AutoGyro Ring Glider

LoboCNC

VIEW IN BROWSER
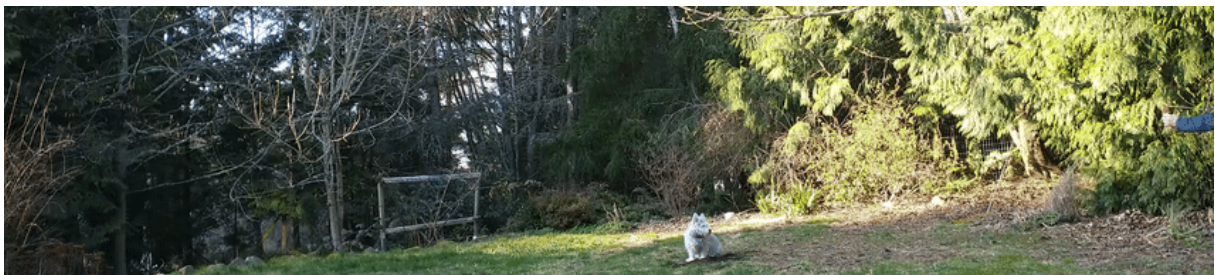
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Summary

Holy cow, this one really soars (50m+)!

Toys & Games   >   Outdoor Toys

Tags: glider

There are a couple of problems with most of the 3D printed flying rings: Firstly, it's difficult to get the right mass distribution with 3D printed plastic. Secondly, they are damnedably difficult to throw with the proper spin, and liable to tear your rotator cuff.

This is a rubber band launched version that derives its spin from the angled fins that connect the ring to the central "stick". The stick itself solves the mass distribution problem allowing you to have a uniformly thin ring, yet still get enough mass out front to locate the center of gravity at the center of lift. And minimal cross sectional area minimizes drag.

Launching with a rubber band, however, presents it's own challenges as the lower part of the circular wing wants to hit the launching stick. To solve this, I've used an articulated stick where the business end springs forward out of the way once the rubber band launch tension is released.

Note: I've completely updated the launcher so that it releases the glider more reliably.

Printing
Both the glider and the launcher print without supports. I used 0.2mm layers and have printed this in both in PLA and PETG (PETG is more durable). The ring prints at a single-wall extrusion, so you need to have well-tuned retraction so that you don't end up with any gaps or thin spots in the walls. Lastly use at least 5 perimeter lines and 90-100% infill so that the stick portion prints solid.

Assembly
The stick should slide into the center of the ring and then bump up against a little stop on the stick. The fins should be towards the back of the glider, with a short section of the stick protruding out the back. (See 1st photo.) You may need to sand any lumps off the end of the stick if it doesn't slide in easily. Use a couple drops of superglue to glue the stick in place.

For the launcher, insert the articulated arm into the handle and then shove the pin in one side. It should be a slight press fit, but you'll want to use a drop of superglue on the head of the pin to hold it in place. To make it spring forward, pass a #33 rubber band through the hole, twist the two sides together a few times and then stretch the loops over the handle as shown in the 3rd photo.

For the launching rubber band, use another #33 rubber band and looped through the hole in the articulated arm.

Launching
Hook the "arrow" end of the stick onto the launching rubber band as shown in the 2nd photo. As you stretch it back, it should also cock back the articulated arm on the launcher. Hold the launcher so that the arm is more or less vertical. Stretch the rubber band all the way taut and aim upward about 10 degrees. Then let 'er rip!

Using one #33 rubber band, I've gotten flights about 30+ meters. With two rubber bands in parallel, my maximum flight distance was 57m.

Repairs
The glider is light and flexible, so it pretty much just bounces when it lands. However, if you hit anything at speed, you may crack the thin ring. Minor cracks can easily be repaired with transparent tape or masking tape.

As you can see below, after whacking into a number of trees, fences and walls, the glider can endure quite a few repairs and still fly well.
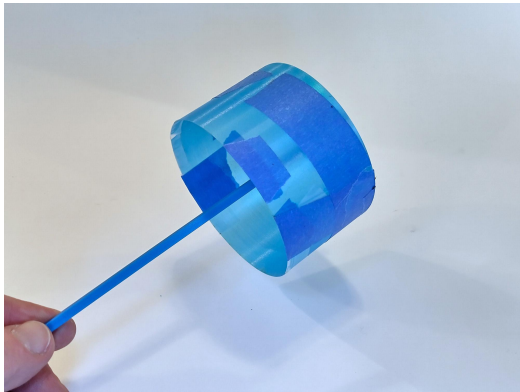
Model files

autogyro.stl

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launcher.stl

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