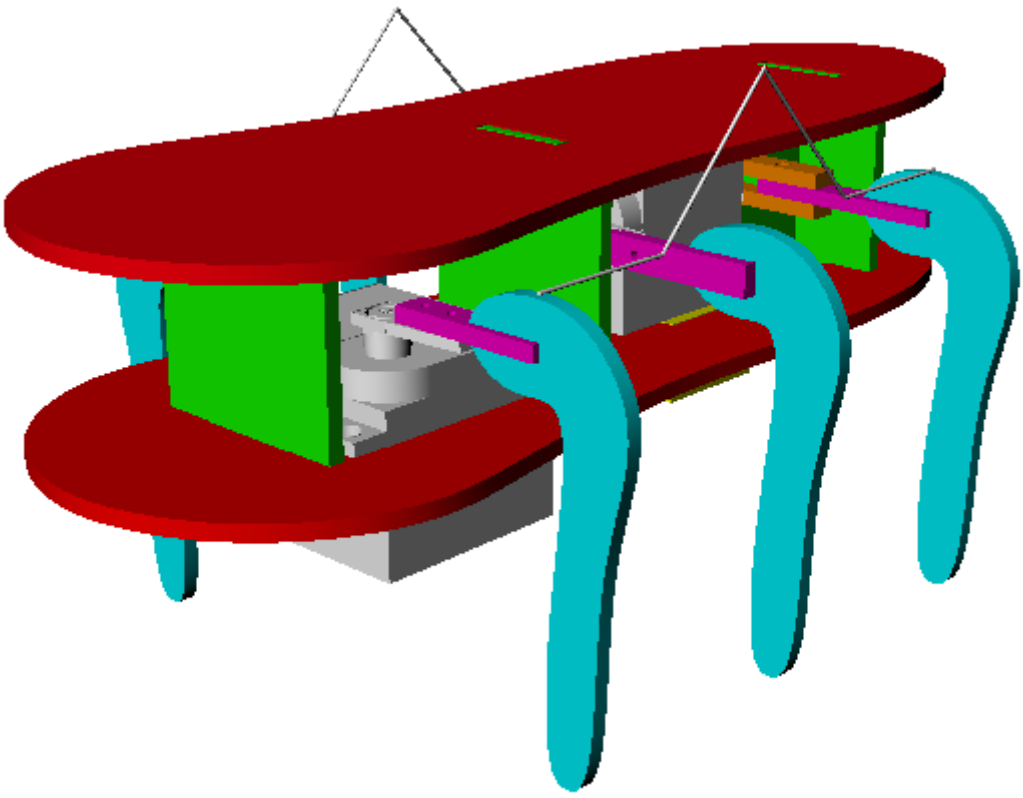
Instructions to build the Hexapod in plywood



Author: Jørgen Vendorf

Disclaimer
The author can in no regards be held responsible for anything regarding this instruction, drawings or anything that goes wrong while following this instruction or using the construction that it amounts to.

Intro

This is a 6 legged platform, that moves by walking around. You will need an RC servo controler to move the legs.

Material list

Plywood - The size of 2 pieces of A4 paper.
Bolts - 2 x M3 20mm
Locknuts - 2 x M3
Self tapping screws - M2 x 6mm
Piano wire - 1.5mm x 270mm
Glue
Drills - 1.5mm and 1mm

Legs moving pattern

Here is the patterns to move the legs, for different directions

Forward

1. Lower middel left
2. Left legs forward
3. Right legs backward
4. Lower middel right
5. Left legs backward
6. Right legs forward

Backward

1. Lower middel left
2. Right legs forward
3. Left legs backward
4. Lower middel right
5. Right legs backward
6. Left legs forward

Turn left

1. Lower middel left
2. Left legs backward
3. Right legs backward
4. Lower middel right
5. Right legs forward
6. Left legs forward

Turn right

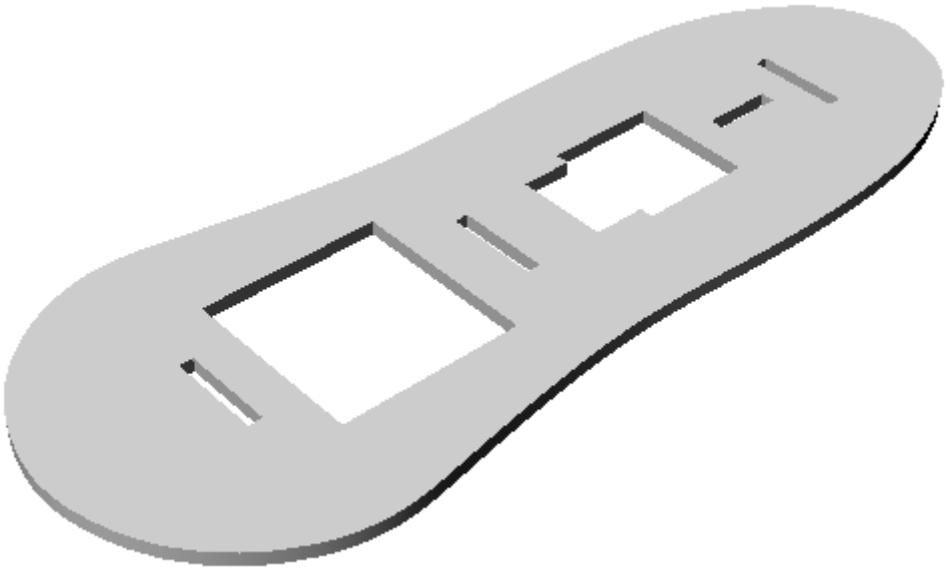
1. Lower middel left
2. Left legs forward
3. Right legs forward
4. Lower middel right
5. Right legs backward
6. Left legs backward

Always
Read the whole instruction before you start. Please.

Step 1
First thing to do, is to print out the Hexapod_Legs.PDF and Hexapod_Body.PDF. Remember to set Page Scaling to ”None”, if you dont do this, the drawing will shrink and the parts wont fit.

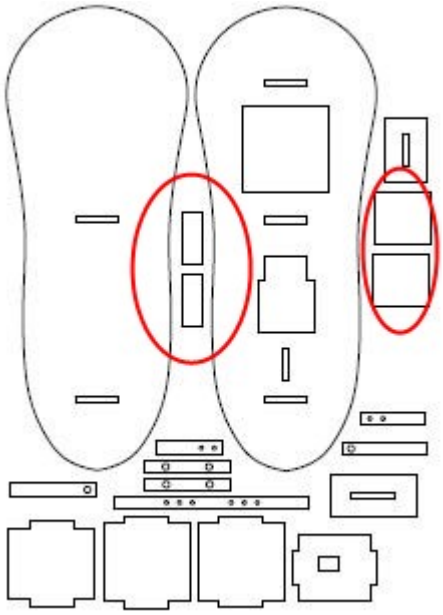
Step 2
Next step is to use some double sided tape and glue the printed drawings on to a piece of 3mm plywood. Cut out all the pieces and get ready to assemble the kit.

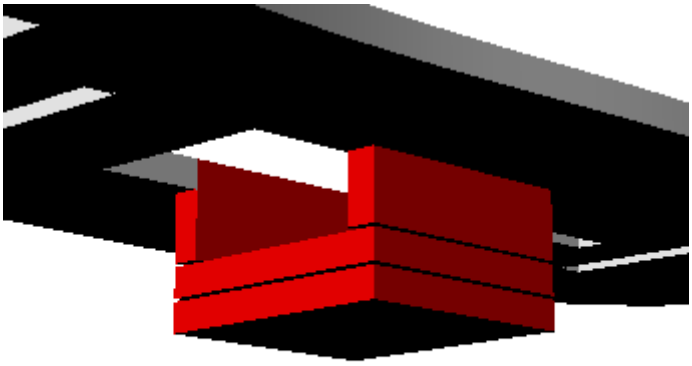
Step 3
The base plate, looks like the image below. This is where we will mount all the other stuff. The widest part of the base plate is the front, also where the square hole is.



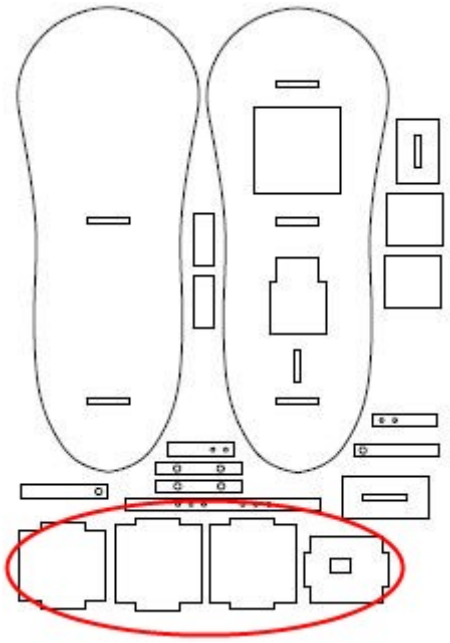
Step 4
The first thing to assemble is the base mount for the tilt servo.
The mount is placed on the bottom of the base plate, because the tilt servo needs to get a little bit lower in order for the legs to keep the same height.

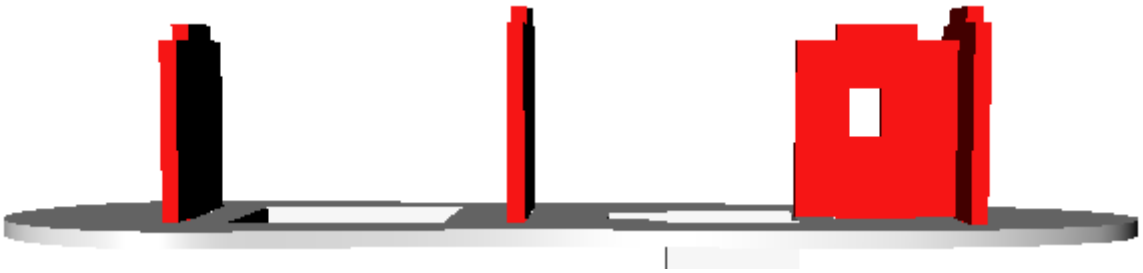
Place the base plate on the table.
Take the two sides and glue them into the slots of the back most hole.
Next make a sandwich of the two square pieces and glue the sandwich as the bottom of the sides.



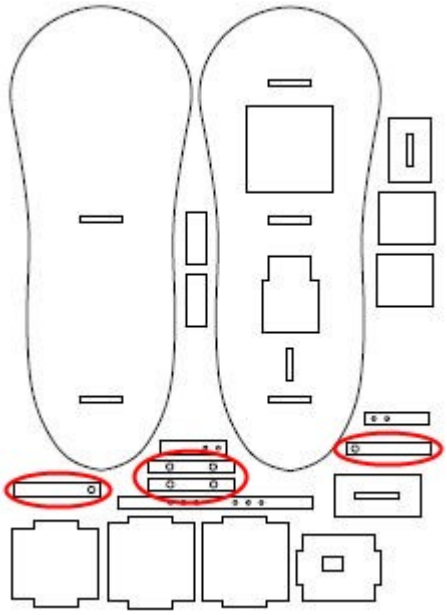


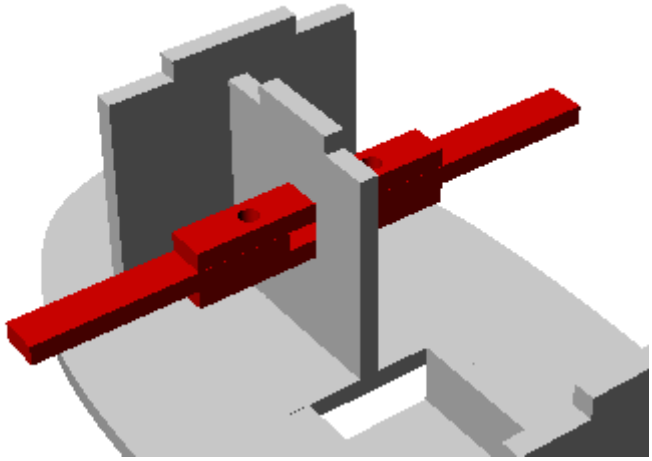
Step 5
Now we will glue in the walls that will hold the top plate.
Remember here that the lowest of the pieces goes in the front. The one with the hole in it, make sure that the hole is placed in the front most, upper corner when mounted and that all pieces is 90 degrees on the base plate.



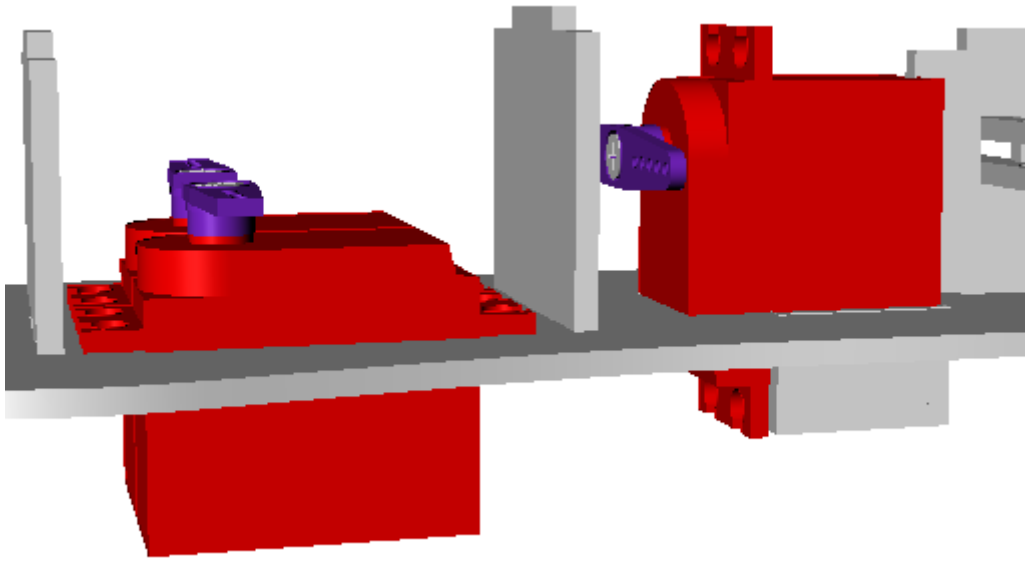


Step 6
Now we can mount the rear legs.
Mark the center on the leg holders, those with two holes in them.
The best way, is to use the leg mounts as spacers when you glue in the leg holders.

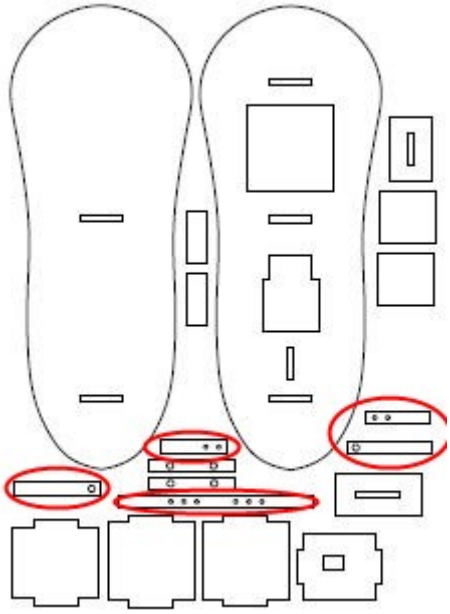


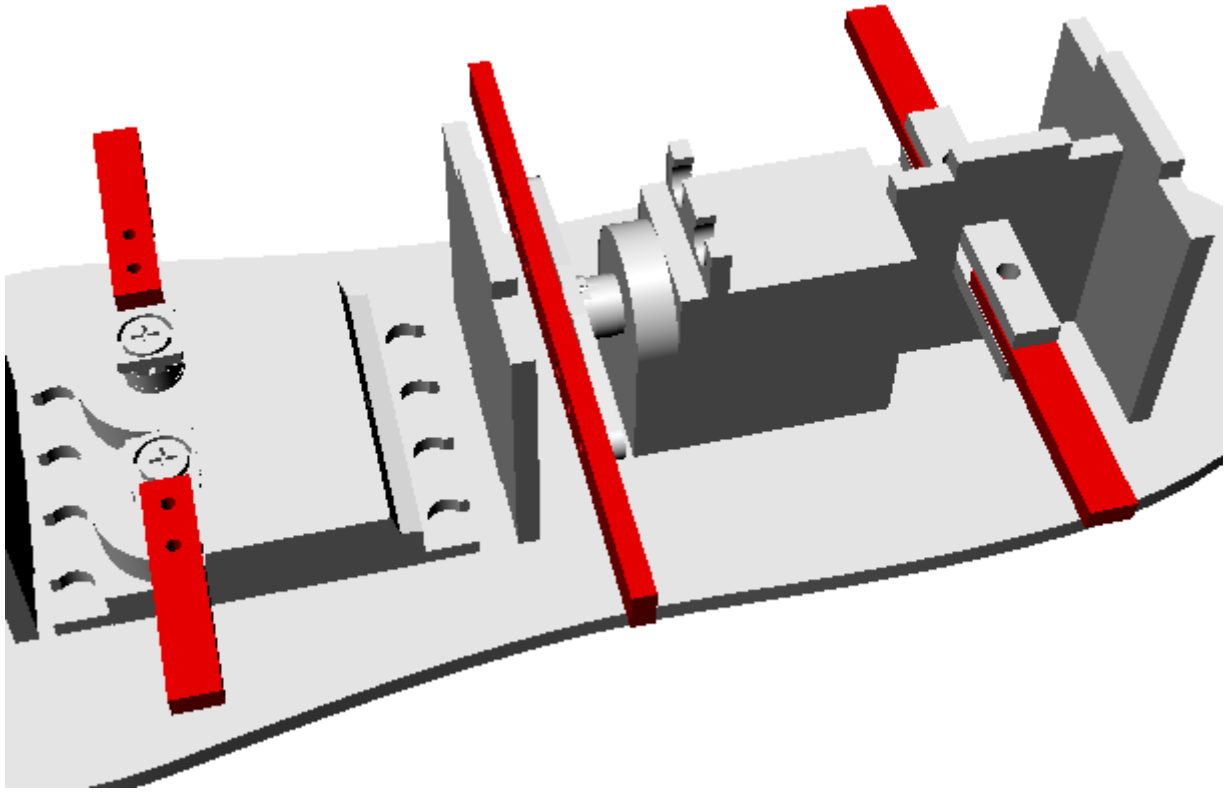


Step 7
Before you mount the servos, please make sure, the arms are in center and remove the arms you won't need. The two front servos only need one arm for each servo and they should be opposite. The middle servo needs an arm on each side. In doubt, see the picture below.
If you have problems getting the servos in place, widen the holes, until you can slide the servos in with out problems.
You might need to sand down the top servo mounting piece with 1-2mm for the top plate to fit. Make a test fit and sand till it don't touch the top plate.
Remember to drill half size holes for the screws so the wood don't split when they enter the wood.
Now mount the tree standard servos as shown in the picture.

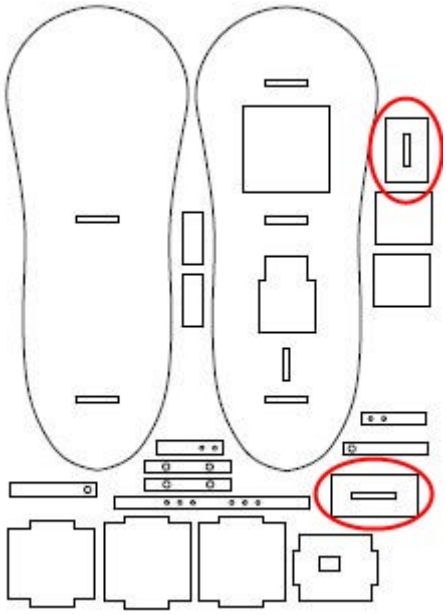


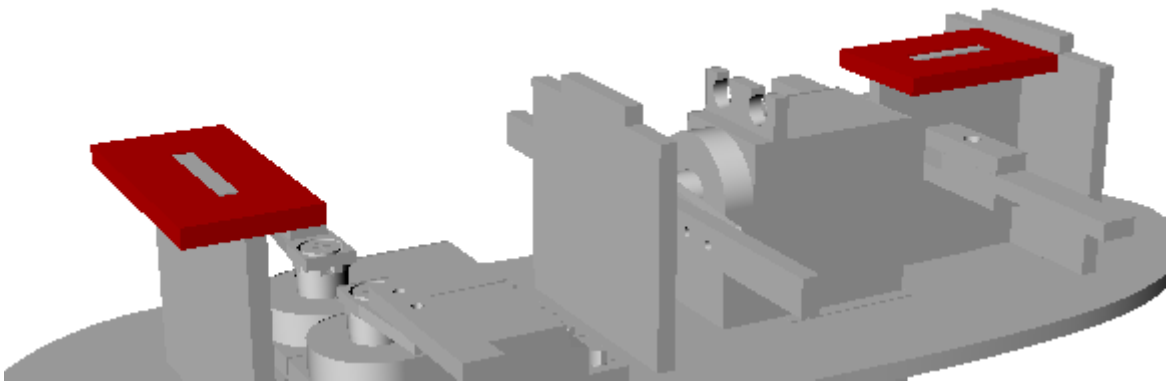
Step 8
Time to mount the leg holders.
The front leg holders, are hold in place with 2 screws for each leg or glue, just make sure the holes match.
The middle leg holder are hold in place with 4 screws, 2 in each servo arm, be sure the leg holder is in center over the servo.
The rear leg holders are hold in place by 2, 3mm bolts with lock nuts, so the leg holders stay lose for movement.



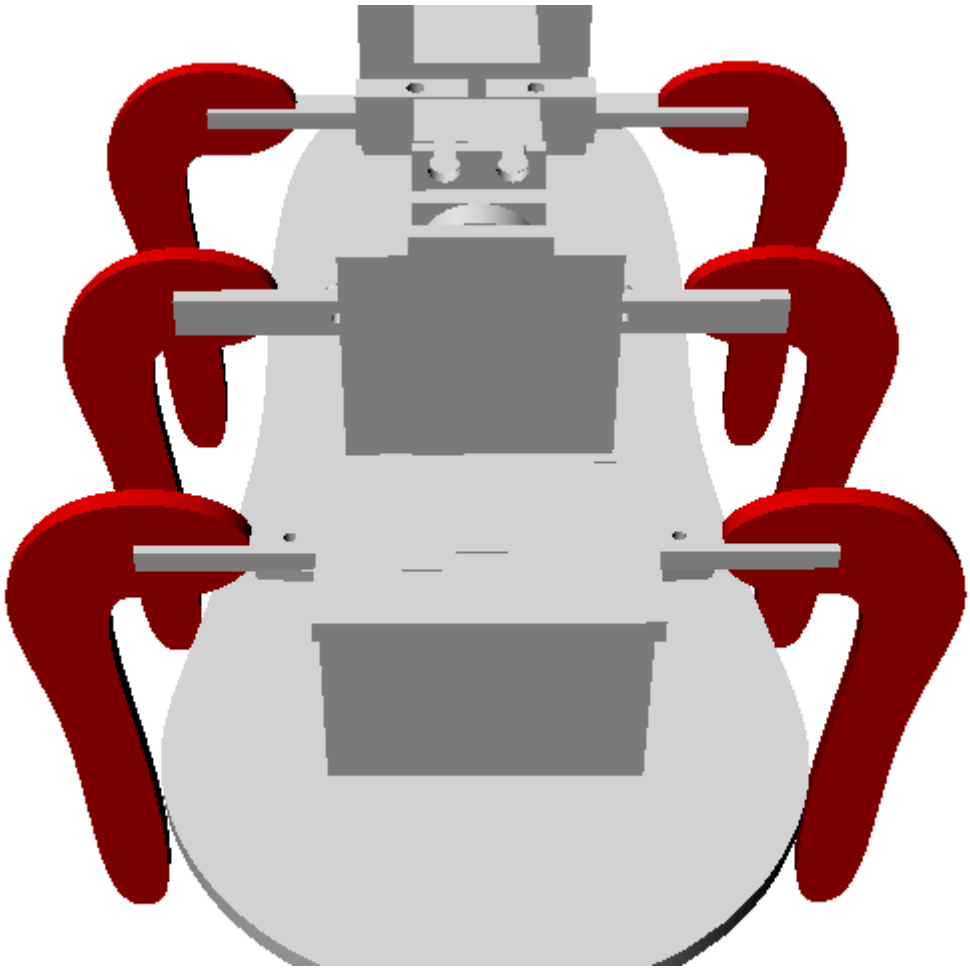


Step 9
Next thing to mount is the stabilizer plates for the top plate.
The longest of the two, goes in the front and the short one, goes in the back. Glue them in.

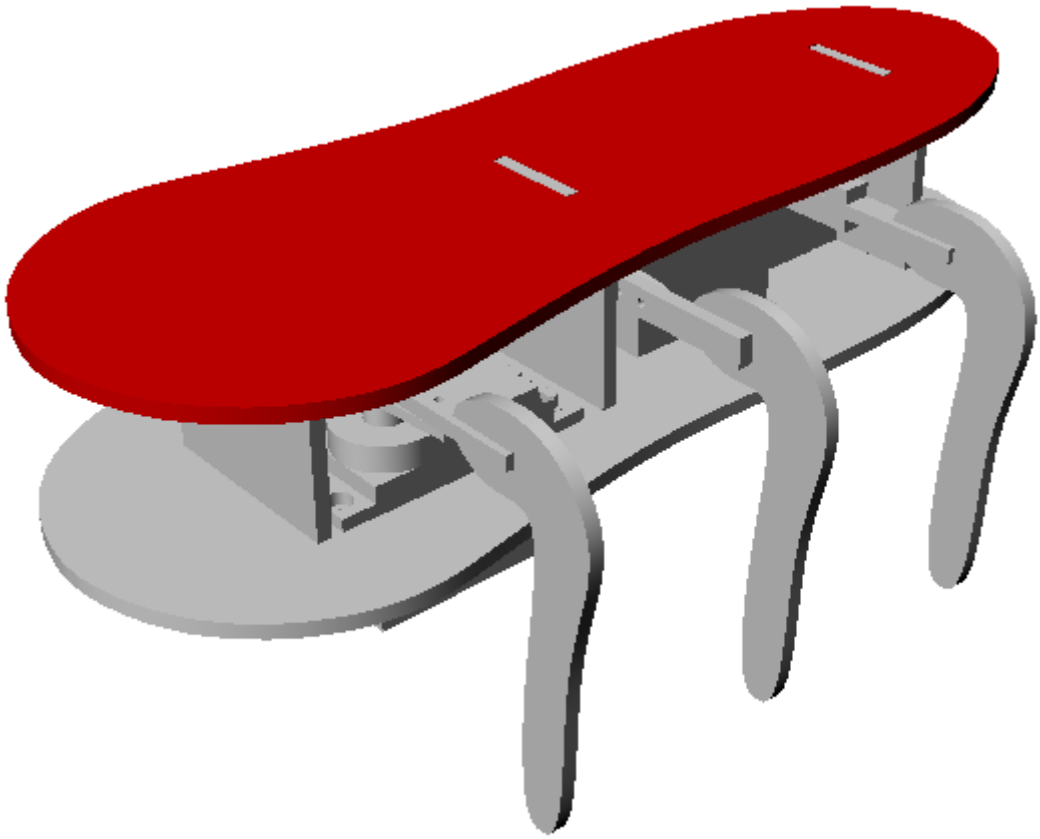




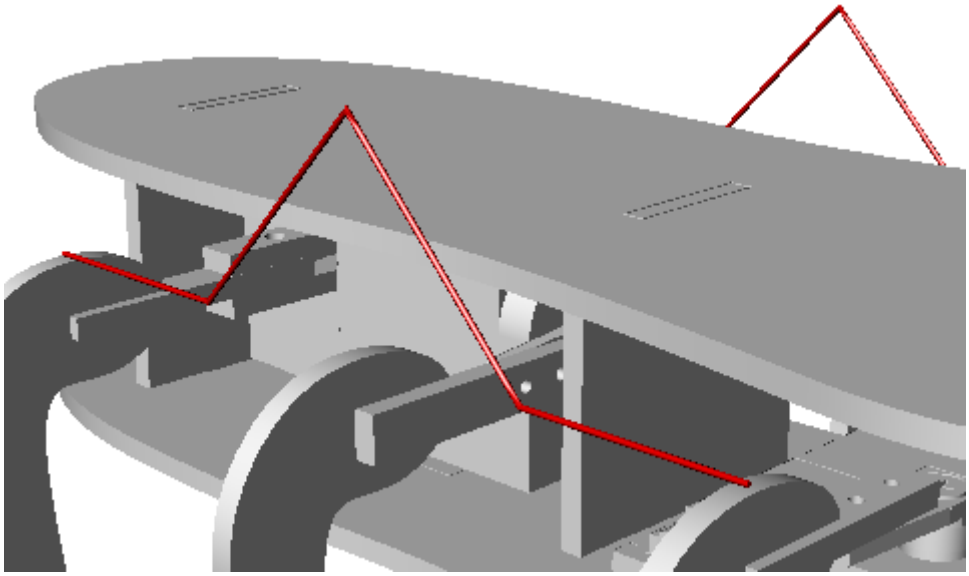
Step 10
Now we can mount the legs.
Start by mounting the front and rear legs, the leg holders should go to the bottom of the slice in the legs. When the four legs are in place, stand the robot on the four feet, this will make it easier to adjust the height of the middle legs. Make sure the middle servo is in center, rest the leg on the table and hold the legs holder on the side of the leg so that the leg holder reaches the end of the slice of the leg and glue in place. Do the same on the other side.



Step 11
Its time to mount the top plate, so we have a lot of space to mount our control unit and batteries.
Don't glue this in place, cause that would make you unable to change a servo if they break.
I order to get the servo wires to the top, You need to drill a hole on top of the middle servo. It's also a good idea to drill a hole thru, in the front, along the front of the front wall, to get the wires from the front legs to the top.
Put screws thru the top plate, into the stabilizer plates, the one in the front and the one in the back.
Drill half screw size holes first so the wood won't break when you enter the screws.



Step 12
In order to make the front and rear legs work, they need to be connected. This is done by using a 1.5mm piano wire and a screw into the top of the legs.
You will need two pieces of 135mm piano wire. Bend them at 90 degrees in the middle and at a ¼ of the length from each end, bend in 45 degrees, so that they look like the ones in the picture.
At each end, bend the wire into a small loop that exactly fits around the 2mm screw that is going to hold it in place.
At the highest point of the legs, drill a half size screw hole and mount the wire from the front leg to the rear leg, on each side.



Congratulations, you have build a Hexapod.

Tips

You can add some Hot-glue to the tip of the legs, for better traction.