

Paraglider Prosthetic Hand

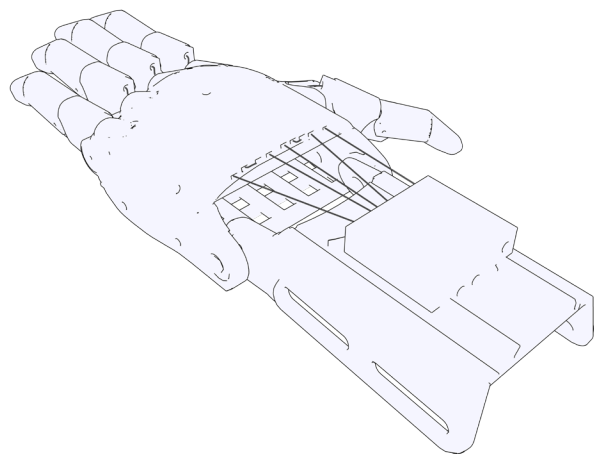
Assembly Instructions and Guidelines

Link to Github:

https://github.com/mendenm/flexible_flyer

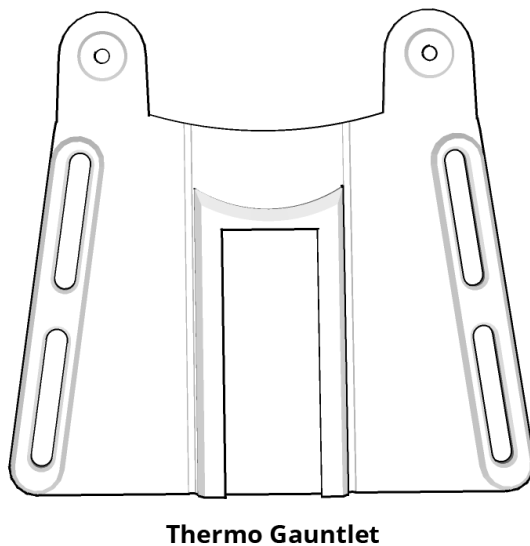
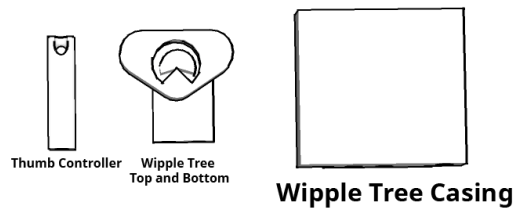
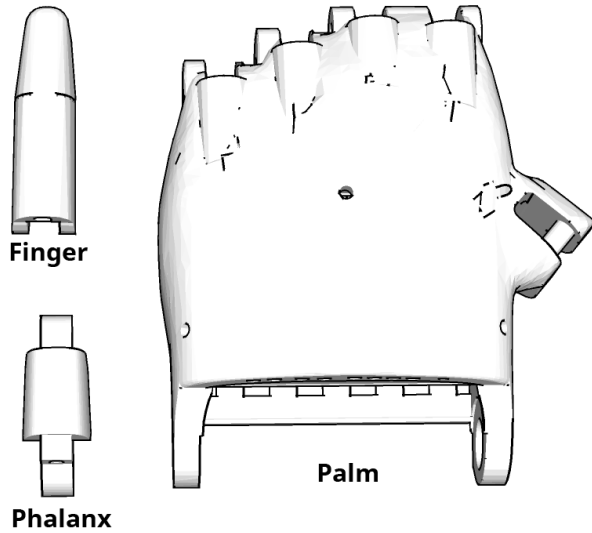
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An Example of a Completed Hand



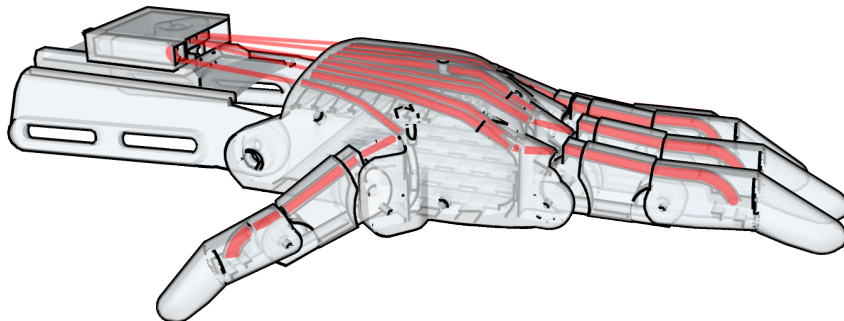
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Parts Required



Paraglider Prosthetic Hand

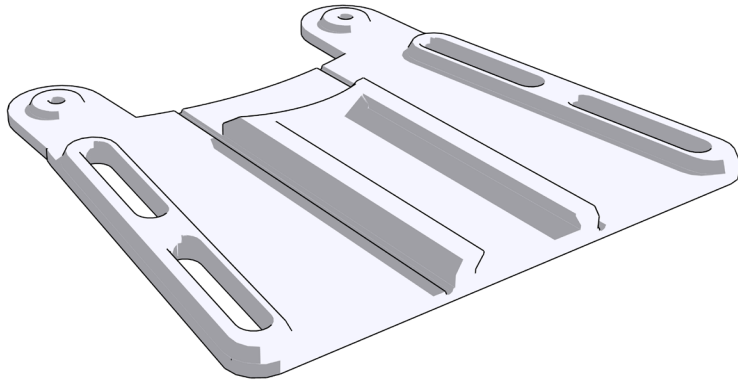
Information Necessary for Assembly



There are channels in the palm and fingers that are meant to route string and elastic through. The illustration above highlights these channels in red.

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Thermoforming the Thermo-Gauntlet



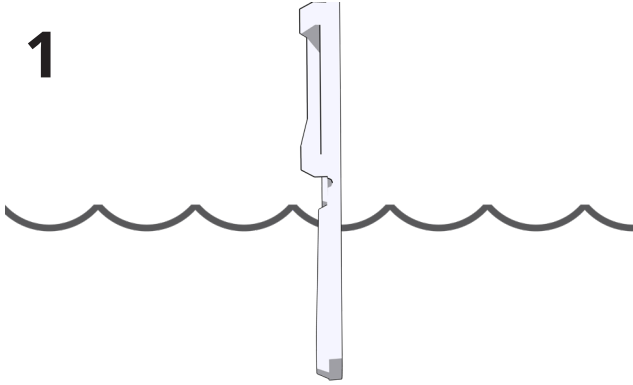
This is the Thermo Gauntlet. It is designed to be bent into shape after being softened by heat. This provides extra structural rigidity.

To Form the Thermo Gauntlet we need to apply heat, and then shortly afterward bend it into shape. It is recommended that you have a 2x4 wooden plank to use as a forming jig. We have found that it provides the best shape.

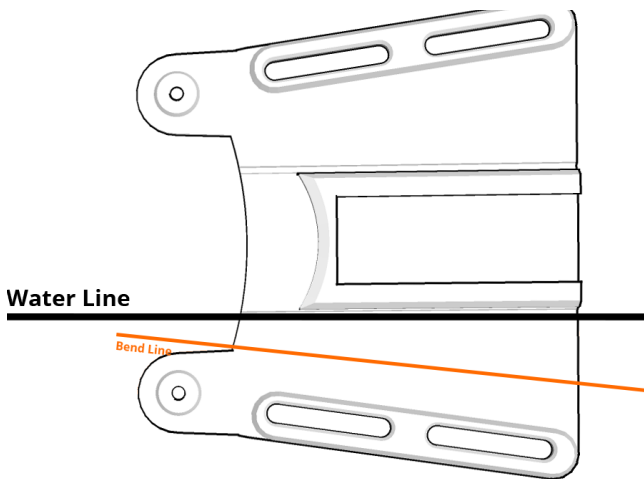
Paraglider Prosthetic Hand

Thermoforming the Thermo-Gauntlet (Continued)

1



Bring a deep pot of water up to boiling point. At this point quickly dip one end of the thermo gauntlet into the water until the plastic softens. This may take some practice.
Side View:

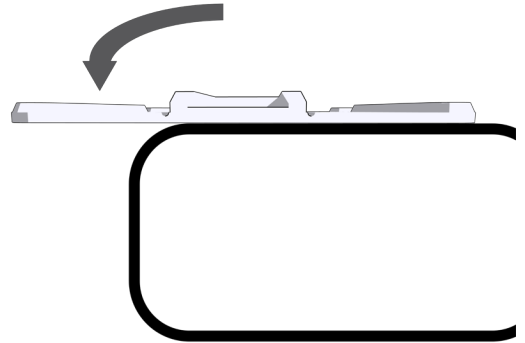


2



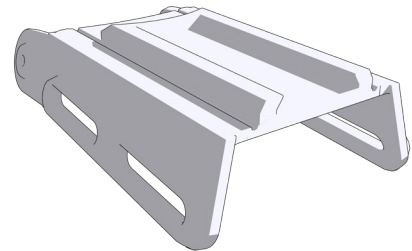
Prepare your 2x4 wooden plank, it will be used as the forming jig to form the softened thermo-gauntlet into the correct shape.

3



Bend the softened side of the thermo gauntlet over the 2x4 wooden plank. Repeat the previous steps with the other side of gauntlet.

4

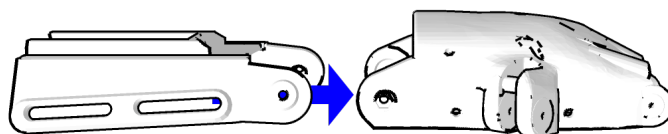


You now have a completed thermo-gauntlet.

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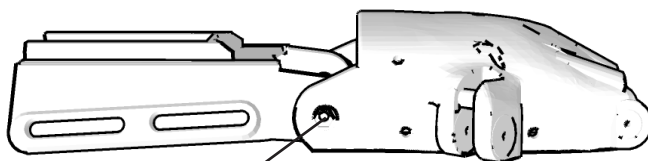
Attatching the Thermo-Gauntlet to the Palm.

1



The Thermo-Gauntlet should snap into place like the illustration above.

2

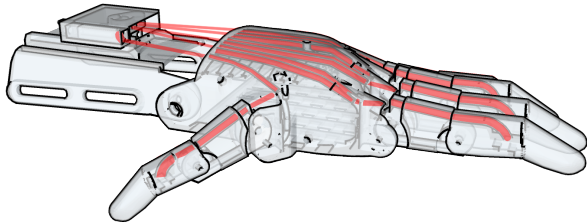


Bolt the Thermo Gauntlet into place on both sides.

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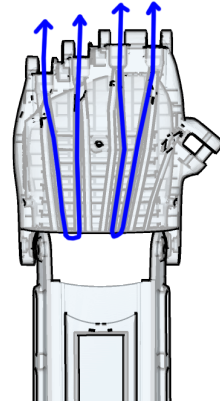
Stringing the Hand (Part one: Elastic)

1



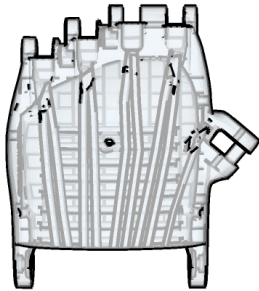
Like previously mentioned, there are channels that run through the palm and fingers that are meant to route strings and elastic cord through.

3



Loop four sets of elastic cord through the channels as shown in the illustration above. The blue color denotes the elastic. Make sure you have roughly 3 - 4 inches of elastic left over on both ends.

2

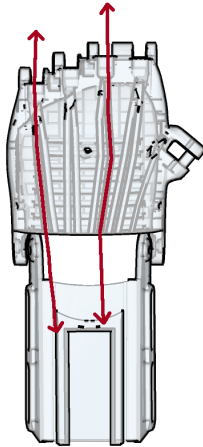


For the first part, stringing the elastic, and some of the cord, we will only need the palm.

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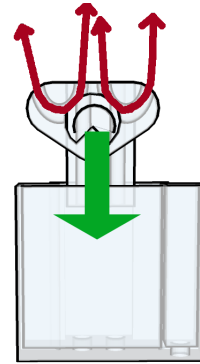
Stringing the Hand (Part two: Cord + Gripper Box)

1



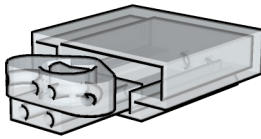
Feed the cord through these two channels. The fingers are controlled in pairs, and the string will loop back to tie into the other finger.

4



Slide the two components into the housing.

2



Gather your wipple tree pieces and lay them out like this.

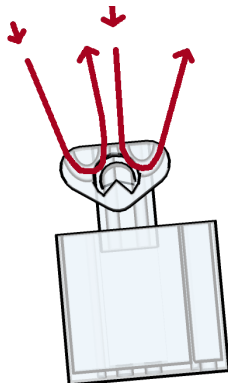
5



Bolt the slider securely into place.

This is what the semi-completed gripper box should look like.

3

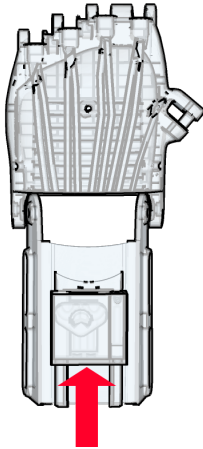


Loop the ends of the string that are closest to the thermo gauntlet through the gripper box like this.

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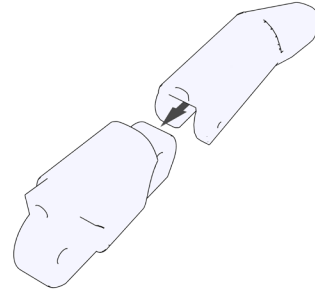
Stringing the Hand (Part two: Cord + Gripper Box)

1



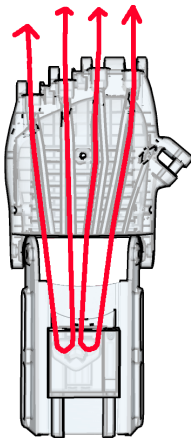
Slide the semi-completed Gripper Box into the thermo Gauntlet.

4



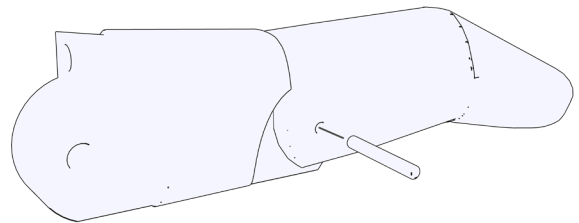
Align the phalanx and the finger. Then slide them together.

2



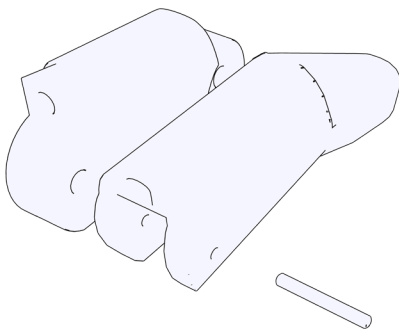
Complete feeding the cords through the palm's cable and cord routing channels.

5



Insert the dowel like the illustration shows.

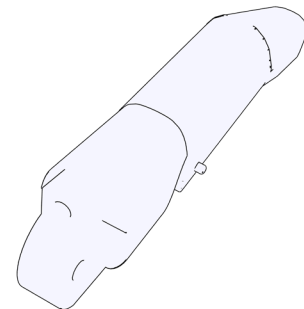
3



Gather the parts you will need for the finger as the illustration shows:

- 1 - Finger Phalanx, 1 - Finger (Long or Short)
- 1- Axel (Dowel, 3mm Screw, etc.)

6

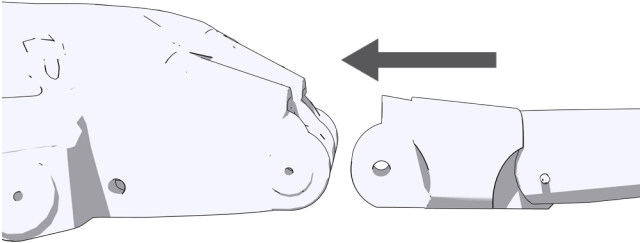


Repeat process 5 times, (the thumb is the same).

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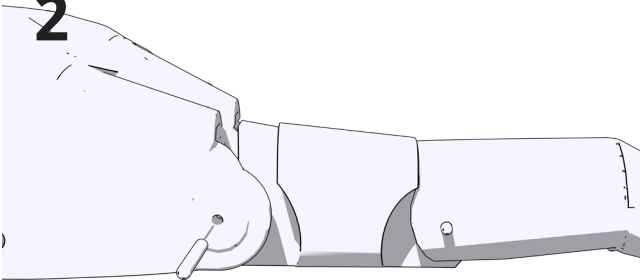
Stringing the Hand (Part two: Cord + Gripper Box)

1



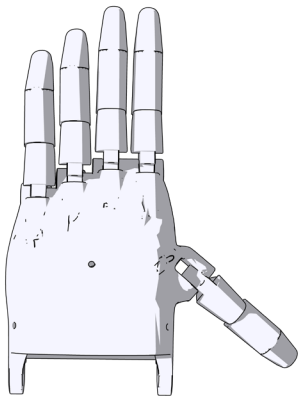
Align the finger and the palm and then slide it in.

2



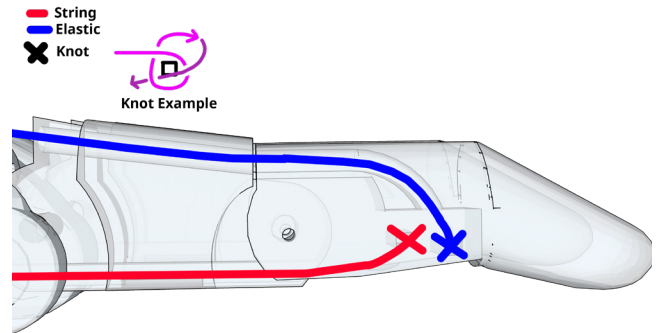
Insert dowel. And repeat process four times for the rest of the fingers.

3



The thumb is done in the same way just at an offset angle.

4



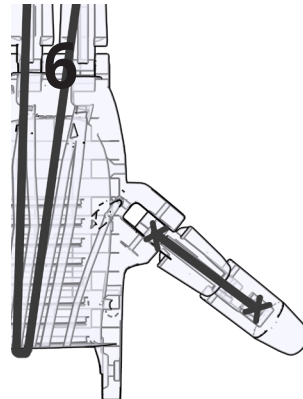
Feed the cord and elastic through the channels in the finger.
(Do this for the thumb as well)

5



You can tie both the cord and the elastic on the bars shown below.

6

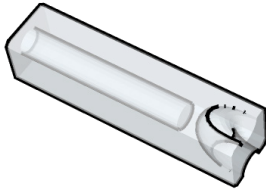


There is a bar on the palm where the thumb is mounted, tie the elastic off there. Make sure ALL elastic is taught.

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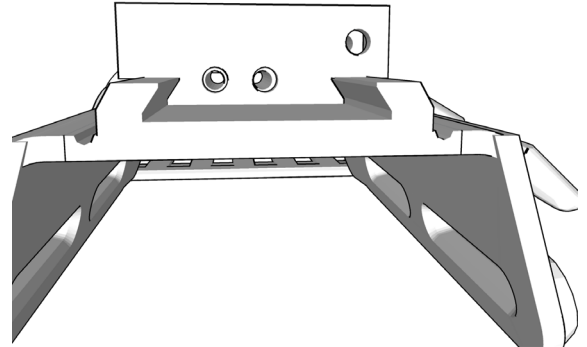
Stringing the Hand

1



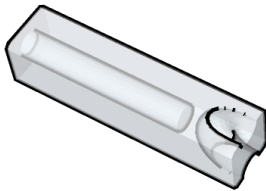
Obtain the thumb controller for the final wipple tree assembly.

4



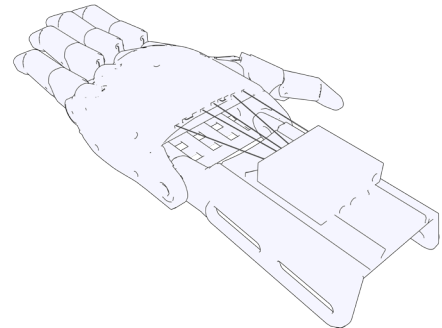
There are three holes on the back of the gripper box, use three 3 mm screws to fasten the wipple tree together.

2



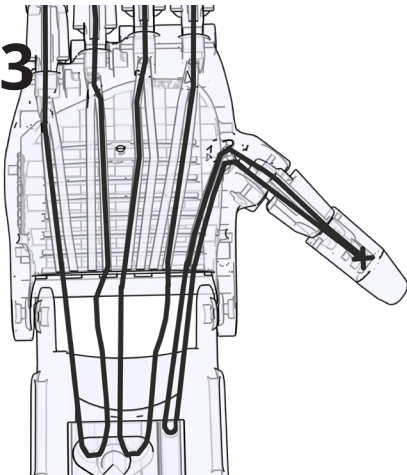
Feed the string for the thumb through the U shaped channel, and route the string back to the thumb.

5



Use the 3mm and an M3 nut to bolt the thermo Gauntlet to the Palm, and the hand should be complete.

3



Insert the thumb controller into the wipple tree casing like such, trim the cord, and tie off the end of the cord onto the thumb like such.



Created by:

Peter Ilyin's Eagle Scout Project

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