Coroplast Aeropod Assembly: production prototype v1.0

Contents:

What is in your box

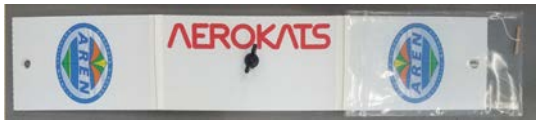
Each Aeropod kit contains one pre-assembled Aeropod and one unassembled Aeropod.

You should see these pieces in your box:

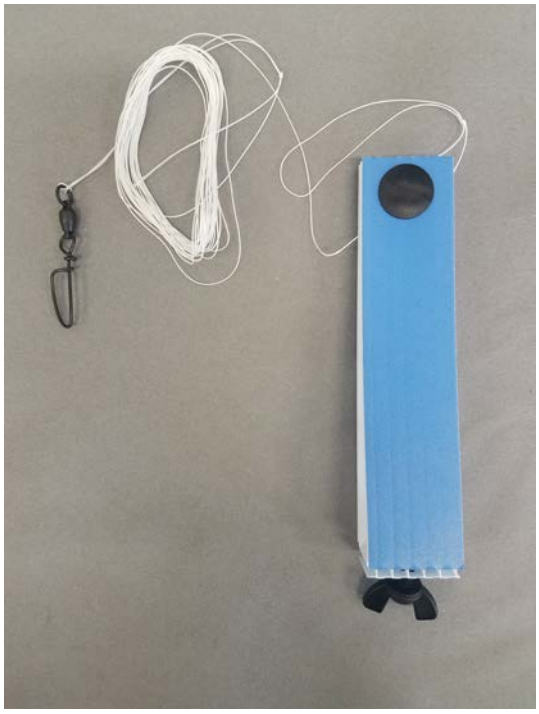
Pre-assembled Aeropod*

*Some Assembly Required. Instructions below.

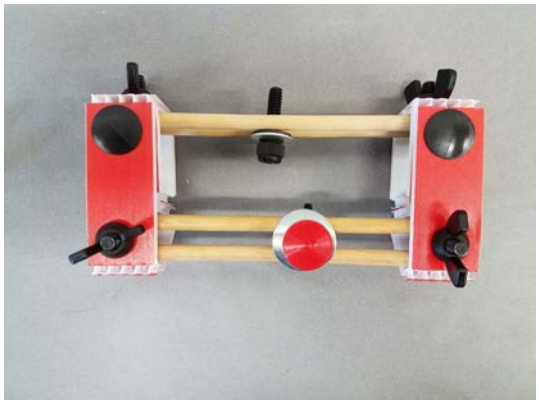
Fin



Pylon

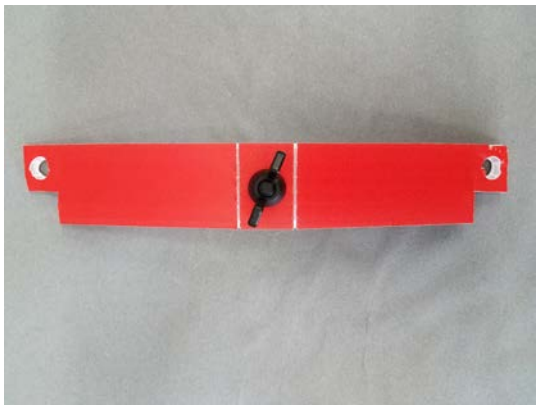


Point and shoot camera mount



Kestrel mount

vTech camera mount



Double boom

Extra hardware

These include: extra velcro for the Kestrel mount, a curved washer for the fin, and a shorter thumbscrew (3/8") for camera mounts. Also are two aluminum-backed rubber washers that are lighter than the steel-backed rubber washers, but not wide enough to replace them.

Full Aeropod Kit

Tools needed:
scissors (fin assembly)

Bag 1

- 8" velcro ties
- 14 ratcheting rivets (7 pairs)
- one small aluminum carabiner
- two 1" x 1/8" birch dowels

Bag 2

- Two steel-backed rubber washers
- two aluminum-backed rubber washers

- one 1/2" thumb screw
- one 3/8" thumb screw
- two curved steel washers
- ten 1/4" rubber washers
- eight 1/4-20 wingnuts
- eight 1" 1/4-20 Nylon thumb screws

Four 6" x 1/4" birch dowels

Four 4" pieces of 3/4" Artist Tape

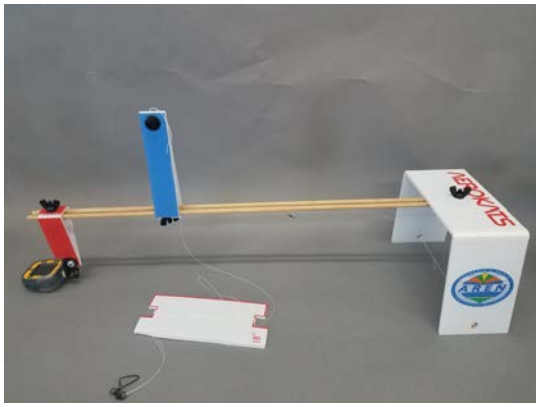
Double boom (1/4" birch dowels)

Coroplast parts

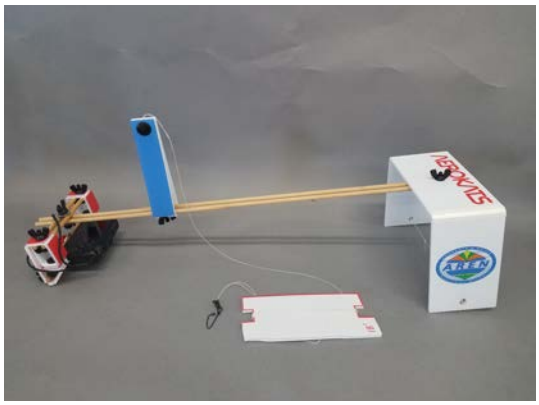
Configuring the assembled Aeropod pieces

The aeropod components are designed to be hand-tightened to the double booms in adjustable positions. Three configurations are provided:

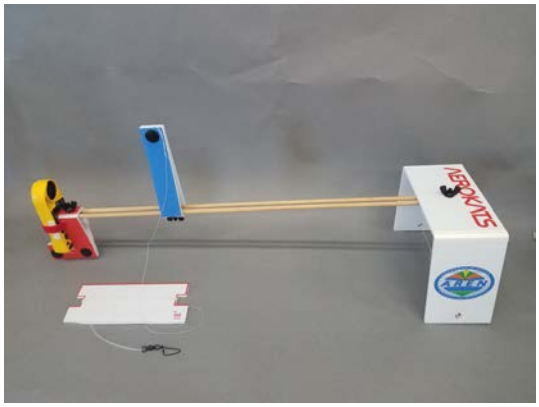
vTech camera



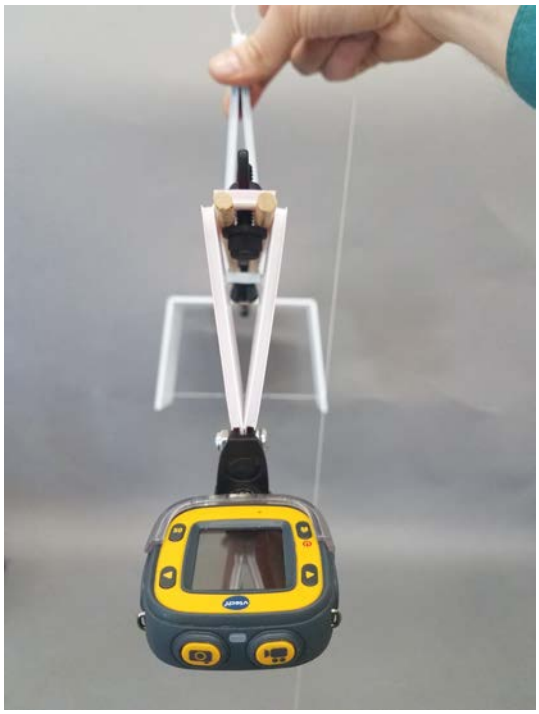
point and shoot camera



Kestrel

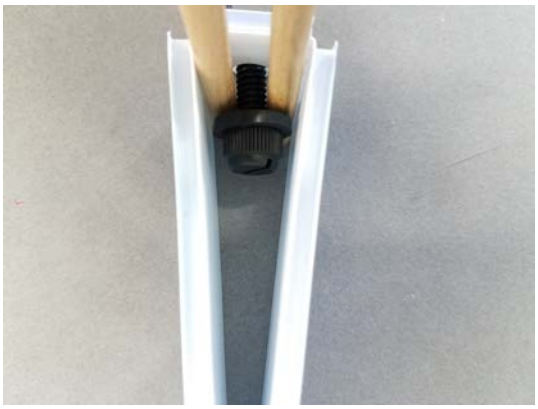


The Coroplast Aeropod is designed to be stable in flight with a low center of gravity, with its weight balance pulling it towards alignment. It may wobble laterally when resting on the ground, but will stay straight in flight. The rubber washers provide a tight hold while allowing some rotation; the fin and modules twist rather than snap on impact.



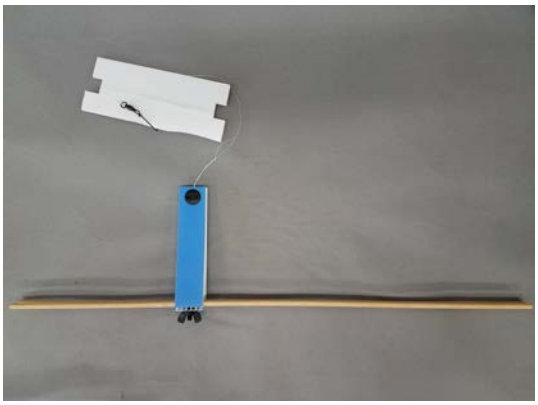
Attaching the pylon to the boom

The coroplast Aeropod's birch dowel twin booms are held in place by pressure between the coroplast and rubber washers on the nylon thumb screws:

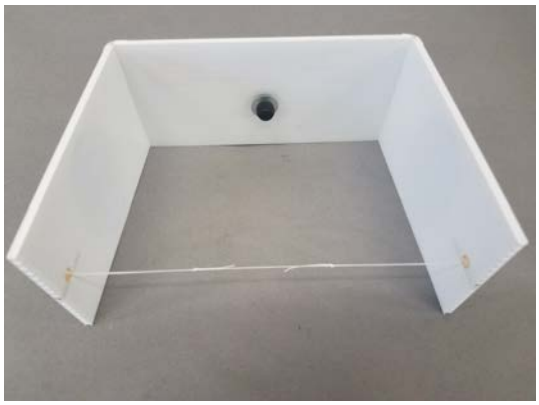


The screws do not need to be tightened very hard to grip the dowels. Light pressure will provide a good grip without crushing the coroplast's corrugations.

Attach the tensioning string to the other side to give the fin its shape.



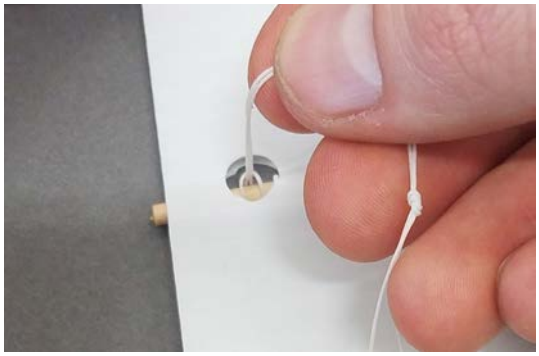
The pylon provides structure for attaching other Aeropod modules, but will need to be moved later to balance the weight of the Aeropod.



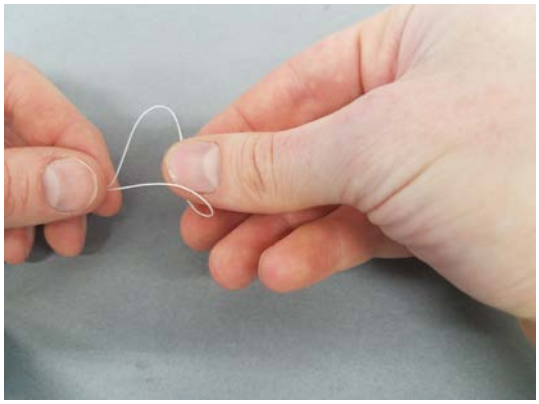
The tension string attachment relies on the 1" x 1/8" birch dowels held in place with a simple loop knot.

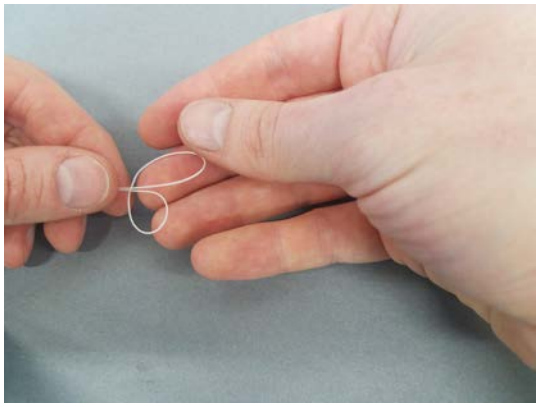
Assembling the fin

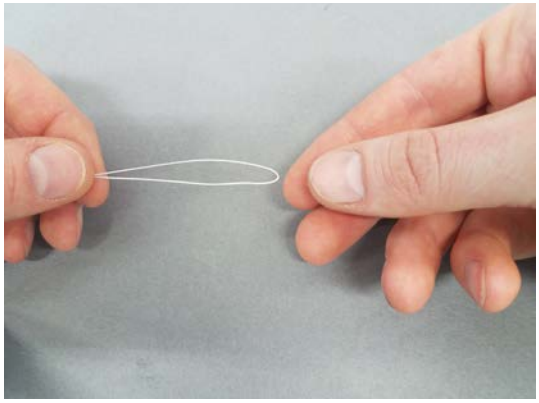
The fin is designed to be flattened and unfolded. The pre-assembled fin has one side bagged up with the tensioning string.



The knot is inserted into the fin's mounting hole, and the dowel slid into place.

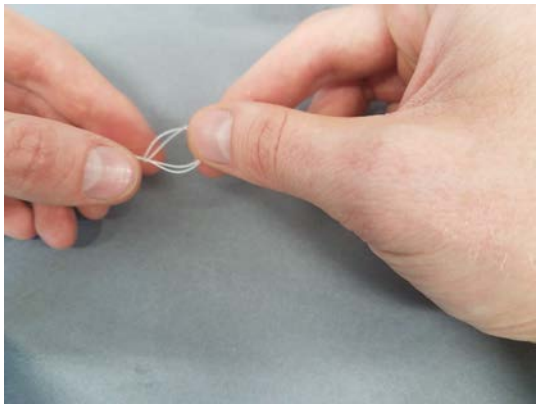


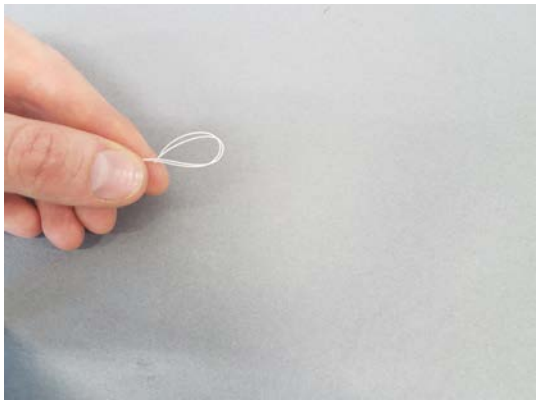




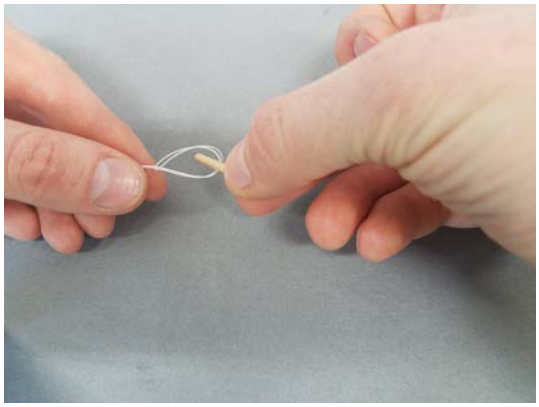
Tuck the end of the loop under its legs to form two loops.

Pinch the two loops upwards, so that the end of the loop remains underneath the legs.

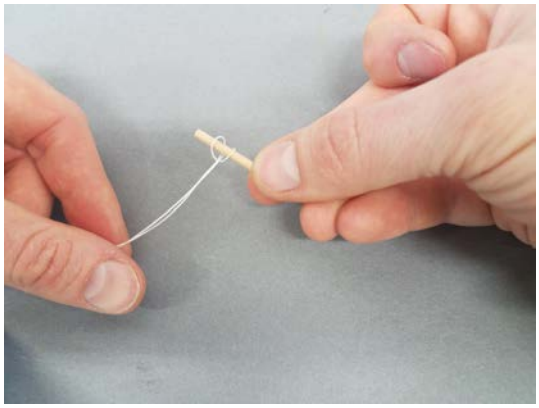




Insert the dowel.



Pull tight:



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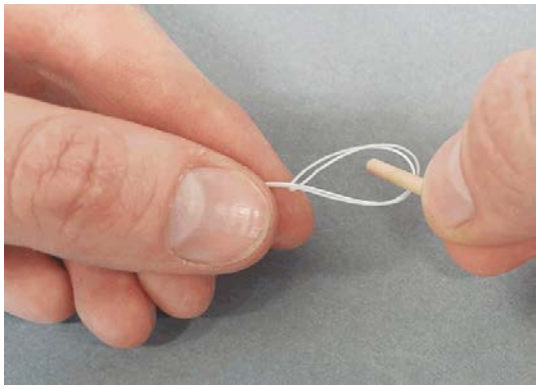
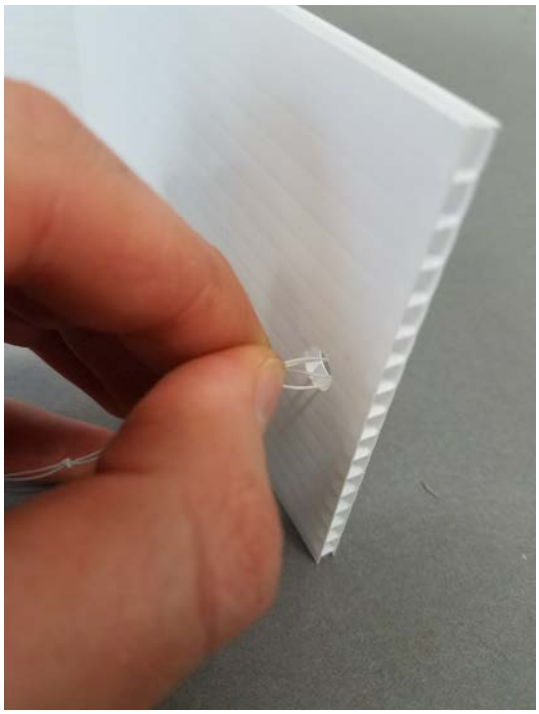
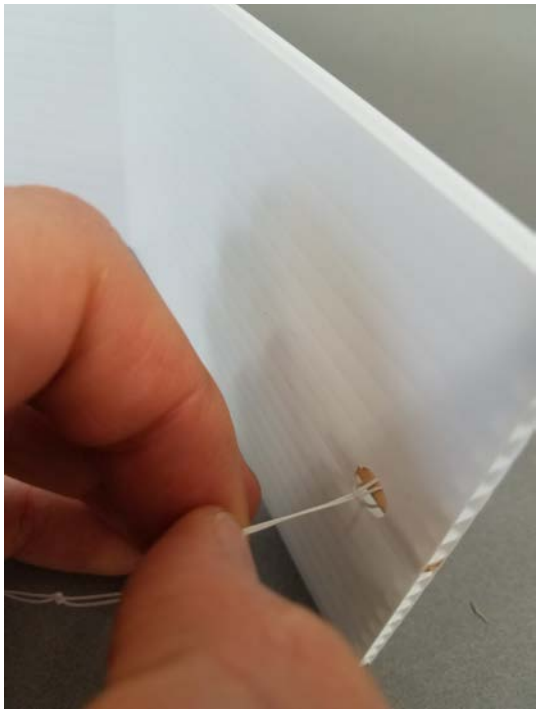


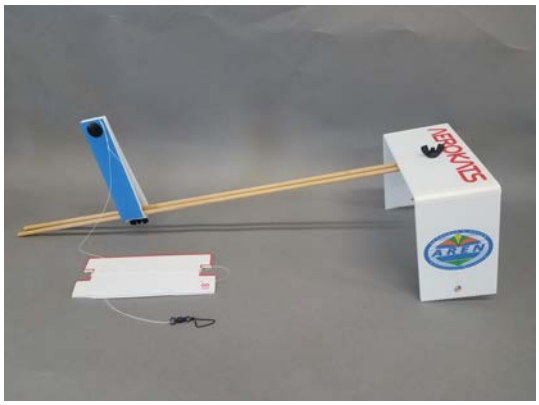
Repeat these steps, inserting the loop knot into the fin's mounting hole, and sliding the dowel into place through the corrugations:





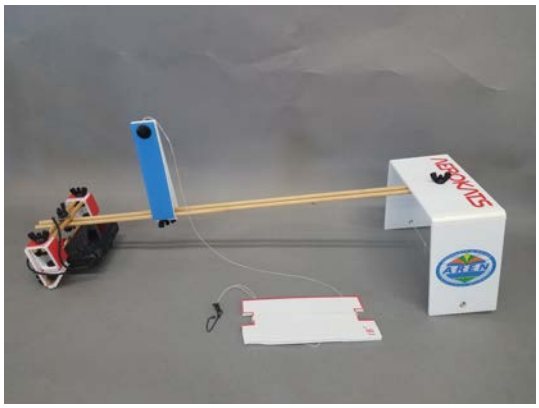
Attaching the fin to the booms

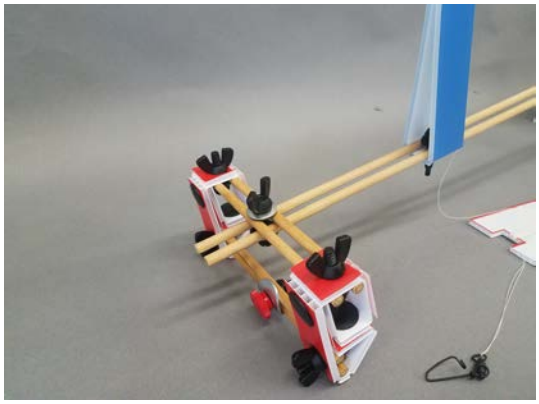
I find the steel-backed rubber washers provide a good hold. A tighter hold is provided by the (heavy) curved steel washer in the *Extra Hardware* bag, if necessary. I have hoped to find a ligher-weight backed washer, but the aluminum-backed washers are not wide enough.



The fin uses a steel-backed rubber washer to hold the booms. Slide the booms between the coroplast fin and the washer. Hold the booms together around the washer, and tighten:

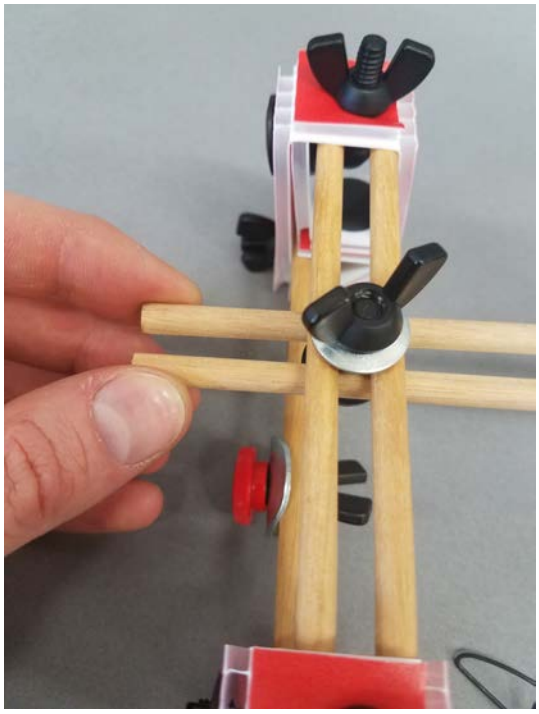
Attaching the point and shoot mount



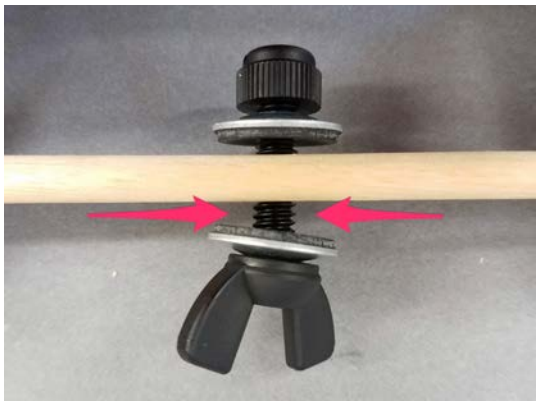


The point and shoot mount uses pairs of dowels as rail mounts to support a variety fo cameras and to allow for off-center mounting on the booms in order to center the camera's mass.

Slip the double boom around the nylon thumb screw and between the point and shoot mount's rails and the steel-backed rubber washer.

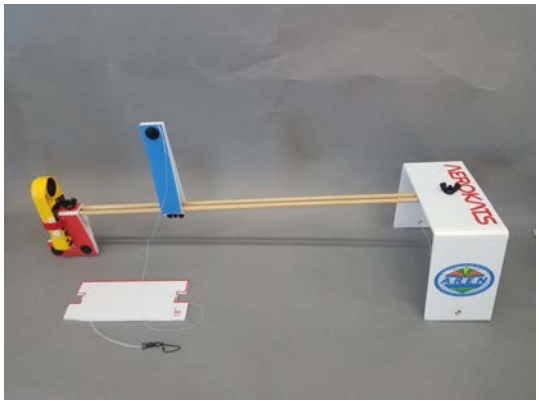


Attach the point and shoot camera to the other set of rails using the red thumb screw.



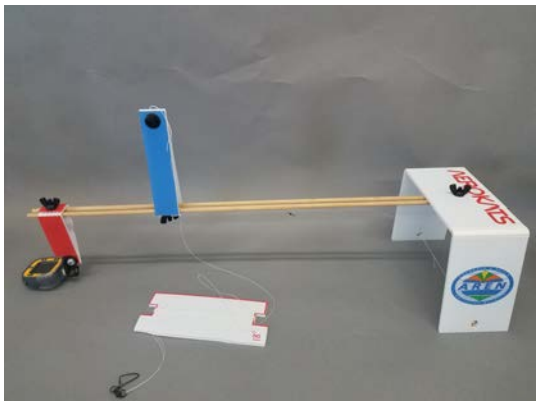
Pinch the booms together and tighten the wingnut:

Attaching the Kestrel mount



Attach the kestrel mount to the front of the aeropod.

Strap the Kestrel in with the bottons facing the coroplast mount.



The coroplast mount has a second slit at the bottom for another velcro strap to run vertically around the Kestrel for a tighter hold (available in the *Extra Harware* bag). I have not found it necessary.

Attaching the vTech camera mount

You will need a wrench and screwdriver for the vTech's mount.

Tighten down:

The coroplast around the vTech mount must be crushed to fit into the narrow space:

Attach to the front of the Aeropod.

Assembling the full Aeropod kit

Fin

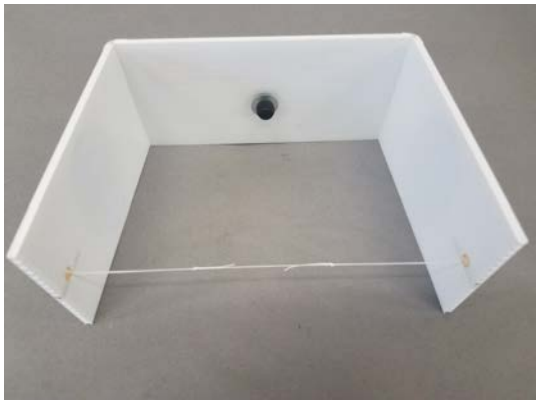
Parts:

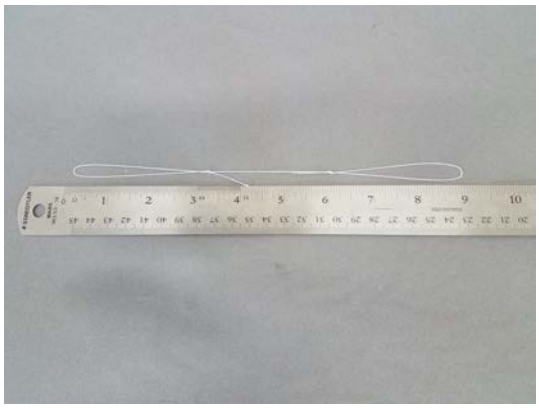
- fin

- two 1/8" dowels
- Artist tape
- one nylon thumb screw
- one steel backed rubber washer
- one wingnut
- 18" of string

Tools needed:

- Ruler
- scissors for cutting string

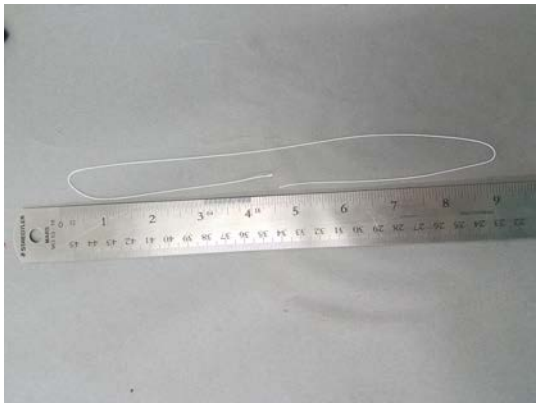


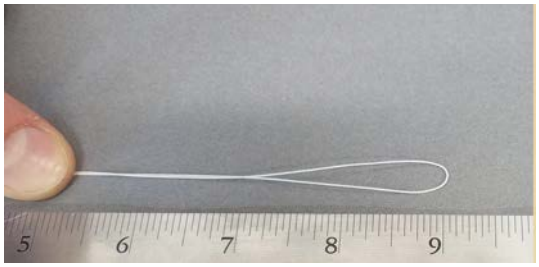


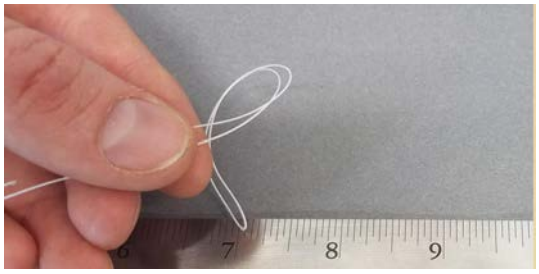
The Aeropod fin is held at an angle with a 9" tensioning string made from 18" of string with a loop on each end.

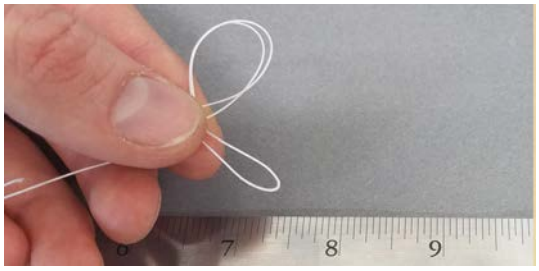
A ruler helps to keep the string at a 9" total length. Making the two loops the same size is not important.

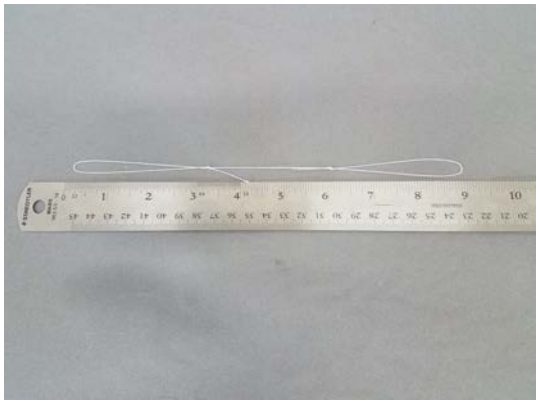
Use an overhand knot to tie a loop in both ends of the string.











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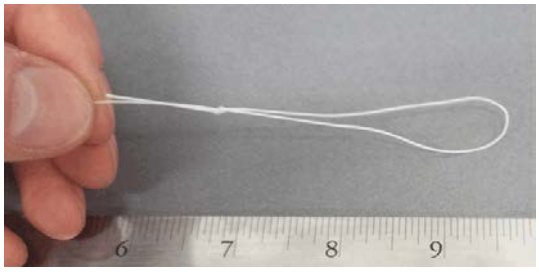
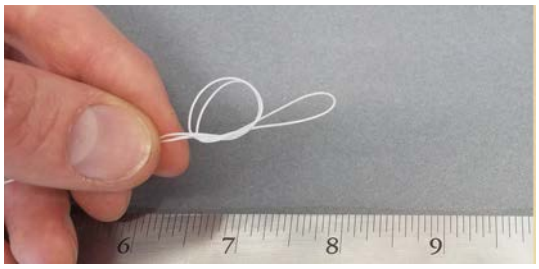
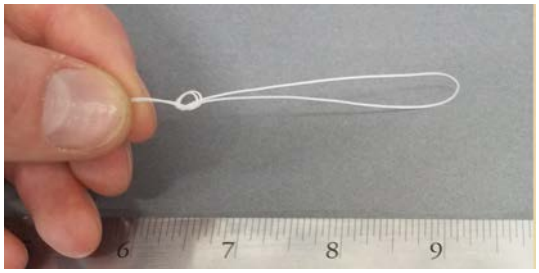
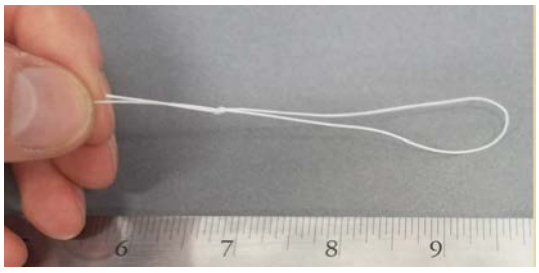
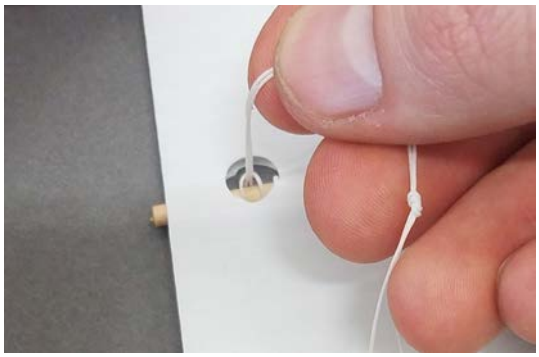


The tension string attachment relies on 1" x 1/8" birch dowels held in place with a simple loop knot.

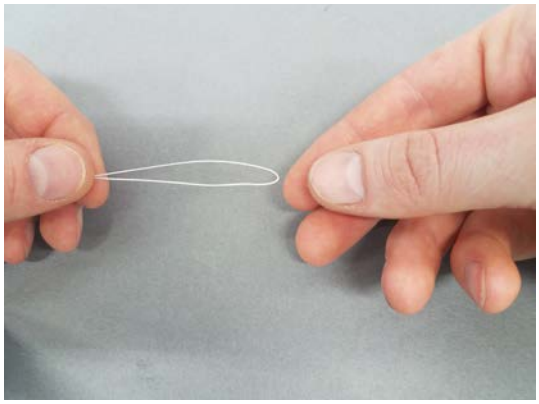






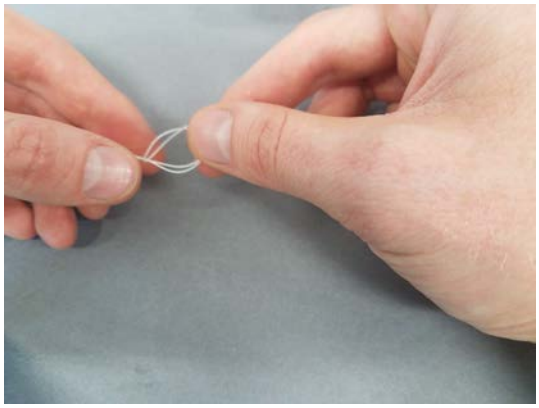


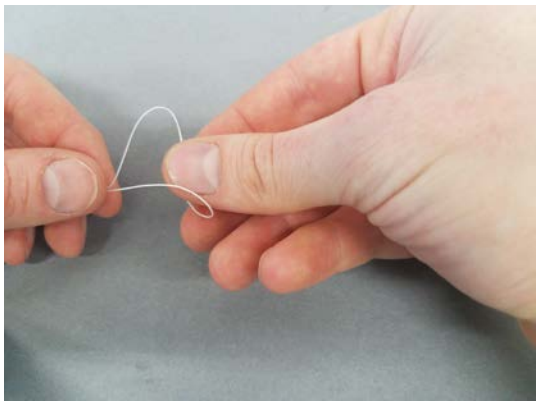
The knot is inserted into the fin's mounting hole, and the dowel slid into place.

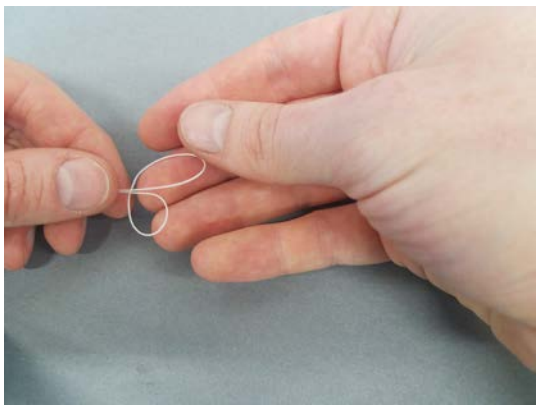


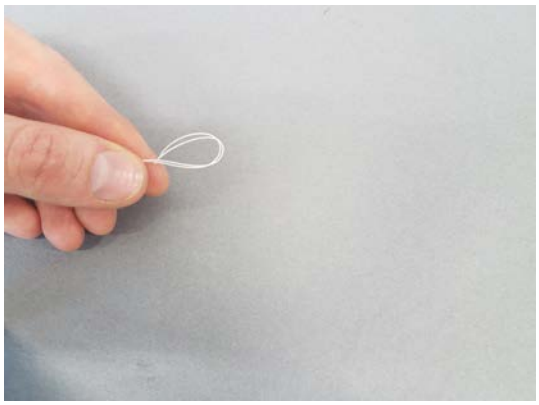
Tuck the end of the loop under its legs to form two loops.

Pinch the two loops upwards, so that the end of the loop remains underneath the legs.

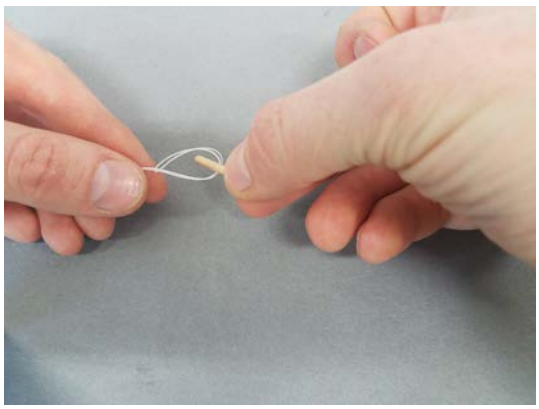




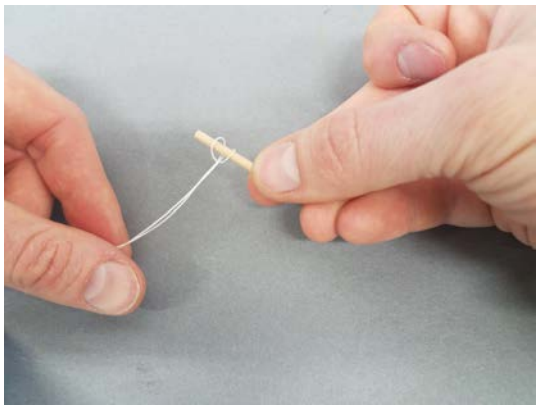




Insert the dowel.



Pull tight:



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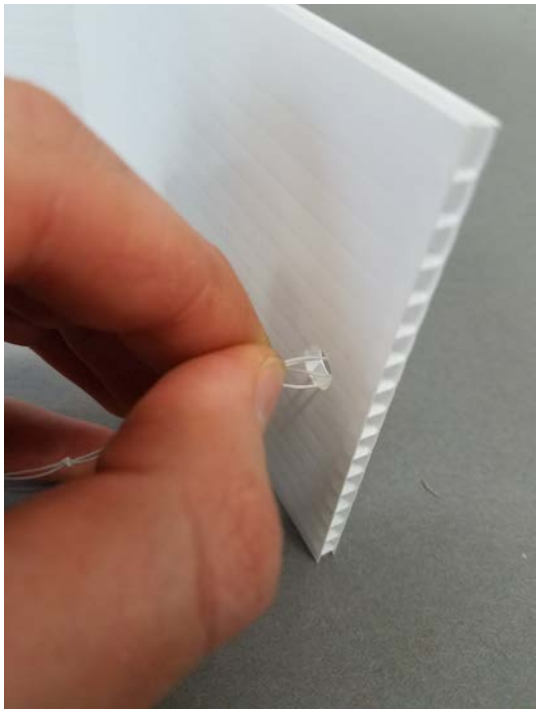
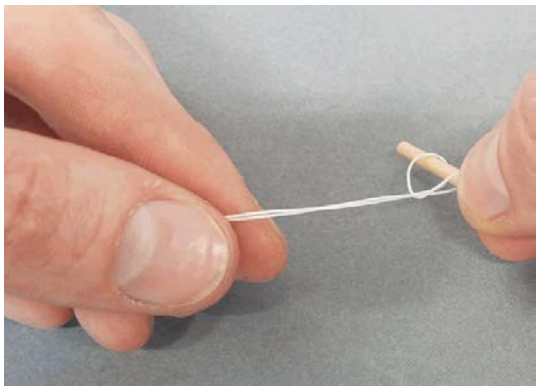
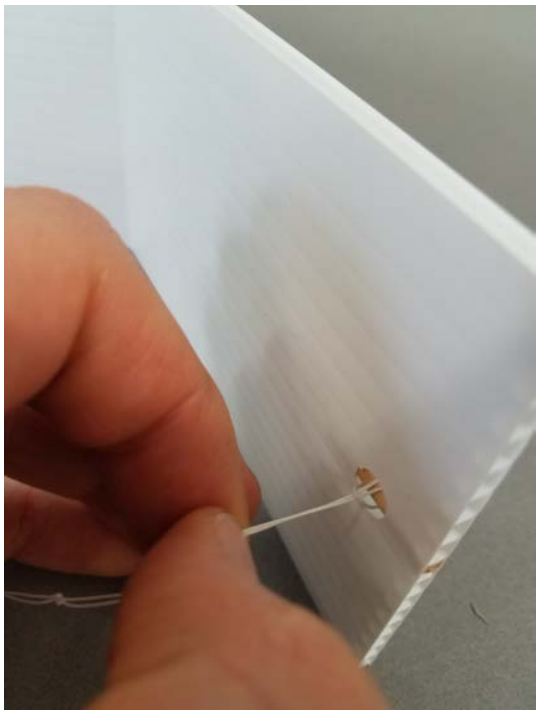




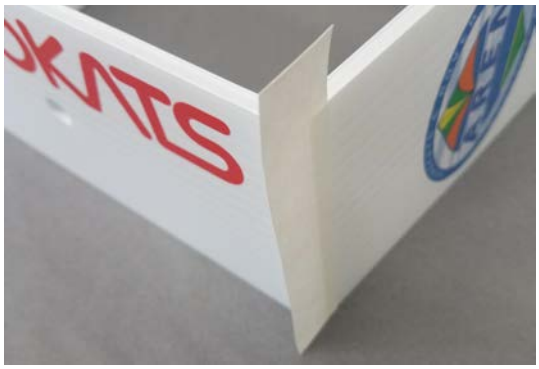
Repeat these steps, inserting the loop knot into the fin's mounting hole, and sliding the dowel into place through the corrugations:



The fin is now tensioned, but it may be unevenly bent. Taping the corners will make it symmetrical.

Attach the strips of tape to only one side of the Aeropod's corner. Stick down about 1/3 of the width of tape.

Hold the fin so that both sides are bent evenly and fold the tape over tightly.



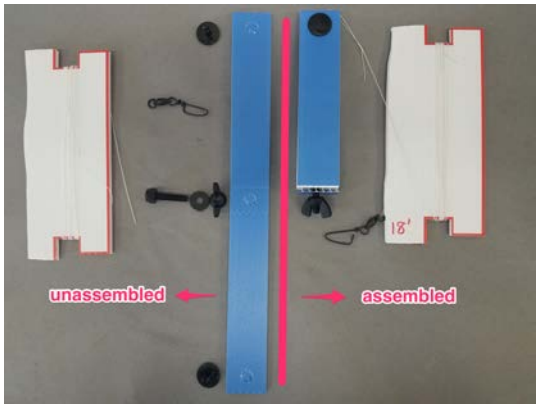
Trim the excess tape with scissors.

Pylon

Parts:

- pylon
- String
- snap swivel
- one nylon thumb screw
- one rubber washer

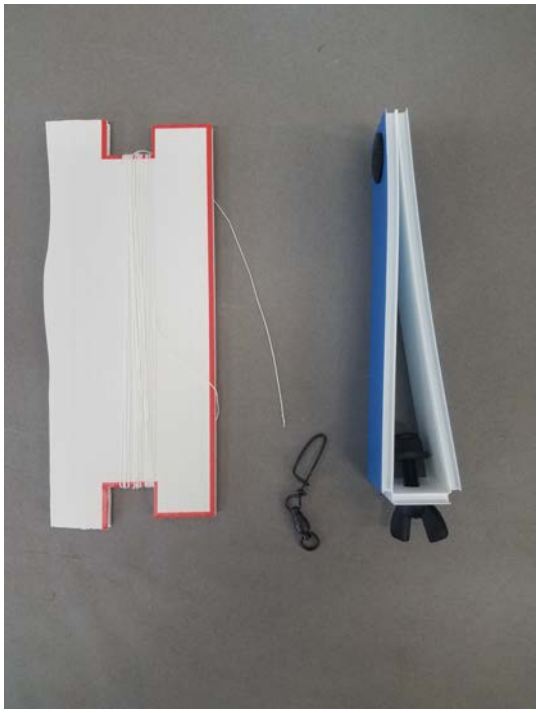
- one wingnut
- one pair of ratcheting rivets



Pull out all the remnants from punched holes and fold at all scored marks

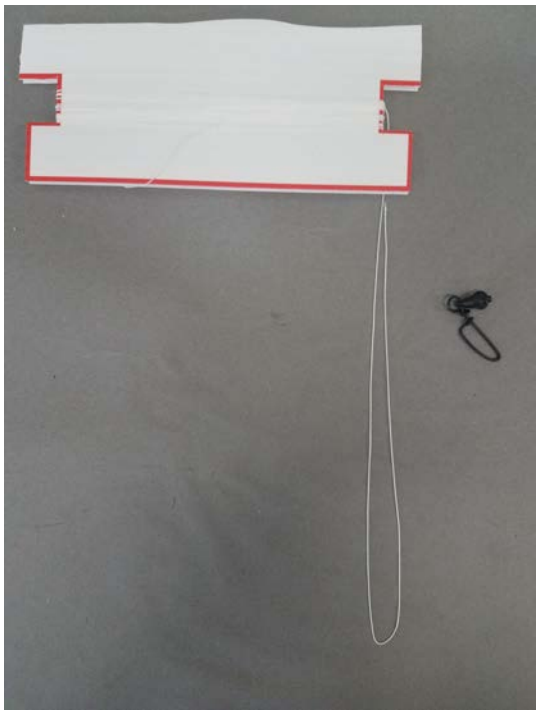
Fold in half and insert the pair of ratcheting rivets in the top of the pylon:

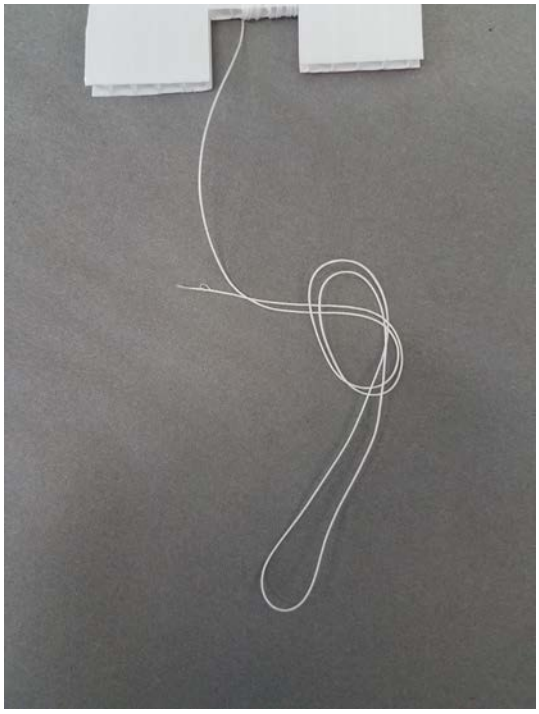
Push the rubber washer down to the head of the nylon thumb screw and insert into the bottom of the pylon:

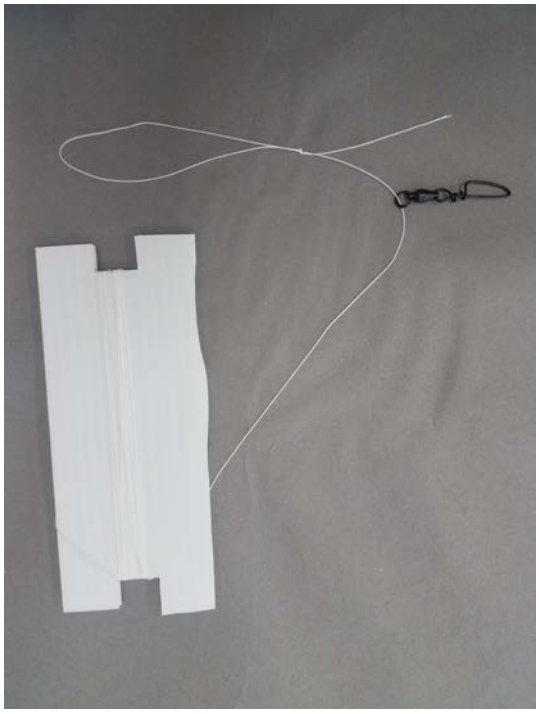


Tie a 4-6" loop in the end of the string with an overhand knot

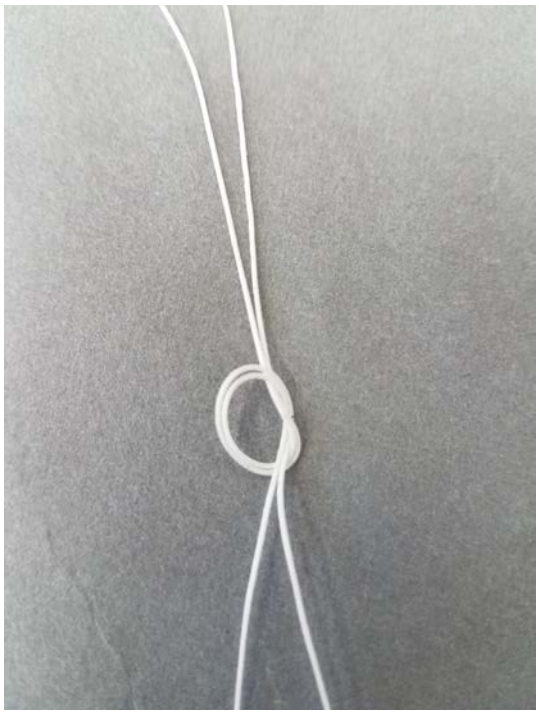
Tying string to the pylon



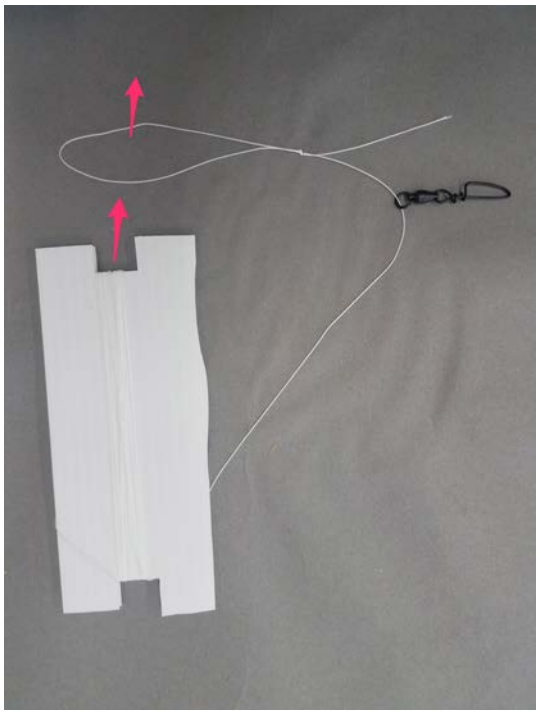


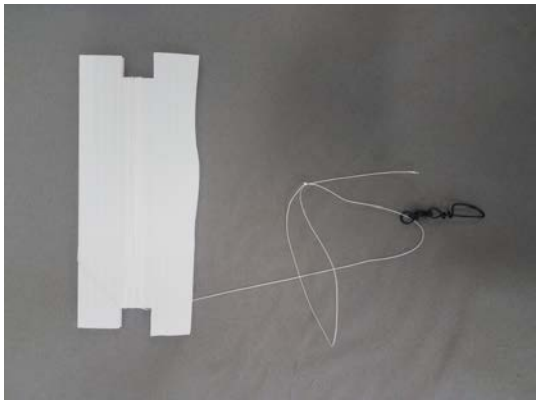


Encircle the spool of string with the loop and pull the loop back onto itself and around the snap swivel's ring.

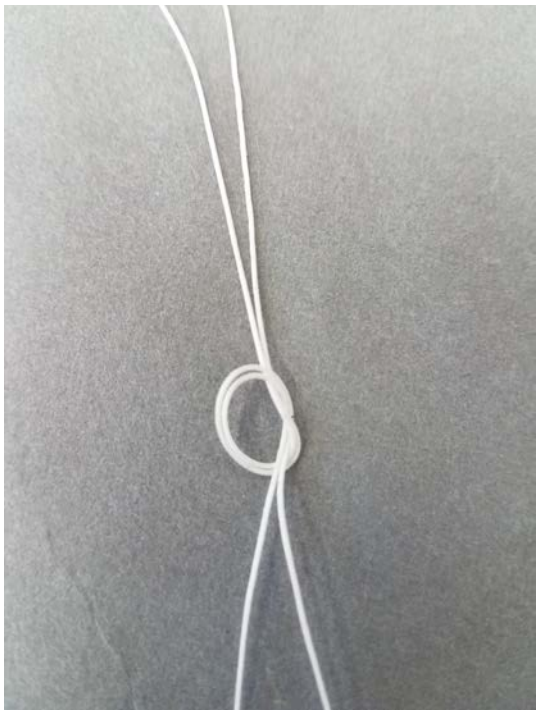


Slide the loop through the ring on the snap swivel:



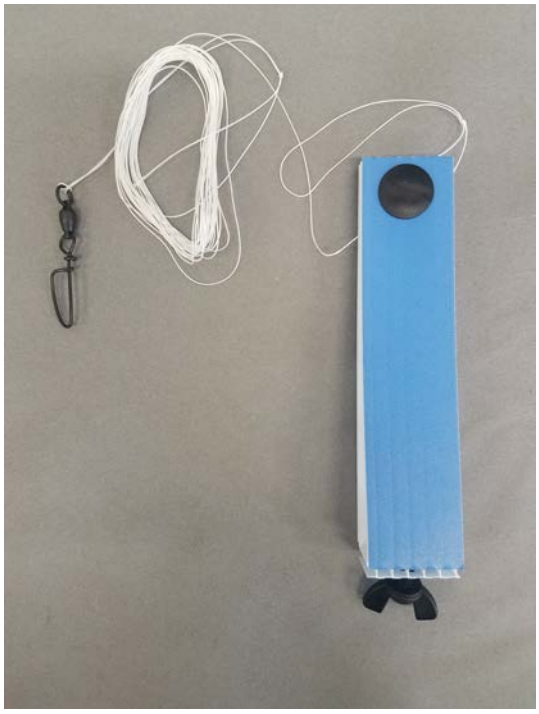


Carefully unwind the string from the spool and tie aloop on the other end.

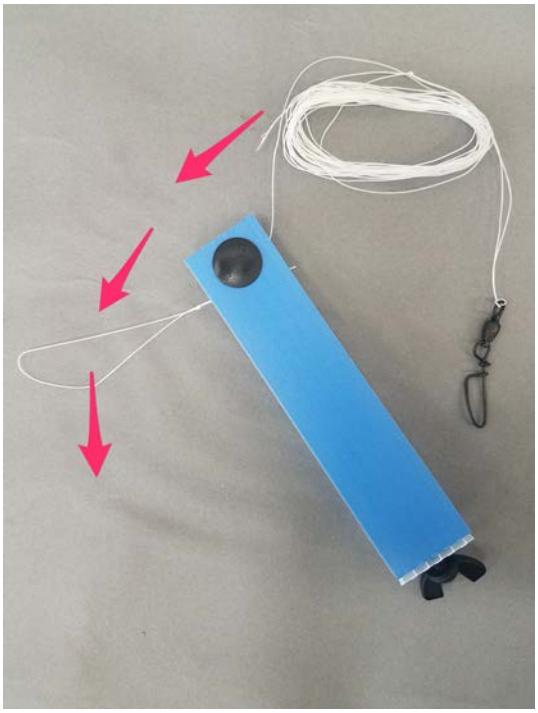


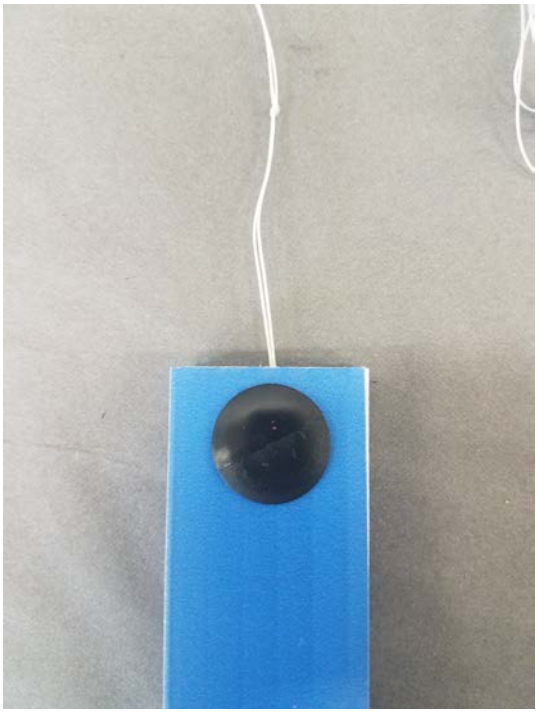
Push the pylon over the loop.

Carefully pull all the string through the loop.



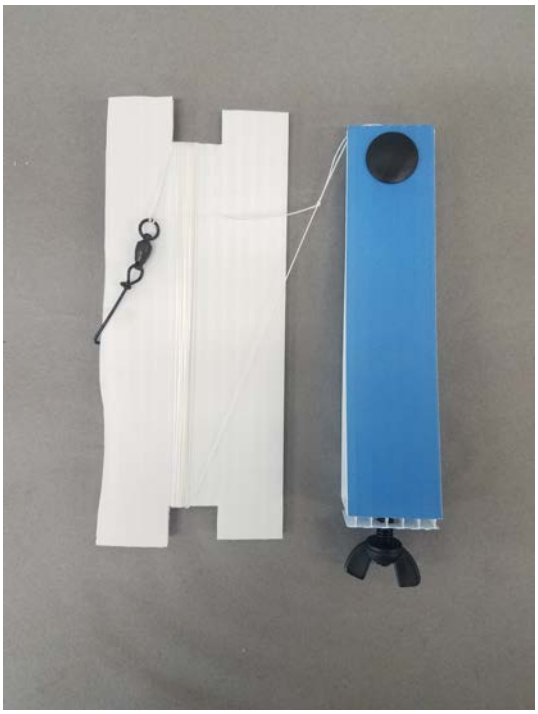
work the loop down onto itself before pulling tight around the ratcheting rivet.



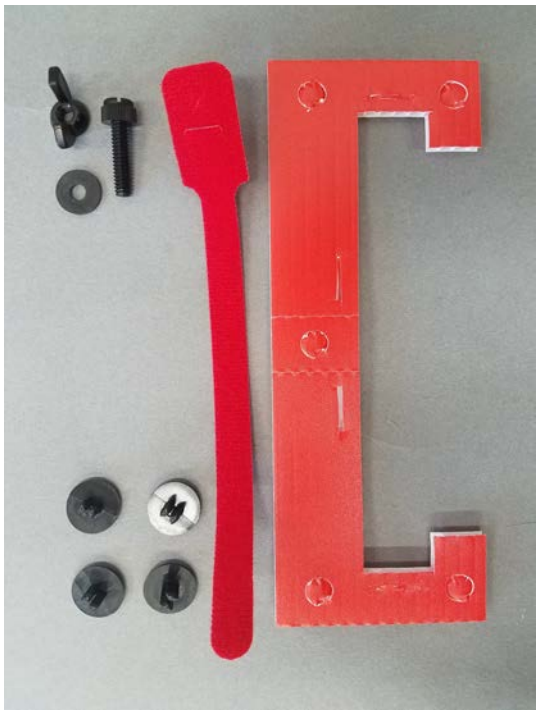


Parts:

- coroplast Kestrel mount
- one nylon thumb screw
- one rubber washer
- one wingnut
- two pairs of ratcheting rivets

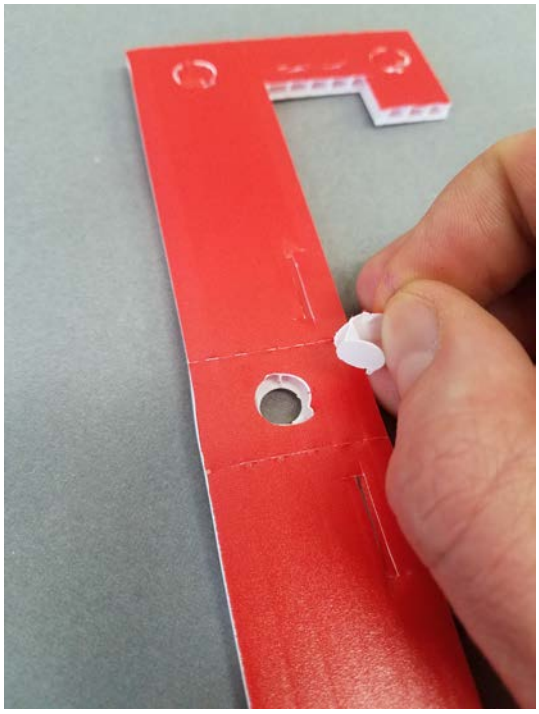


Wind the string back onto the spool for safe keeping.

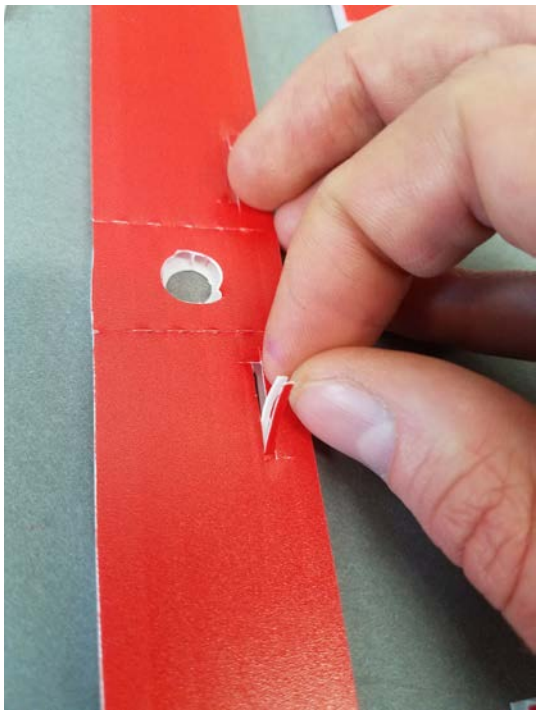


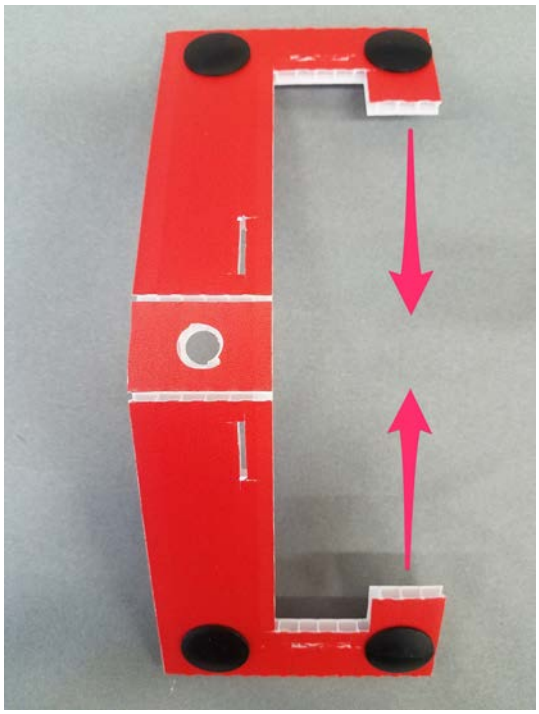
Remove all the remnants from punched holes.

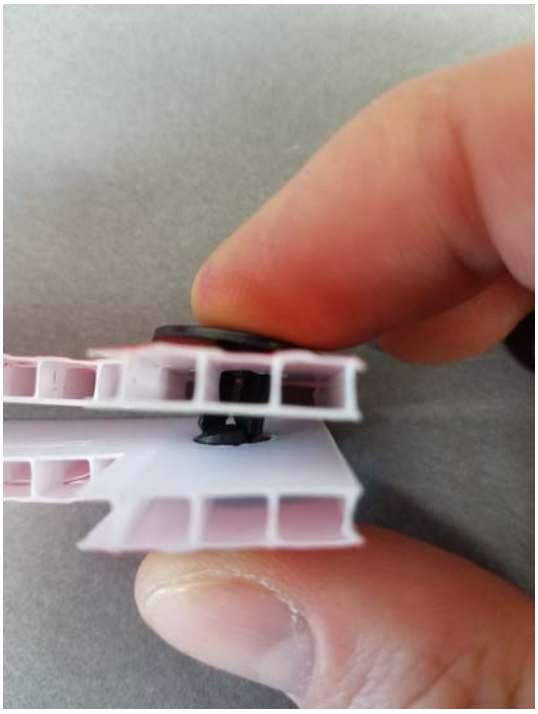
Kestrel Mount



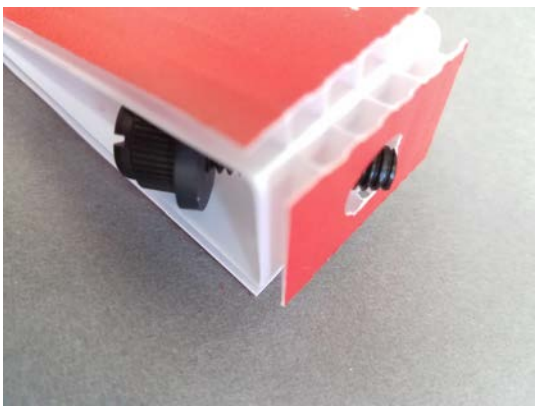
Insert the rivets into the four corner holes and press them together.







Push the rubber washer onto the Nylon thumbscrew and insert into the Kestrel mount.



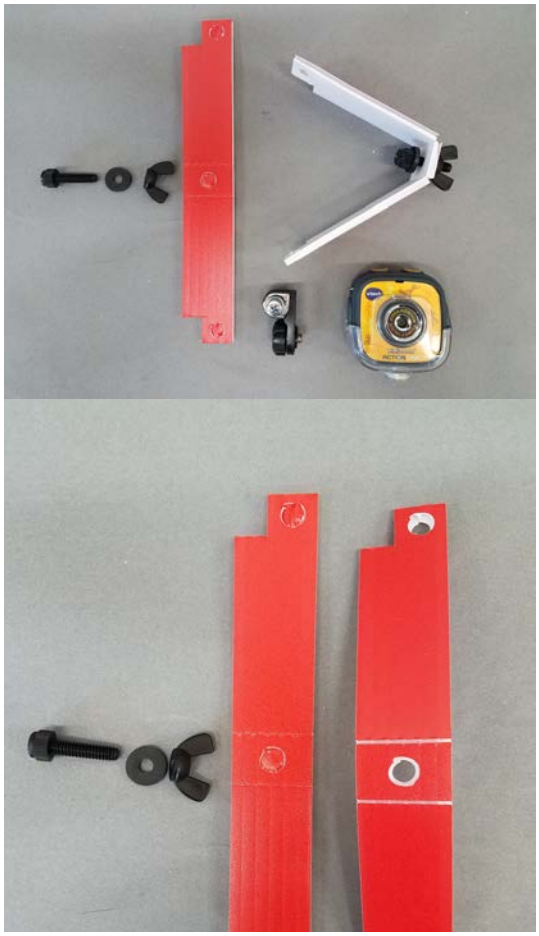
Push the velcro strap through the slit near the thumb screw.

vTech camera mount

You will need a wrench and screwdriver for the vTech's mount.

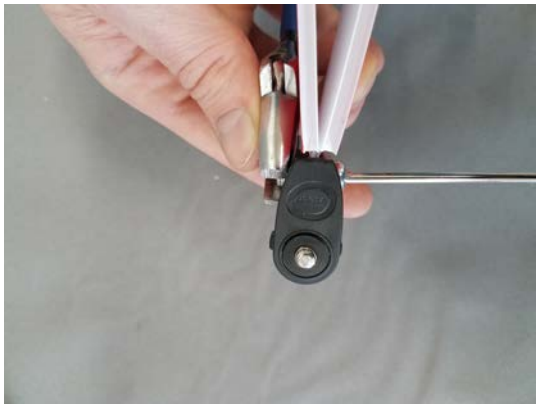
Parts:

- Coroplast vTech camera mount
- one nylon thumb screw
- one rubber washer
- one wingnut
- vTech bolt assembly

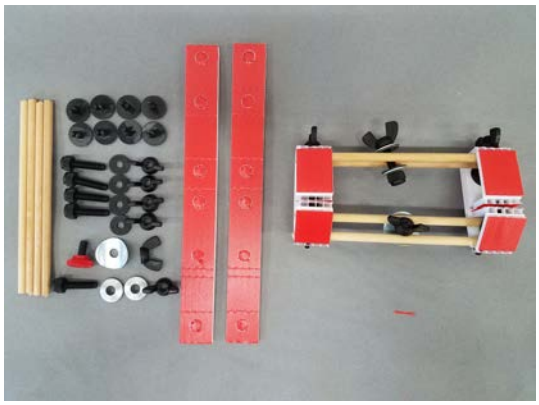


The coroplast around the vTech bolt assembly a must be crushed to fit into the narrow space:

Tighten down:



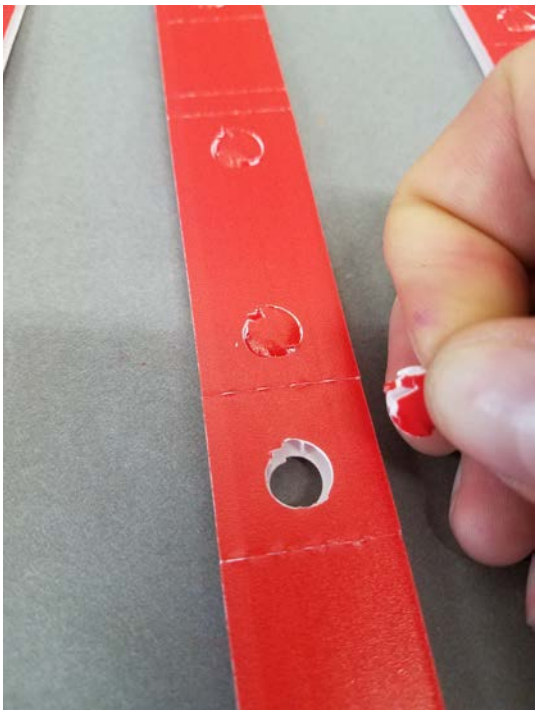
Point and shoot mount



- four 1/4" x 6" birch dowels
- four pairs of ratcheting rivets
- four nylon thumb screws
    - four rubber washers
    - four wingnuts
- one 1/2" steel thumbscrew
    - one curved washer
    - one wingnut

- one nylon thumb screw
    - two steel-backed rubber washers
    - one wingnut

Begin by removing the remnants from all the punched holes.



Each side of the point and shoot mount requires:

- two pairs of ratcheting rivets
- two nylon thumb screws
    - two rubber washers
    - two wingnuts

Bend all the scored points.

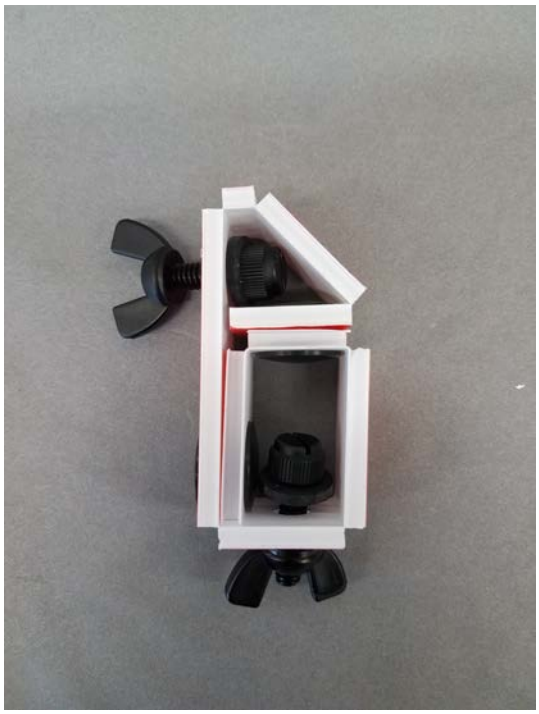
Roll the bottom up and rivet the bottom hole to the hole third from the top.

Push a rubber washer onto a thumb screw and insert it into the second from the top hole

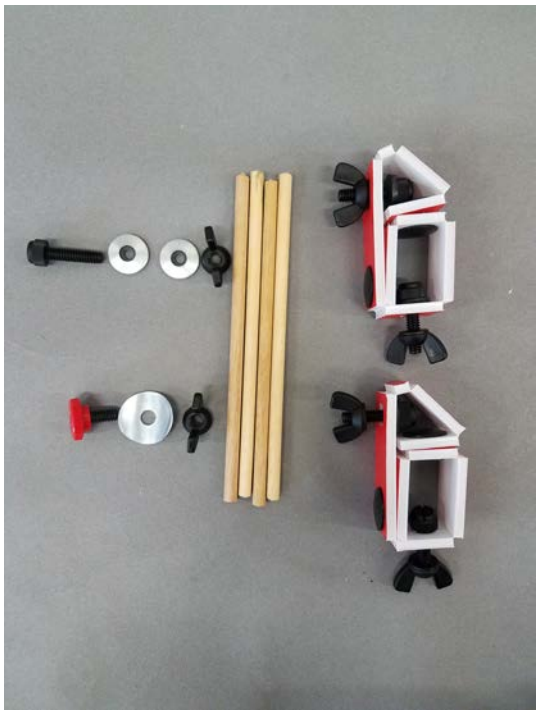
Insert a ratcheting rivet into the white inside of the top hole. Fold down and attach to a rivet through the remaining open hole.

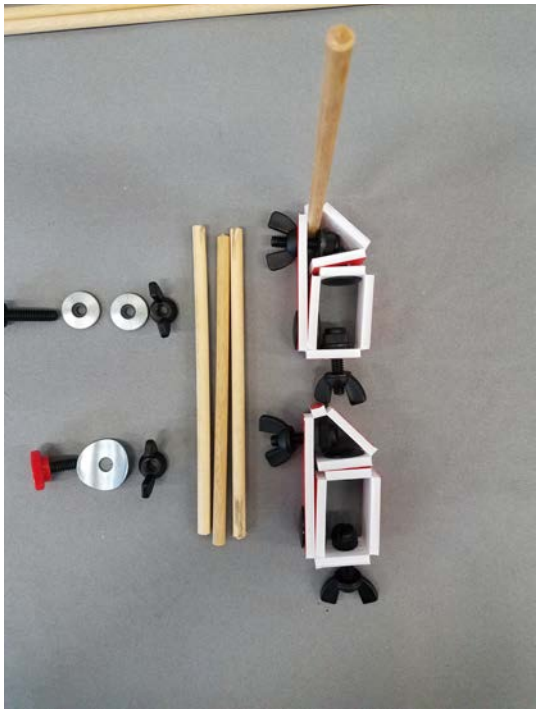
- four 1/4" x 6" birch dowels
- one 1/2" steel thumbscrew
    - one curved washer
    - one wingnut
- one nylon thumb screw
    - two steel-backed rubber washers
    - one wingnut

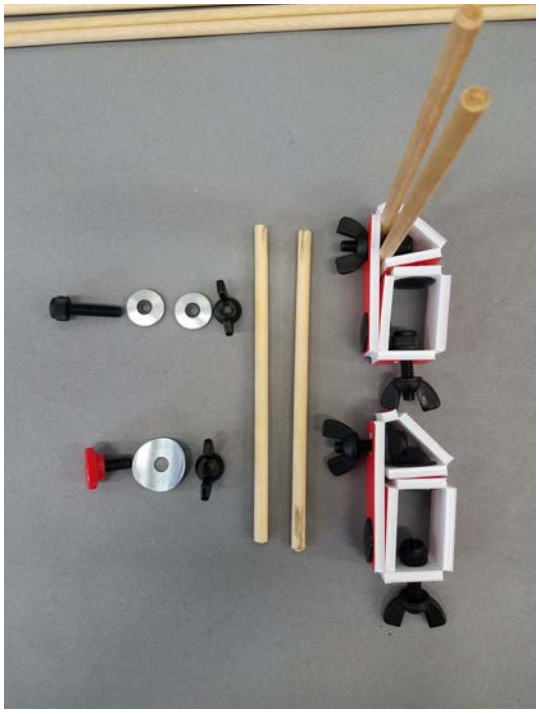
Insert the two top dowels one at a time into one side.



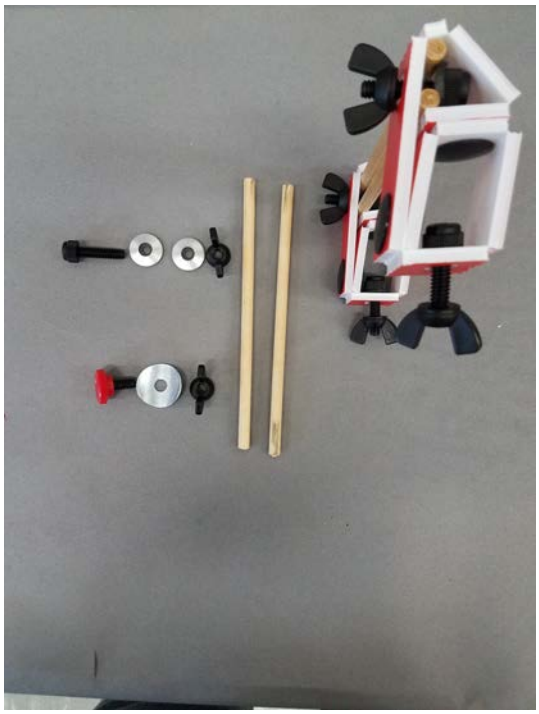
Repeat assembly of the second side. Gather the remaining parts to connect the two sides.





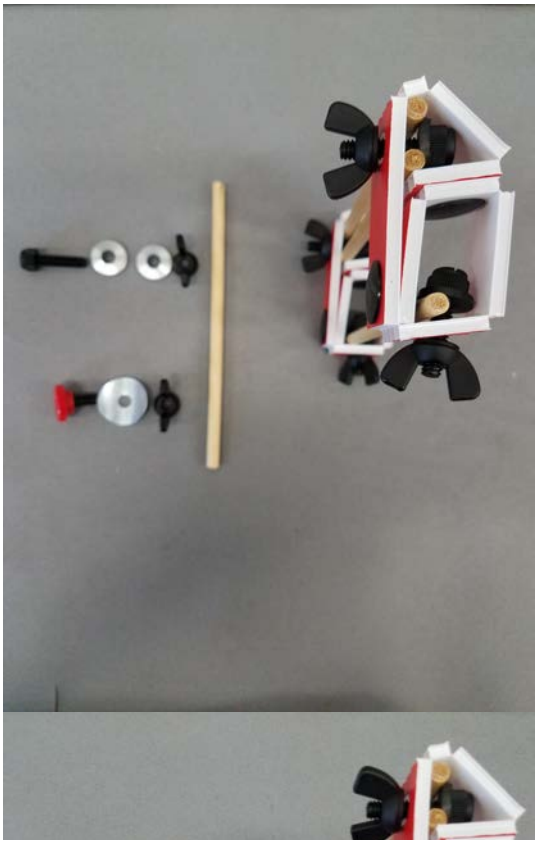


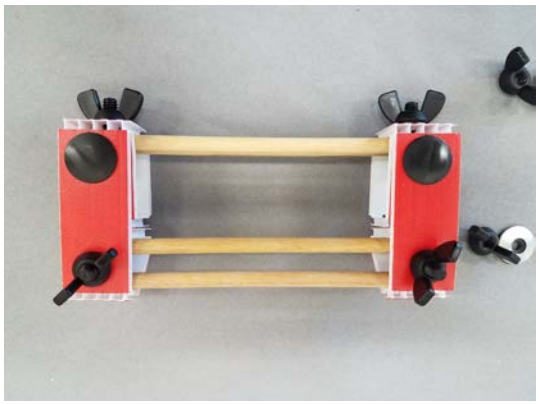
Attach the other side to the top dowels.



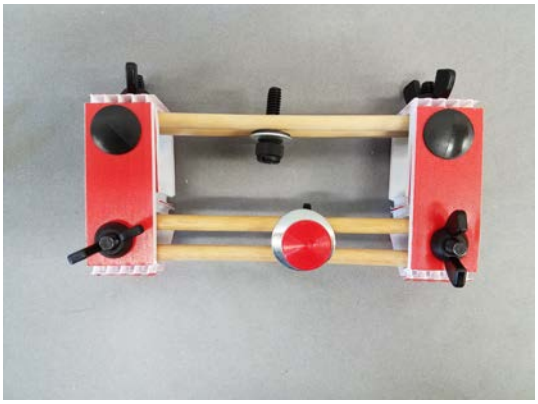
Tighten lightly.

Insert the remaining two dowels one at a time.

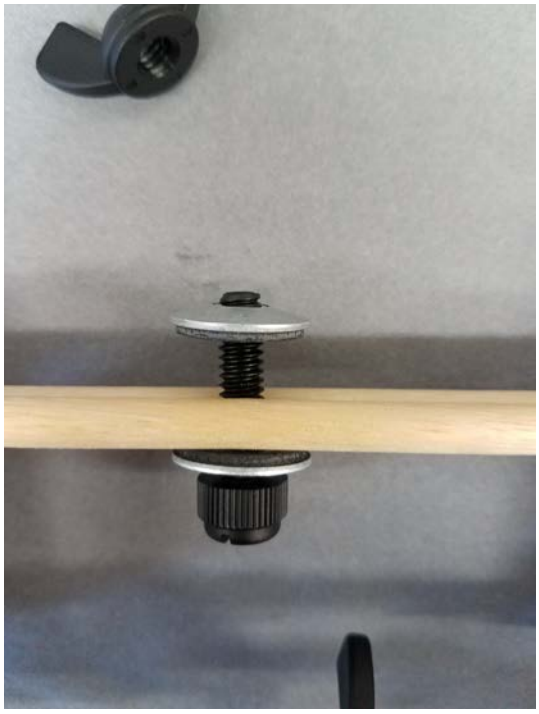




Insert the red steel thumb screw into the top rails with the curved washer holding the rails. Use a wingnut to hold in place. These rails hold the camera

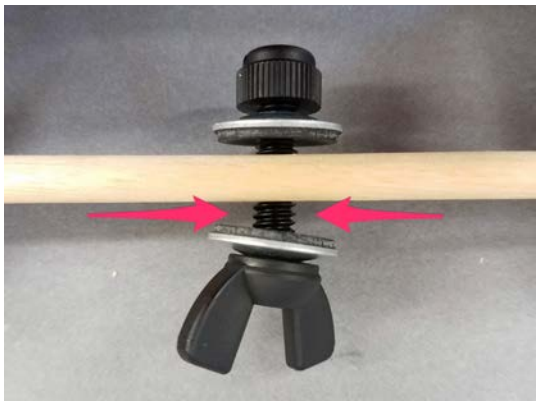


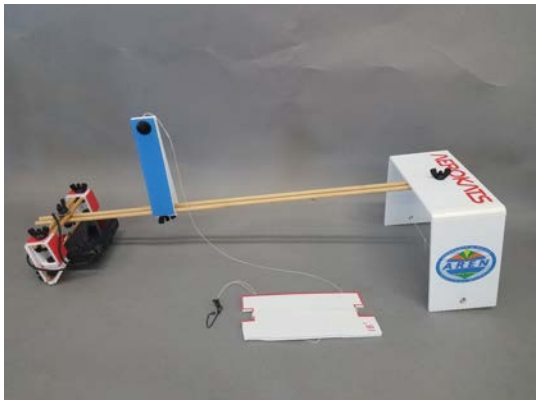
slide the steel backed rubber washer onto the nylon thrumb screw and between the mounting rails.



mount with the twin booms below the top rails of the point and shoot mount.

Push another steel-backed rubber washer onto the nylon thumb screw and put a wingnut on top.





Kit assembly before shipping

These are assembly tasks conducted before sending kits out.

Camera mounts: 1/4-20 Thumb Screws

Note: Currently we are using steel hex head machine screws with thumb screw heads attached. They weigh 6g for a 1/2" and 6.5g for a 5/8".

I use a C-clamp and my desk edge to push the thumb screws in. Be careful to keep them straight. Crooked screws will crack the heads. Three at a time takes some effort, but can be faster. Often I'll do them one at a time.

Don't over-squeeze the screws into the heads, they will deform the heads. Push in until flush between the bottom of the machine screw

head and the bottom of the thumb screw:

I have tried to use nylon hex head machine screws to save weight, but the nylon is too soft to force-fit into the thumb screw head. Aluminum machine screws are ~$2 Each. This part is a prime candidate for replacement with a 3D printed part, as are the specialty washers (steel backed rubber, curved washers, etc).