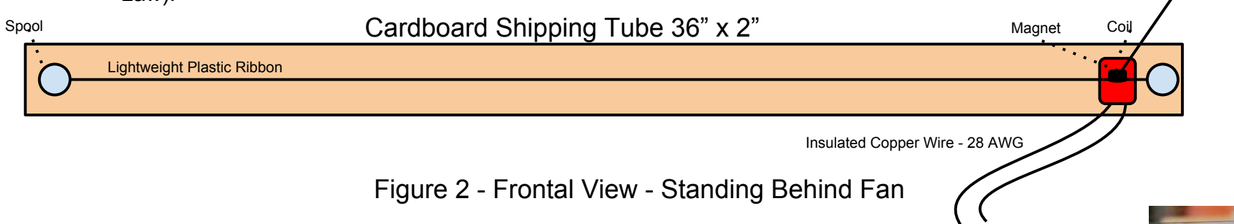


Figure 2 - Frontal View - Standing Behind Fan

Prototype Version #3

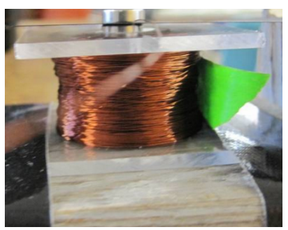
- PVC pipe instead of cardboard
- Coil has about 500 windings using 28AWG copper insulated wire
- Six smaller (1 cm) size magnets connected together were used for maximum current with the least amount of weight.
- Tensioners were modified so that a section was cut out of each spool to pass the ribbon through them. They were then taped for extra support.
- Coil was adjusted to apply Faraday’s correctly, with the magnets oscillating at the end of the coil, into the core.
- Prototype hit forward voltage on the diode (620mV at 1.5mA), steadily generating 150mV DC voltage after the diode.
- 150 ohms load and 10 pF capacitor were used for testing with an IN5107 diode
- Improvements considered:
  - Increase n to larger value
  - Lower-power diode - smaller voltage drop

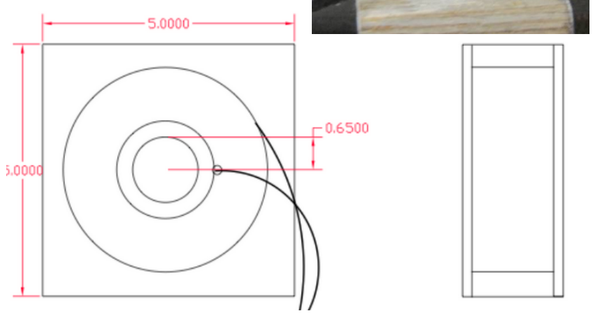
Prototype Version #4

- 2 feet long, 4 inches tall
- 3.3 VAC target - powers an LED
- Coils have fiberglass structure and core
- Tensioner made of PVC and metal bracket
- 2 coils in series - 1000 windings each
- Less than 2” of clearance for each coil

Additional Materials

- 2 x 1” by 22” board
- 4 x 1” by 3” board
- 2 x coil assemblies (plexiglass)
- Epoxy
- Gorilla tape
- PVC pipe and metal brace
- Bolts, screws and washers
- More mylar tape
- Ferrite cores
- 28 AWG wire
- Testing base
- Super glue





Tensioner made of PVC pipe and metal bracket

Windbelt Base