

Balloon Launched Gliders  
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Introduction

A few years ago I was introduced to Balloon Launched Gliders or BLG. Rob Romash was the first person I saw flying BLG. It was fun to watch and the gliders were very impressive. BLG is basically where one takes a glider and places it on a balloon filled with helium which is on a string. The balloon and glider is carefully raised to the ceiling, then with a quick movement or tug on the string the glider slips off the balloon and starts gliding down to the floor. The goal is to maximize the time it takes the glider to land on the floor after it is released from the balloon.

This "event" has changed over the last couple of years in that restrictions or rules for the type, size and weight of the glider have been different. Last year at the 2005 Nationals an unofficial BLG event was held which had the restrictions that the glider can only be constructed out of balsa wood and the max. wingspan is 14". For this year 2006 Nationals the rules are 10" max. wingspan, .5g min. weight and the glider can be built out of any material. Also for 2006, Science Olympia has a trail event, BLG. The SO – BLG glider restrictions are:

Max Wing span 40 cm

Max Wing chord 10 cm

Max Stab span 28 cm

Minimum total weight 1.5 grams

Carbon fiber is not allowed just wood, plastic, foam, glue etc.

The specific rules for Science Olympia are at <http://www.soinc.org/events/trial/BLGlider.pdf>.

SO-BLG Design

I think that in order for an event to become popular, designs need to be published so others can have a starting point on what to construct and improve on. Therefore, I have designed and published plans of a SO-BLG which I believe follows the 2006 SO-BLG rules. I have built two of these gliders and tested them off a balloon only once. This design is by no means well tested. From a balloon 25 ft from the floor my gliders were typically able to turn about 1 minute.

Design Philosophy

Let me share some of my thoughts with you about the design. From past experience and some knowledge of aerodynamics, I made one of my design goal's to be that the glider should weigh 1.5 grams. Another design goal was the wingspan should be 40 cm and the root wing chord should be 10 cm. With these goals in mind I decided that a built up wing was the easiest way to go. Now aerodynamically a built up wing with plastic covering is at a disadvantage. The covering is hard to shape perfectly and changes/moves/flexes.

Now a hollow rolled fuse tube would be lighter and stronger than the fuse I design, but making rolled fuse is not easy, so for my design I used a simple solid fuse.

For the elevator I decided on a solid balsa design. I am trying to keep the drag down and it is not that hard to build an elevator this size to only weigh .2 grams out of commonly available balsa sheets. The same logic holds true for the rudder.