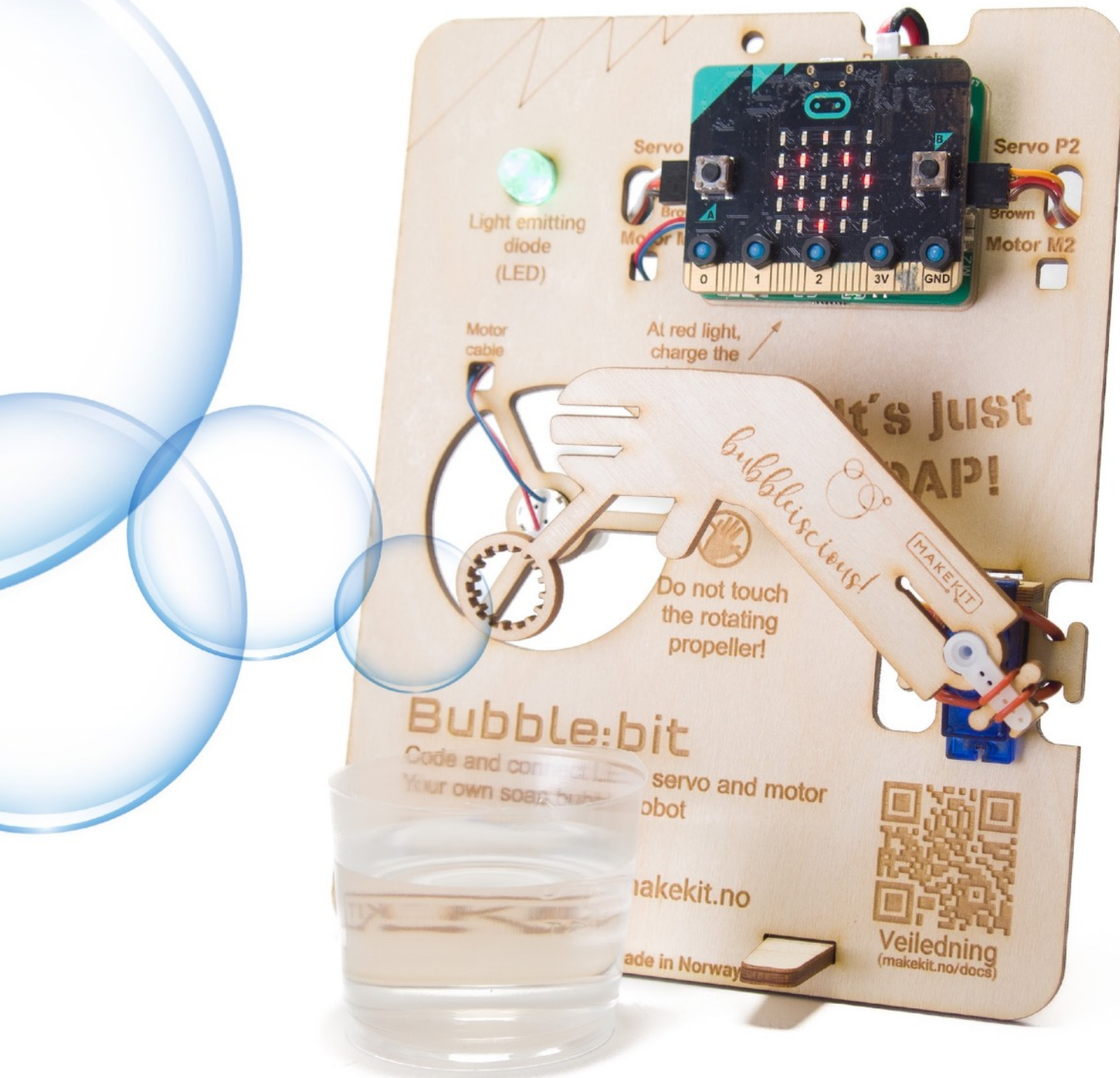


Bubble:bit

Micro:bit soap bubble machine
With rechargeable battery

From 11 years



About the product

Hover:bit is designed and manufactured in the old premises of Tanbergs Radiofabrikk at Skullerud in Oslo, Norway

We welcome questions and feedback.

Do not hesitate to contact us!

Feel free to use our Facebook page as well



www.makekit.no



support@makekit.no



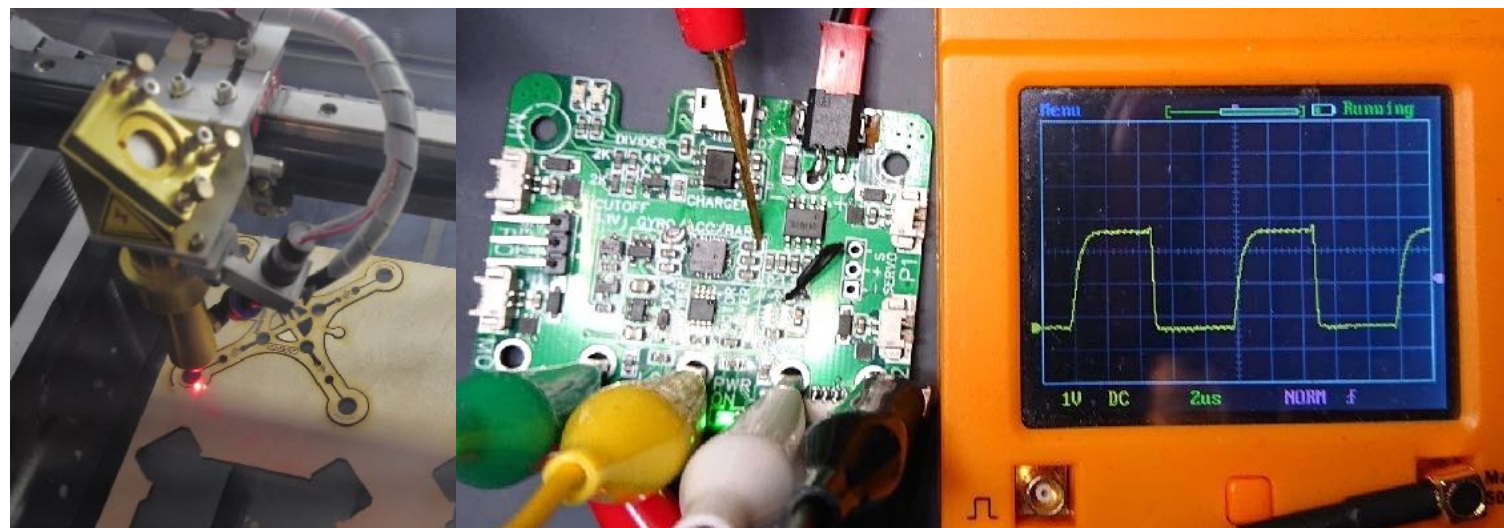
makekit



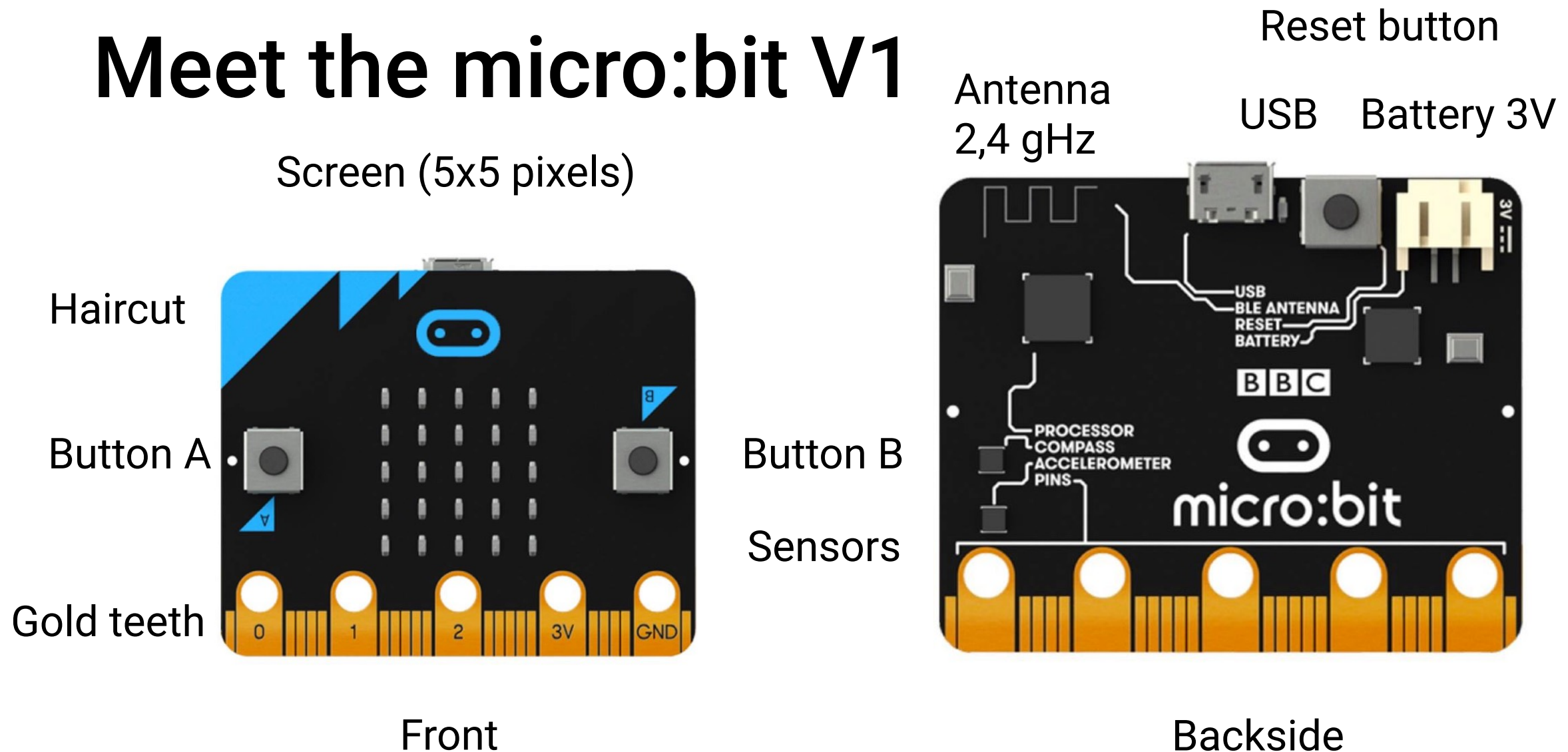
gomakekit (also twitter)



*Henning and Steinar
At the Tandberg exhibition at
Skullerud*



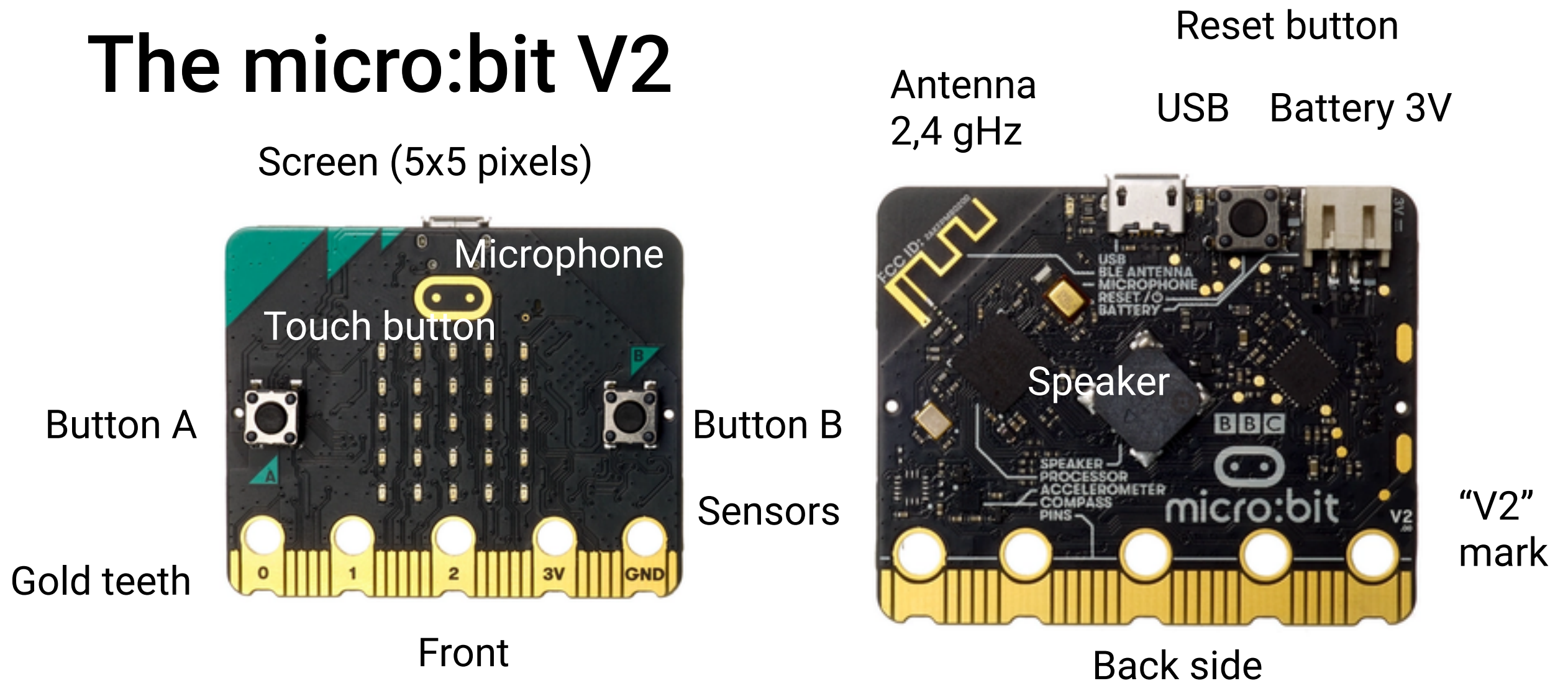
Meet the micro:bit V1



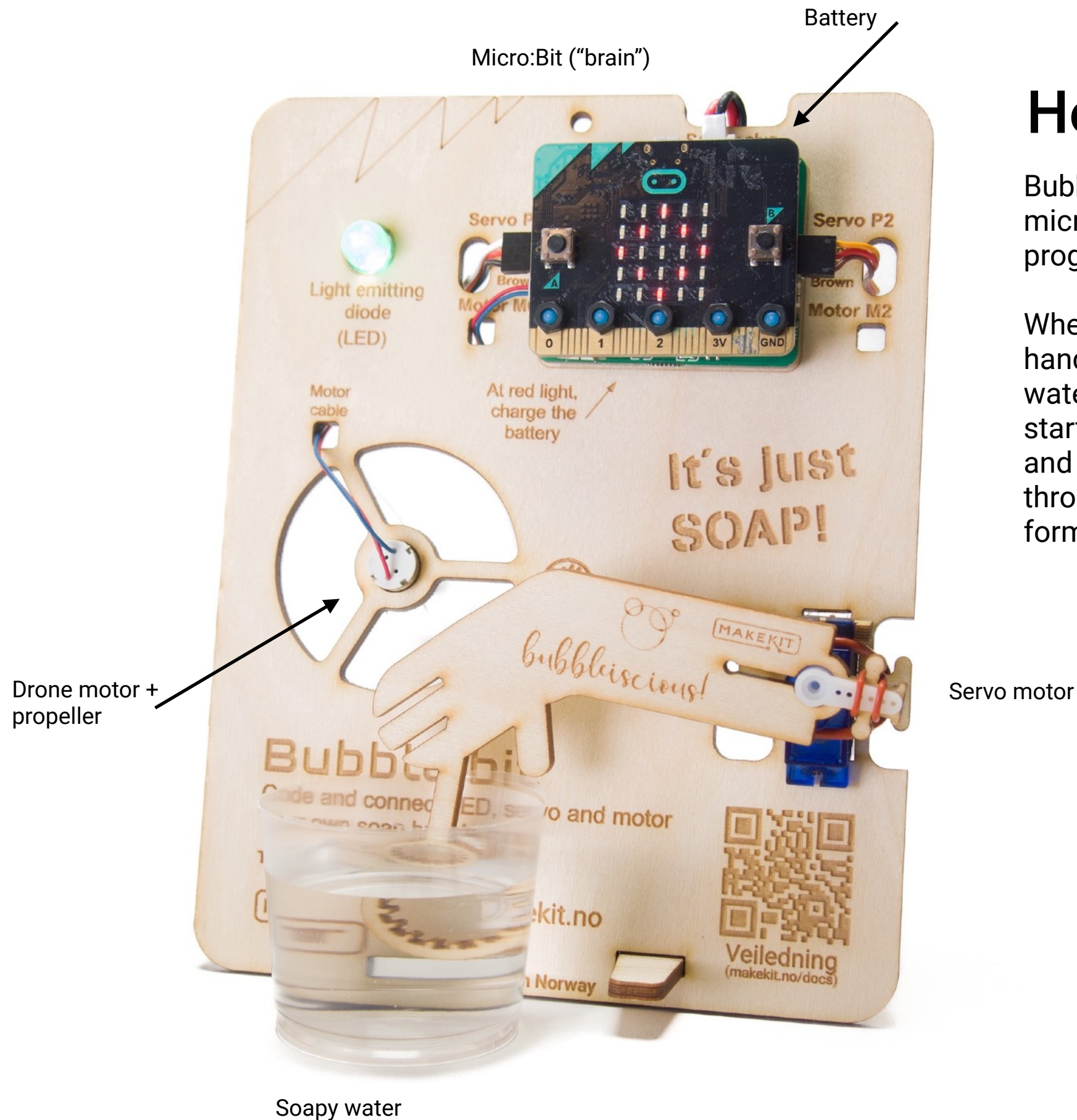
micro:bit is a small computer with prosessor, sensors, display and radio. It has connection pins for external components like LEDs, speakers or various sensors.

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

The micro:bit V2



The micro:bit V2 is very similar to V1 but with extra features, like: Microphone, speaker, touch button, faster processor and more memory. The “gold teeth” looks different compared to V1, for better grip with crocodile clips.

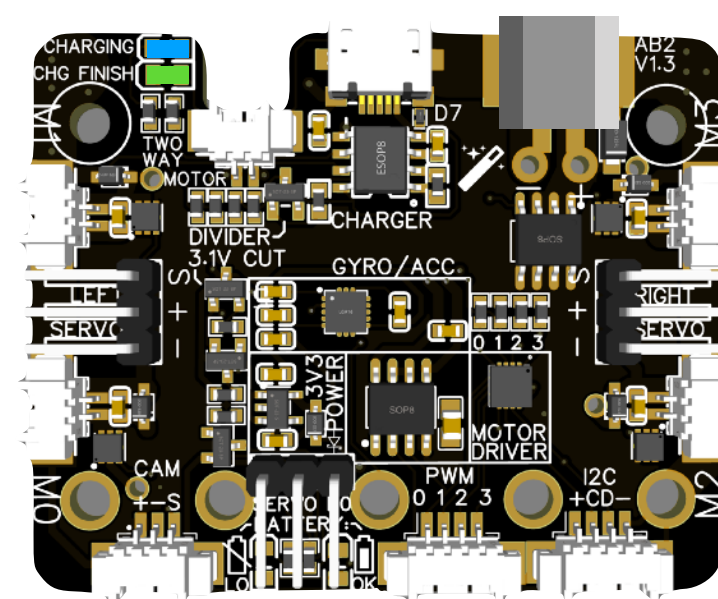
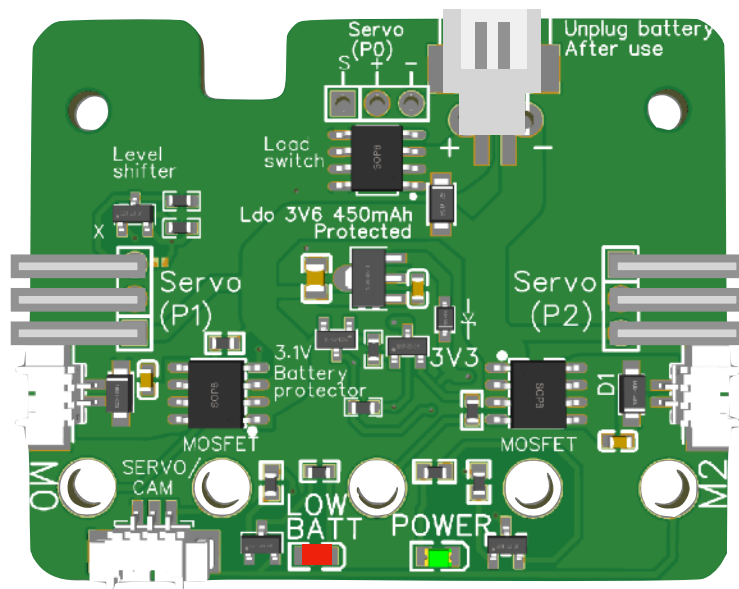


How it works:

Bubble:bit is controlled by a micro:bit which runs a small program.

When you press button B, the hand will dip the ring in soapy water and the propeller will start. A film of soap will form and when the air is blown through, soap bubbles will form!

Same function on Bubble:bit

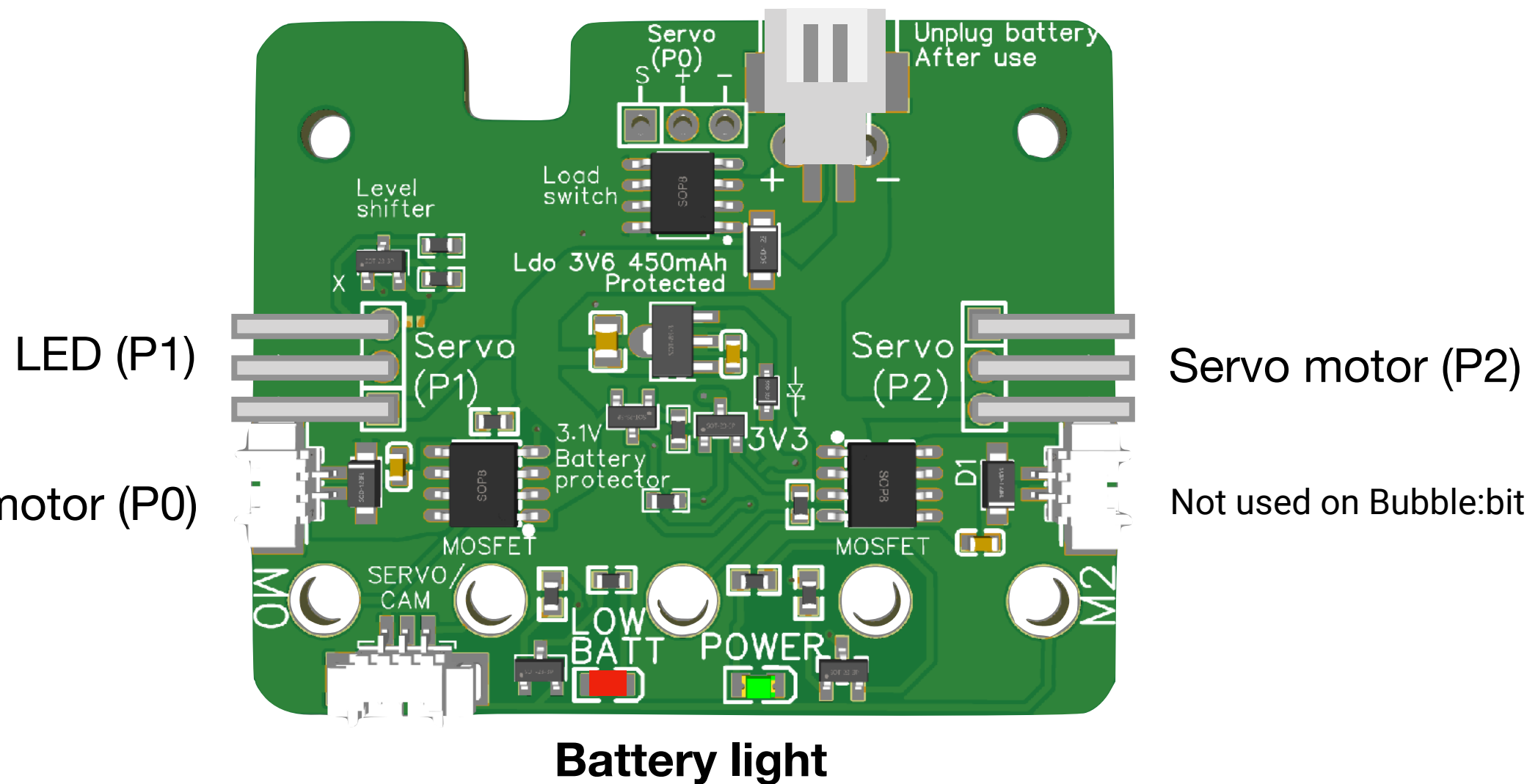


The black card has more connectors, but function for the Bubble Bit is the similar.
The motors, LED and servo should be connected at the same connections for both cards.

The green board needs no code extension, the black board needs the wonderkit code (download from makekit.no/docs)

Green card

Battery connector

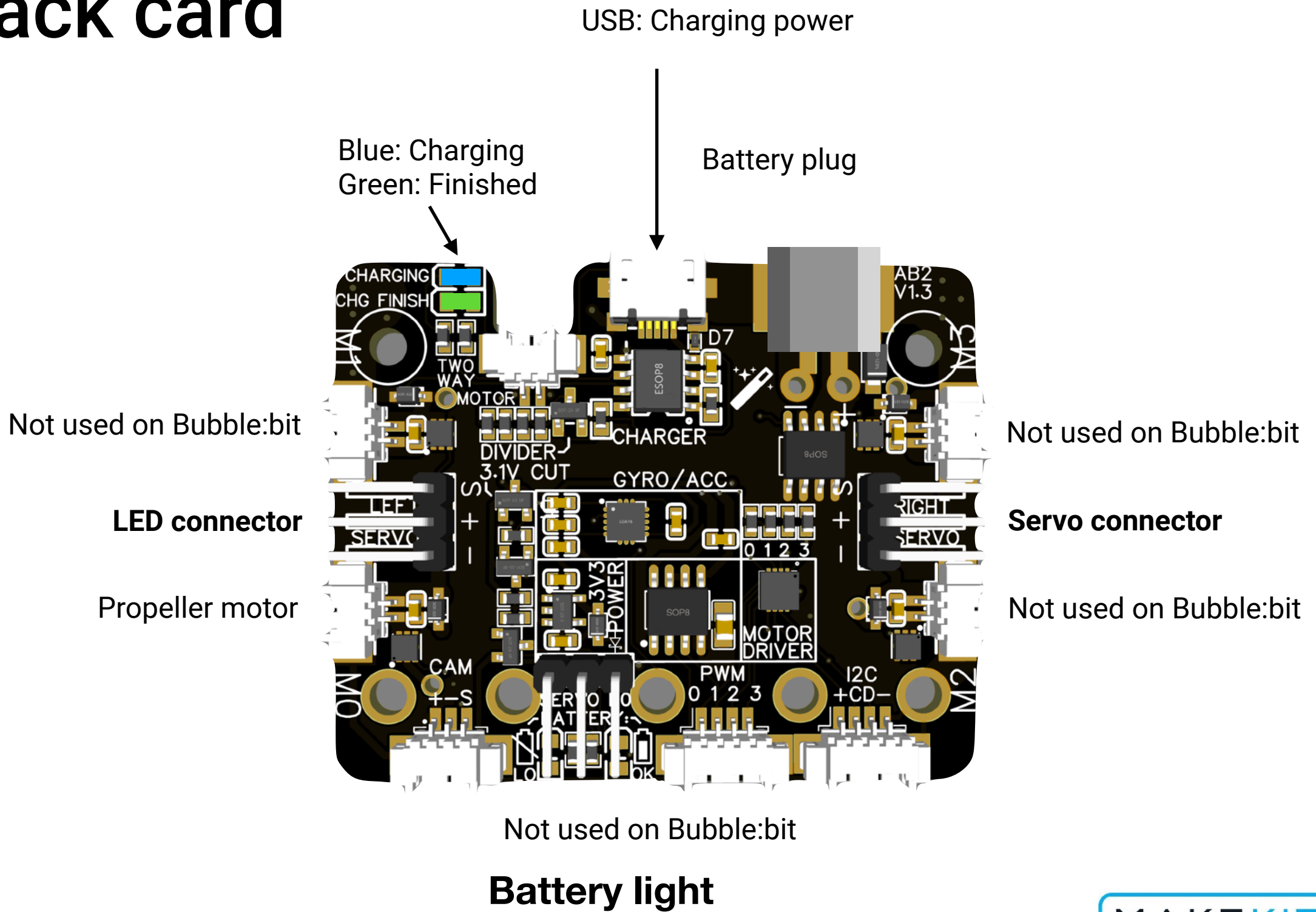


The control board helps the micro:bit to connect to external things such as motors, and amplifies the current.

It also ensures that the micro:bit gets the right amount of power from the battery. If the battery is running low, the power is turned off to protect the battery.

Note that if the red light is flashing, the battery needs to be charged.

Black card

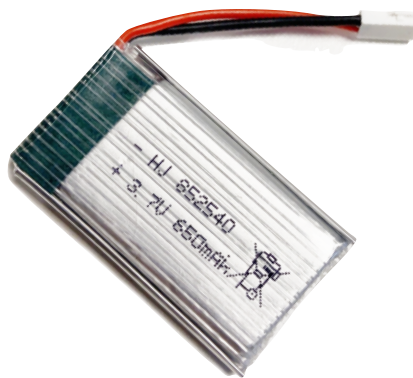


Charging (green card users)

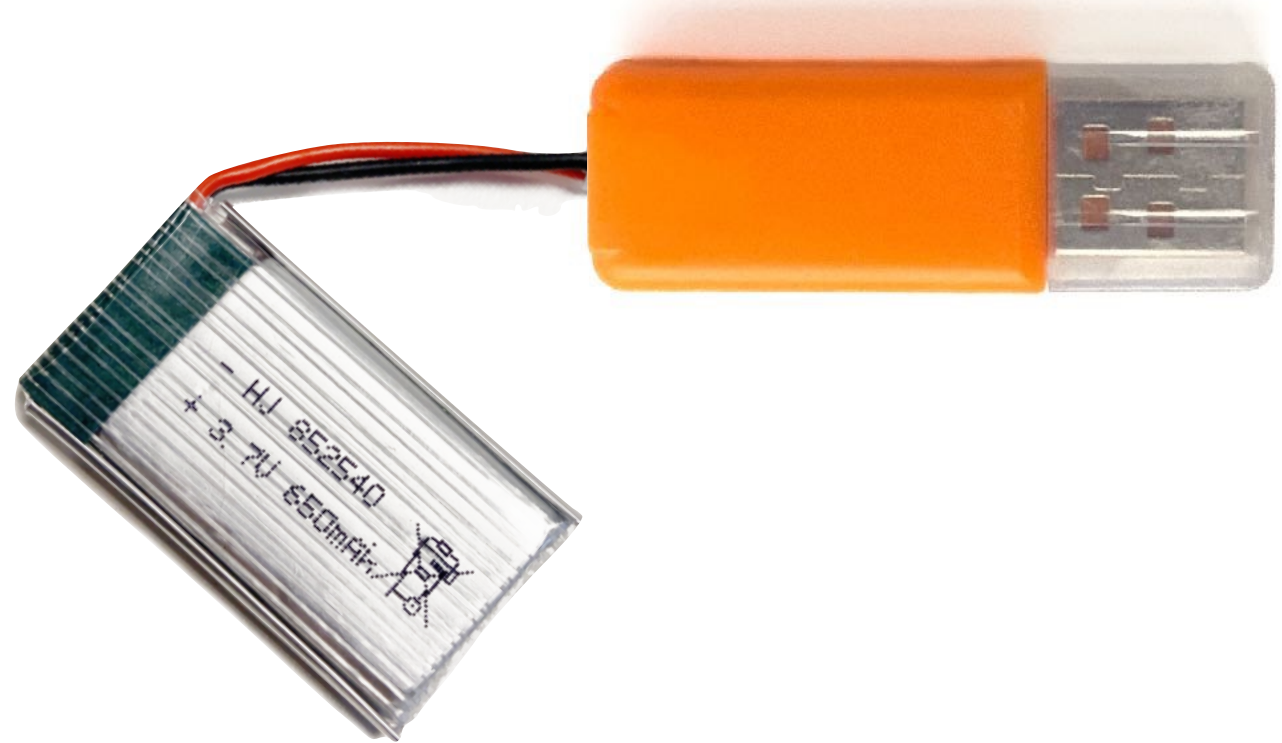
Deler:



Usb-charger



LiPo-Batteri



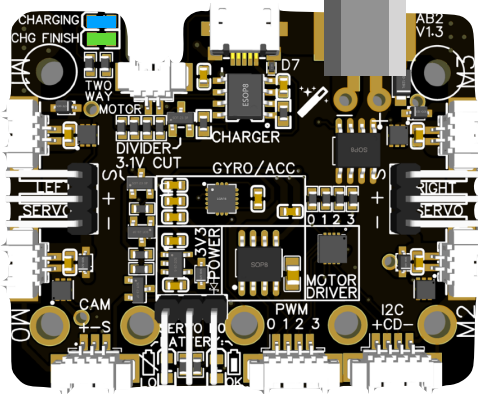
The green card comes with an orange charger.
First plug battery and charger together.
Then plug the charger into a USB socket. Orange light
lights up until the charger is finished after 1-2 hours.

**Note! For safety reasons, lithium batteries must always
be charged under supervision.**



Charging (black card)

Parts:



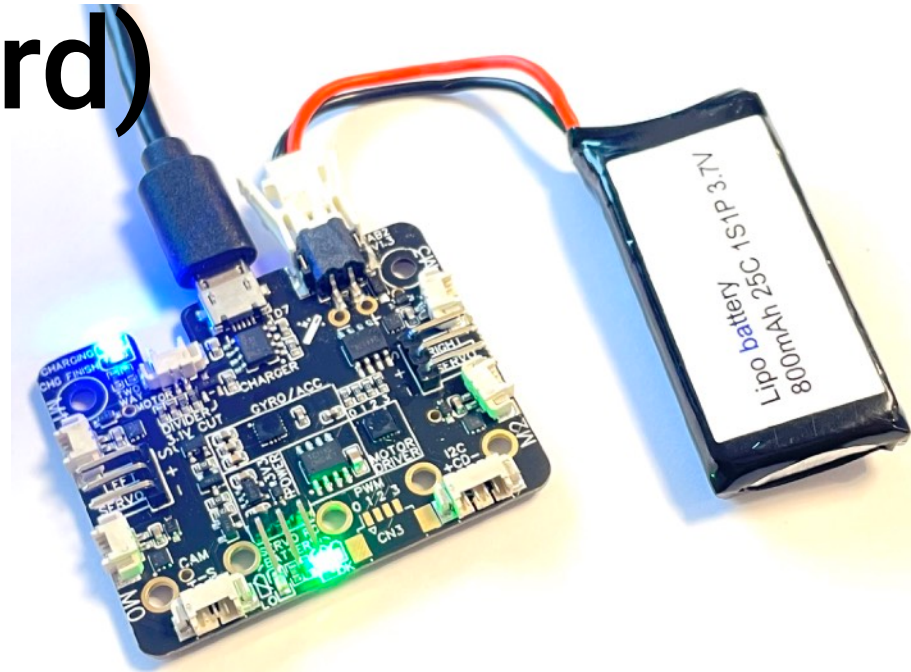
Black control board



Lithium (LiPo)-
battery



Micro USB-
Cable



1. The battery can be charge with or without the micro:bit connected.
2. Plug the big white battery plug into the grey connector
3. Connect the micro USB into the control board (not the microbit)
4. Connect the other end into a USB charge outlet
5. Blue light indicates charging. Green light indicates charging finished. It takes about 1 hour to charge.
6. To prevent battery drain, always unplug battery when not in use!

Fire hazard:
Never charge a Lithium battery unattended!



Recommended tools



Pipe wrench



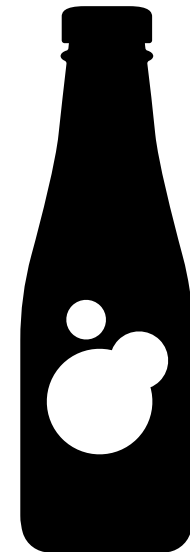
Small philips
screwdriver



Small plastic cup

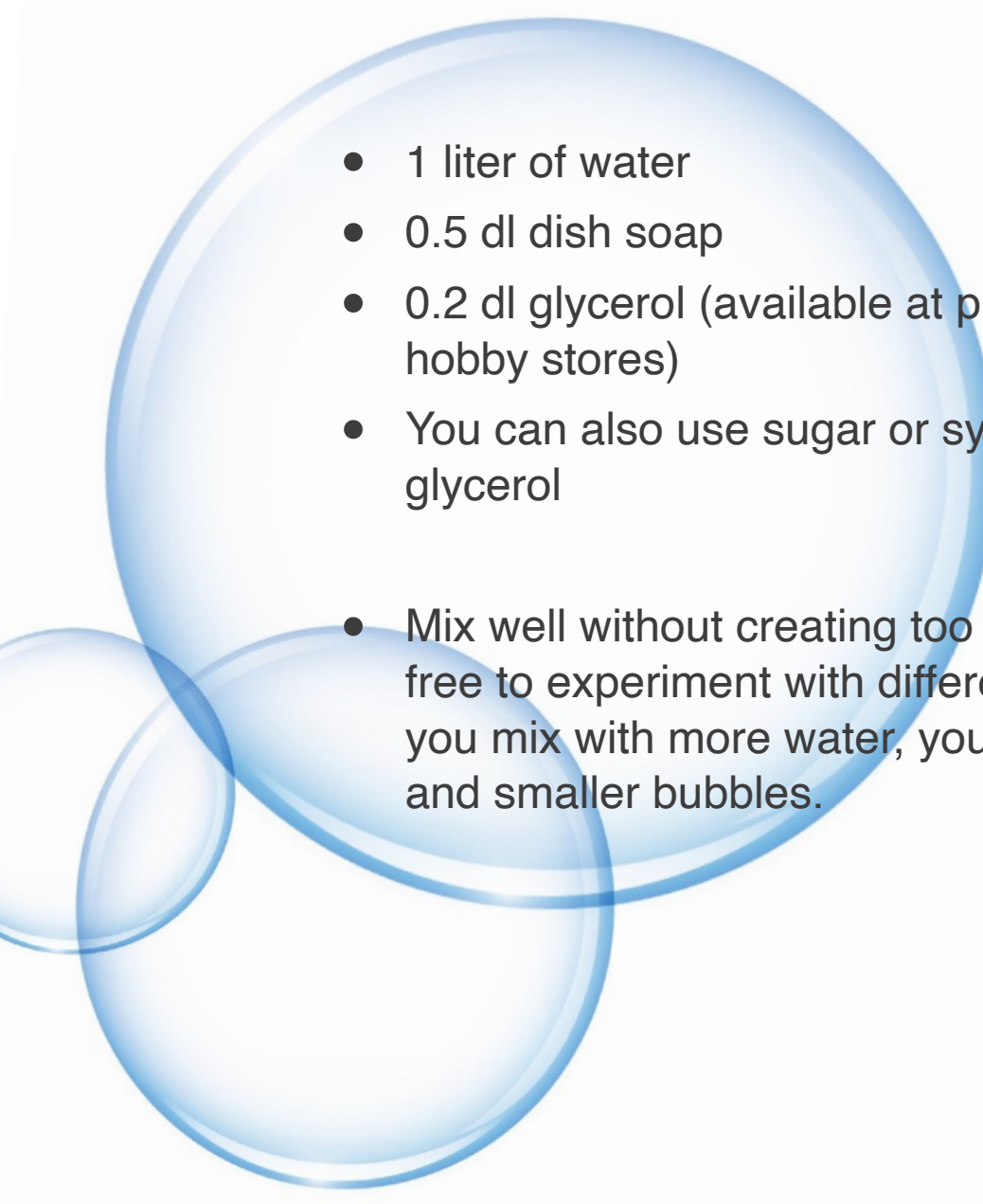


Optional scissors to
cut plastic cup



Bubble water or soap recipe

Soap bubble recipe

- 
- Several translucent blue bubbles of varying sizes are clustered on the left side of the slide, partially overlapping the text area.
- 1 liter of water
 - 0.5 dl dish soap
 - 0.2 dl glycerol (available at pharmacies or hobby stores)
 - You can also use sugar or syrup instead of glycerol
 - Mix well without creating too much foam. Feel free to experiment with different quantities. If you mix with more water, you may get more and smaller bubbles.

Parts



Servo motor



Charger



Servo horn



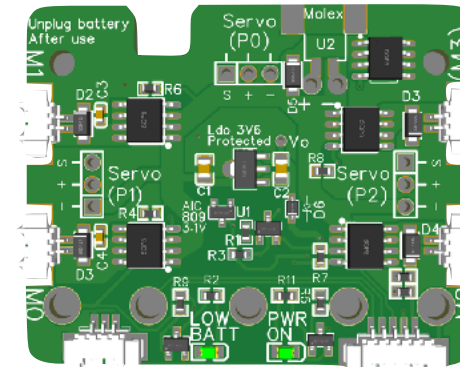
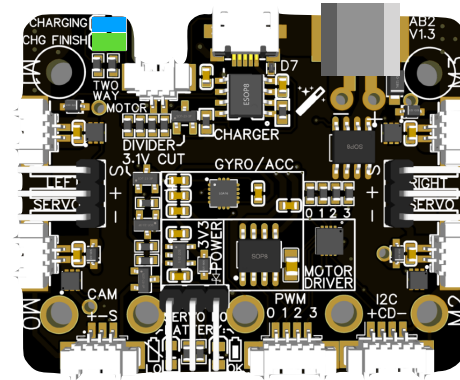
Motor



Propeller (CW)



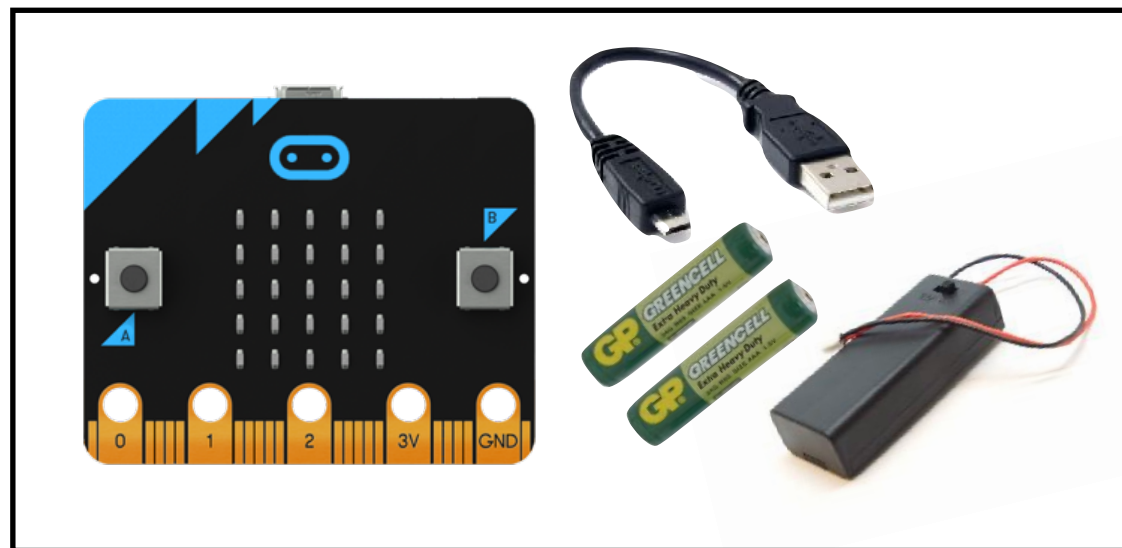
LED



Control board,
Green or black



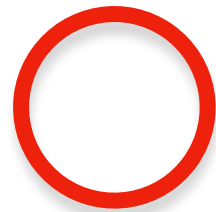
Rechargeable
battery



Micro:bit start kit



Servo cable



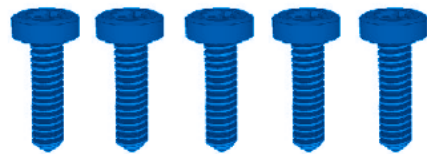
1 large
Rubber ring



2 small rubber
rings



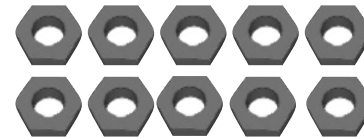
Rubber band



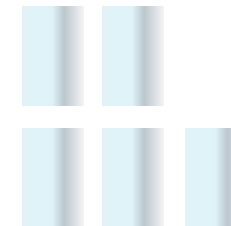
5x m3x12
nylon screws
Blue



2x m3x12
screw, white



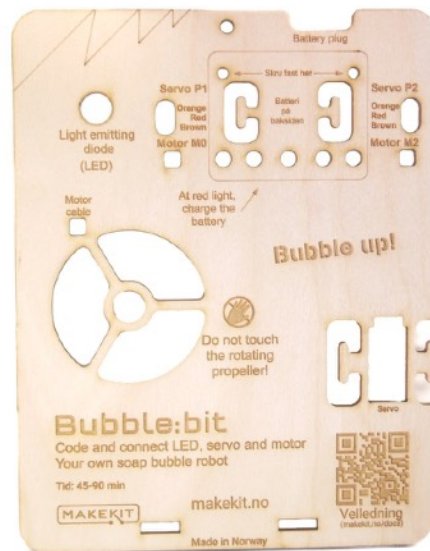
10x nylon nuts



5x spacers,
aluminium



Spacer for servo



Main plate
(Birch ply)



Arm with bubble
blower
(Birch ply)



Support pin
(Birch ply)



Cup holder with wedge

Countersunk screws

Tools: Medium philips screwdriver, wrench

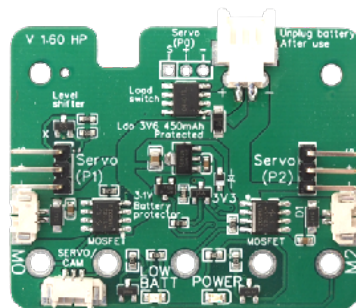
Parts:



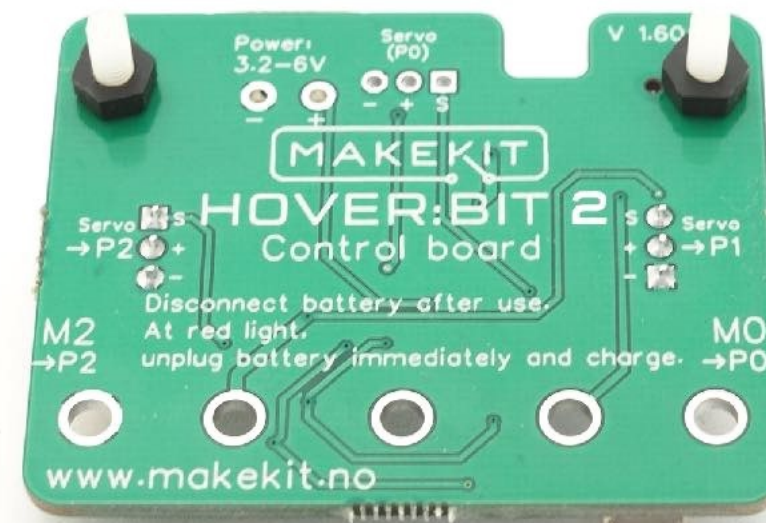
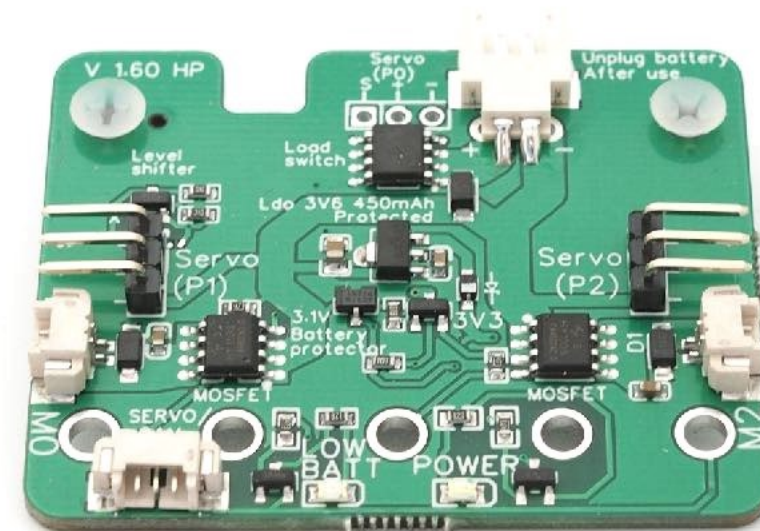
2x
Nylon screws
(Countersunk)



2x
Nylon nuts m3



Control board

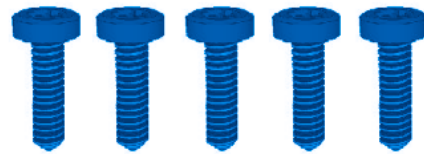


Insert the screws from top.
Attach the nuts on the backside of the board
(where the "MakeKit" logo is).

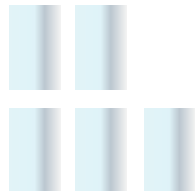
Spacers

Tools:

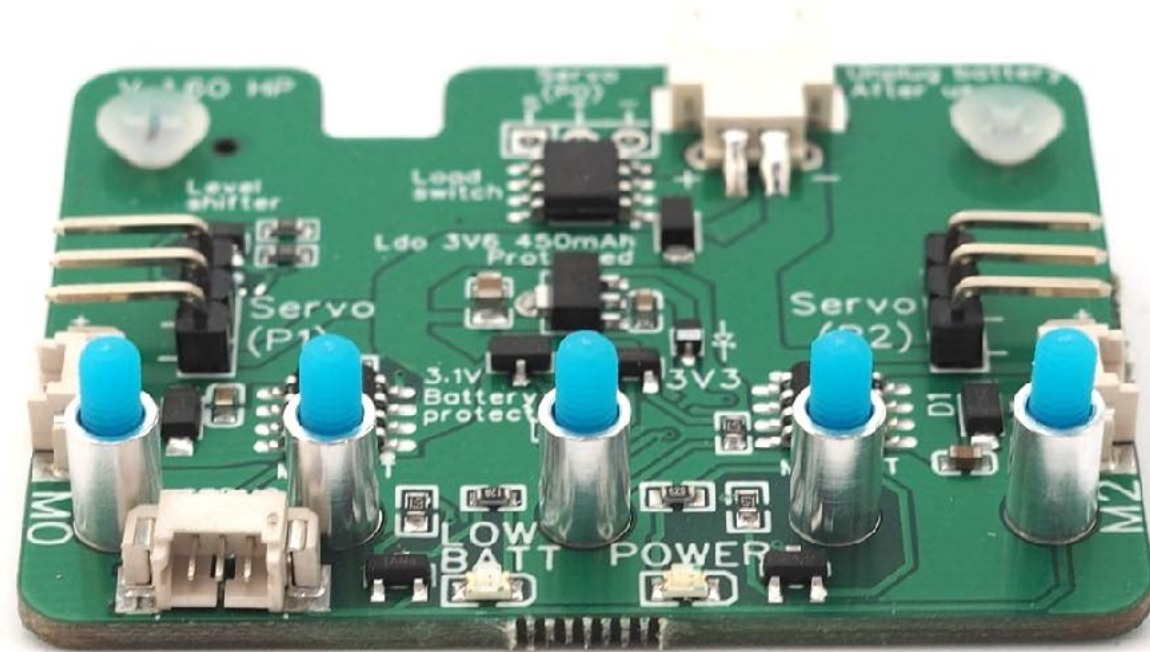
Parts:



5x m3x12
nylonskruer, blå



5x
Electrical conducting aluminium
spacers

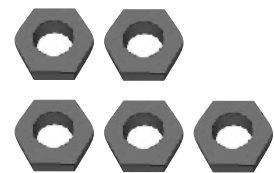


Insert five screws, pointing upwards.
Thread an aluminum ring onto each screw

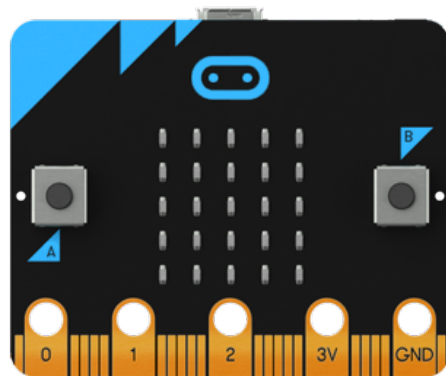
Micro:bit

Tools: Medium philips screwdriver, wrench

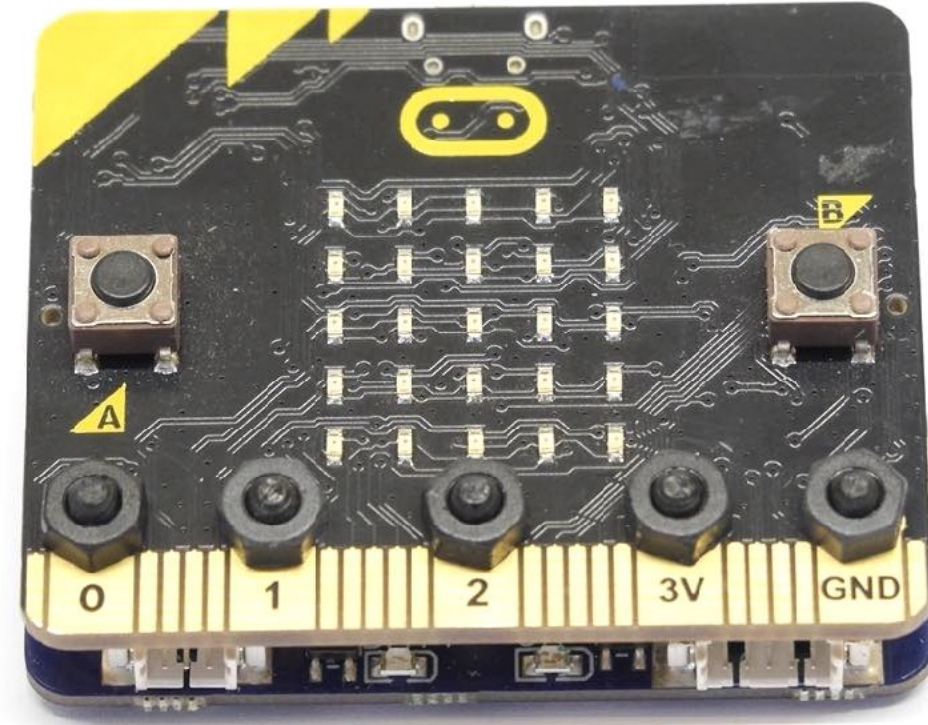
Parts:



5x nuts

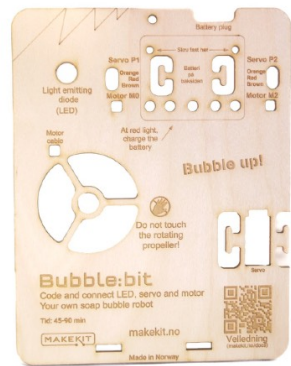


micro:bit



Place the micro:bit over and screw on the five nuts on top. Tighten the screws on the underside so that there is a tight and good contact. Do not use excessive force as this can damage the nuts.

Prepare plate and arm



Mounting plate



Arm



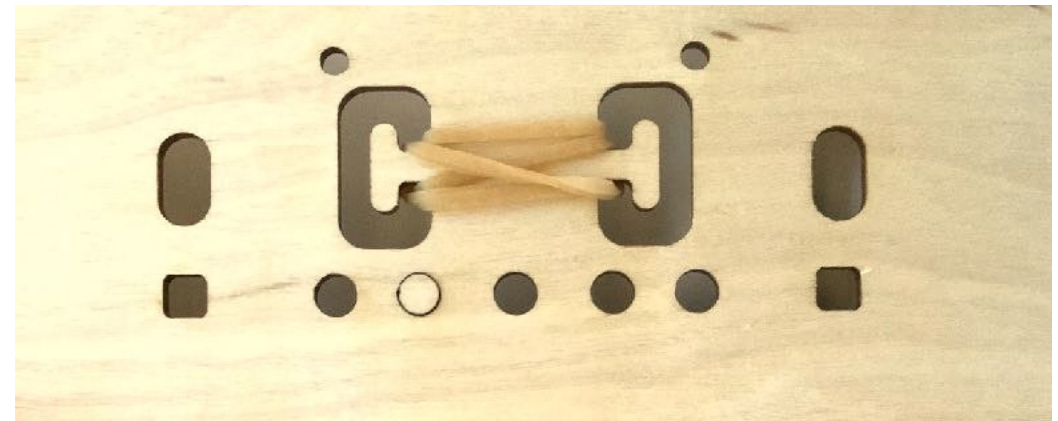
Servo-horn



Small Rubber ring



Rubber Band

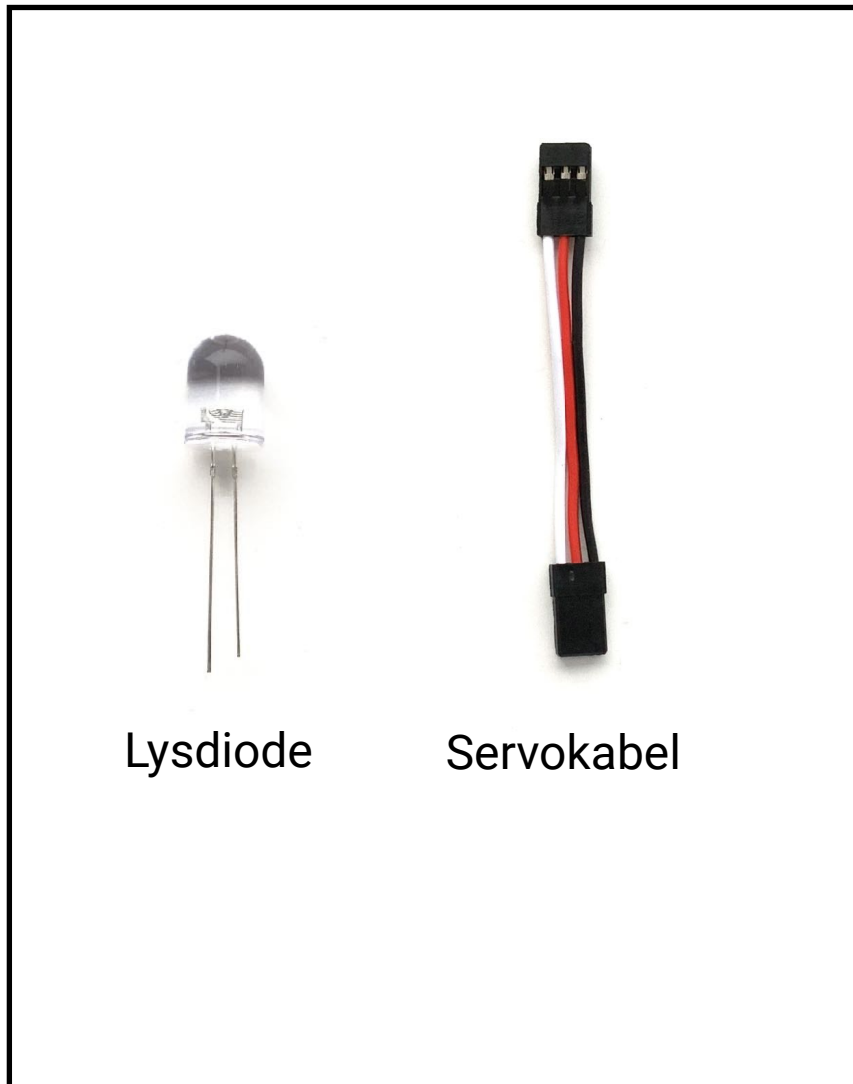


On the back of the plate, fasten the rubber band from one "ear", around the other and back again.



With a small rubber ring, mount the servo horn to the arm

Lysdioden

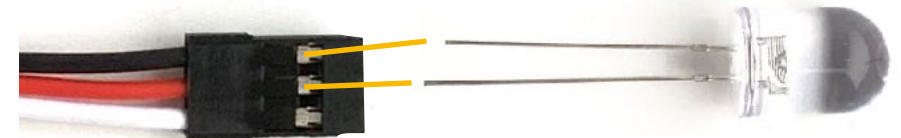


The LED has two legs, one long and one slightly shorter. The short leg should always go to ground, or black cable, while the long leg should go to plus, or red cable. Rule to remember: "It's positive to have long legs"

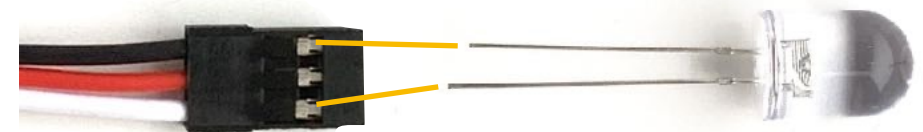


The servo cable has three colours, black, red and white. The red cable always outputs power, while the white one outputs power if you program it. In addition, the short leg must be connected to black (ground)

Always on

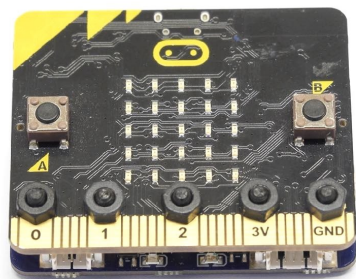


Programmeable

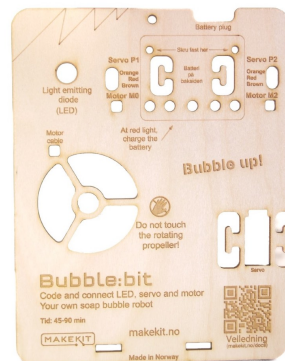


- If you want the LED to always light up when the battery is connected, connect it to black and red.
- If you want to program the light so that it flashes, you connect it to black and white.

Montere styreenheten



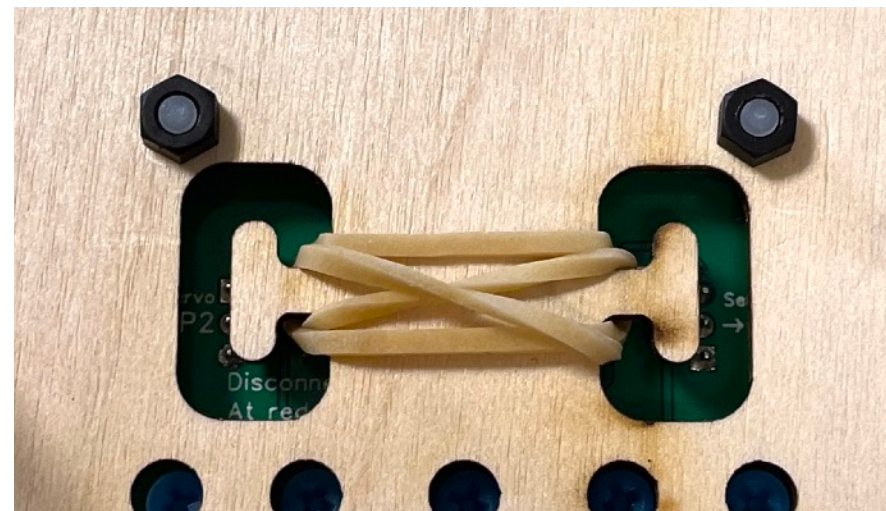
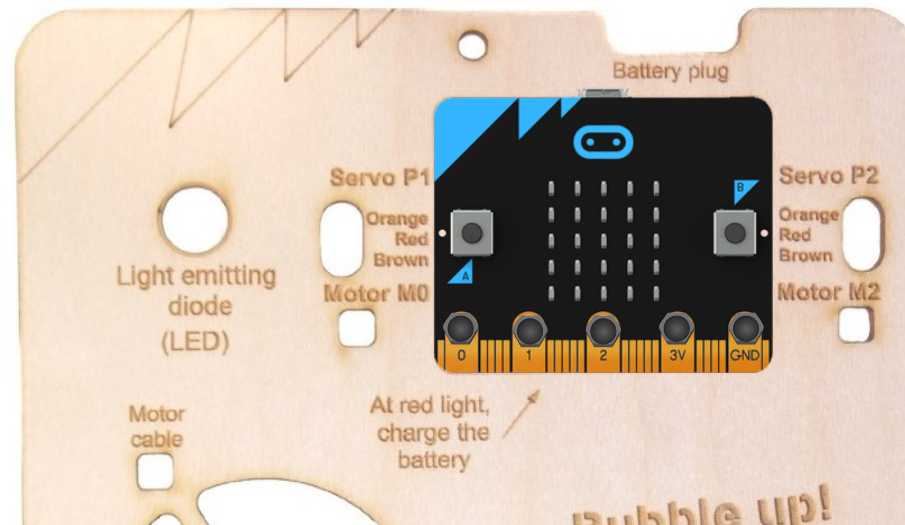
Control unit



Mounting plate



2x nuts



Place the control unit in place and secure it with two nuts on the back.

Start screwing with your fingers, tighten slightly with a socket wrench or nut tool

Feste støtten



Support

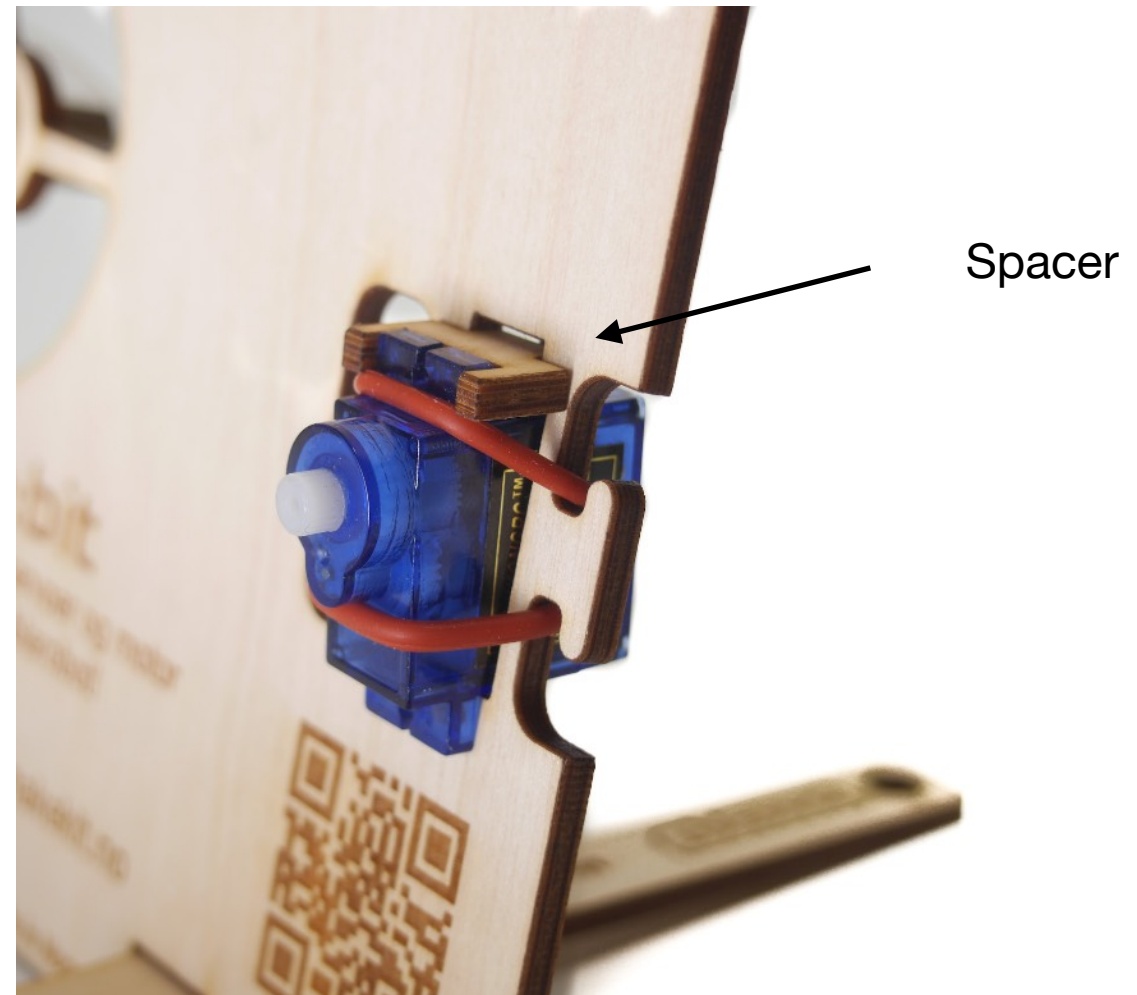
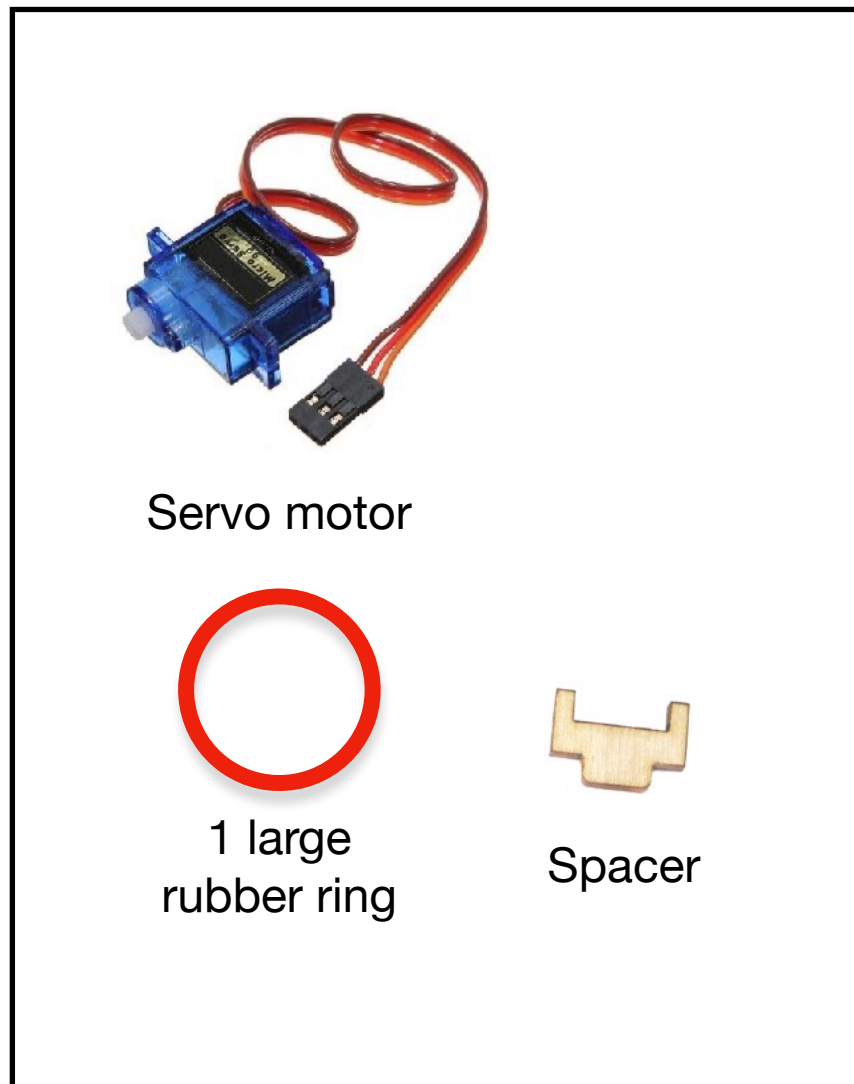


Insert the support from the back, just like a wedge



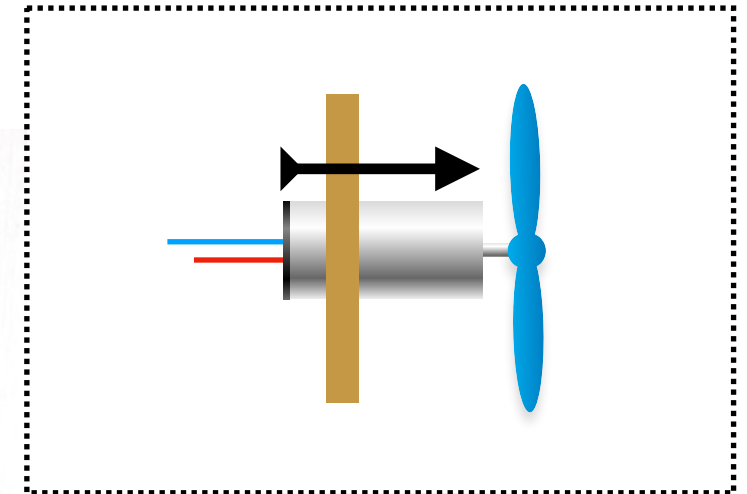
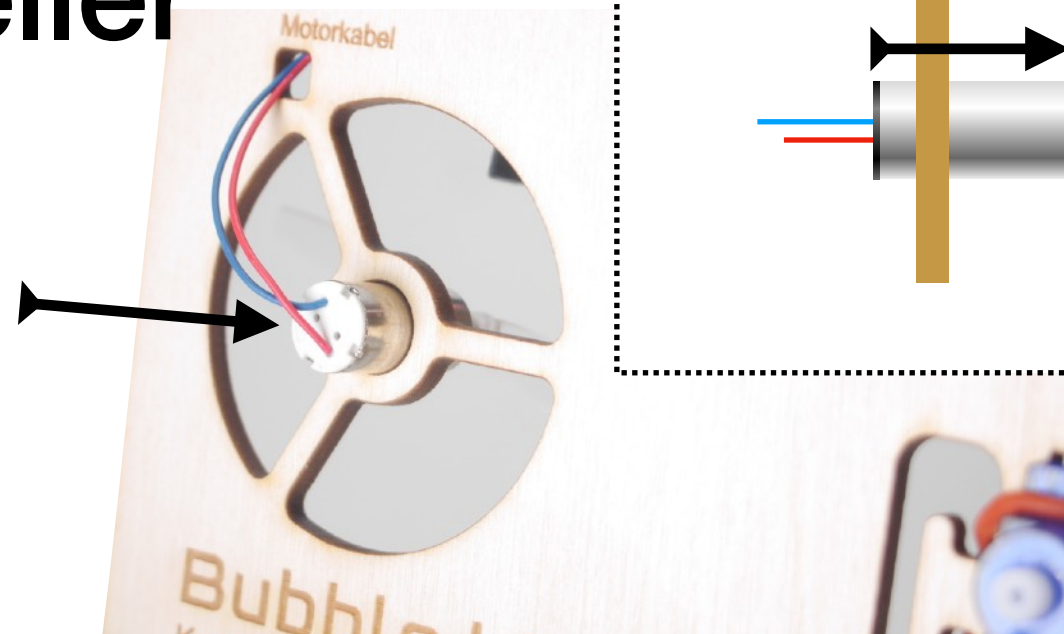
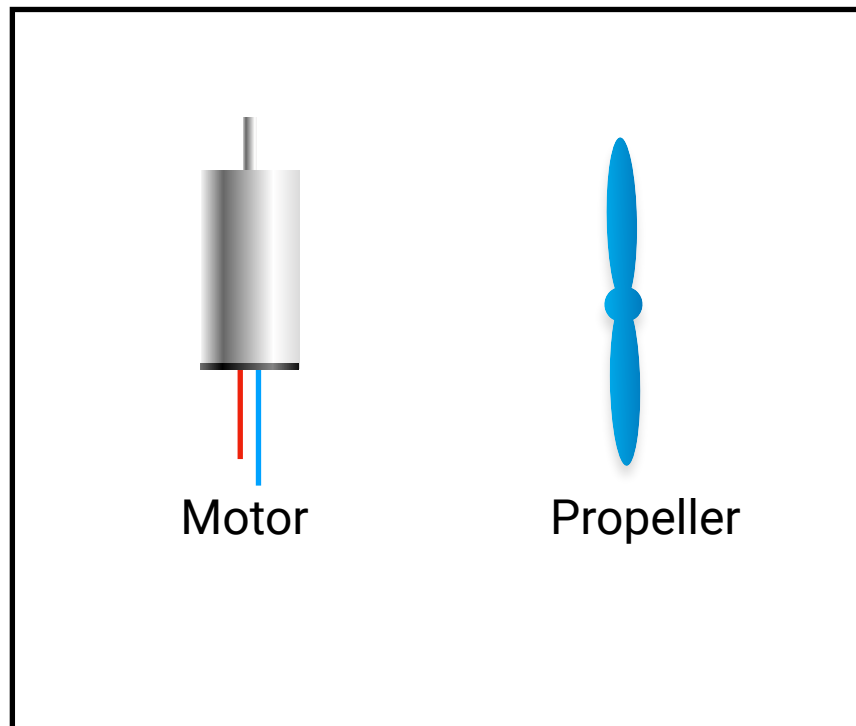
It will be visible on the front side as well

Feste servomotoren



On the front of the plate, first thread in the cable and push the servo motor into place so that the white wheel comes up high. Press into place the spacer between the top of the servo and the plate.

Motor and propeller

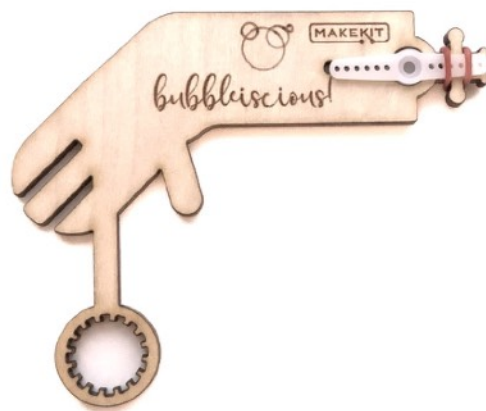


Press the motor into place and lay up the cable as shown in the picture. The motor should be a good distance in so as not to get in the way of the arm later.

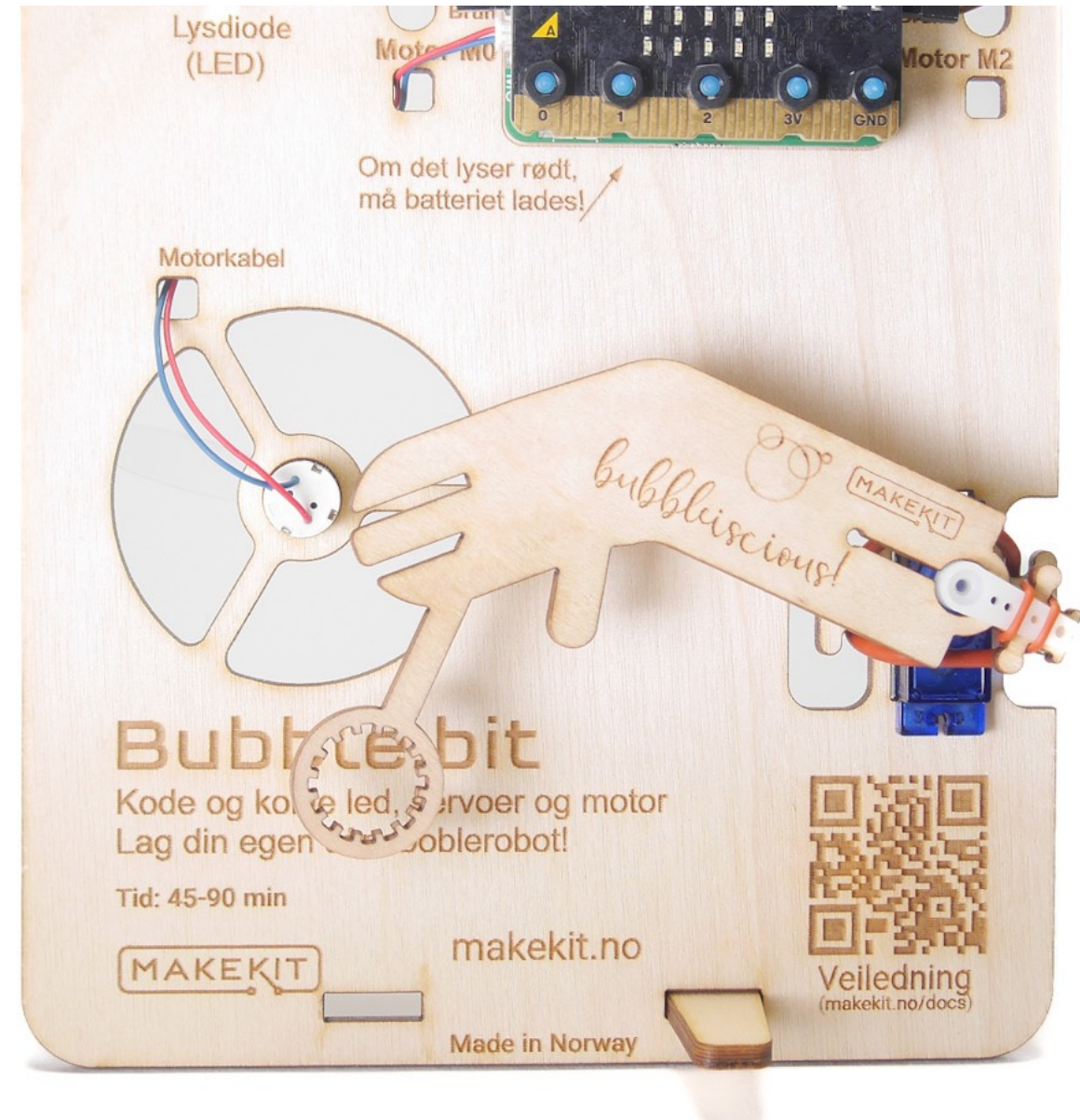


Press the propeller into place on the back. Hold the back of the motor to prevent the base from loosening. The propeller does not need to be pushed in too hard, but should be slightly stuck.

Feste armen



Arm med
servo-horn



You should now have attached a servo horn to the arm, which can be pressed into place on the servo so that the arm attaches.

ATTENTION! Do not force the servo to rotate. This can damage the gears inside the servo.

If you need to adjust the angle, lift off the arm, rotate and press again.

Download the code

You can find finished code at www.makekit.no/docs
Go to bubble bit. Select the code that matches the color of the wonderkit circuit board (black or green color)

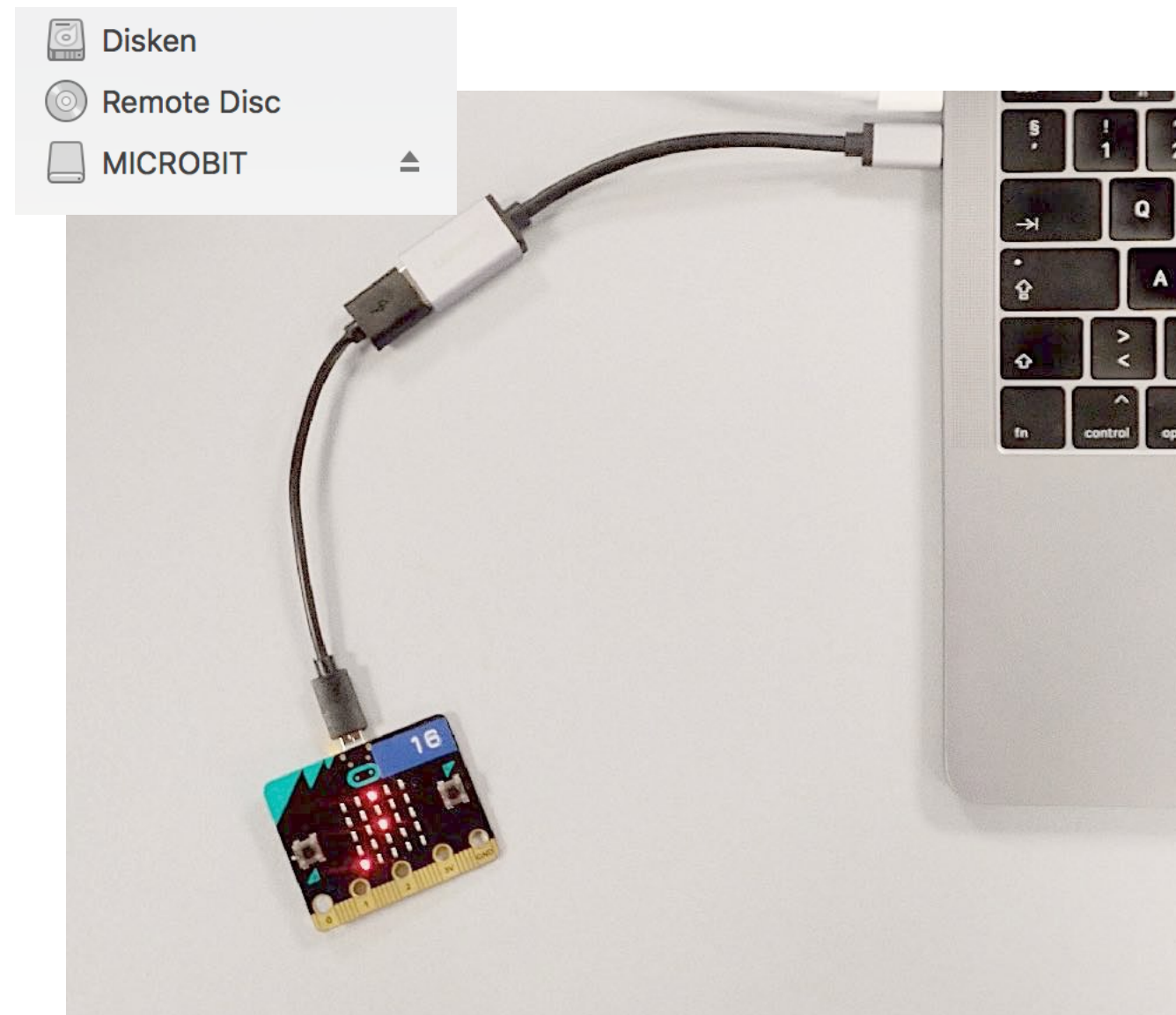
It is easily downloaded by connecting the micro:bit to a PC with the micro-USB cable. A drive called micro:bit should appear. Copy over the .hex file onto this.

You can also edit the code by going to makecode.microbit.org and open the code there (drag and drop from the file explorer or read more at microbit.org)

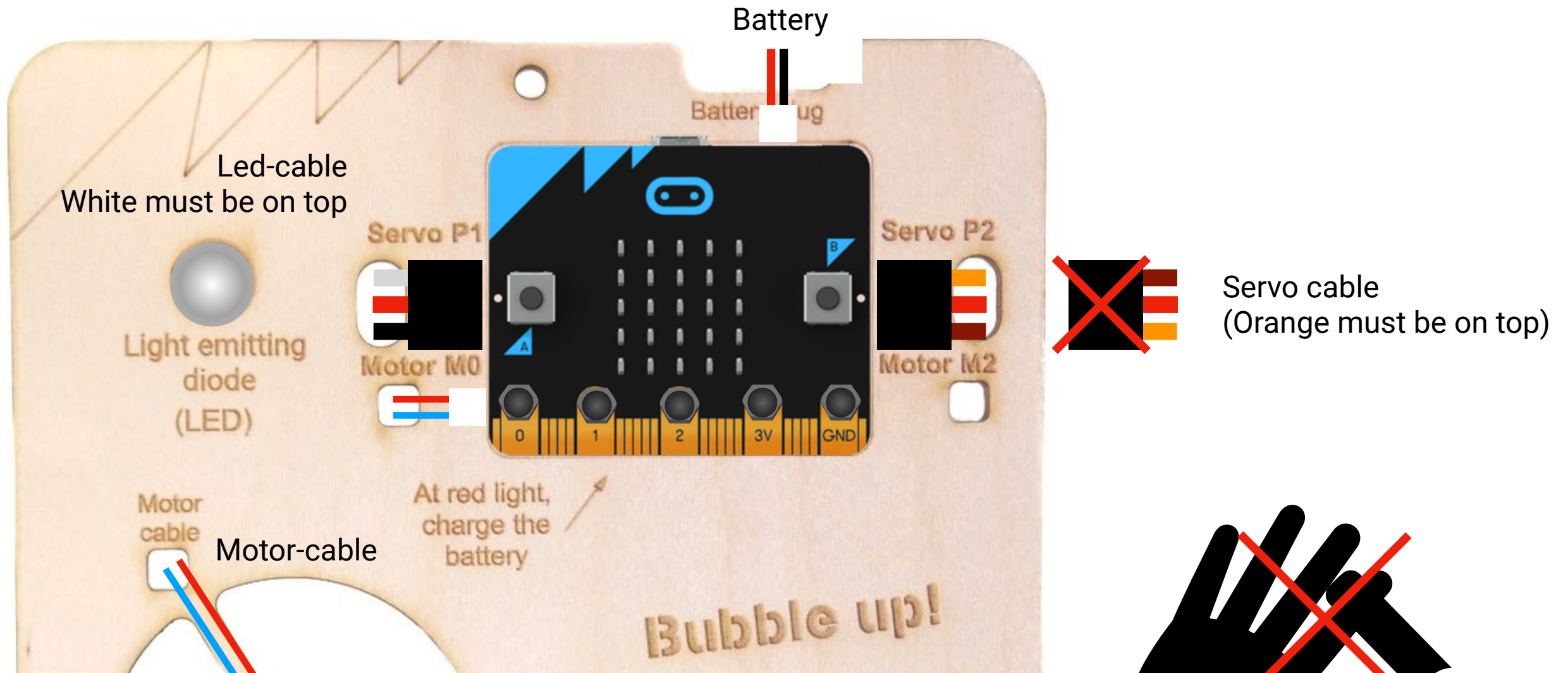
Chrome is the best browser for makecode.

Read more about getting started with micro:bit:

<https://microbit.org/get-started/first-steps/set-up/>



Connections



Connect the LED cable on the left side. White color must be up
Connect the servo cable on the right side. Orange must be up.
Connect the motor cable at the bottom left where it is marked "M0"

Attach the battery to the back and connect the power

ATTENTION! The propeller can spin very fast.

Keep your fingers away from the propeller when the battery is connected.

Bubble up!

Fill a small glass or cut-down plastic cup with soapy water or soapy bubble water from a toy/hobby store.

Connect the battery

Press button B to test. Stop with A again.

If the arm misses the airstream or cup, stop the machine, lift off the arm from the servo, adjust it, and press it back into place.

Do not force the arm to move and do not block the movement.

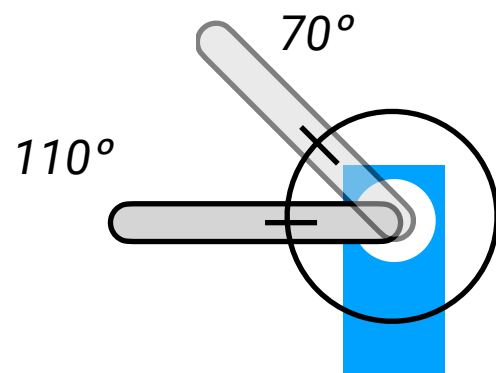
Disconnect the battery when finished.



About the code

The variables **topAngle** and **bottomAngle** indicate where the arm should start and stop. The bottom angle must be such that the arm is able to dip the "soap ring" completely into the water. The top angle must be "low" enough for the hand to lift the ring in front of the air from the propeller. **fanTime** is how many seconds the arm is in front of the propeller before the soap runs out. **fanPower** is the speed of the motor and can be up to 1023. If the power is too low, the bubbles will not be inflated. Too much force, and the bubbles burst. The running variable determines whether the machine should work or go into pause mode, and can be changed with buttons A and B.

To control the servo, we use the block **servo write** and select P2 as the servo is connected to P2 (see mounting plate). To control the motor, we use **analog write** and select P0. To control the LED, we use **digital write** and select P1. **Analog write** can also be used here, as long as the number is between 0 (darkest) and 1023 (brightest)



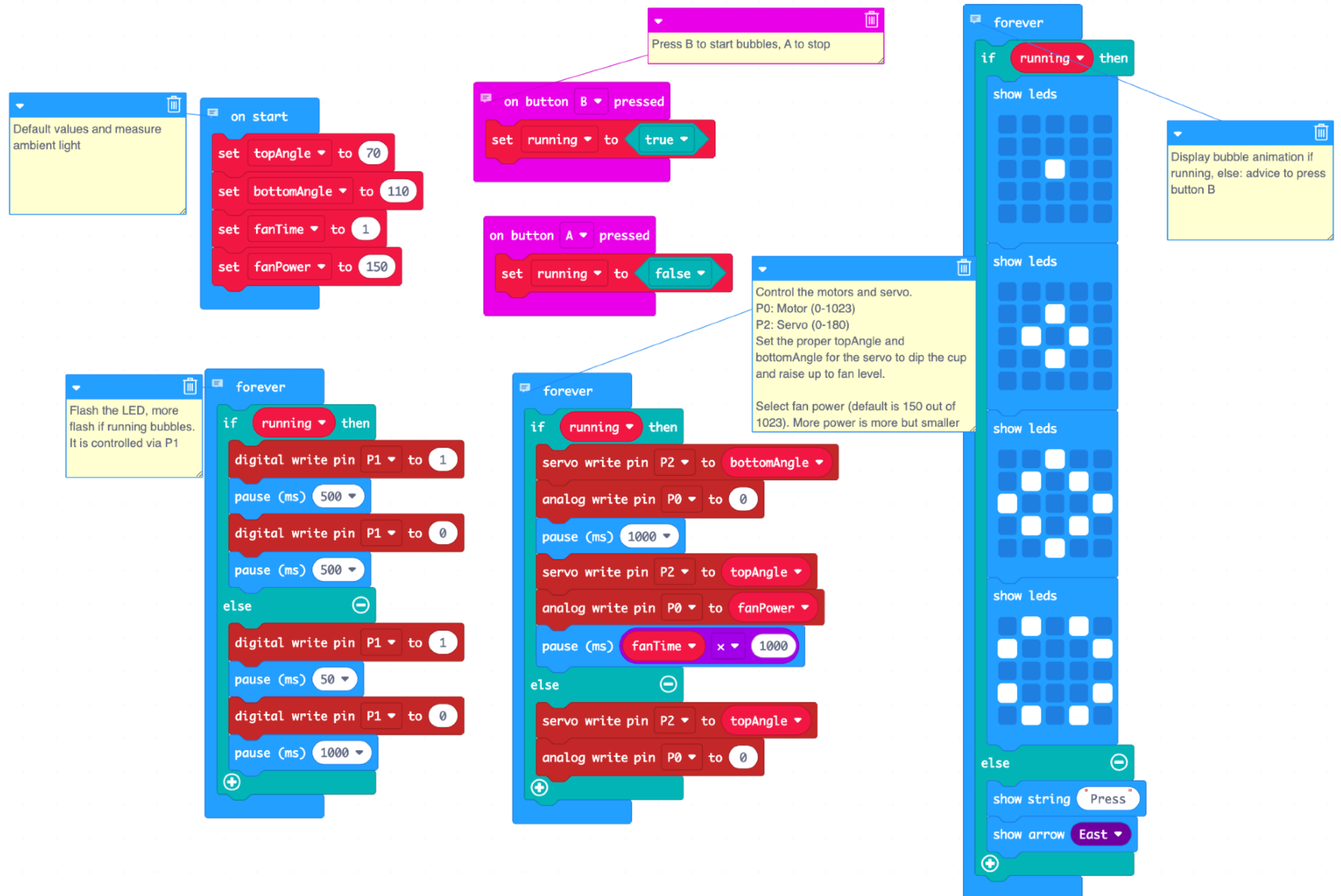
Different angles gives different rotation. Please note that decreasing the angle makes the servo rotate clockwise. Thats why the top angle is lower than the bottom angle.



Things to try:

Can you get the machine to start with a loud sound (micro:bit V2) or perhaps with extra bright light from a flashlight?

Basic operation (micro:bit V1 and V2)



Sound and light activated code (micro:bit V2)

Default values and measure ambient light

```
on start
  set topAngle to 70
  set bottomAngle to 110
  set fanTime to 1
  set fanPower to 150
  pause (ms) 100
  set ambientLight to light level
  pause (ms) 100
  set ambientLight to light level
```

Press B to start bubbles, A to stop

```
on button A pressed
  set running to false

on button B pressed
  set running to true
```

If loud sound, run bubbles for 1 sec

```
on loud sound
  set running to true
  pause (ms) 1000
  set running to false
```

Enable/disable light detection

```
on button A+B pressed
  if lightDetection then
    basic.showString("LD OFF",50)
    set lightDetection to false
  else
    basic.showString("LD ON",50)
    set lightDetection to true
  set ambientLight to light level
  show number ambientLight
```

```
forever
  if lightDetection then
    if light level < ambientLight - 10 then
      set running to true
      pause (ms) 3000
      set running to false
```

See if a shadow appears above the micro:bit, the shadow must be below the ambient light in the room.

```
forever
  if running then
    digital write pin P1 to 1
    pause (ms) 500
    digital write pin P1 to 0
    pause (ms) 500
  else
    digital write pin P1 to 1
    pause (ms) 50
    digital write pin P1 to 0
    pause (ms) 1000
```

Flash the LED, more flash if running bubbles

```
forever
  if running then
    show leds
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
  else
    show leds
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
    [ 0 0 0 0 0 ]
  else
    show string "Press"
    show arrow East
```

Display bubbles if running, else: advice to press button B

```
forever
  if running then
    servo write pin P2 to bottomAngle
    analog write pin P0 to 0
    pause (ms) 1000
    servo write pin P2 to topAngle
    analog write pin P0 to fanPower
    pause (ms) fanTime x 1000
  else
    servo write pin P2 to topAngle
    analog write pin P0 to 0
```

Control the motors and servo. Set the proper topAngle and bottomAngle for the servo to dip the cup and raise up to fan level.

Select fan power (default is 150 out of 1023). More power is more but smaller bubbles.

Make a crazy bubble carousel!

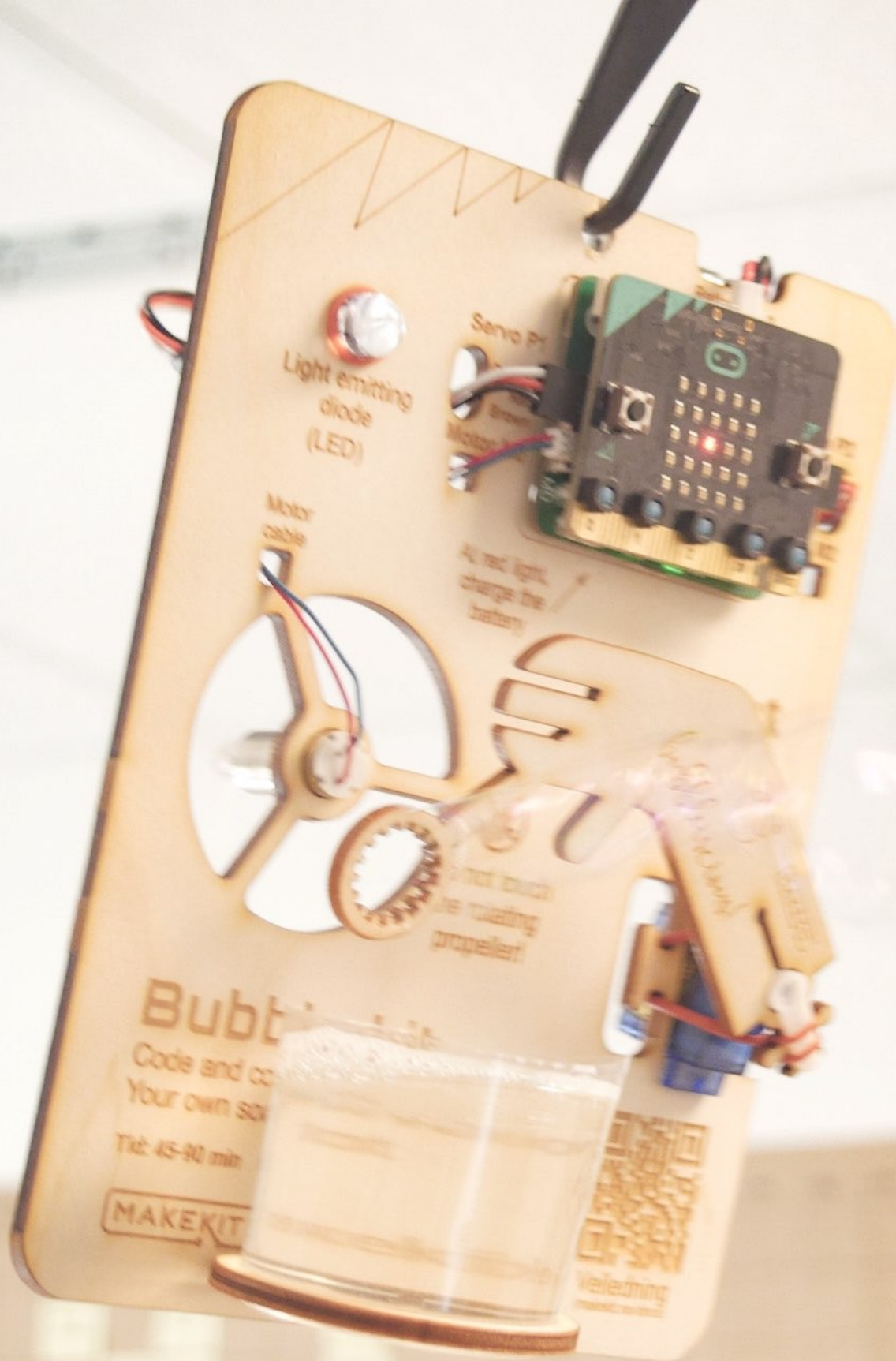
1. Use the cup holder and wedge and mount the cup.
2. Hang the machine by a thread.
3. First put little or no liquid in the cup.
4. Start the machine.

Now the machine will start spinning for a while. Gradually the speed slows down. Then you can fill in soapy water.

If everything works, the machine should now spin around slowly while shooting bubbles in all directions.

Note! Watch your fingers (propeller) and take into account that there may be some spillage under the machine.

If you don't want a rotating machine, hang it on a thick wire, steel wire or use two wires.

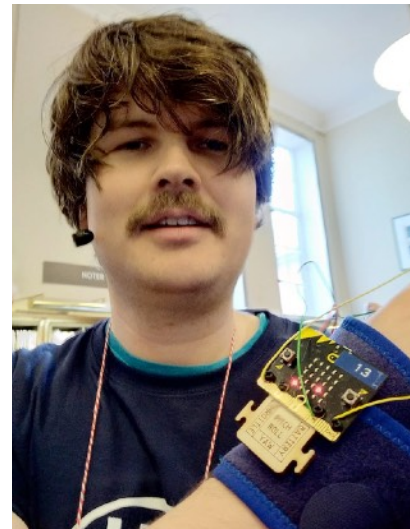


Contact us:

Get help at our Facebook group:
www.facebook.com/groups/goairbit/

Do you have suggestions for improvements to the product or the guide?
Then I would like to hear from you!

You can contact me directly at
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