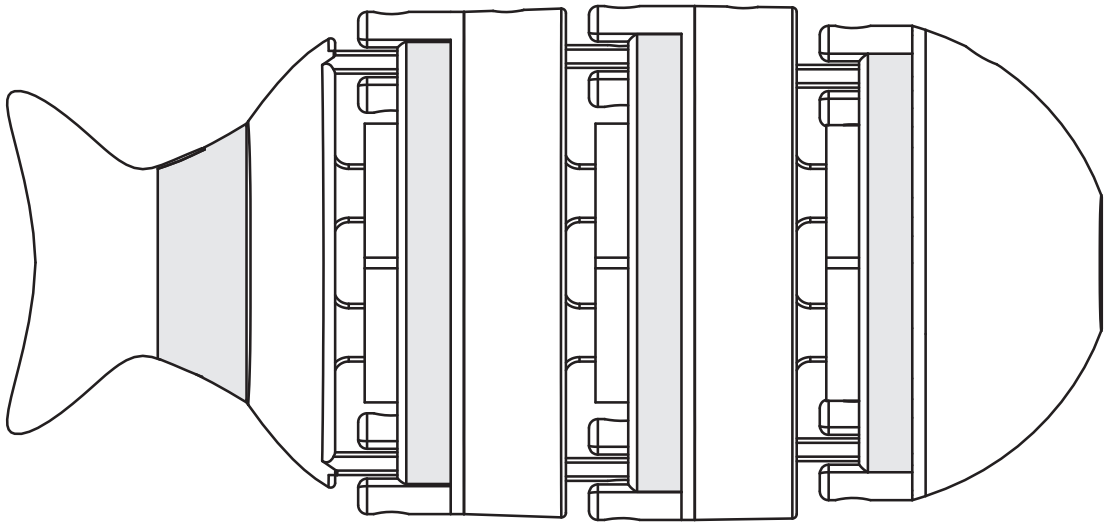
Miniature Oscillating Robotic Agent

User Manual



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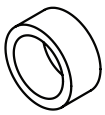
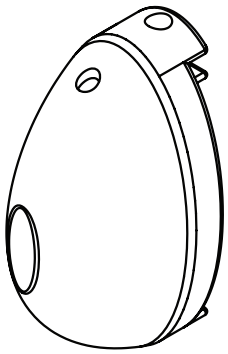
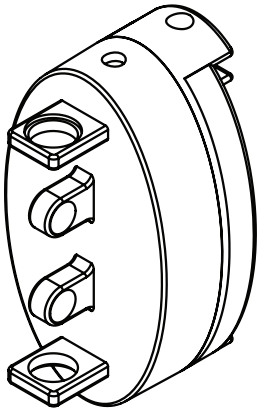
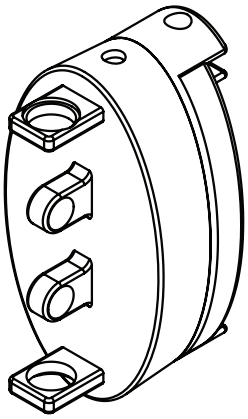
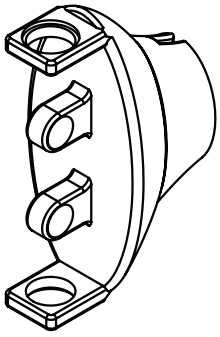
Developed at the LAIR.

In the Box

Ball Bearing, 4x7x2.5mm, 6x	Magnet, 30x30mm, 6x	PVC shaft, 5/32", 6x
		
Coil, copper, 6x	**Head, 1x**	**Segment 1, 1x**
		
Segment 2, 1x	**Tail, 1x**	**Fin, balsa wood, 1x**
		

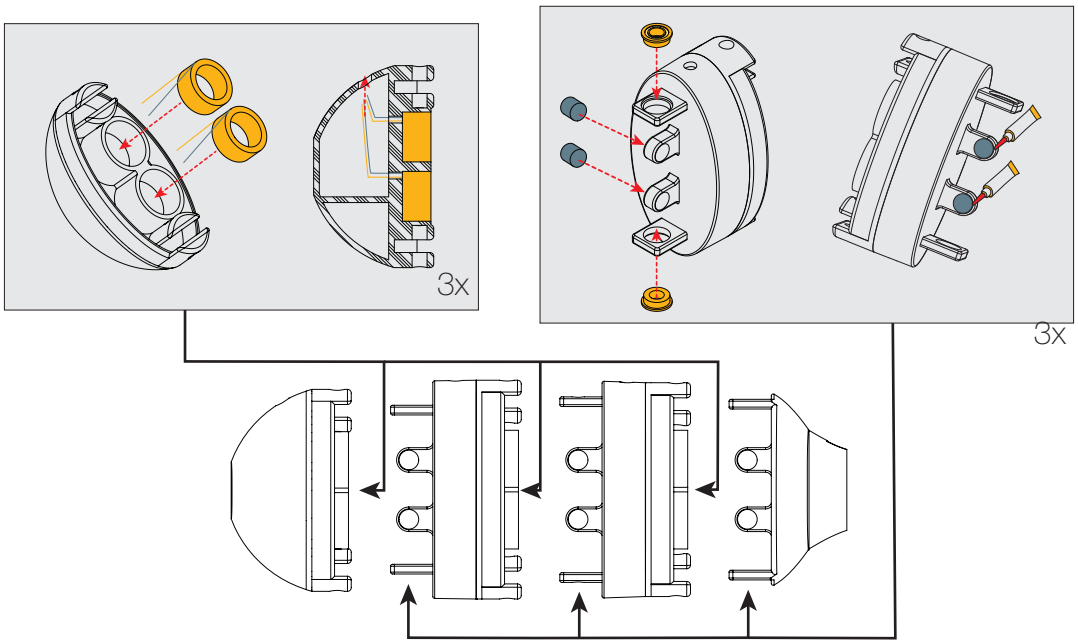
Tools Required

Tools	Usage
Super glue, gloves	Securing magnets and coils in holders.
Pliers	Working with wire, fitting shafts.
Expandable Foam	Filling cavities.
#4-40 bolt 1x, nut 1x, washers 2x	Securing fin.
Flat head screwdriver, flush cutters	Removing support material.

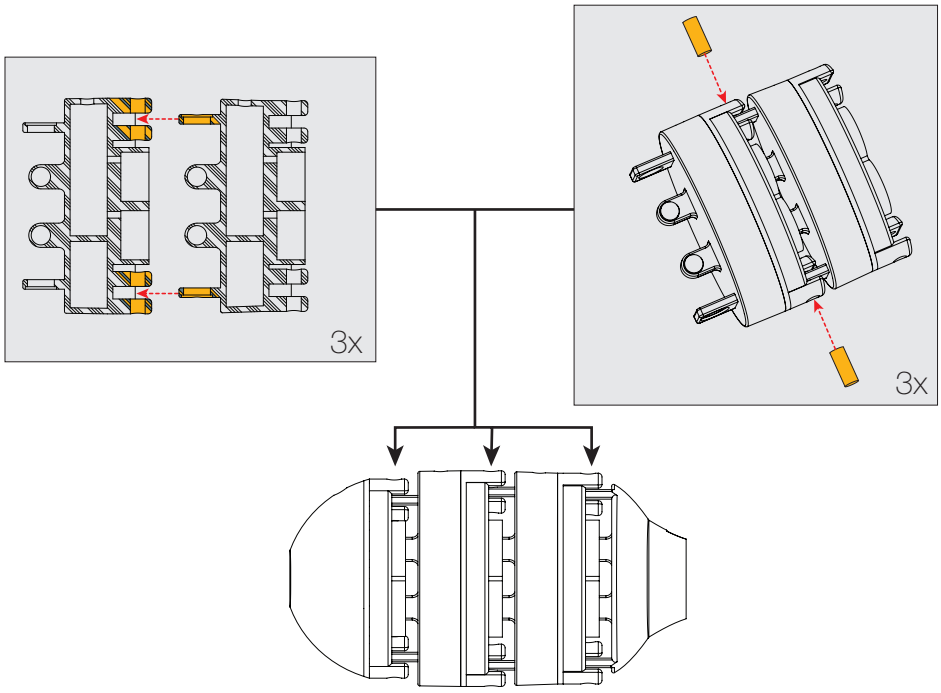
Assembling the Body

Instructions

1. Place one coil inside each holder. Thread wires carefully out through the top of each segment.
2. Gently push bearings into each hinge. Use pliers to press fit.
3. Insert magnets into their holders. Apply a small amount of superglue to the edges and allow to dry.
   * Check that all magnets are facing the same direction.



4. Fit segments together. Ensure that there is minimal friction at the hinges. Insert shafts to secure the segments. Push shafts in until they touch the propulsor wall.



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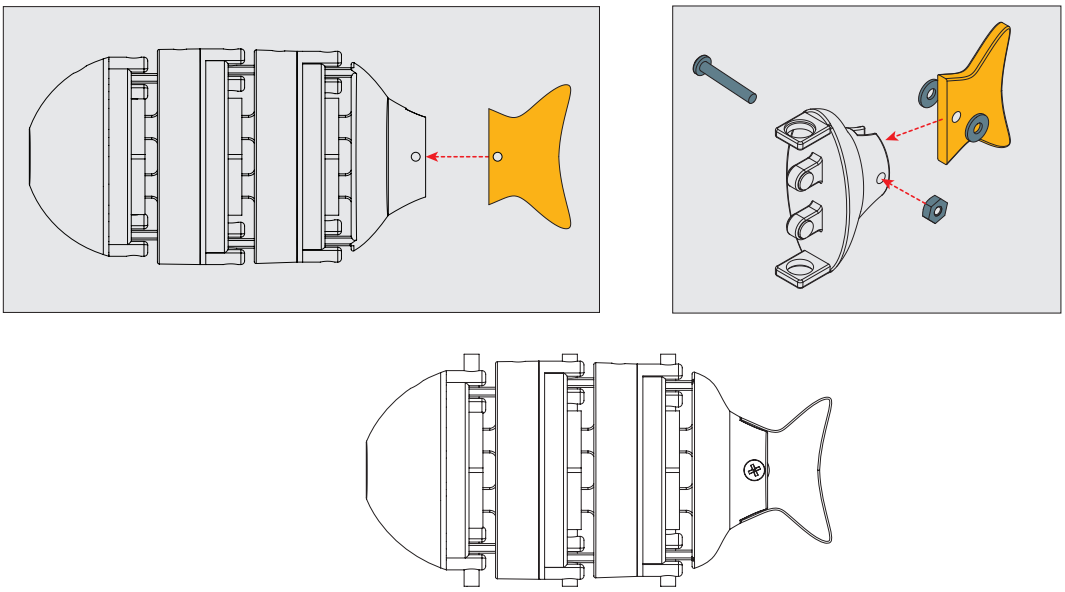
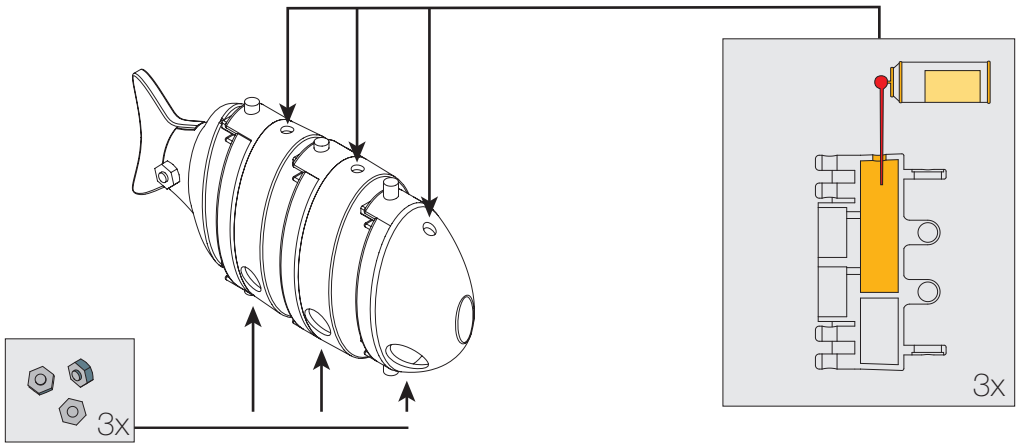
5. Attach fin to the tail segment. Place one washer on each side of the fin inside of the tail segment to prevent wobbling. Secure with nut and bolt.



Achieving Neutral Buoyancy

Instructions

1. Start with adding buoyancy with foam.
   (1) Locate holes at the top of each segment and ensure spray foam straw fits.
   (2) Spay foam into hole until it begins to bubble out. Be prepared to remove excess foam with paper towel.
   (3) Allow to set before sanding excess foam off.
   * Check that foam has not expired. Side effects include lesser expansion and falling during setting.
   (4) Place in water and ensure that robot floats to the surface.



2. Add small weights such as nuts and washers into side holes.
   (1) To secure weights inside, add hot glue to the hole.
   (2) Experiment with weight placement until the robot remains in a state between floating at the surface and sinking to the bottom.
   * To test for neutral buoyancy, push the robot down. If it floats upwards but does not surface, it is ready to swim.