

Ballast and Flight Principles



1



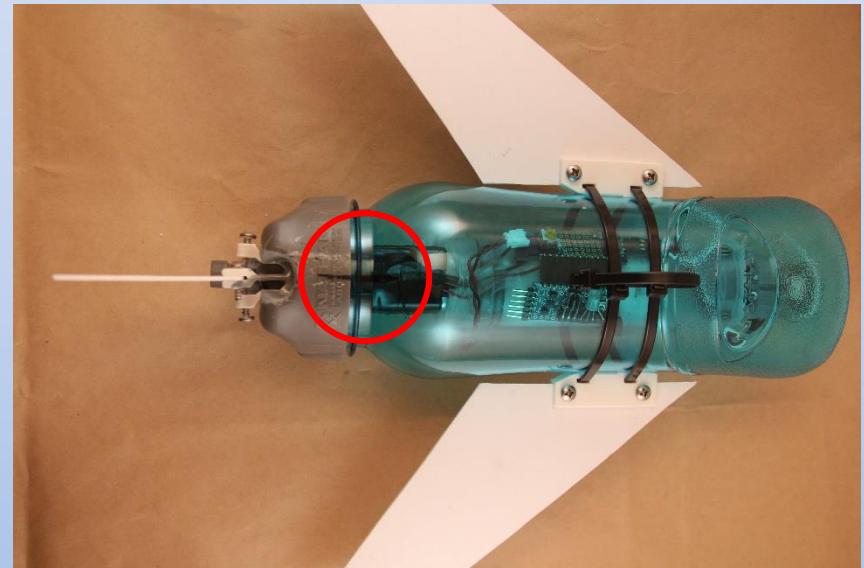
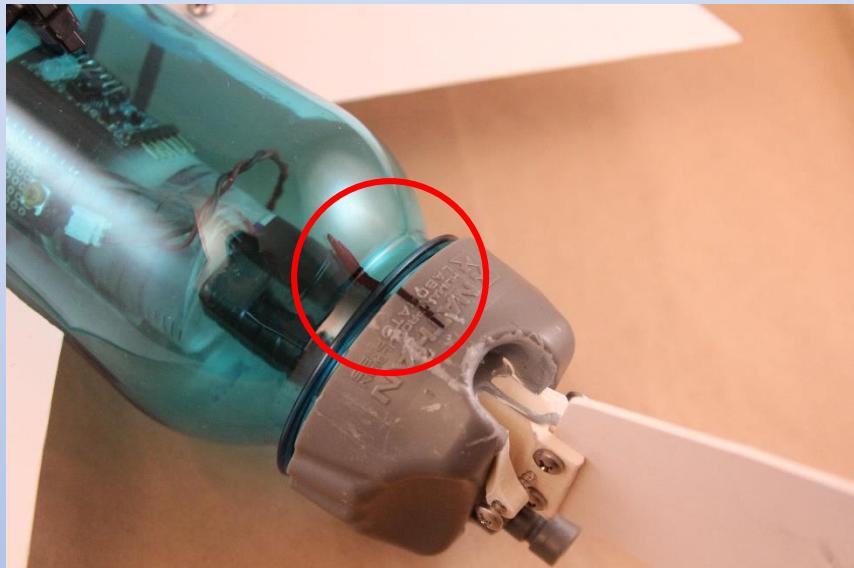
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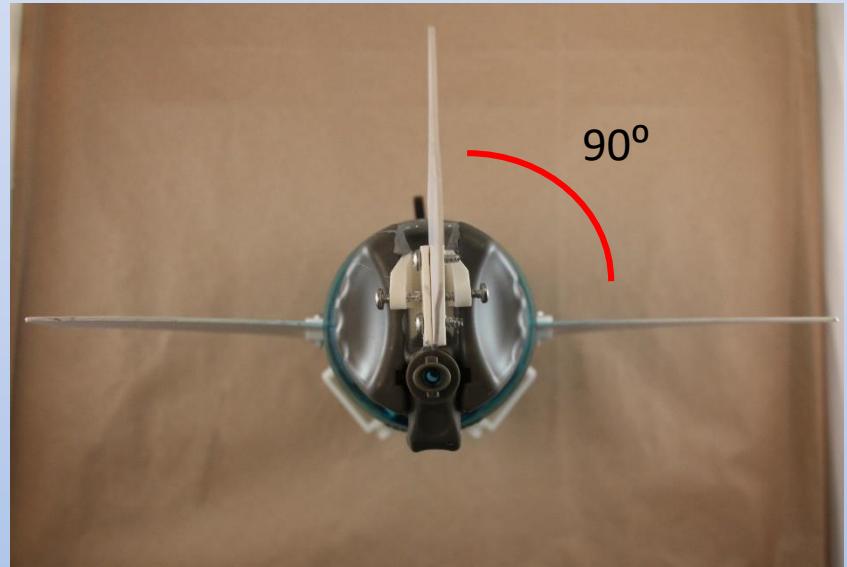
From the Bottle Prep & Ballast bag, you'll need the steel bars: Two 6"-long and one short bar (1), Dura-Lock "Velcro" (2), and eight round ballast magnets (3) as well as your glider.

Tighten Cap and Mark Position



With the cap installed securely, mark the position on both the bottle and cap with a marker. If you match these witness-marks each time you close the bottle, you can ensure that your rudder is perpendicular to your wings every time. This will help your glider fly straight.

Align Rudder Perpendicular to Wings



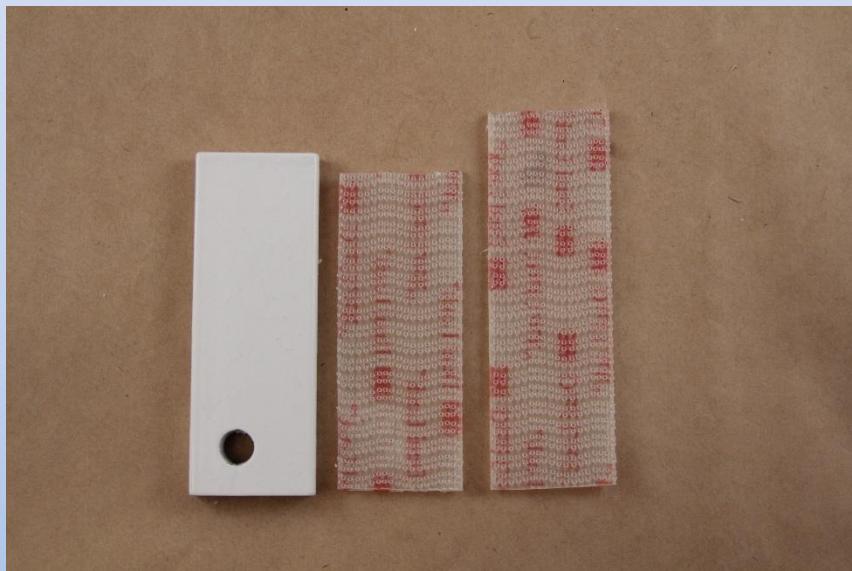
To avoid unwanted turning due to malalignment of the wings and rudder, rotate the wing yoke and wings so that they are at a 90° angle to the rudder.

Fit 6 Inch Bars into Wing Yoke



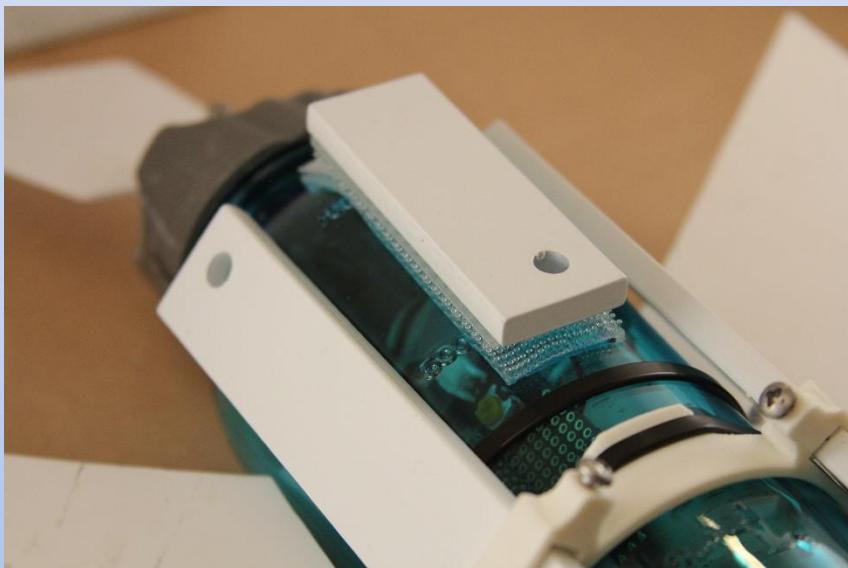
The two 6" bars fit in slots of the wing yoke on the underside of the glider. (The opposite side of the NATHAN label.) Slide one bar into each slot about 1" from the nose of the glider. Secure the bars in place with #6 screws from the Buoyancy Engine bag.

Prepare and Position Small Bar

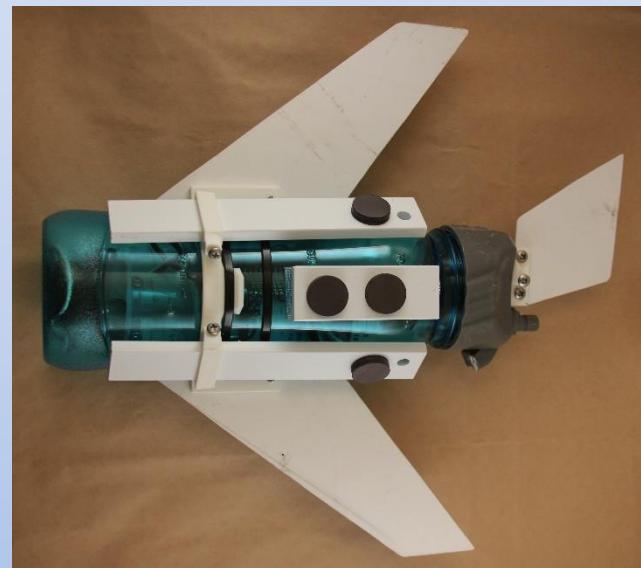


Cut a Dura-Lock strip to the length of the small bar. Remove the backing and stick it to the bar. Cut another Dura-Lock length to fit in space between the two long bars and the wing yoke and cap. Remove the backing and secure midway between the bars as shown.

Attach Small Bar & Add Magnets



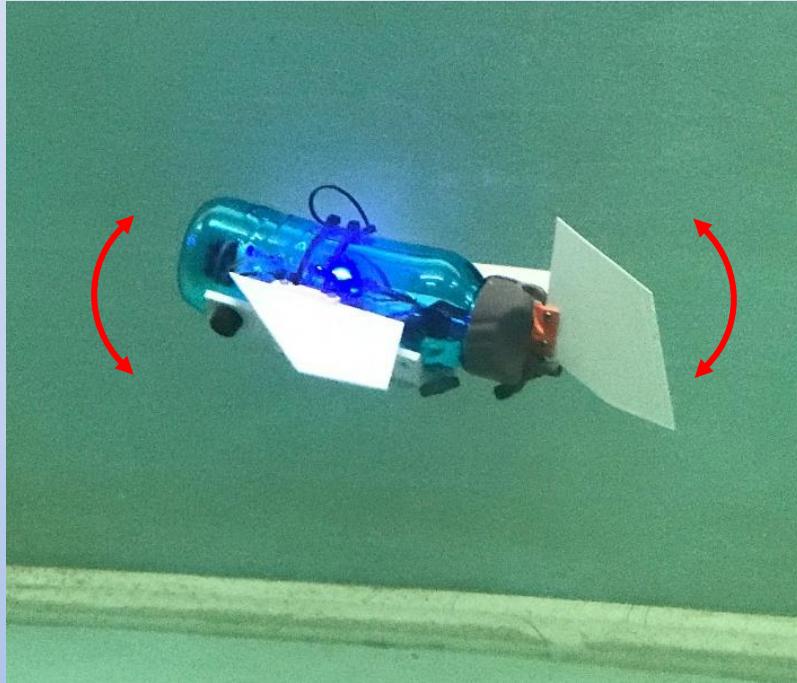
Matchup the Dural-Lock strips and press the small bar into position between the two larger bars.



Stick small magnets on the steel bars for additional ballast.

Flying the Glider: Basic Principles

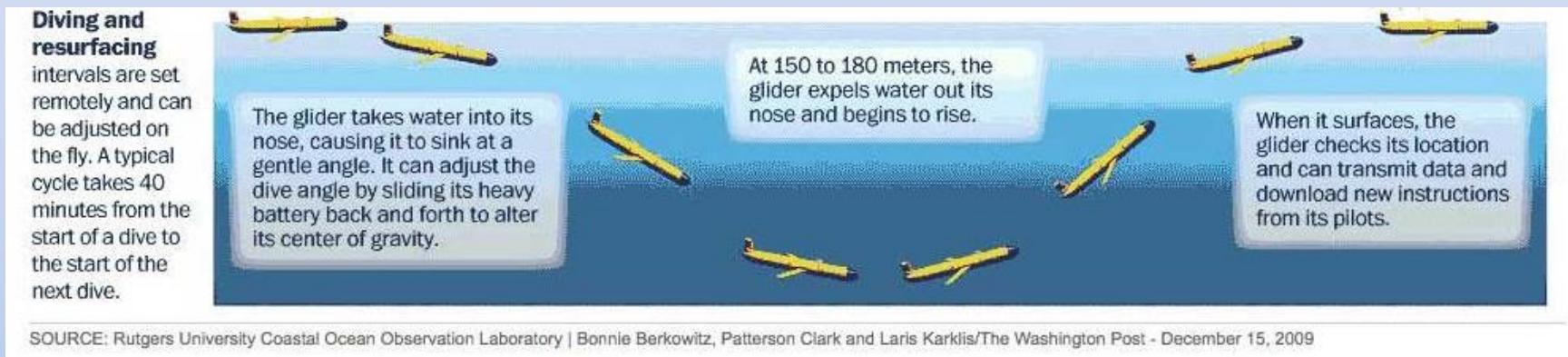
Pitch



Use Position of Weights to Control Pitch

Your first goal for your glider is to make forward progress underwater in a straight line as it dives *and* rises. (See “Sample One-Yo Glide video” at www.seaglide.net). To achieve this, the pitch of the glider has to be balanced and the roll and yaw may also need to be adjusted.

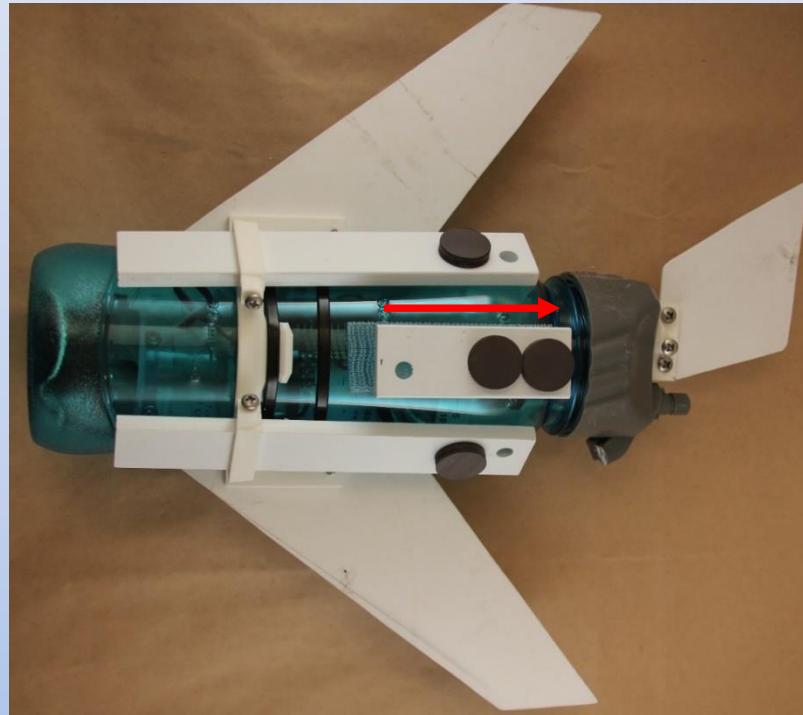
Dive Cycle of Commercial Glider



The graphic above shows an ideal cycle or yo for a commercial ocean-going glider. Good forward progress is achieved on both dive and rise cycles. SeaGlide works the same way; it must sink & pitch down on the dives and float & pitch up on the rises.

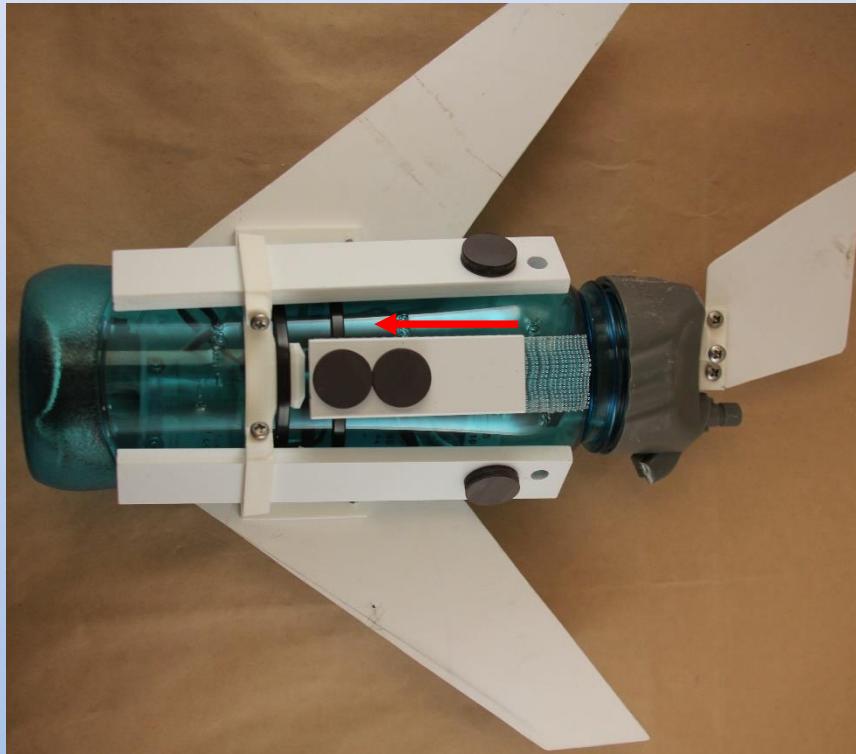
Move Weight to Adjust Pitch for Rise

Underside
of Glider



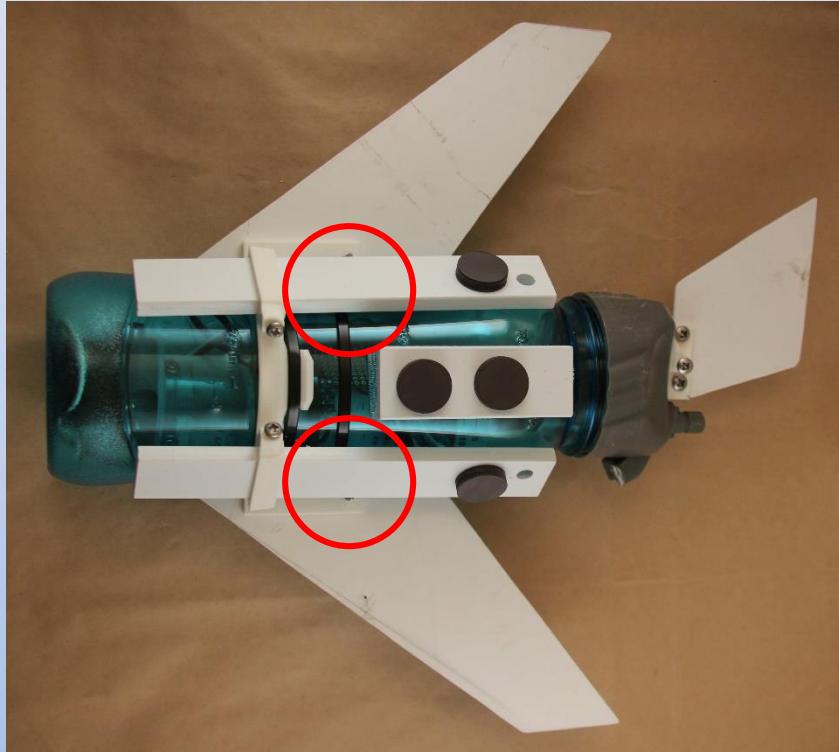
Often a glider flies well when diving, but does not pitch up in the rise cycle. It may float straight up with no forward progress, or even go backwards. To correct this, move magnets and/or small bar backwards towards the tail. If ballasting is way off, you may need to move the two large bars back. This may be required if you attach an action camera to the front of the glider.

Move Weight to Adjust Pitch for Dive



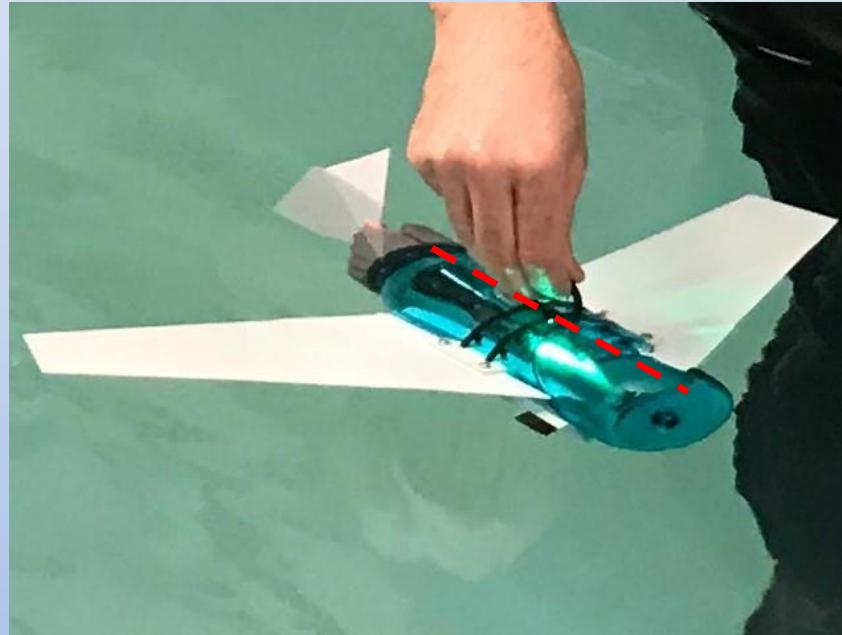
If the glider is not pitching down and diving well, you can move magnets and/or the small bar forward towards the nose of the glider. Usually it's not necessary to move the large ballast bars.

Add More Weight to Sink



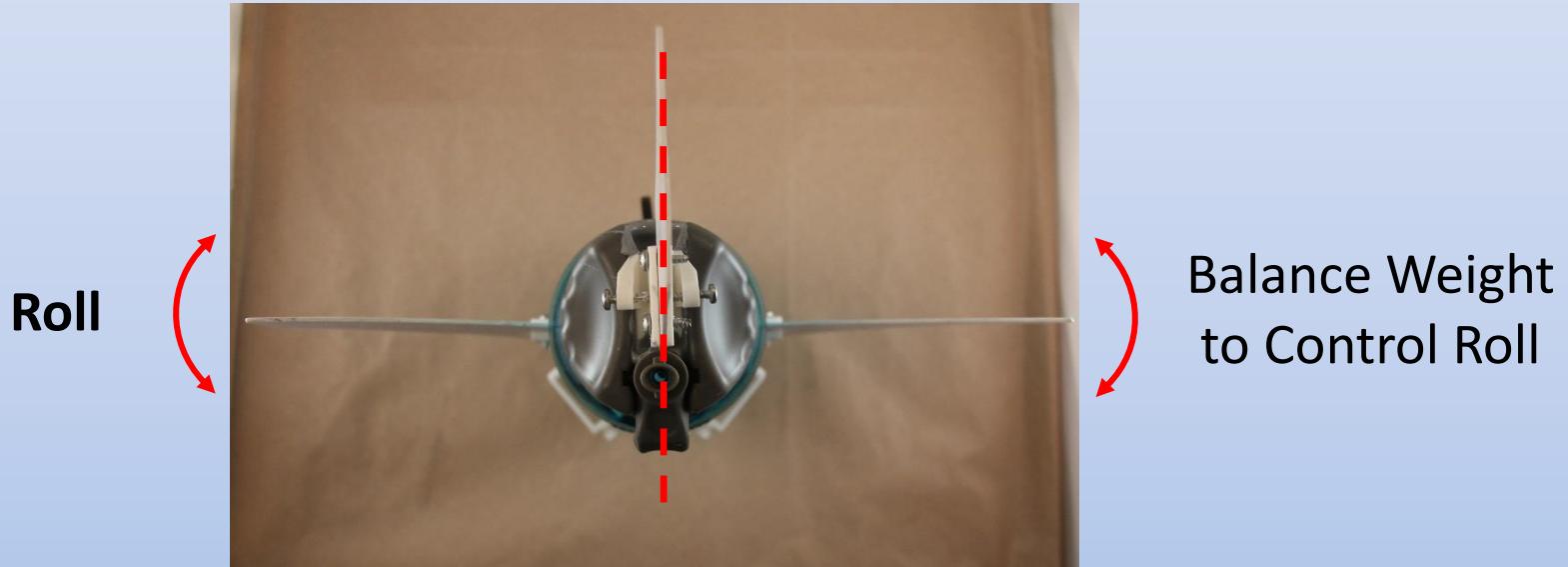
Sometimes the pitch is fine and ballast is needed just to sink the glider when the buoyancy engine draws in water. More magnets can then be added symmetrically to a pitch neutral location, usually under the wings.

Ideal Ballasting



With the buoyancy engine plunger centered and the syringe full of water, the glider should barely float and be level or a little nose up in the water. Only a $\sim\frac{1}{2}''$ -wide strip at the top of the bottle should protrude above the waterline.

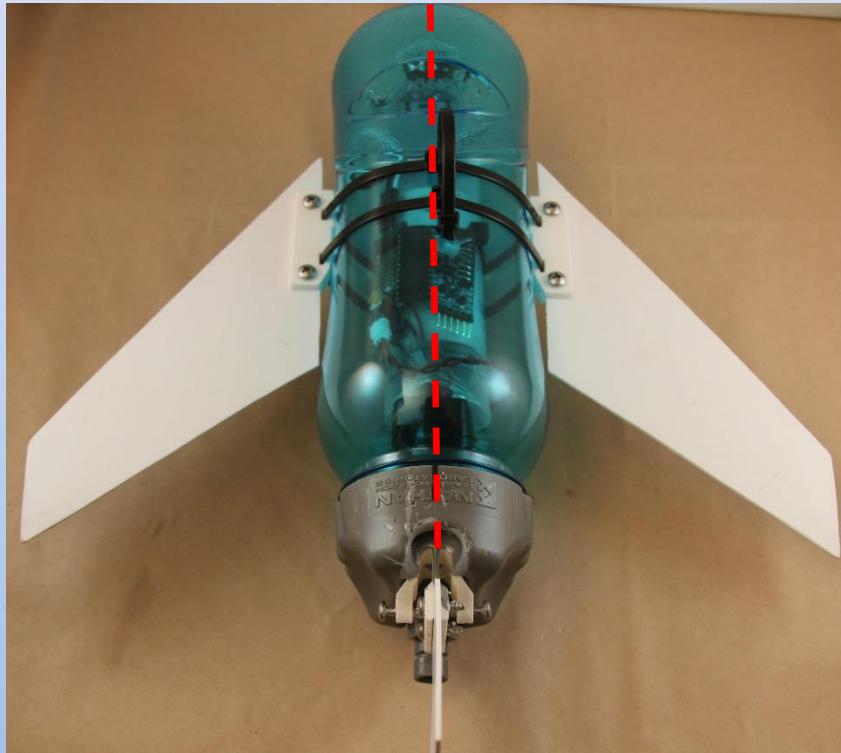
Flying the Glider: Basic Principles



A weight difference between the two halves of the glider can cause roll and a wing to dip, leading to an unwanted turn. Make sure the buoyancy engine is centered in the bottle. If the servo end is off to one side at the nose of the glider, thump the opposite side with the heel of your hand to center it.

Roll: Balance the Glider

Wings should be
Identical



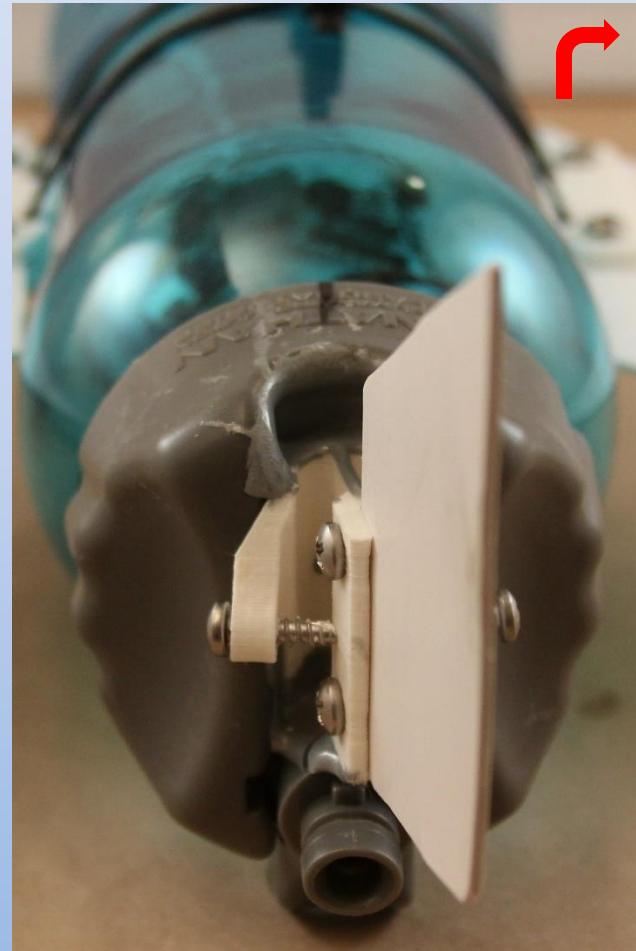
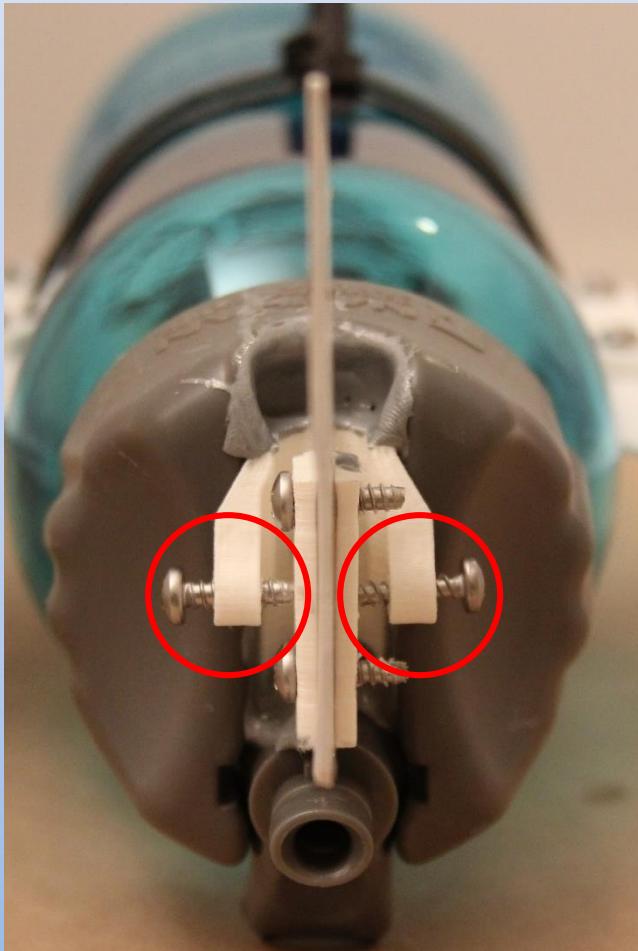
Battery,
Controller and
Servo should be
Centered

Flying the Glider: Basic Principles



The manual rudder on SeaGlide can be used to help direct the glider straight or to turn left or right. It enables the glider to fly in circles or around objects such as a buoy marker.

Yaw: Move Rudder to Turn



Adjust set screws, loosen one and tighten the other, to move the rudder.