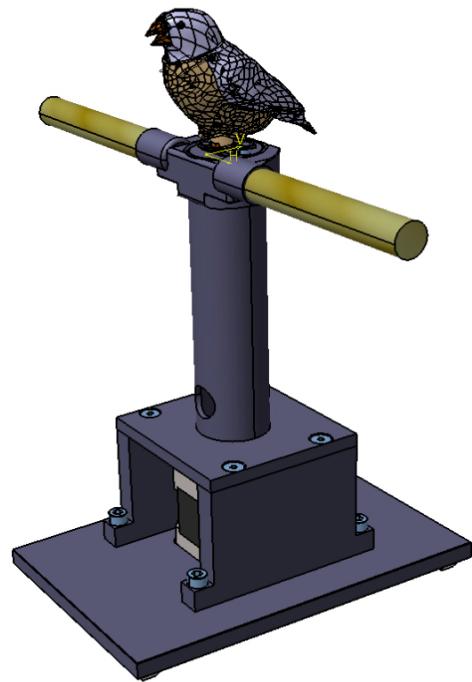


Vrije Universiteit Amsterdam

RoboFinch

assembling manual



Rogier Elsinga and Ralph Simon
20-5-2022

Robofinch assemblage manual

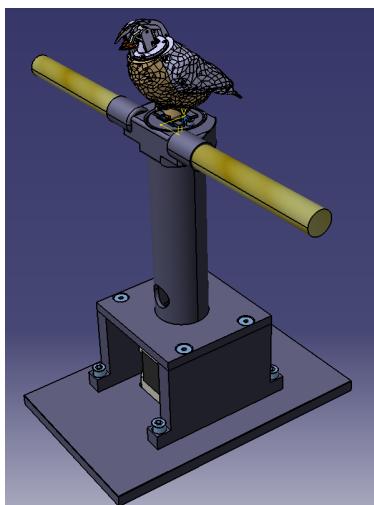
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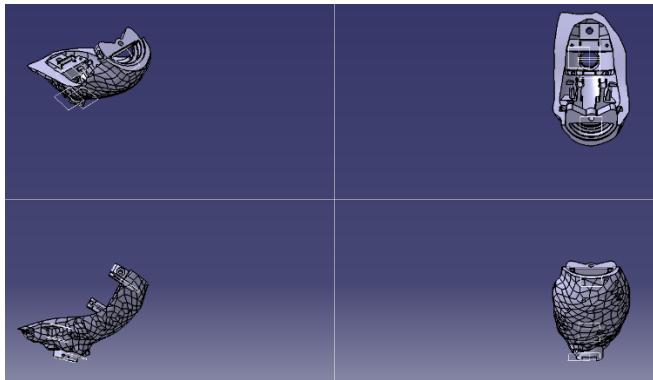
This document describes the assembly of the robofinch as it was made at the FMIB department in June 2019. The starting point is the delivery of 8 robot finches. The main file used for Catia V5R20 is:

Robofinch_assembly_w_bord_rotation17042019



2 The bird's lower body

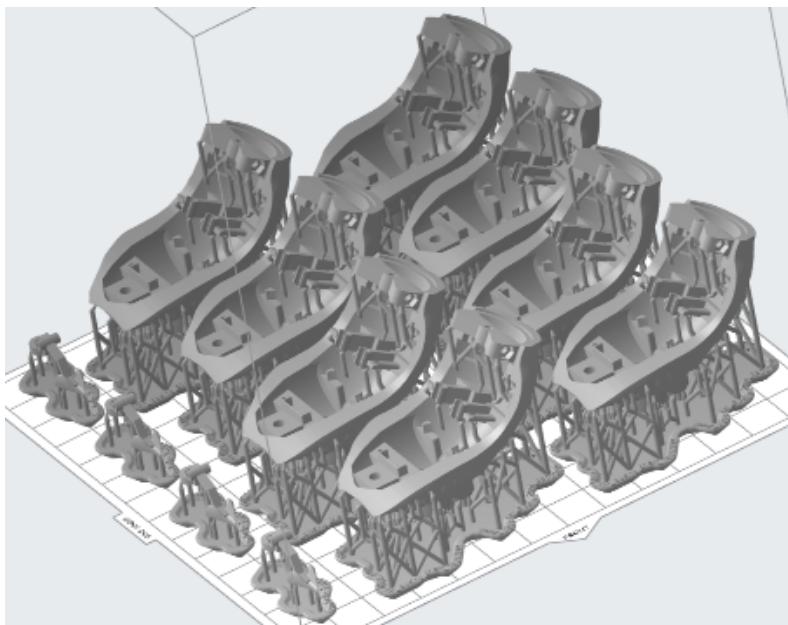
Part name: lower_body_for_closing_chest09012019



Printer: Formlabs Form2

Material: Grey Pro

Filename: batch1_lowerbody_8X

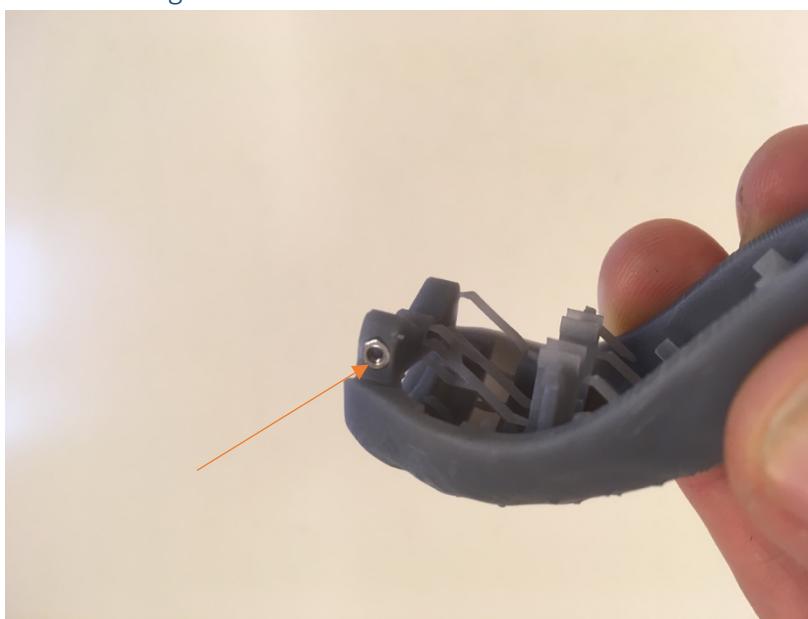


2.1.1 Finishing the printed model:



After rinsing and curing with the Formlabs wash and Cure, remove all support material and finish the product neatly.

2.1.2 Gluing of a M1.6mm nut:



Glue nut 1,6mm on both sides with a drop of Pattex superglue.

2.1.3 Surface finish:



Make sure that this surface is properly leveled and free of irregularities. This is necessary for proper operation of the main turning mechanism.

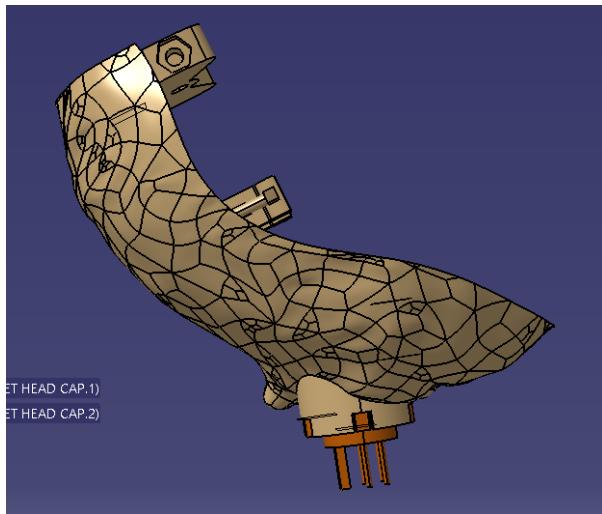
2.1.4 Disassembling the 6 pole Din Plug

RS PRO MDN Series, 6 Pole Miniature Din Plug Plug,

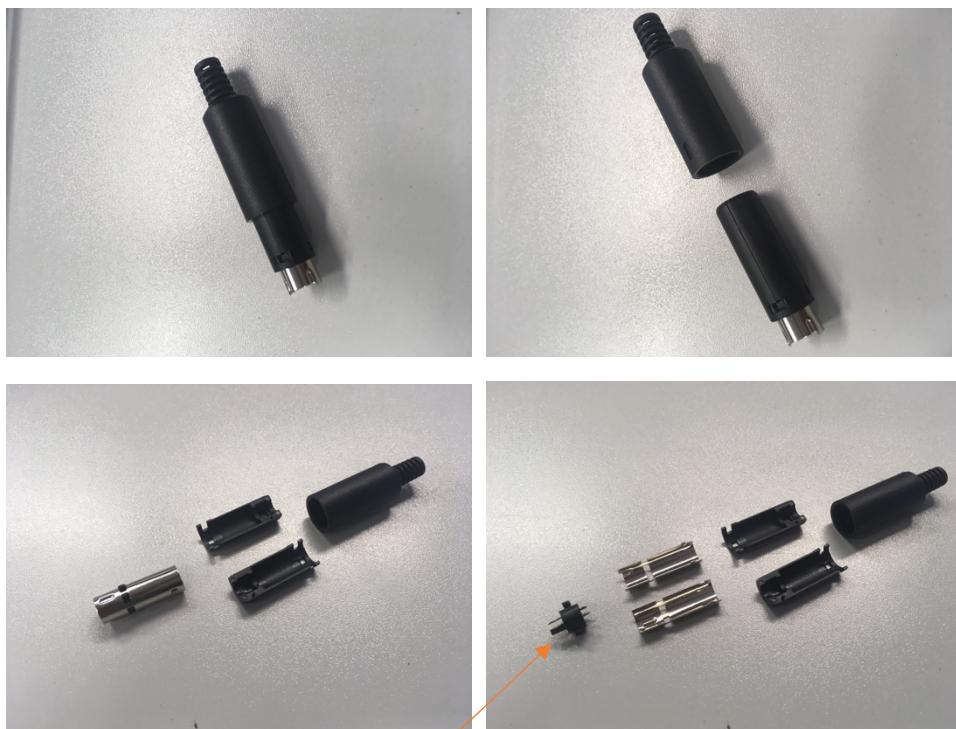
RS-stocknr.: **463-388** | Fabrikant: **RS PRO**



This plug has to be disassembled because only the plug itself is needed.



Order of disassembly:

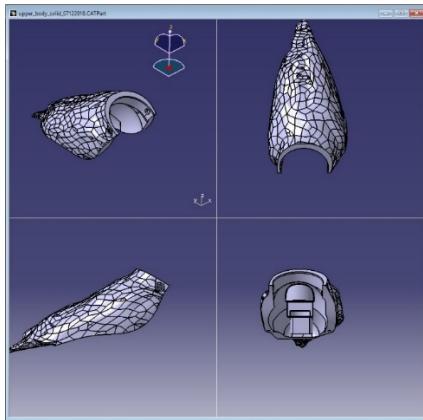


Required part

Warning: Do not glue parts yet!

3 The robot's upper body

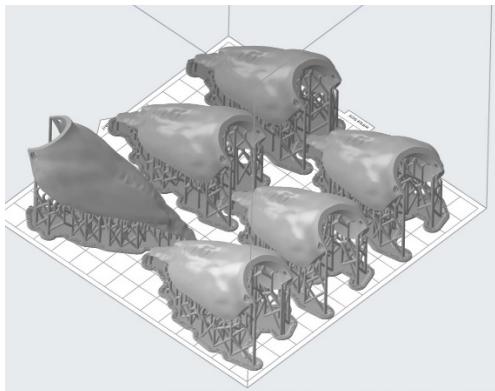
Part name: upper_body_solid_07122018



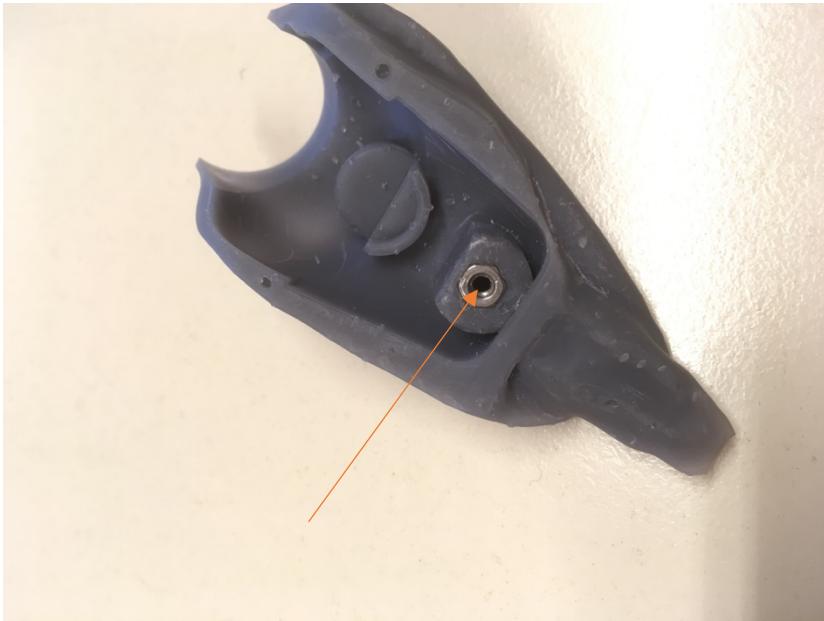
Printer: Formlabs Form2

Material: Grey Pro

File name: batch2_upperbody4X_left_righthand4X.form

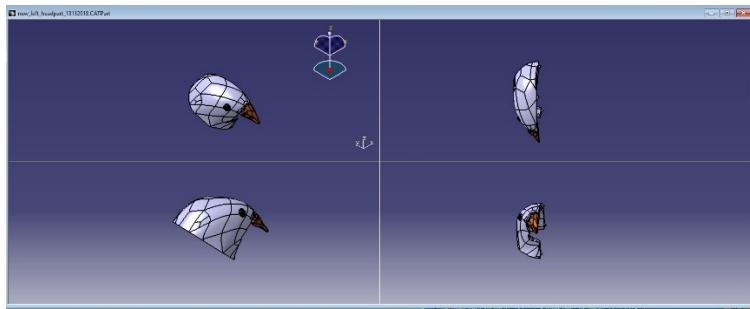


3.1.1 Glue nut M2.5mm:



4 Left part of the head

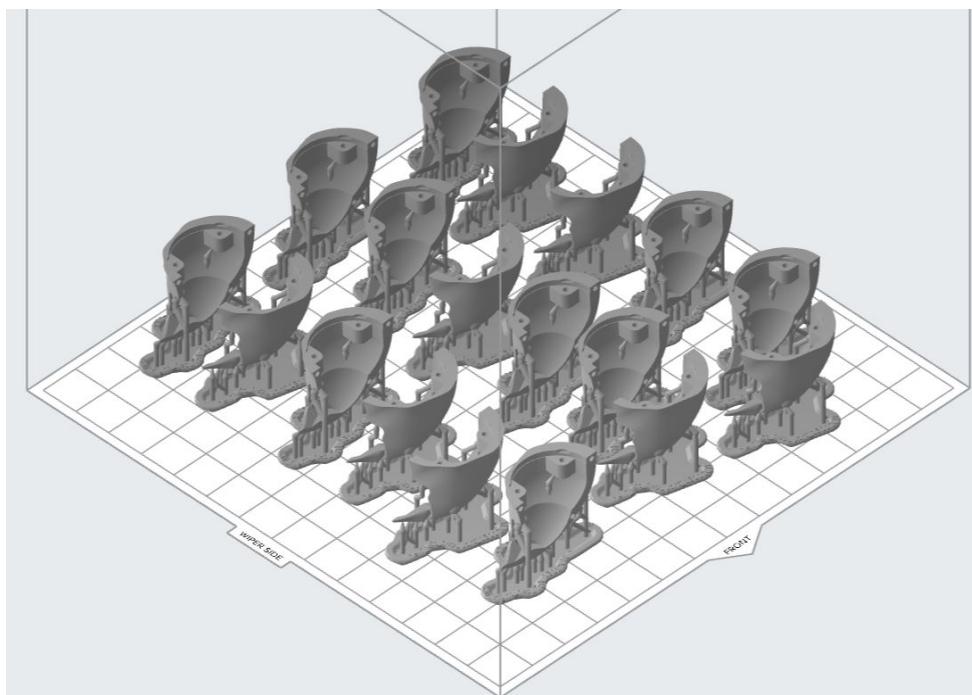
Part name: new_left_headpart_13112018



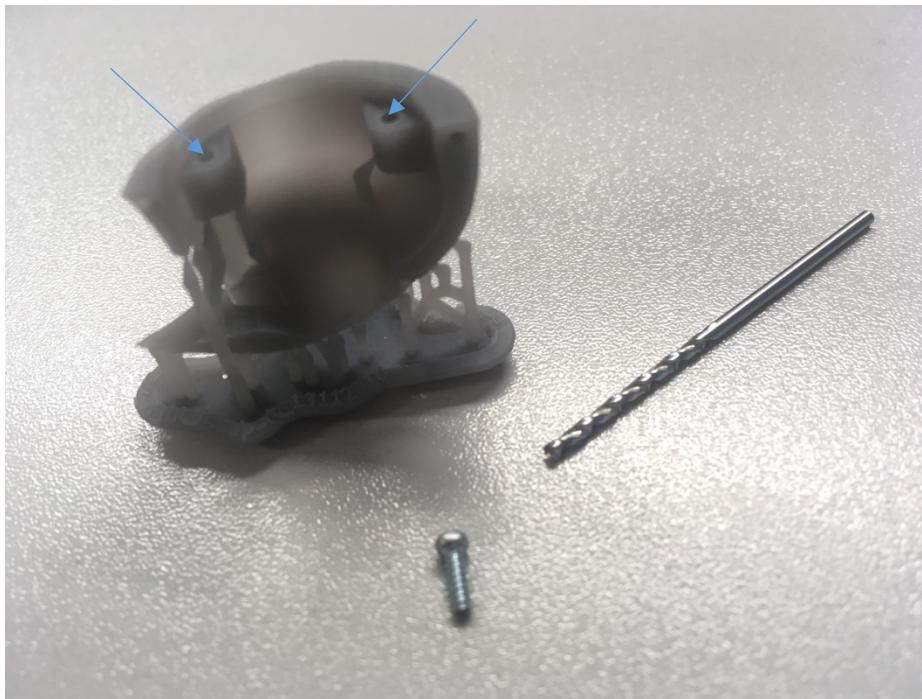
Printer: Formlabs Form2

Material: Grey Pro

File name: batch9_leftright_head8X.form



4.1.1 Drilling mounting holes



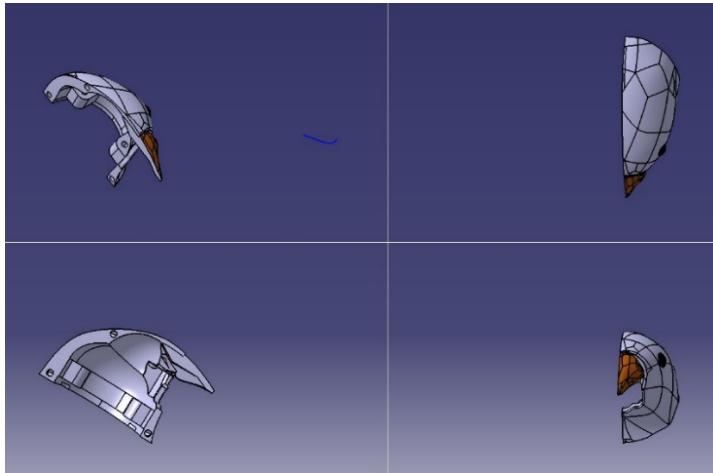
Leave support material on the part before drilling. Drill holes with drill 1.55mm for the plastic screws from the Digibird.



Cut support material and finish part.

5 Right part of the head

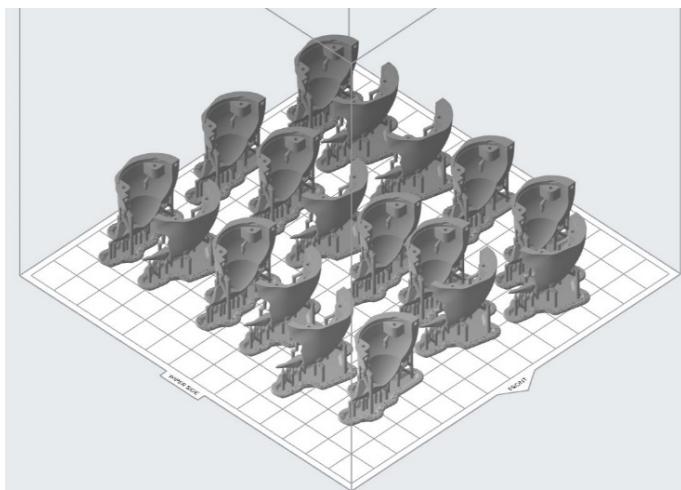
Part name: new_right_headpart_13112018



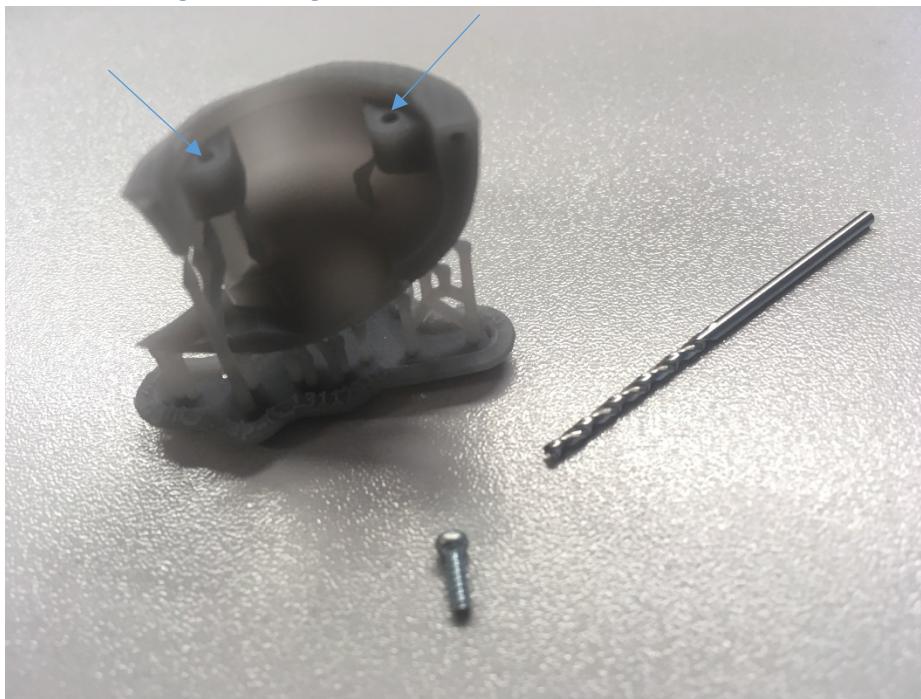
Printer: Formlabs Form2

Materiaal: Grey Pro

File name: batch9_leftright_head8X.form



5.1.1 Drilling mounting holes



Leave support material on the part before drilling. Drill holes with drill 1.55mm for the plastic screws from the Digibird.



Cut support material and finish part.

6 Lower beak

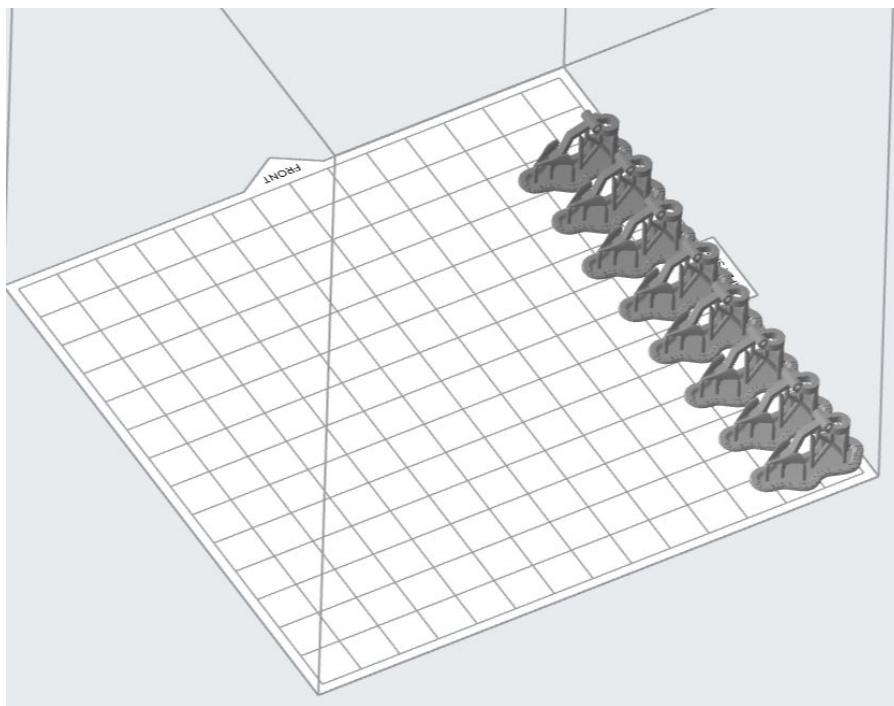
Part name: lowerbale_13112018_ALLCATPart



Printer: Formlabs Form2

Material: Grey Pro

File name: batch6_left_righththead8x_bale8x.form



6.1.1 Finishing the lower beak



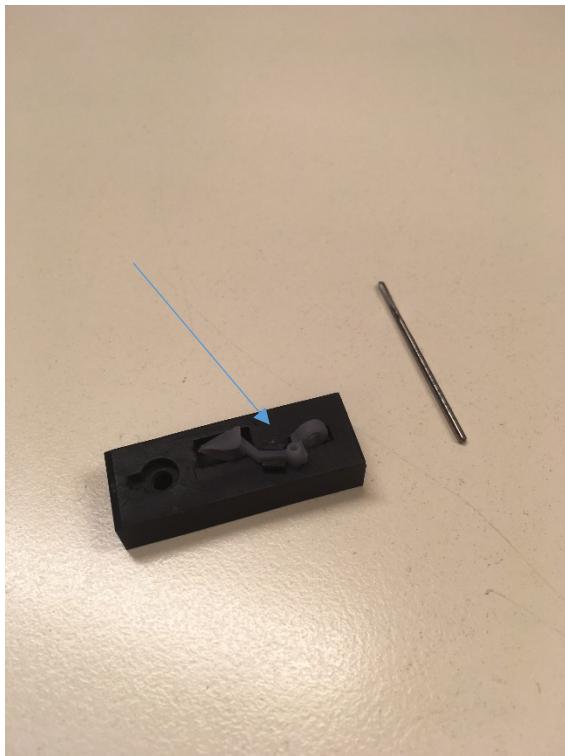
Cut support material and finish part.

6.1.2 Reaming bore of the lower beaks hinge

An accessory is needed for the reaming of the lower beak's hinge



Place the part in the accessory as shown in the picture below and carefully ream the 1.5mm hole with reamer 1.52H7.

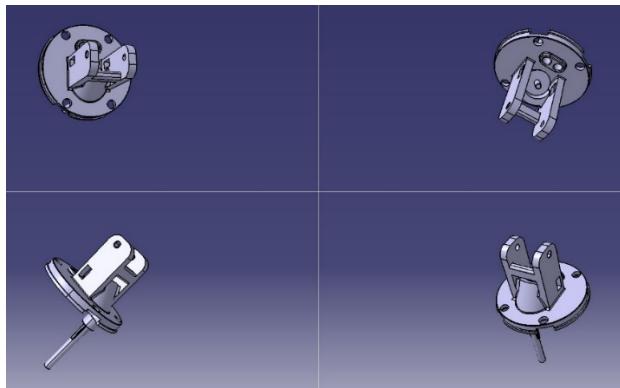


A hole of around 3mm is used for clamping the magnet. Place the part in the attachment as shown in the figure below, then carefully ream with a 2.99H7mm reamer. Carefully press the magnet into the part with the marking facing up.



7 Rotation plate

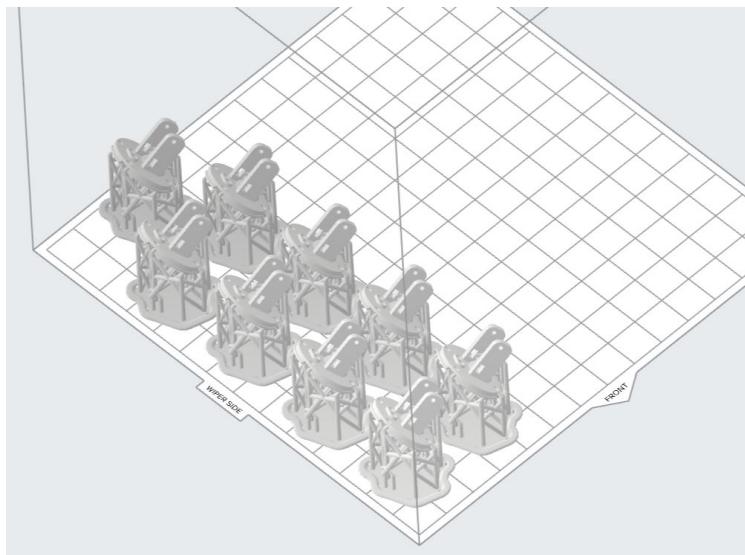
Part name: rotatieplaat_21032019



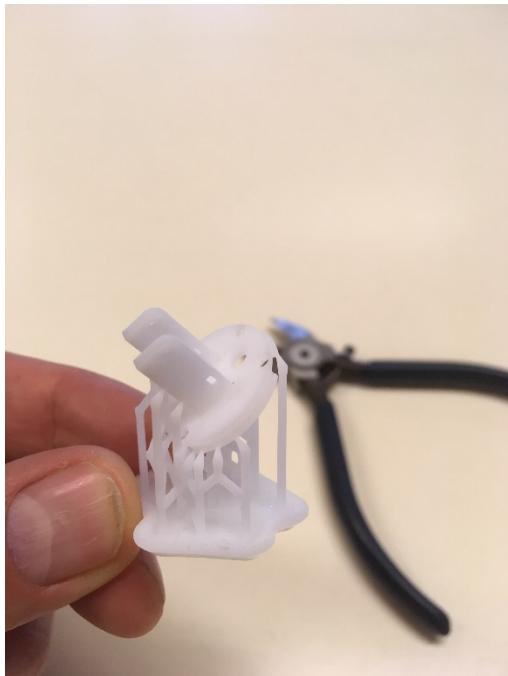
Printer: Formlabs Form2

Material: Rigid

File name: batch8_hoofdrotatieplaat8X.form

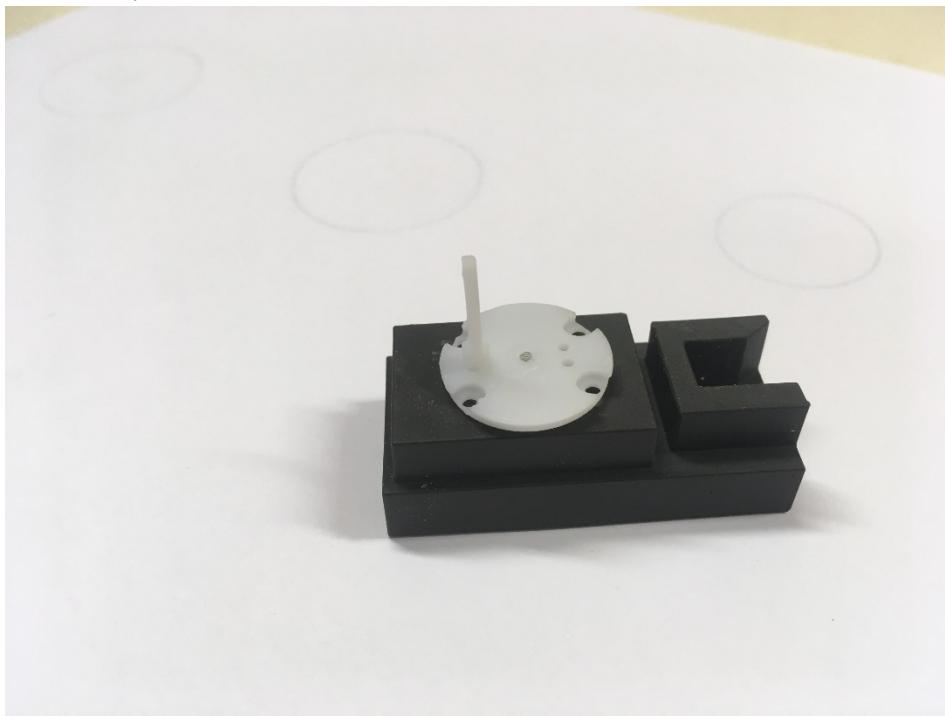


7.1.1 Finishing the rotation plate

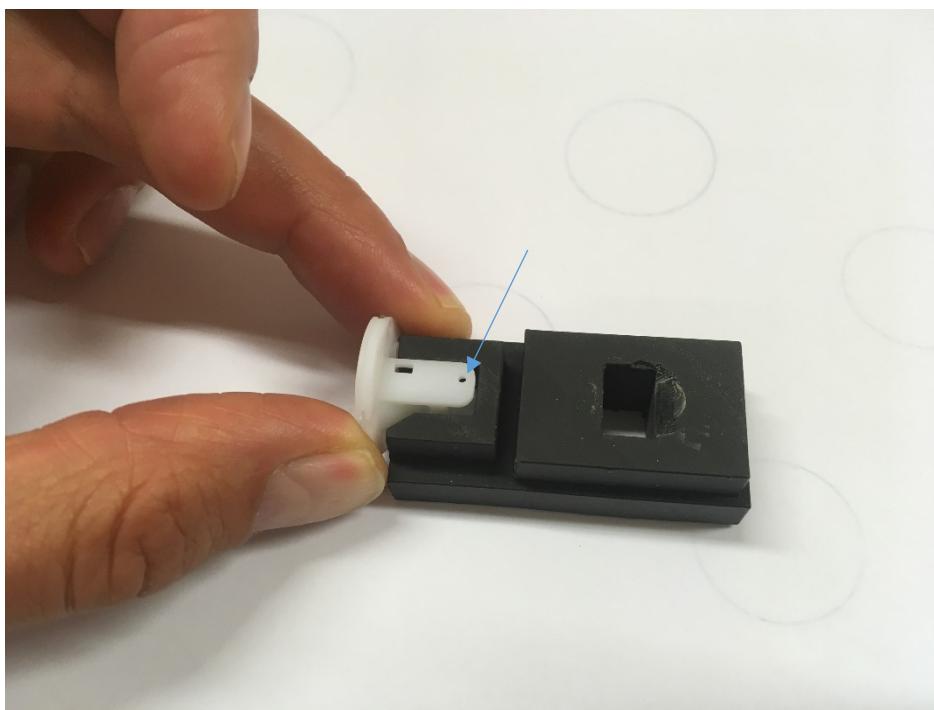


Cutting the support material

7.1.2 Tap hole M1,6mm



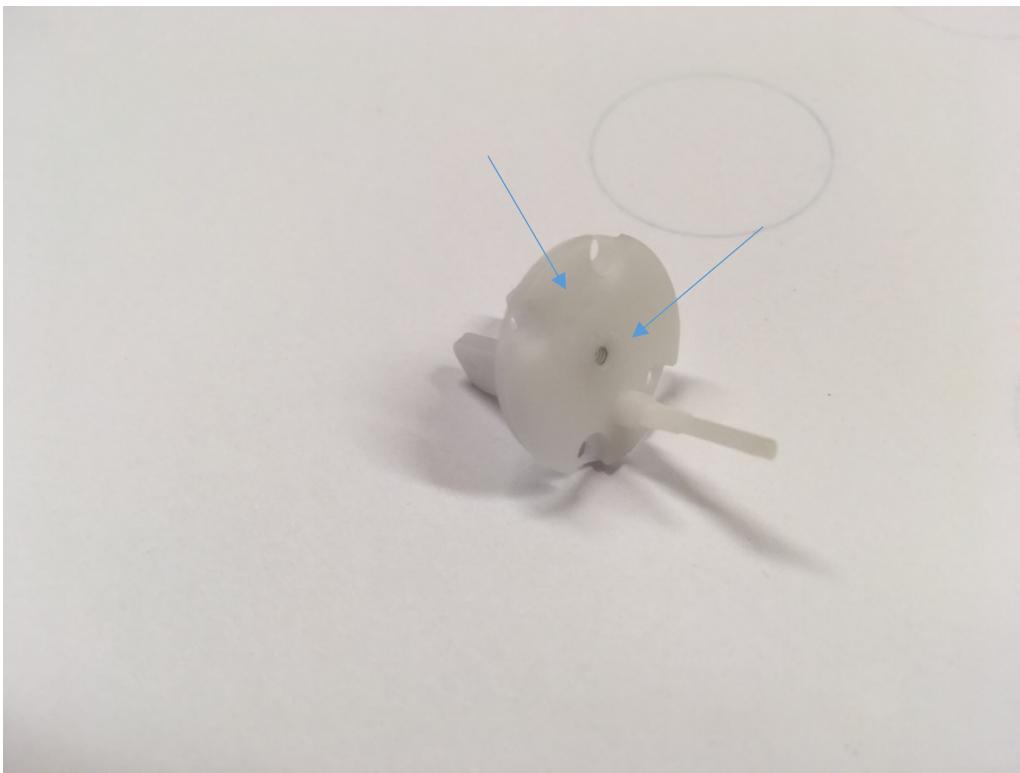
7.1.3 Clear hole 1.5h7



Clear hole with 1.49H7 for dowel pin 1.5H7, it must fit the clamp fit in the hole.



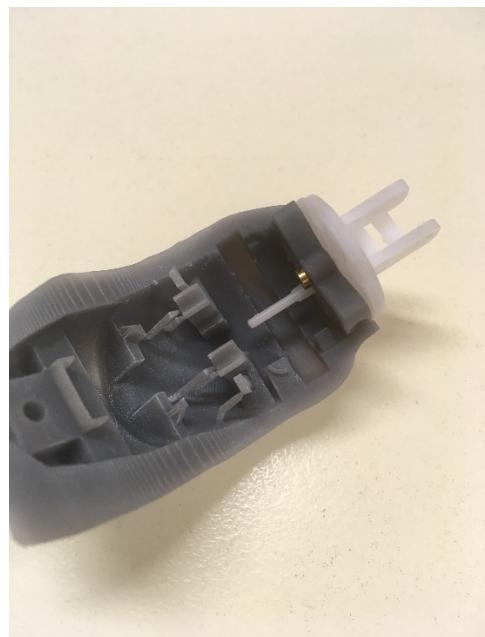
7.1.4 Finish bottom surface



Finish the bottom surfaces on irregularities. These are the turning surfaces and therefore they have to be well finished.

7.1.5 Shorten screw M1.6 x 8 mm

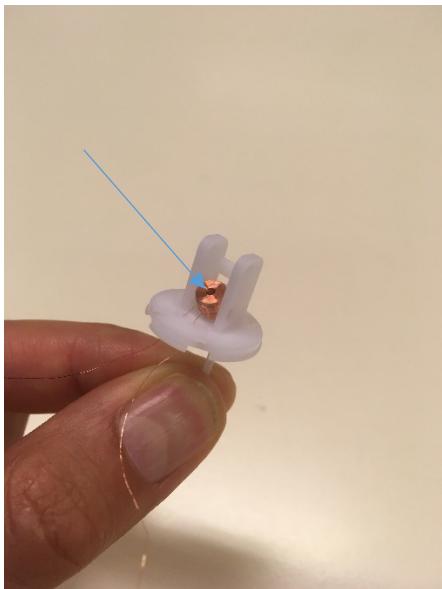
A brass screw will have to be shortened for the connection of the rotation plate to the lower body of the bird. Namely a brass screw M1.6 x 8 mm with a length of 5 mm.



8 Assemble the lower body

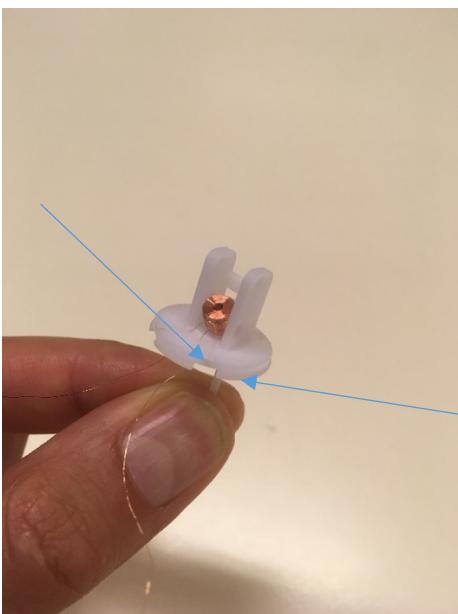
8.1.1 Glue digibird coil on rotation plate

Glue the coil to the rotation plate with a small drop of Pattex super glue.



8.1.2 Glue coil threads

Guide the wires through the required holes, glue these wires with a small drop of superglue in the holes for strain relief.



8.1.3 Assemble lower bill with dowel pin

Gently press the magnet 3x2mm into the lower beak. Then connect the lower bill with dowel pin 1,5H7 x 10m to the rotation plate.



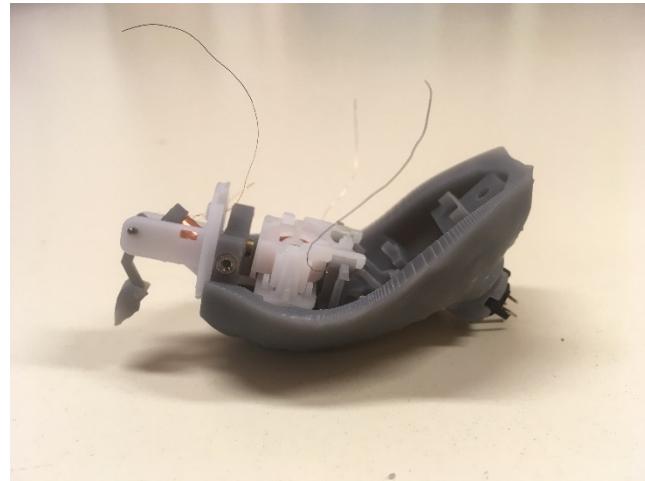
8.1.4 Connect rotation plate to lower body

Connect the rotation plate to the lower body using the screw M1,6x5mm



8.1.5 Assembling the head turning mechanism

Attach the main turning mechanism from the digibird in the lower body.



Press the DIN plug on the underside of the body (do not glue yet!). Connect the coil wires to the DIN plug.

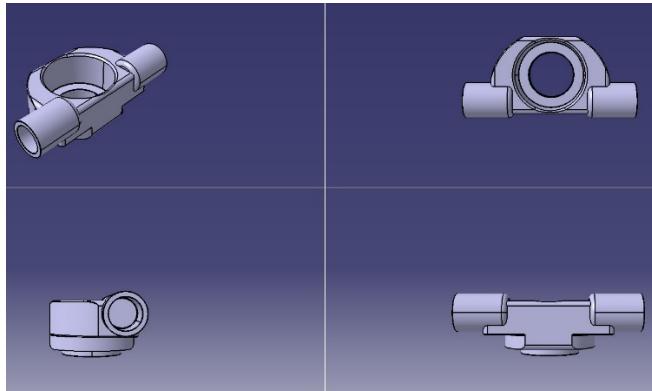
9 Glue left and right head part

Glue the two head parts together with a drop of Pattex superglue.



10 Holder

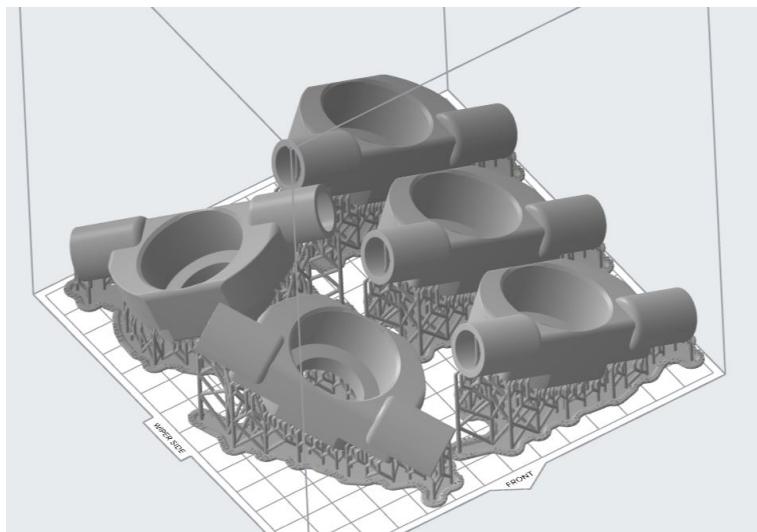
Part name: houder



Printer: Formlabs Form2

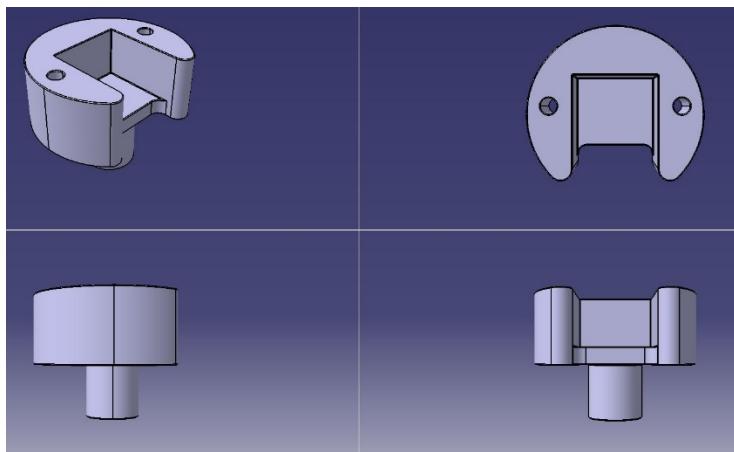
Material: Grey Pro

File name: batch4 en batch444



11 Stepper motor rotation plate

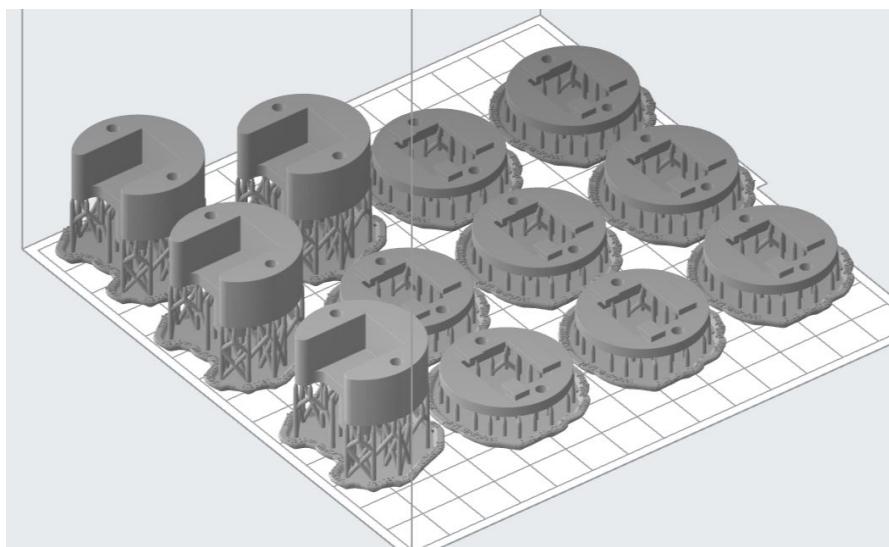
Part name: stappen_motor_rotatieplaat



Printer: Formlabs Form2

Material: Grey Pro

File name: batch444 en batch3_bale4x_motorrotatie4x_drukpl8x.form



12 Plug pressure plate

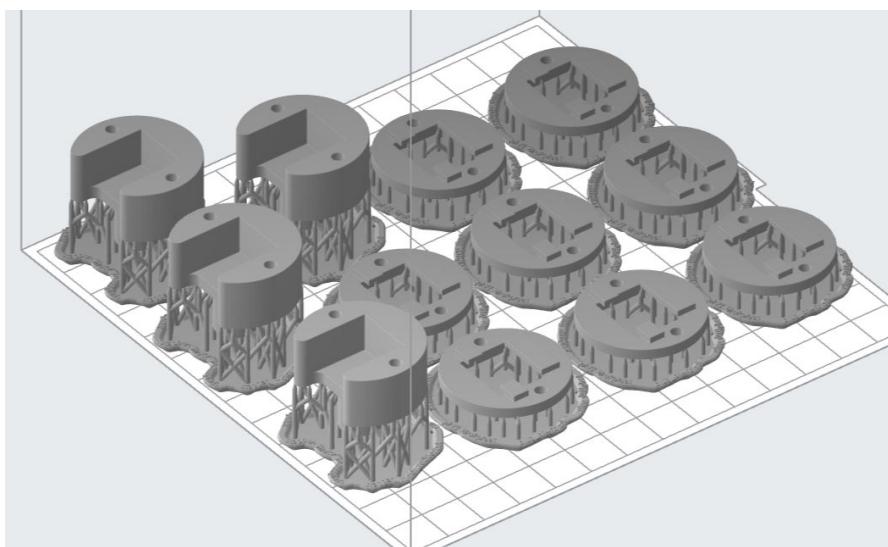
Part name: plug_drukplaat



Printer: Formlabs Form2

Material: Grey Pro

File name: batch3_bale4x_motorrotatie4x_drukpl8x.form



13 Disassembling Digibird for parts

13.1.1 Open battery cover



Unscrew battery cover with small Phillips screwdriver.

13.1.2 Remove Batteries



Remove batteries out of the body.

13.1.3 Remove bottom cover



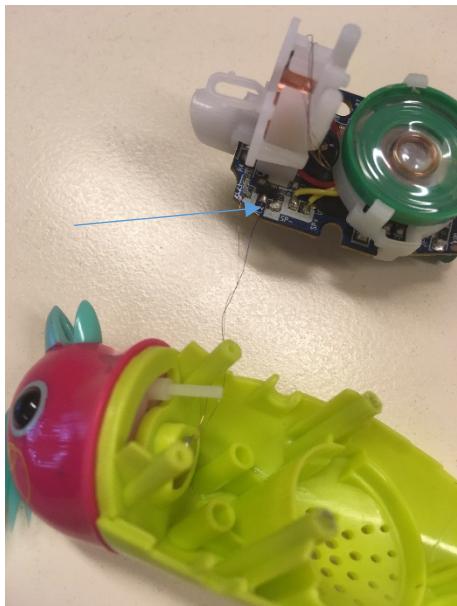
Unclip the hood at the bottom.

13.1.4 Unscrew PCB board



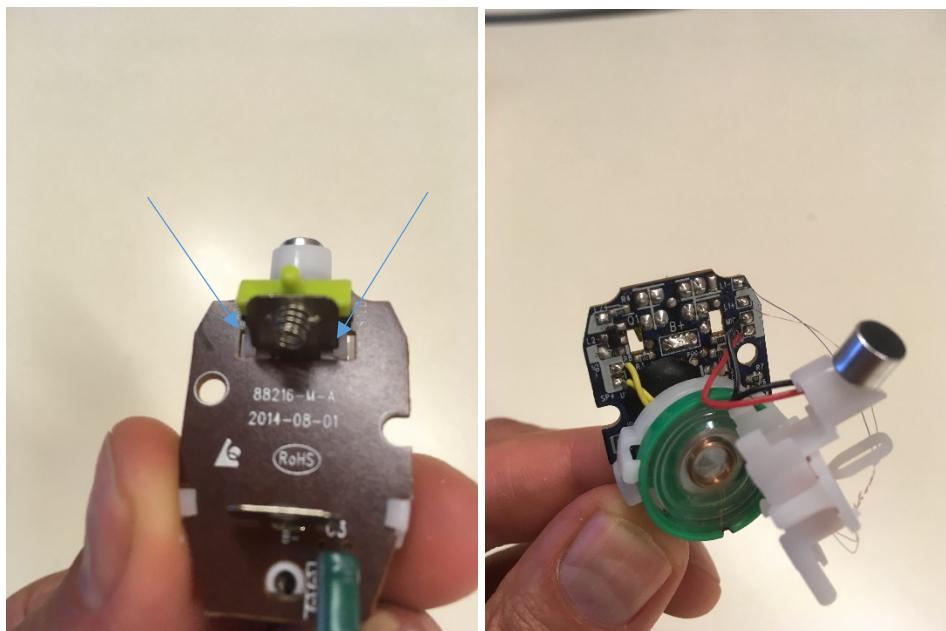
Unscrew the PCB board from the upper body.

13.1.5 Cut coil threads



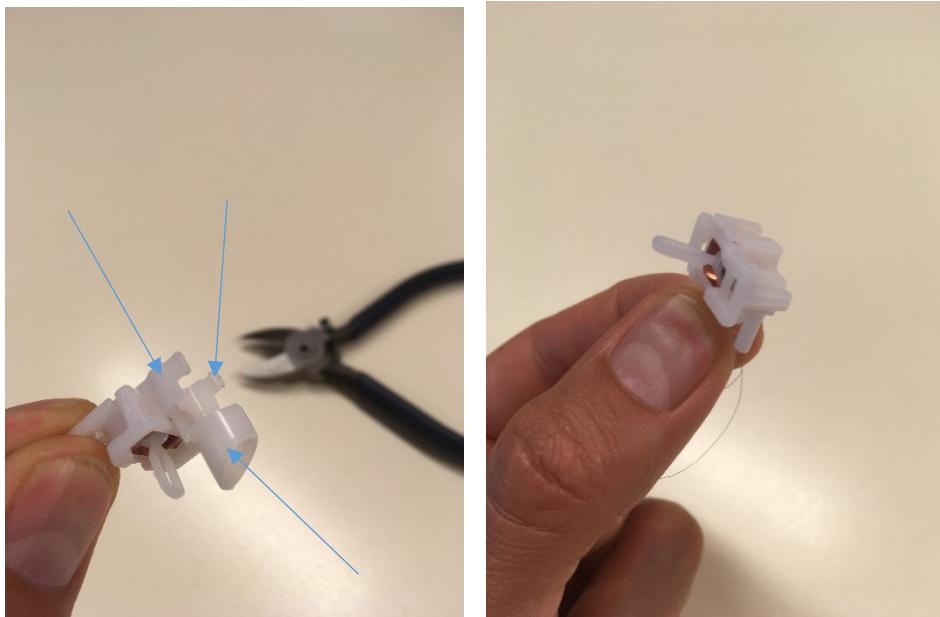
Cut coil wires on the PCB board side.

13.1.6 Removing main turning mechanism



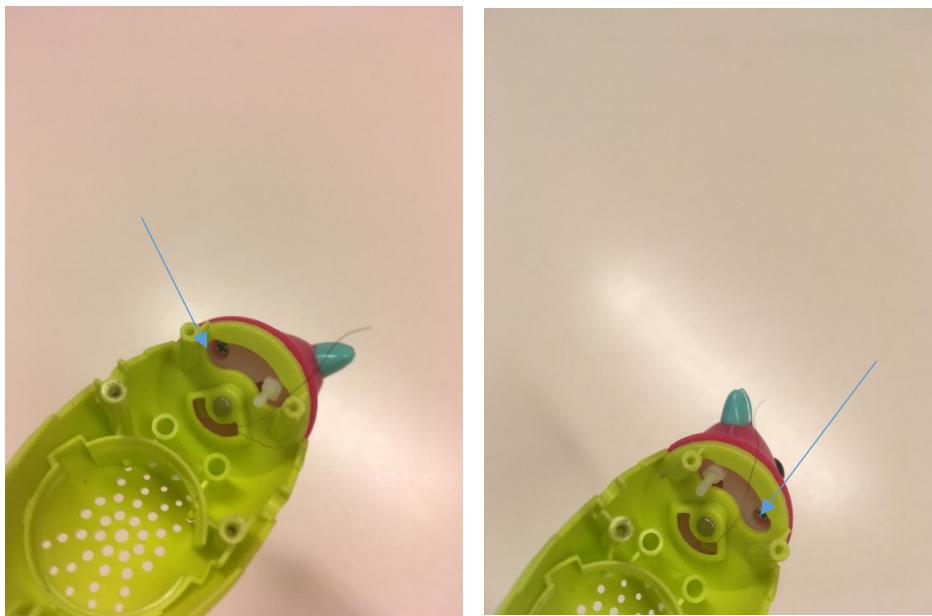
Flip the two white clips to release the mechanism.

13.1.7 Shorten the turning mechanism



Cut off excess parts from the mechanism.

13.1.8 Disassemble the Digibird head



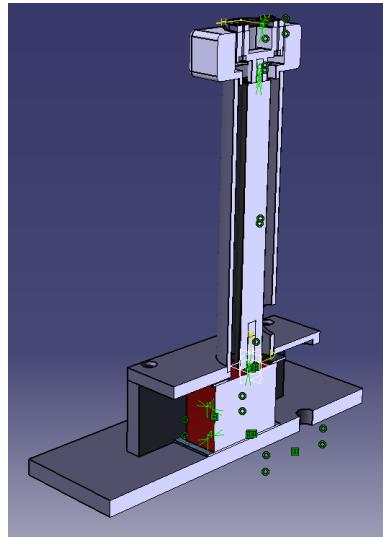
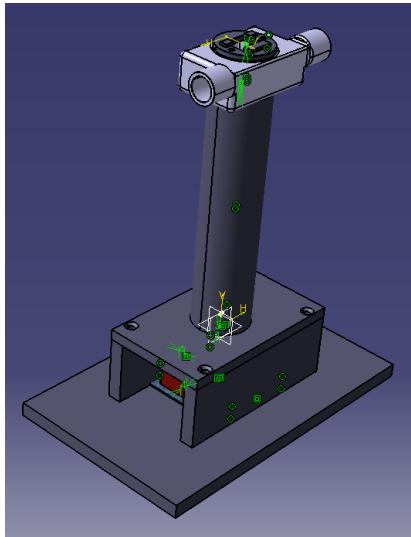
Loosen both screws to remove the head.

13.1.9 Cut the coil threads



Press magnet out of beak.

14 Assemble the stand



Parts:

- 1 bottom plate
- 2 top plate
- 3 side
- 4 rubber base plate
- 5 rubber top plate
- 6 axis
- 7 rotation plate
- 8 plug pressure plate
- 9 holder finch
- 10 stepper motor NEMA 17
- 11 knop