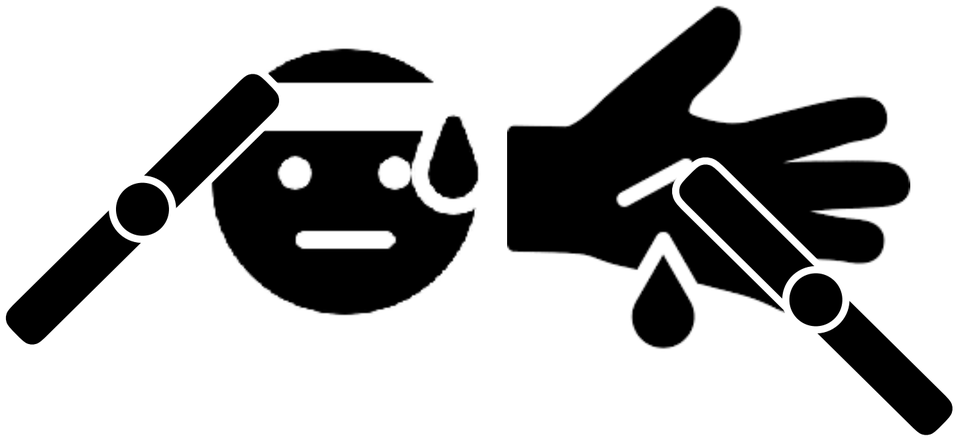
Safety warning

Fast rotation propellers can hurt humans and animals
To prevent injury, do:

- Keep hands off a running vehicle
- If you loose control of the vehicle, stop immediately



Lithium batteries can release smoke or cause a fire
To prevent damage, do:

- Don’t charge the batteries unattended
- Don’t use a damaged or punctured battery
- Do not short circuit the battery
- Avoid temperatures below -10 and above 50 degrees celcius.
- Don’t use batteries that are colder than 15 degrees celcius
- Always have a plan for what to do in case of a fire: If you are indoor, open a window and get the battery outside to prevent smoke or fire.
- Do not open or modify the battery in any way.
- For optimal performance, store the battery at around 30% capacity and between 10 and 20 degrees celcius
- Follow airport regulations for carrying lithium batteries on airplanes. (Usually hand luggage only)

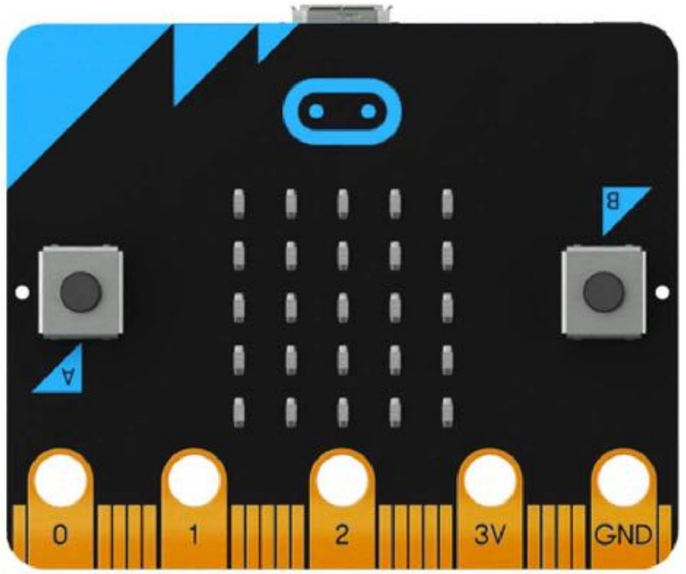
Meet the micro:bit

Screen (5x5 pixels)

Haircut

Button A

Gold teeth



Button B

Sensors

Front

Reset button

Antenna
2,4 gHz

USB

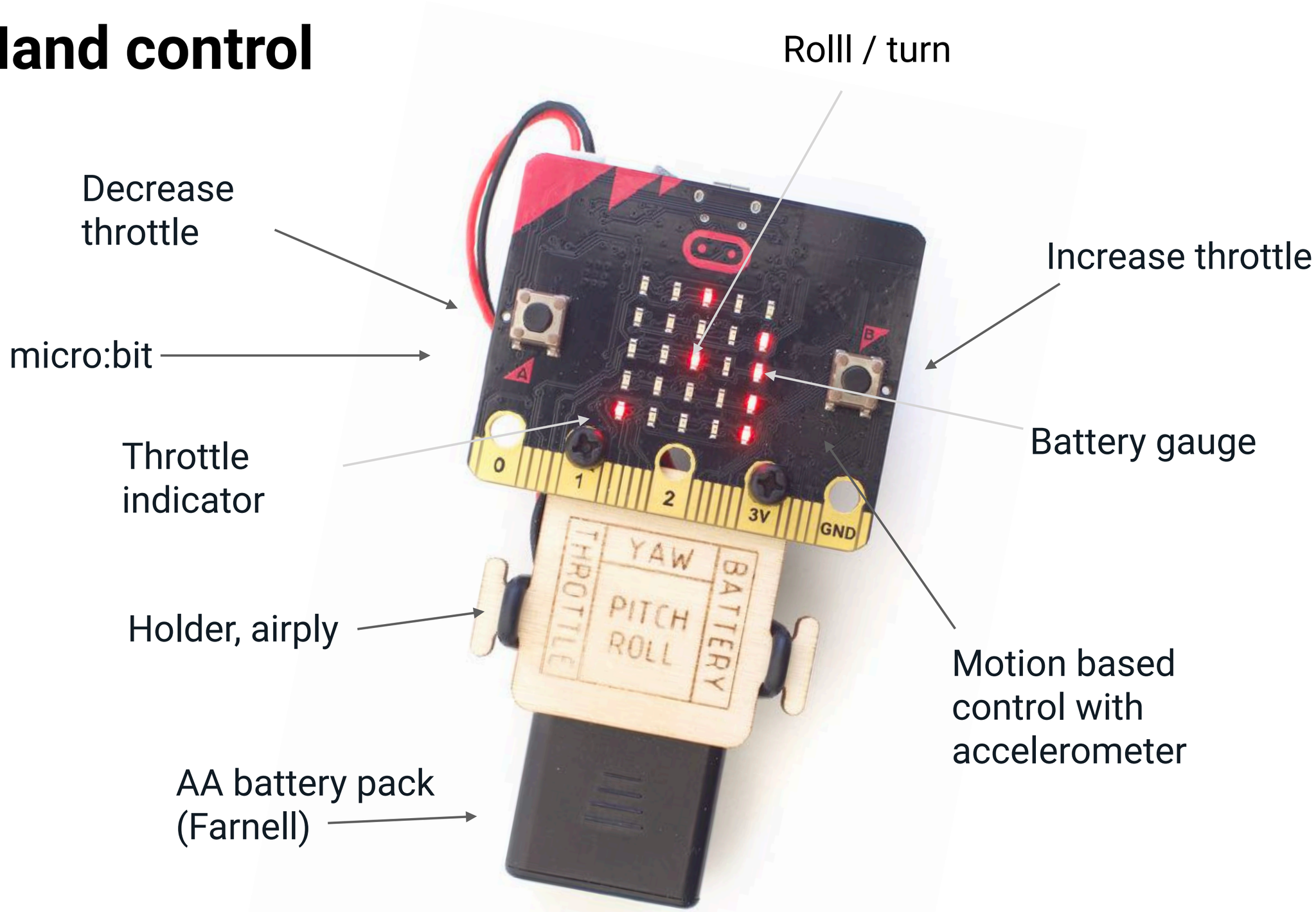
Battery 3V

Backside

micro:bit is a small computer with prosessor, sensors, display and radio. It has connection pins for external components like LEDs, speakers or various sensors.

You can learn more at: https://tech.microbit.org/hardware/

Hand control



MAKEKIT

Control board

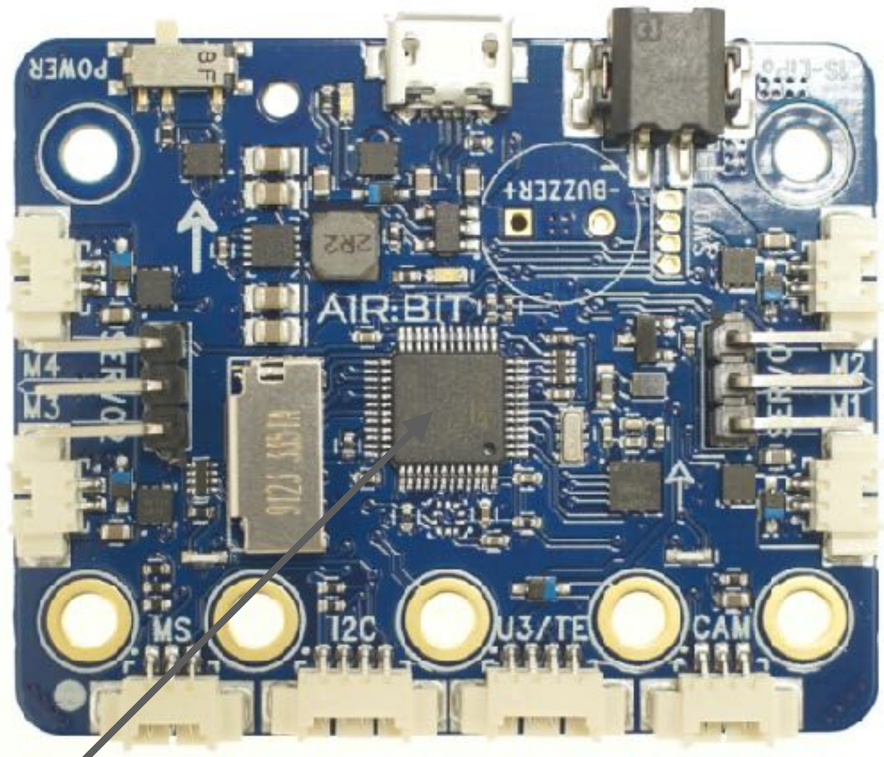
By MakeKit and SPRacing

Charge port +
firmware update
(micro USB)

Main switch

Off On

Battery plug



Servo connector

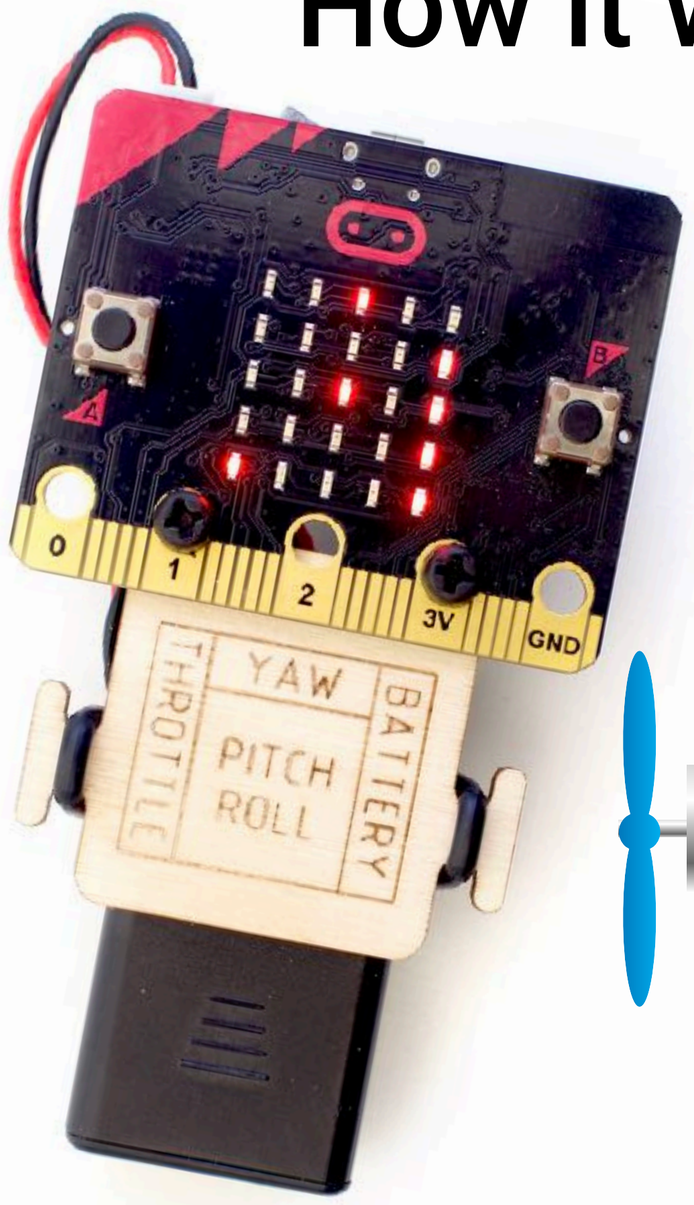
Motor 1 (push)

Motor 2 (skirt)

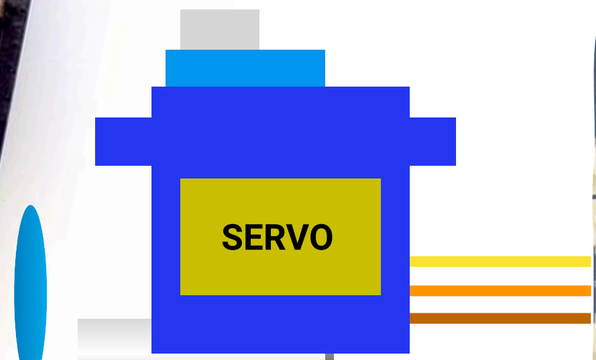
STM32 F303 processor
With Betaflight software

MAKEKIT

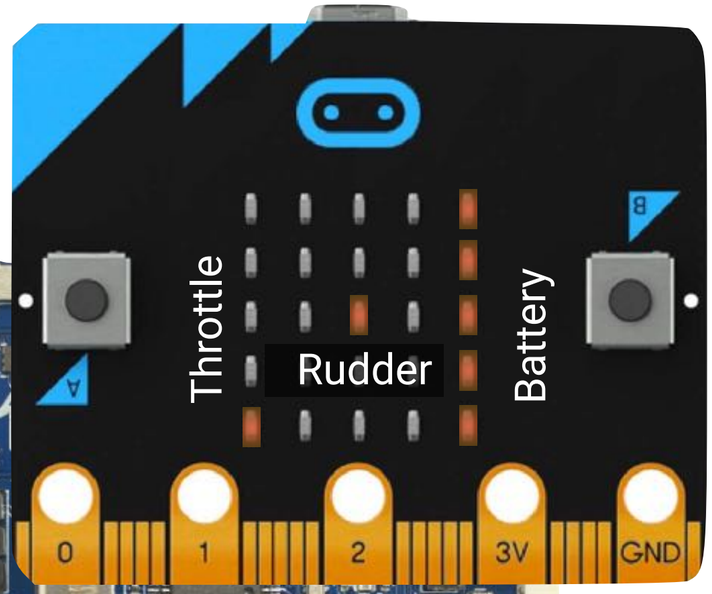
How it works

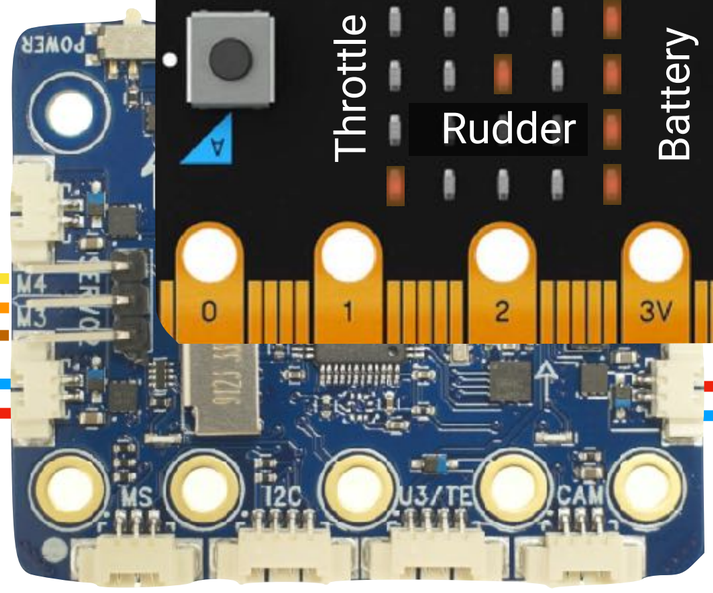


Rudder control



Micro:bit - receiver





Air pillow fan
46000 RPM

Pusher fan
46000 RPM

Control board with motor drivers

MAKEKIT

Charging

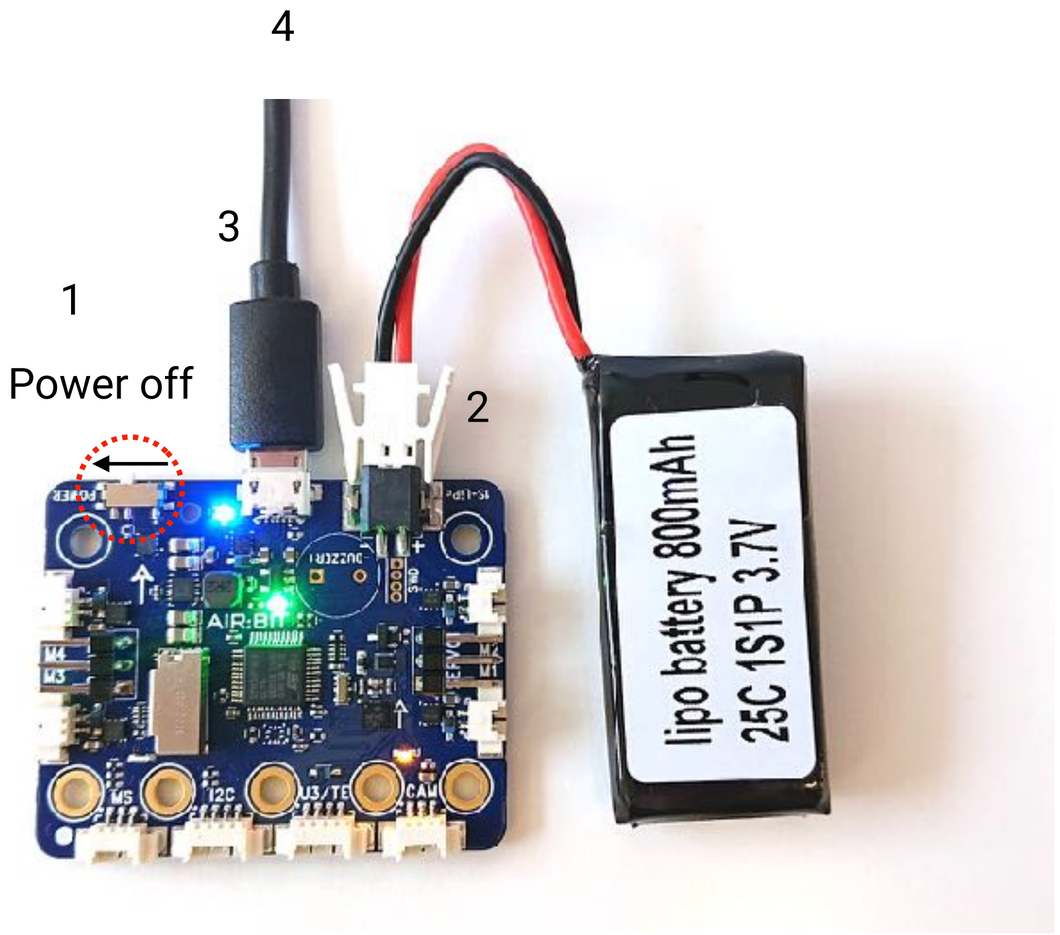
Parts:

Off / On **Battery**

Air:bit control board

Lithium (LiPo)-battery

Micro USB-Cable



The battery can be charge with or without the micro:bit mounted

1. Switch off the power
2. Plug the big white plug into the grey connector “1s LiPo”
3. Connect the micro USB into control board
4. Connect the other end into a USB charge outlet
5. Blue light indicates charging. When light goes off, charging is finished. (1-2 hours)

Fire hazard:
Never charge a Lithium battery unattended!

Tools

Must have:

Small philips screwdriver

Marker

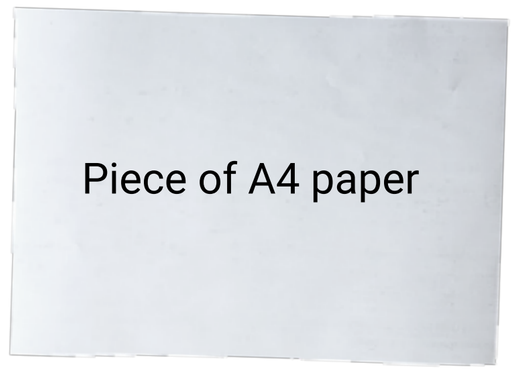
Scissors

Utility knife

Ruler

Glue gun
or
contact adhesive glue

Recommended:



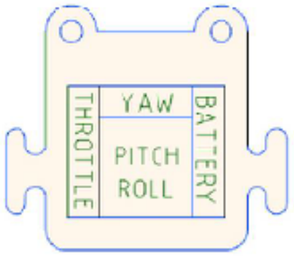
Piece of A4 paper

Small cutting pliers

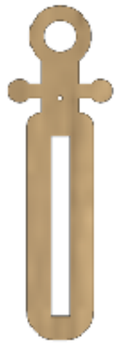
Nose pliers

Socket wrench 5.5mm

Parts



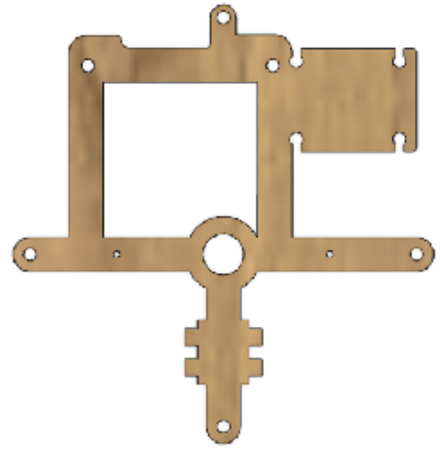
Remote holder



Tail fin holder

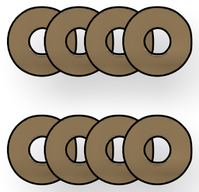
Motor holder

2x angle connectors



Base frame

Wedges



8x spacers

2x small O-rings

3 Large o-rings

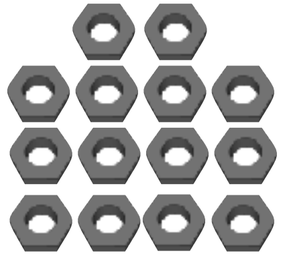
1 CW propeller

1 CCW propeller

2x m3x8 nylon screws

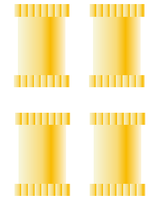
4x m3x12 nylon screws

4x m3x15 nylon screws



14x nylon nuts

2x m3x12 countersunk

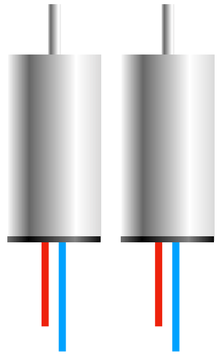


4 stk knurled barrel nuts

Parts (electronics)

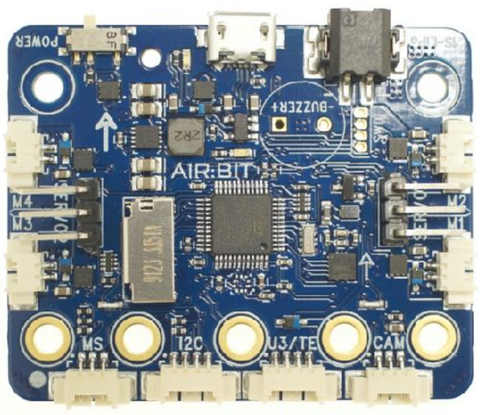
Servo motor

Servo horn



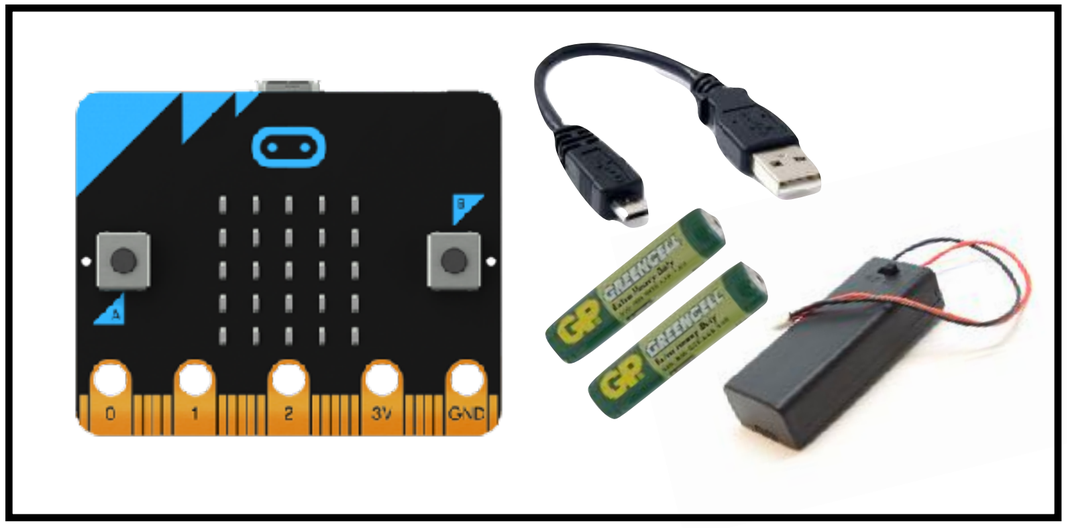
2x Motors

Ziplock bag, 15x20 cm



Control board

Lithium battery



1-2 Micro:bit start kit (sold separately)

Assembly

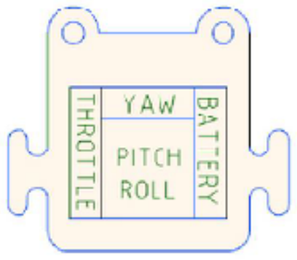
Assemble the remote (skip if you made the Air:bit)

Tools: Philips Screwdriver

Parts:

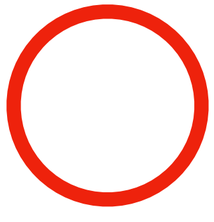
2 nylon screw m3x8

2 nylon nuts m3

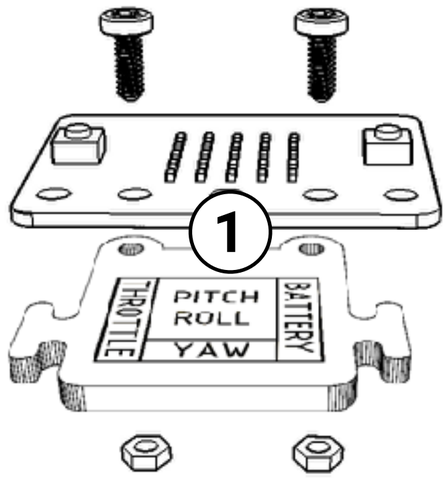


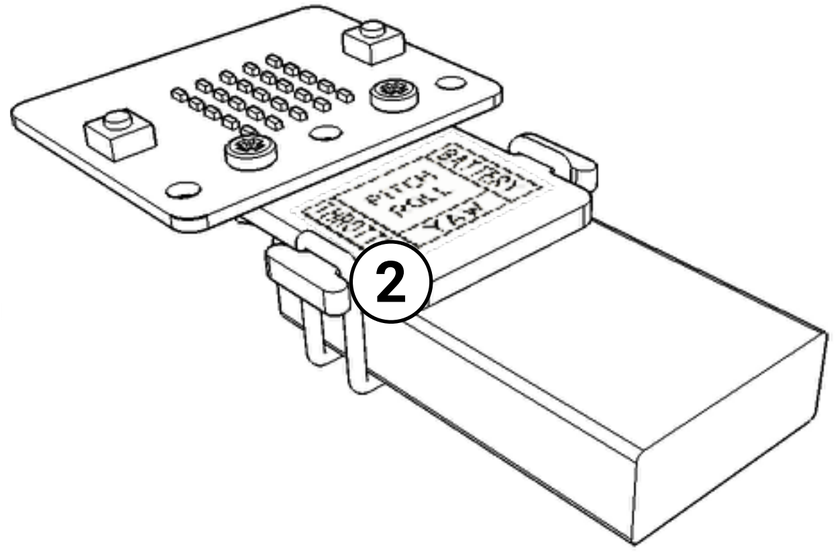
Remote holder

Battery box AAA



Large silicone ring





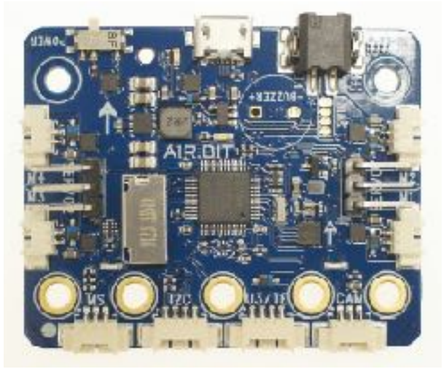
- Place the micro:bit with **screen facing up** on top of the holder (1)
- Make sure the remote holder also is **facing up**
- Mount battery box with the silicone ring (2)

Control board (skip if you made the Air:bit)

Tools: Philips Screwdriver

Deler:

4 stk nylon screws m3x12



Airbit control board

4 knurled barrel nuts

- Screw the barrel nuts to the control board. They will provide a connection to the micro:bit
- **Make sure they are “finger thight”:**
  - Tight enough to provide a steady connection
  - Not so tight the screw is damaged

Countersunk screws
(skip if you made the Air:bit)

Tools: Philips Screwdriver

Parts:

2 x
countersunk
screws

2 x
Nylon nuts

Assembled control board

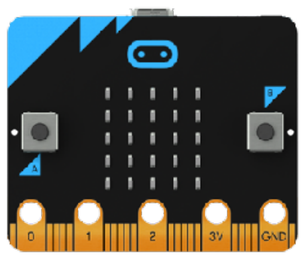
- Pull the screws trough and attach the nuts on the bottom side of the board

micro:bit (skip if you made the Air:bit)

Tools: Philips Screwdriver, pipe wrench 5.5mm

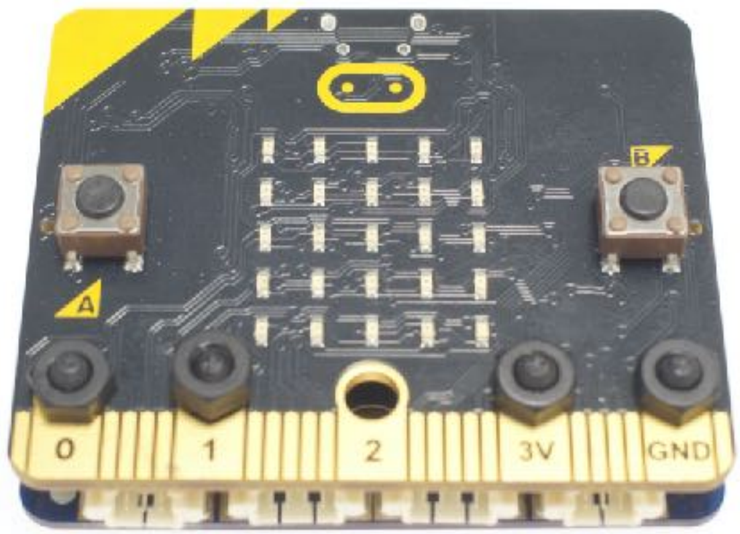
Deler:

Assembled control board



micro:bit

4 nuts



- Place the micro:bit on the barrel nut on the control board
- Screw on the nuts “finger tight” so the connection is solid but you don’t damage the plastic screws.

Making the raft

Tools:
Utility knife or scissors

Parts:

Cardboard box from kit

- Carefully cut along the dotted lines
- Cut out one of the tail fins

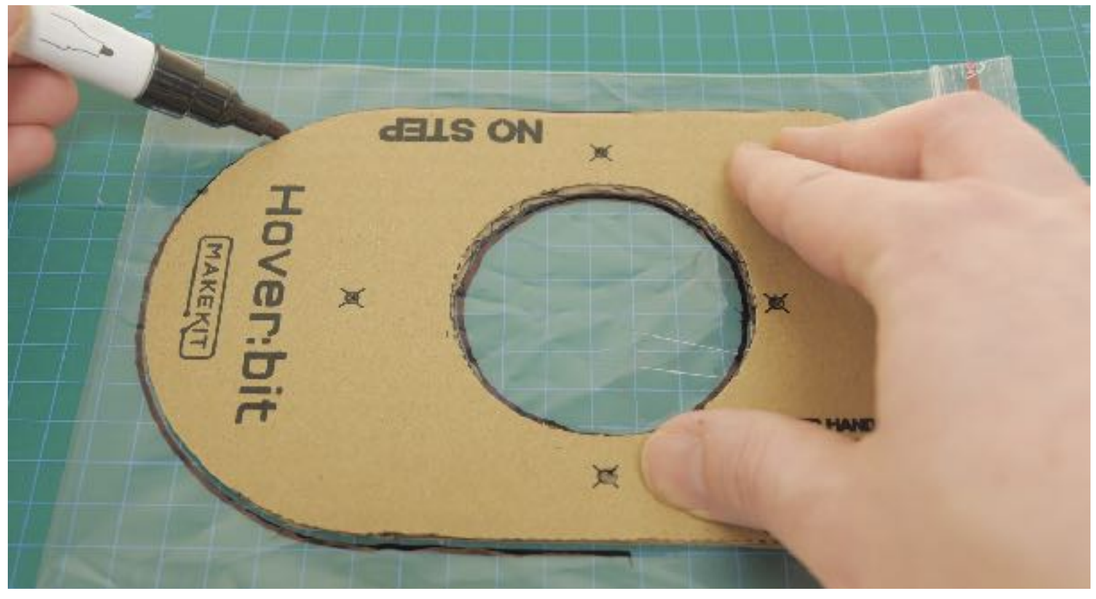
Making the raft

Tools:
Marker

Parts:

Cardboard parts

Large ziplock bag from kit



- Place cardboard exactly in the middle of the ziplock bag
- Mark the inner circle and the outer line with a marker

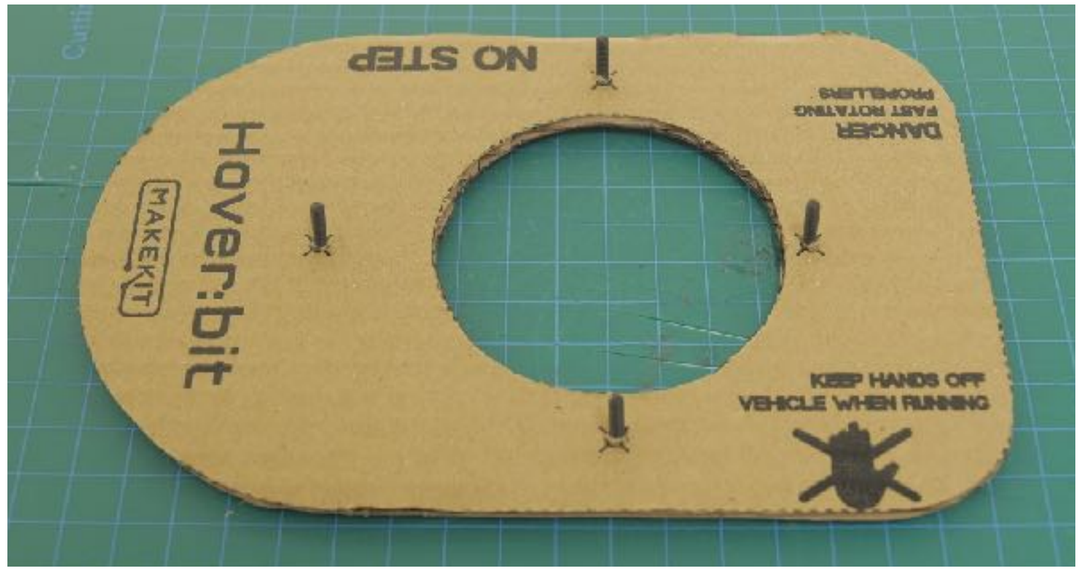
Making the raft

Tools:
Marker

Parts:

Cardboard raft

4 nylon screw
m3x15

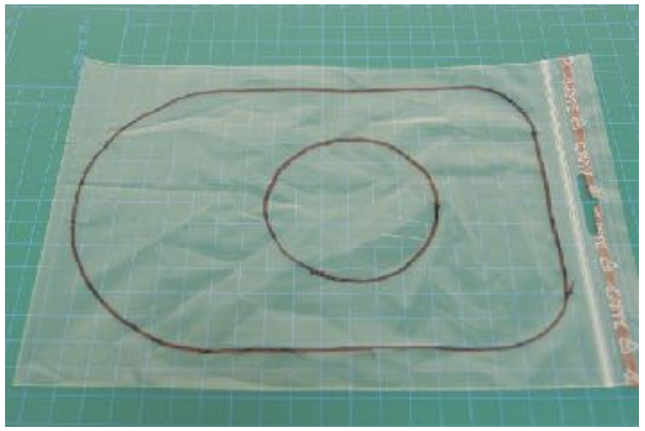


- With a small screwdriver or sharp tip, punch 4 thin holes in the marked crosses.
- Insert the four screws as shown above

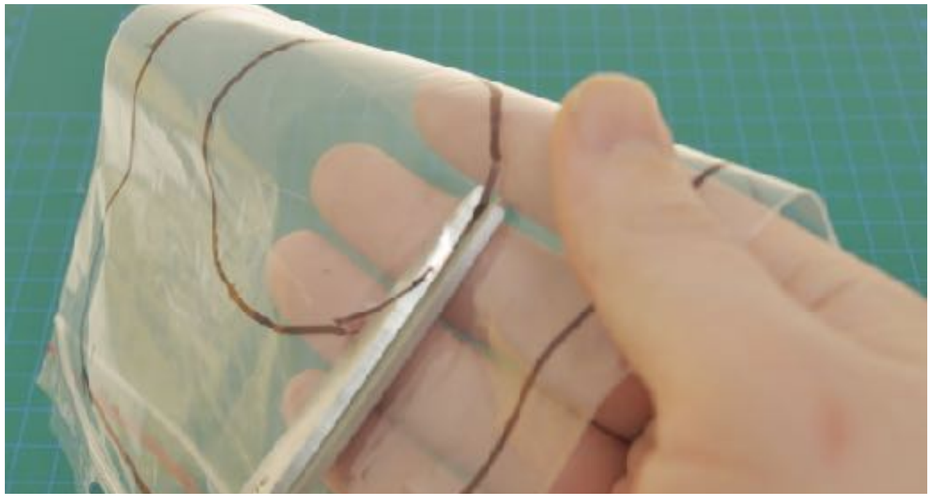
Making the raft

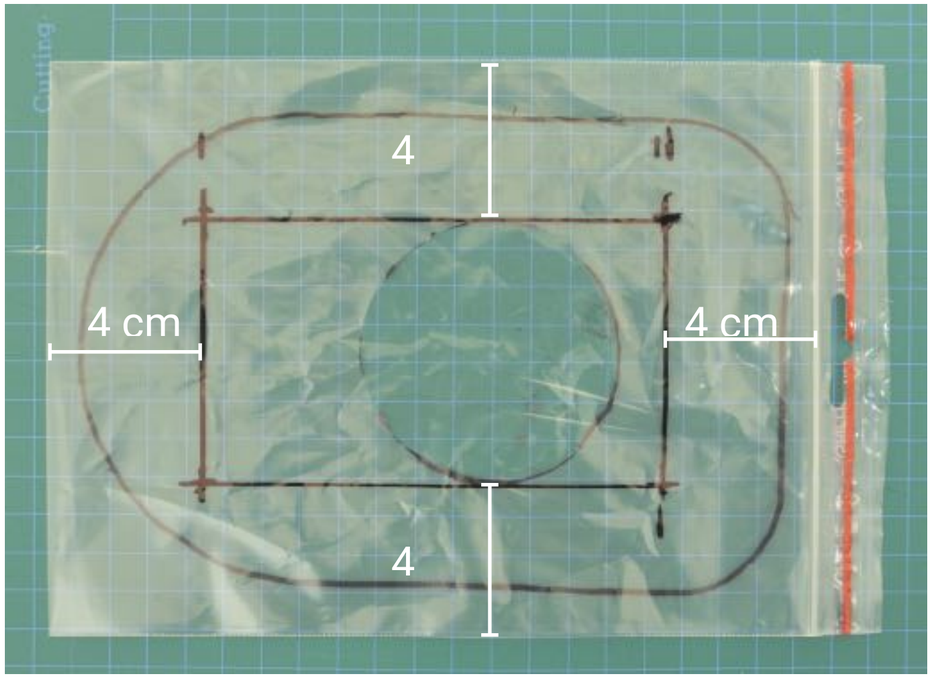
Tools:
Scissors
Marker

Parts:



Ziplock bag



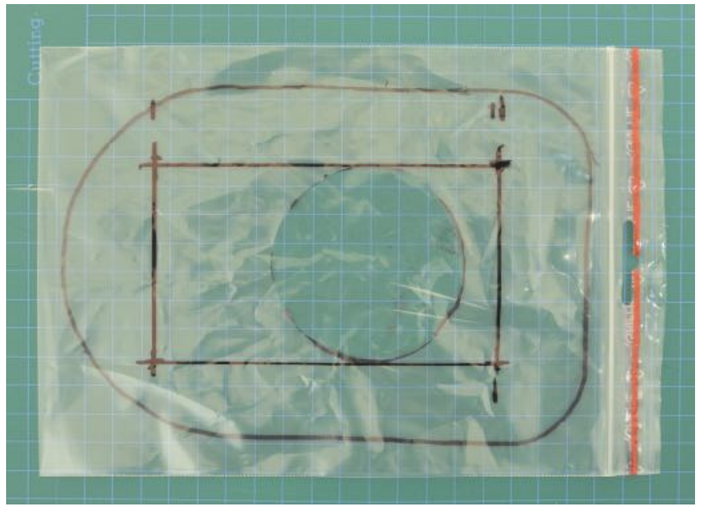


- On **one side** of the ziplock bag, cut out the marked hole with a pair of scissors
- On the **other side** of the bag, use a ruler to draw a square 4 cm from the edges.

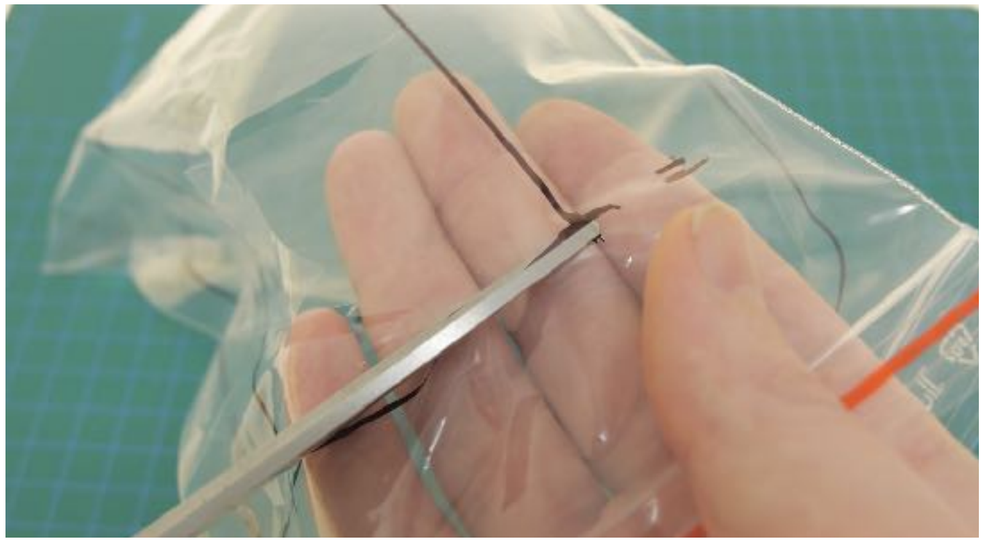
Making the raft

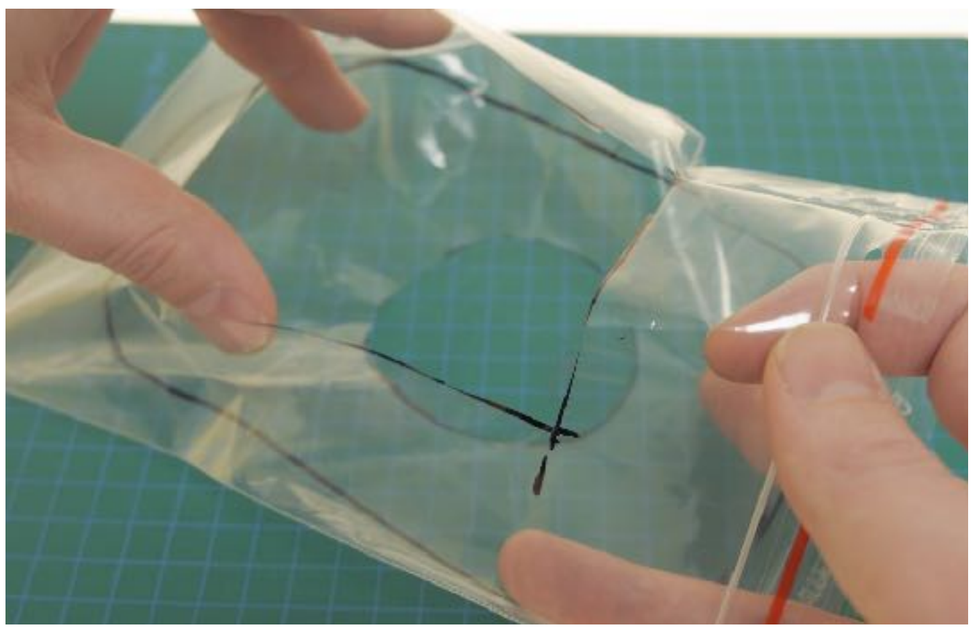
Tools:
Scissors

Parts:



Ziplock bag



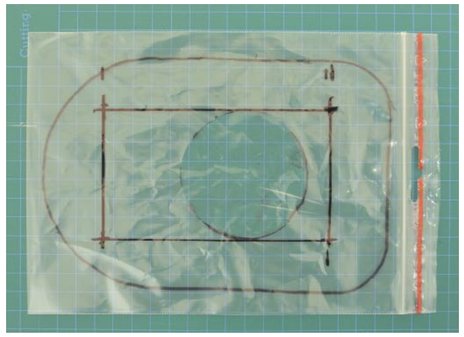


- Carefully cut out the square on back side only
- The bag should have a square hole on one side and a hole on the other side.

Making the raft

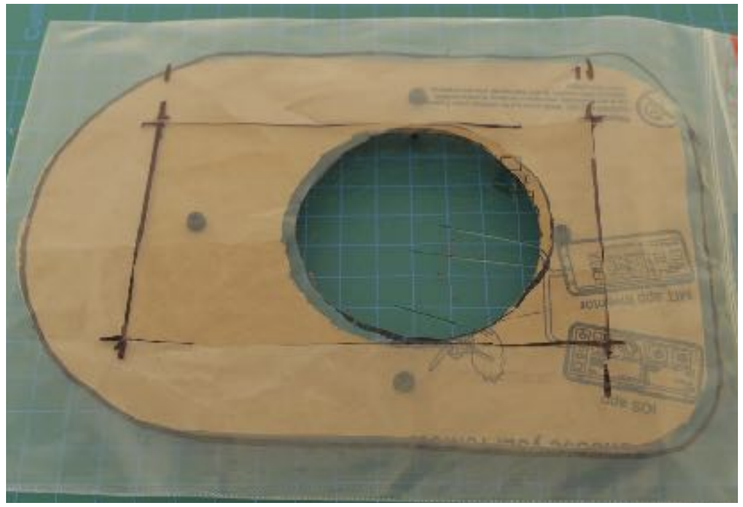
Tools:
Hot glue or contact adhesive glue

Parts:



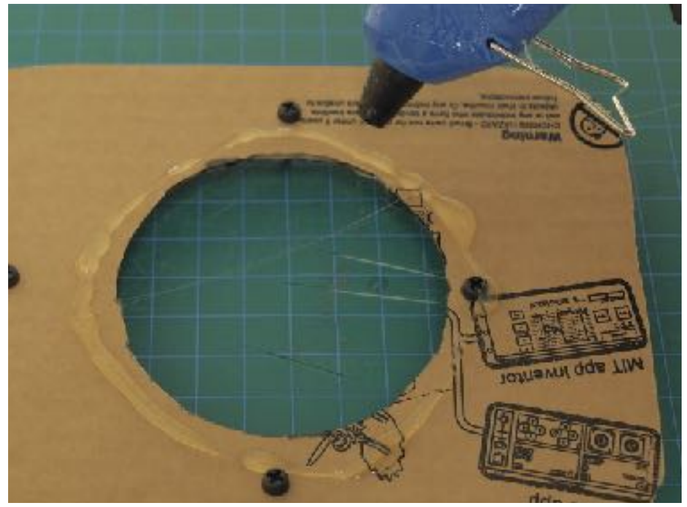
Ziplock bag

Raft with screws



- Turn the raft upside down.
- Place the bag so it matches the markings.
- Make sure the **big squared cutout is on top** and the circular hole is at the bottom.
- Remove the bag

- Carefully place the bag so it aligns with the hole and the rest of the raft



- Place hot glue around the hole

You can also use contact glue

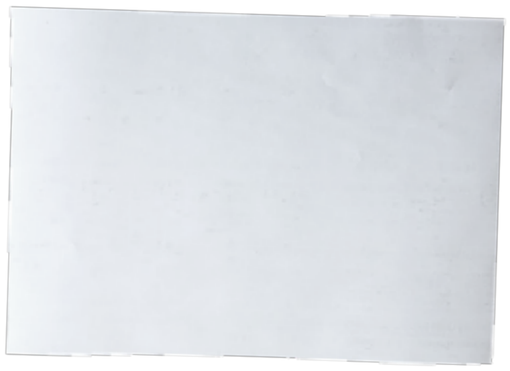
- Put a thin layer of glue around the hole
- Put a similar layer of glue around the hole on the bag
- Wait 2-5 minutes until the surfaces are dry
- Press together
- Other glues might not work on PE plastic bags

Making the raft

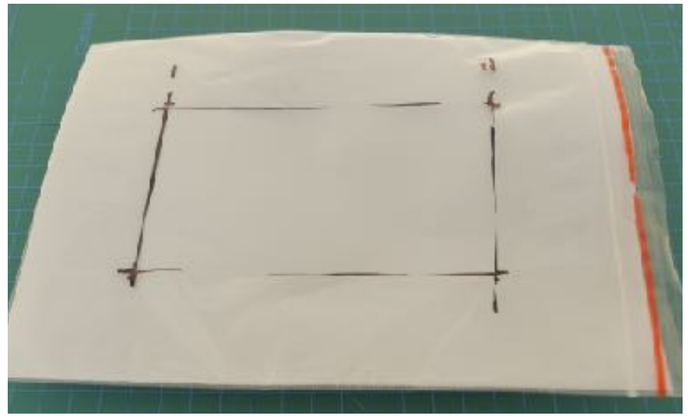
Tools:
Hot glue or contact adhesive glue

Parts:

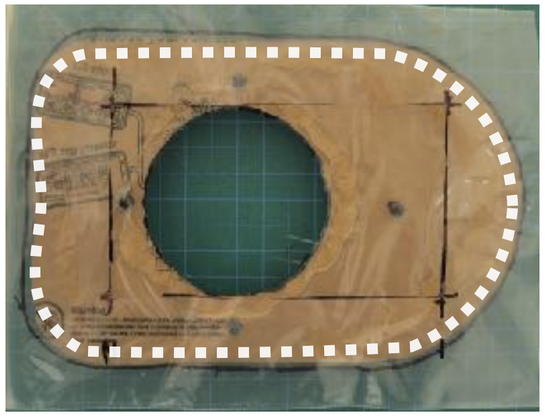
Glued raft



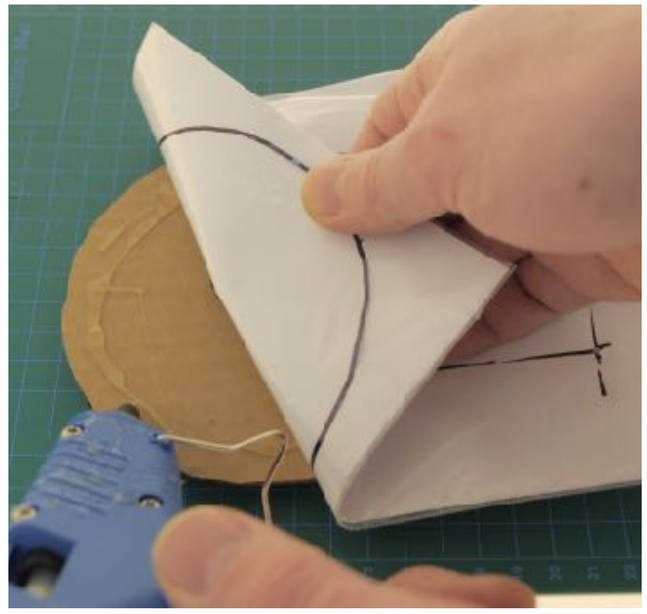
Piece of A4 paper



- To protect the bag from melting, fold a A4 paper and insert into the bag
- This is only needed if using hot glue



- Notice the “glue line” where the glue should be placed



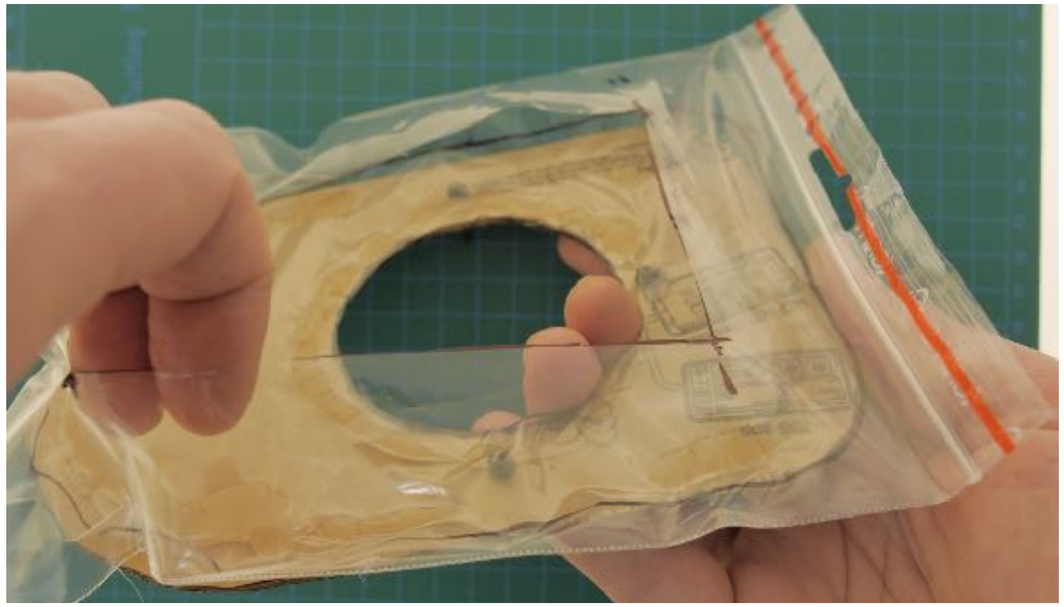
- Start placing glue at the edges on one side of the raft
- Press the bag down to attatch
- Move on to another part until the bag is glued all around the edge of the raft.
- If using contact adhesive, you can glue everything at the same time

Making the raft

Tools:

Parts:

Glued raft



- Your raft should now look like this!

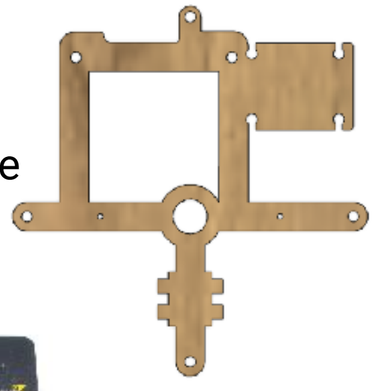
- Zip the bag together to keep the air pressure inside when drifting

Assembly

Tools:

Parts:

Glued raft

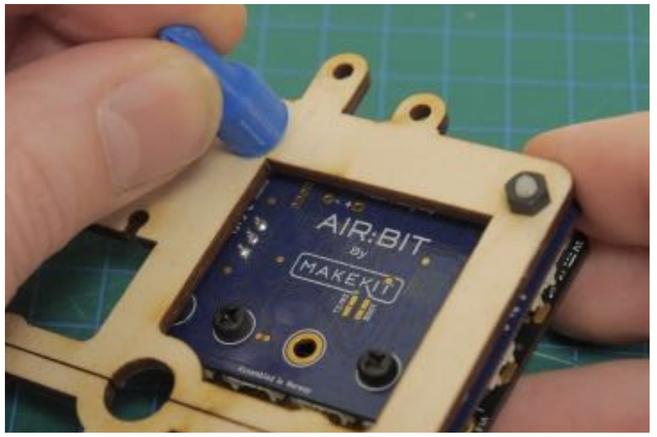


Base frame

Control board assembly

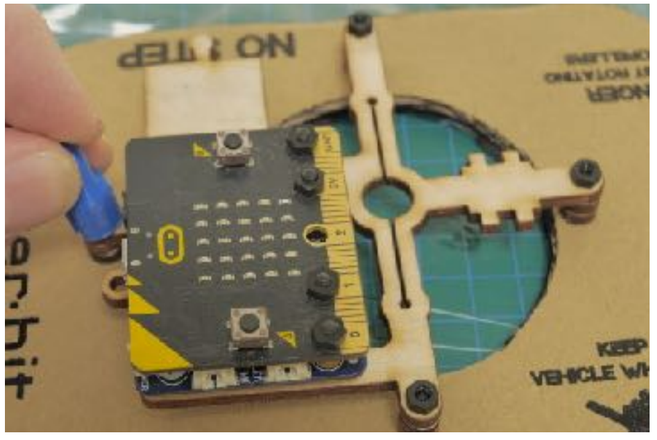
8 spacer rings

4 nylon bolts

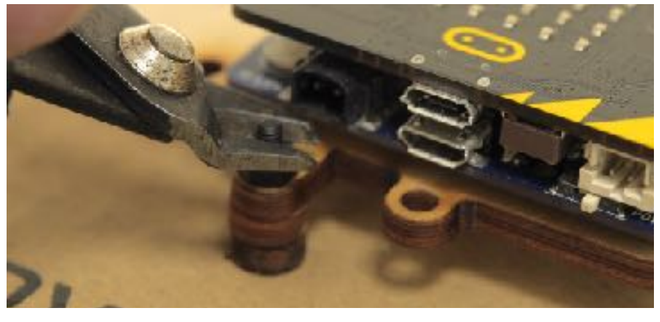


- Mount the control board assembly to the base frame

- Place two spacer rings on each screw



- Screw on all four bolts



- If the screw is too long, cut it with pliers.

- The screw can not go above above the nut as this can block the battery plug.

Assembly

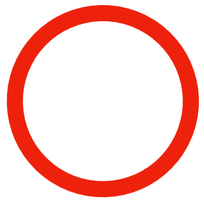
Tools:

Parts:

2 angle connectors

Motor holder

Servo

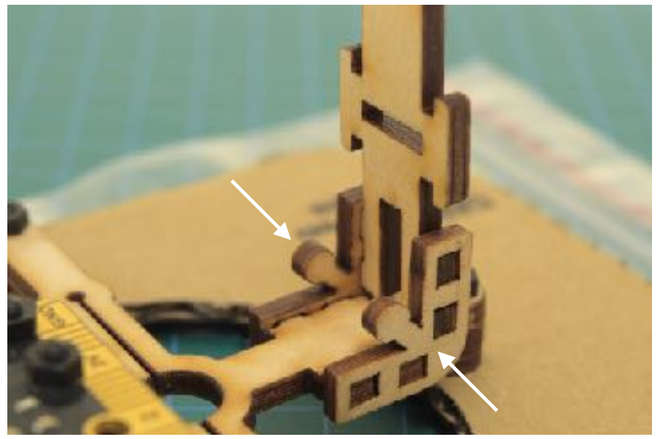


Large o-ring

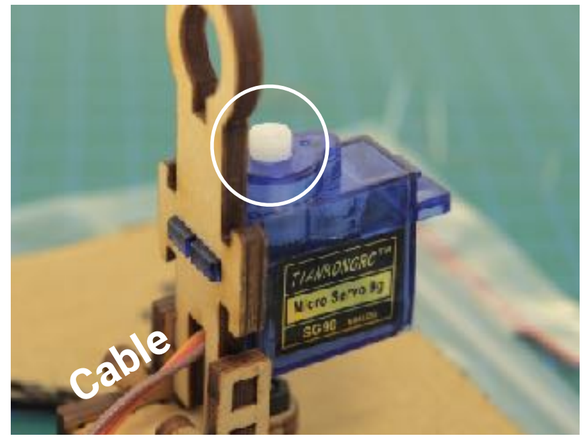
Servo horn

Small o-ring

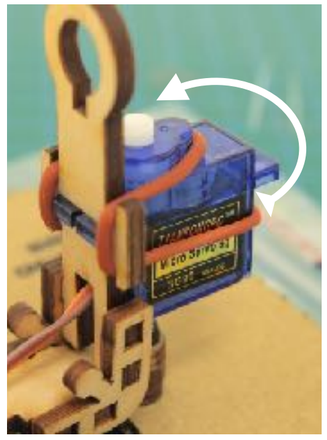
Tail fin holder



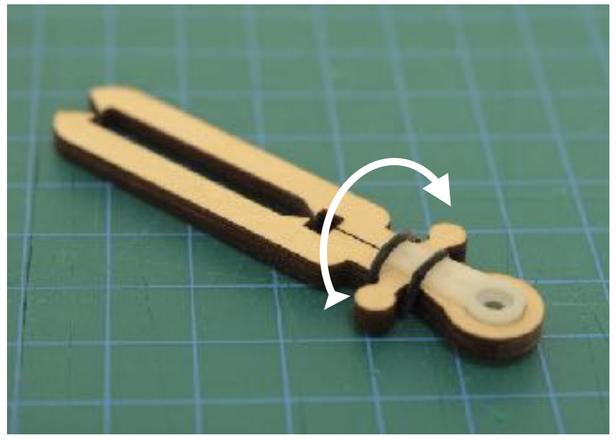
- Use the angle connectors to mount the motor holder to the base frame



- Insert the servo and pull the cable trough. The servo head (white circle) should on the left side.



- Secure the servo with the large o-ring

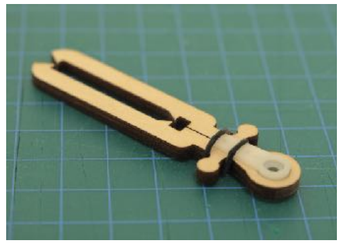


- Insert the servo horn into the tail fin holder
- Secure with a small o-ring

Assembly

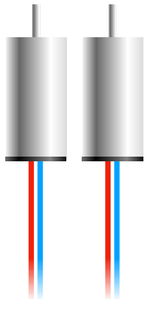
Tools:

Parts:

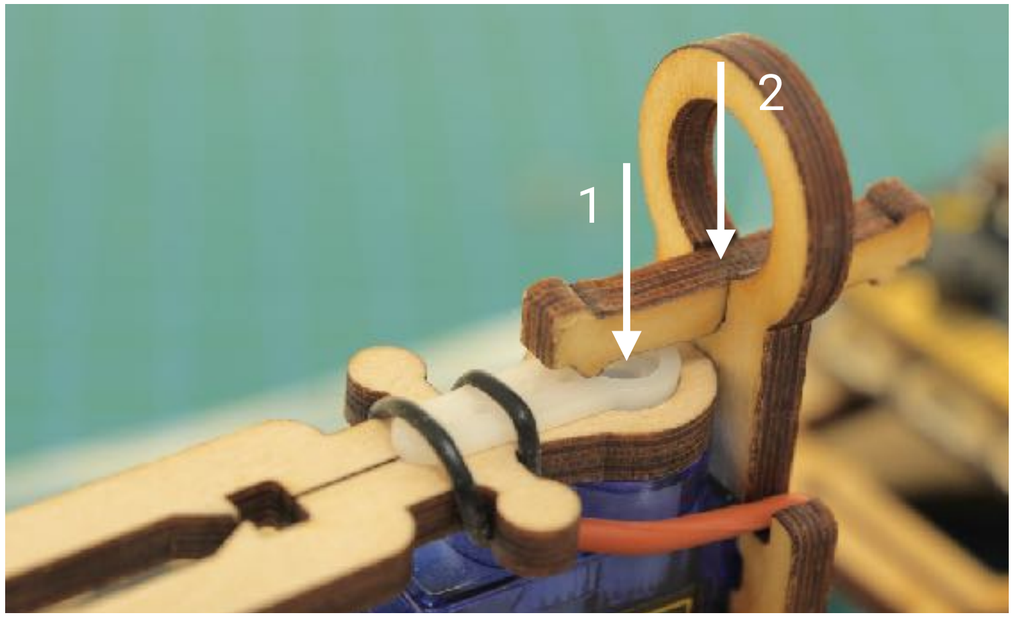


Tail fin assembly

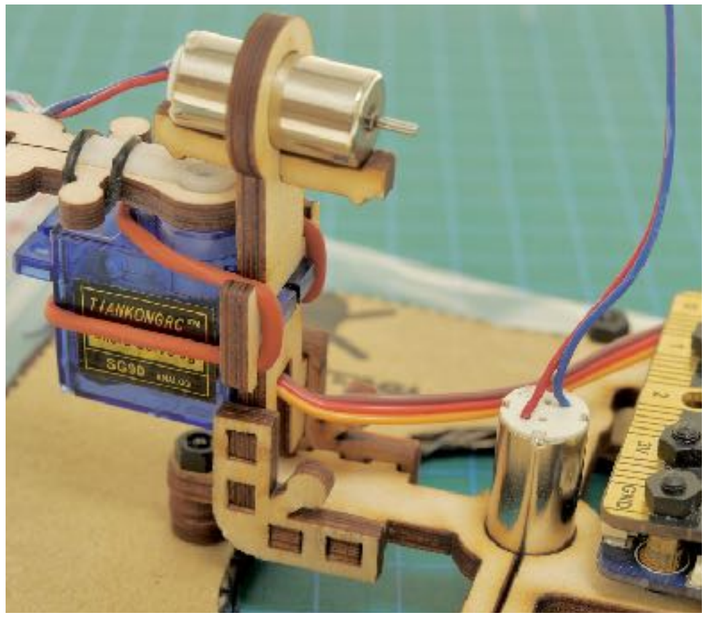
Wedge



2 motors



- Press the tail fin assembly onto the servo head (1). Make sure it sits firmly
- Insert the wedge (2)



- Insert the 2 motors so they sit firmly

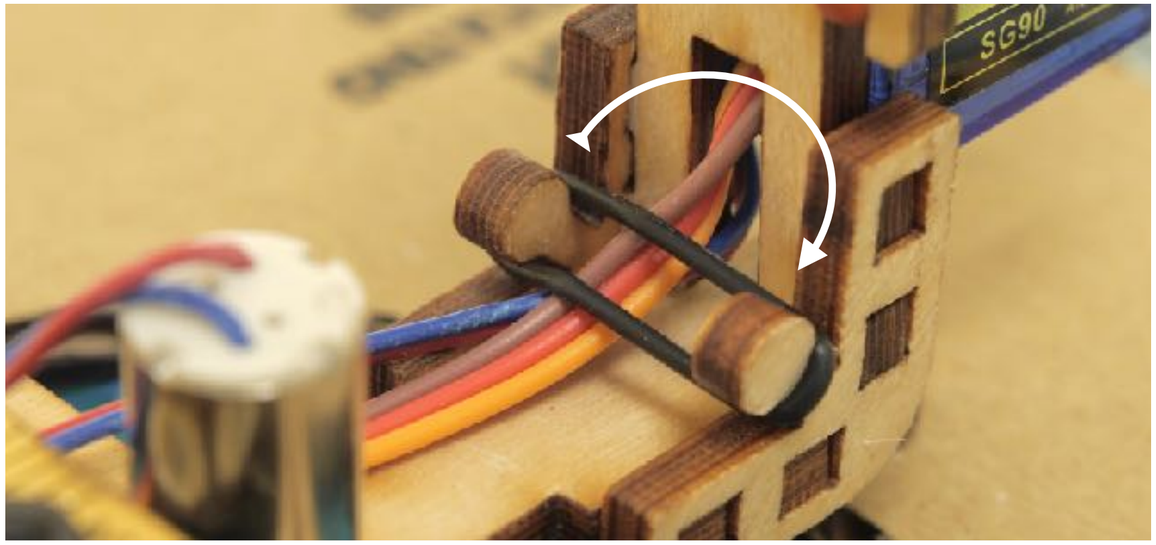
- Underneath, make sure the motor is flush with the base frame and doesn´t stick out too much.

Assembly

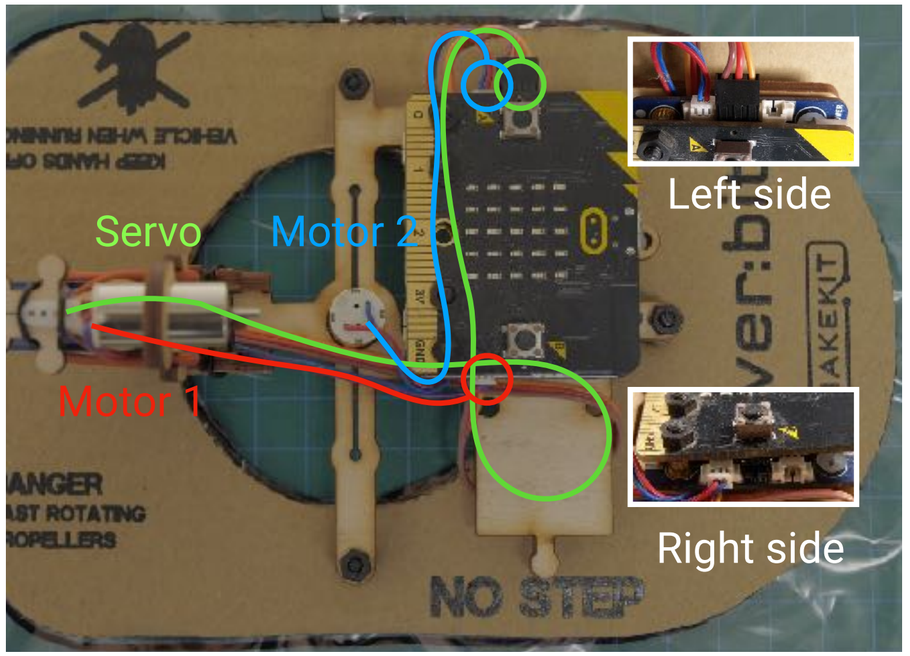
Tools:

Parts:

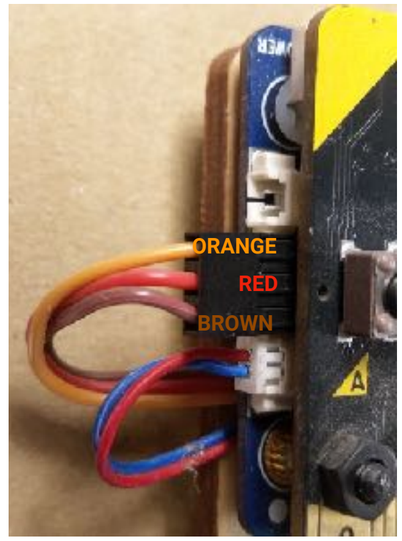
Small o-ring



- Pull the small o-ring over the motor cable and the servo cable to keep them away from propeller motion



- Organise and tidy up the cables.
- Plug motor 1, motor 2 and servo according to the illustration



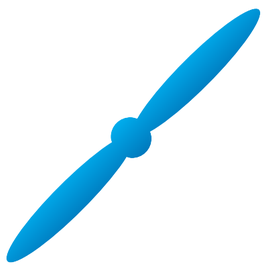
- Make sure to plug the servo plug the correct way regarding the colors on the cables.

Assembly

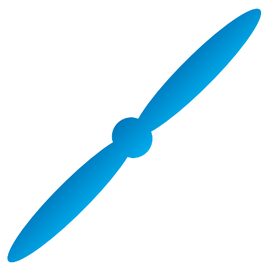
Tools:

Parts:

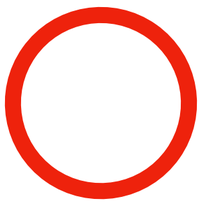
Tail fin



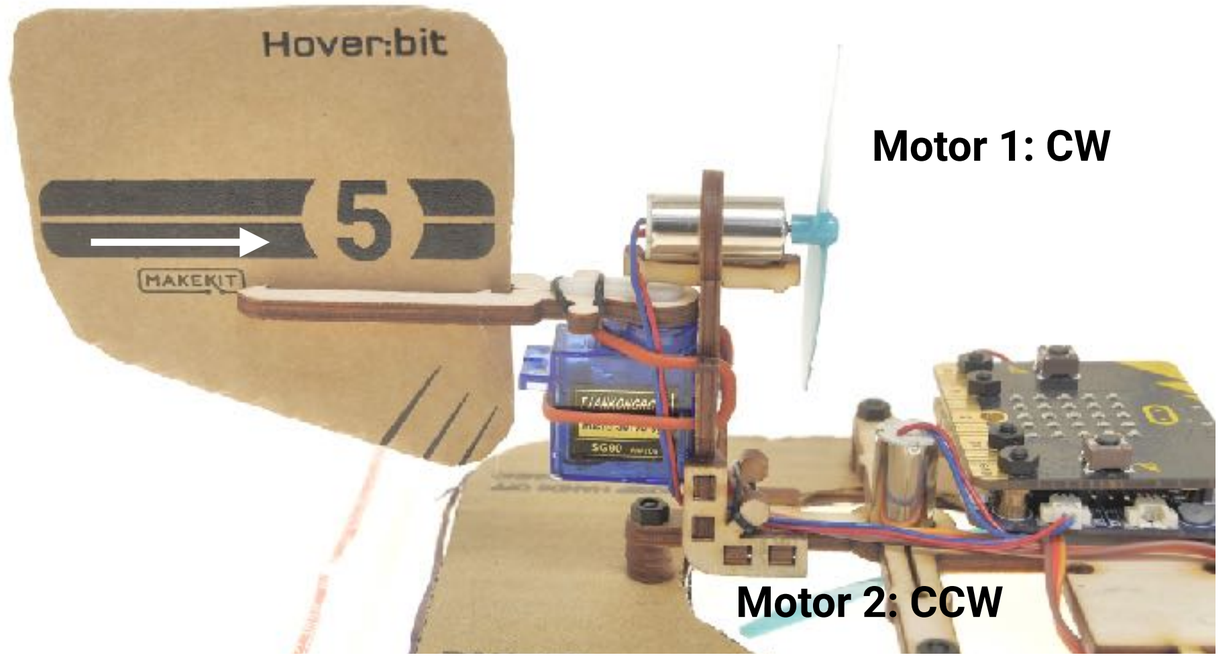
1 CW propeller



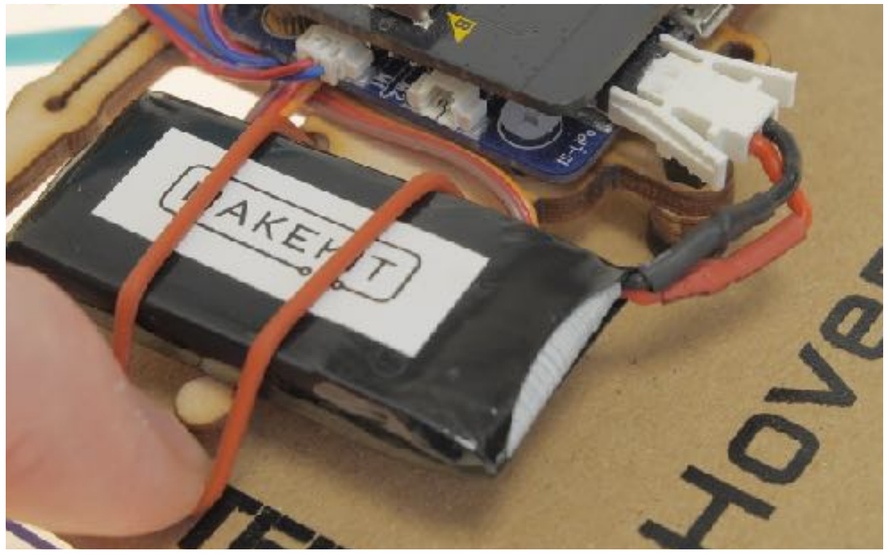
1 CCW propeller



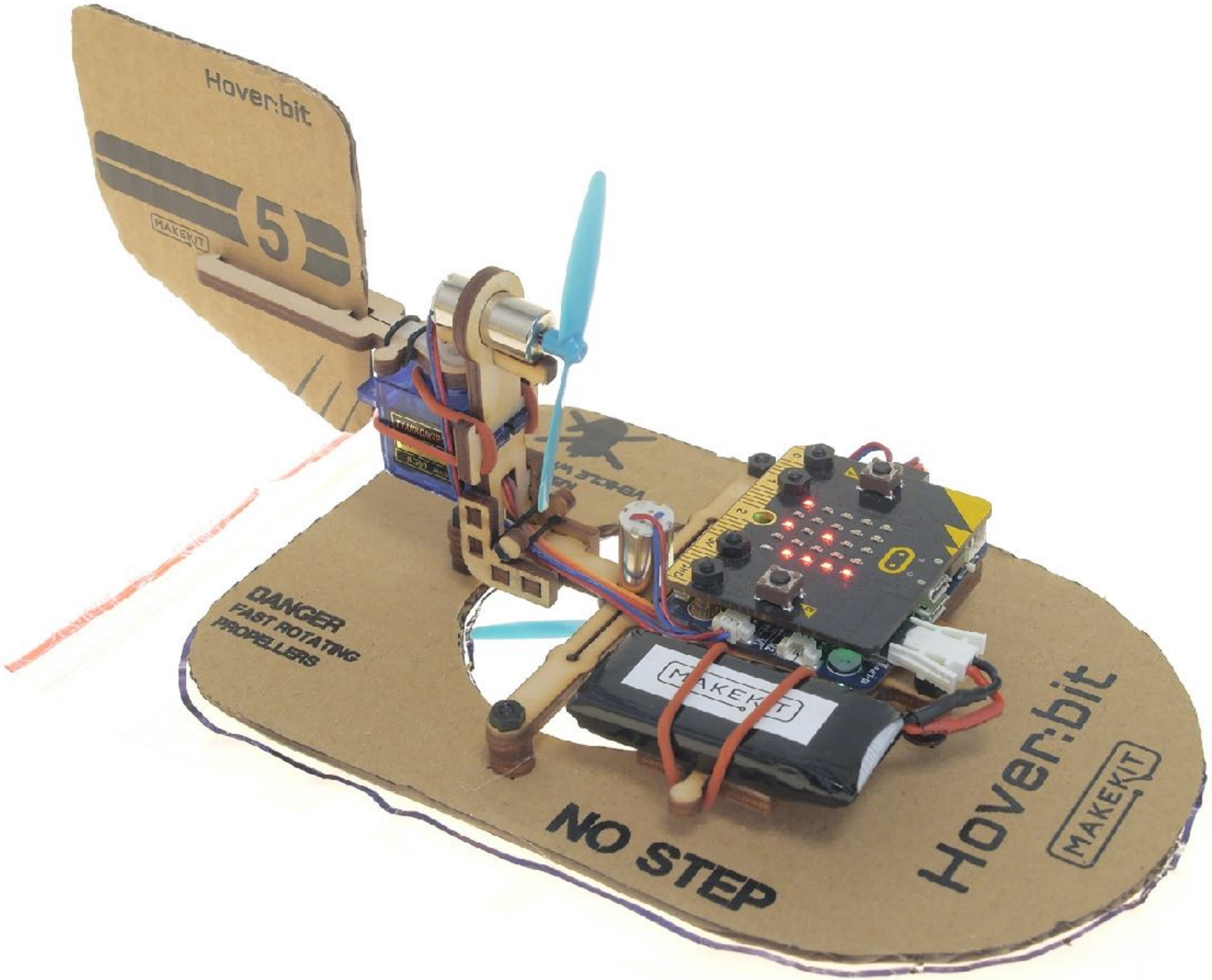
Large o-ring



- Slide the tailfin into the tail fin holder
- Attatch a CW propeller at motor 1
- Attach a CCW propeller at motor 2



- Connect the battery into the grey plug
- Secure the battery with the large o-ring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5
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