CLONE ME IF YOU CAN

Teye – Construction Manual

Hi folks,

It's me again, Teye. Thank you all for your tremendous interest and all the comments, feedback and awards. I guess you really like me! Sadly, though, I have to tell you that you can't buy me in stores – but you can easily make me yourself. This little construction manual contains everything you need to make your own duplicate of me.
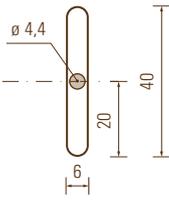
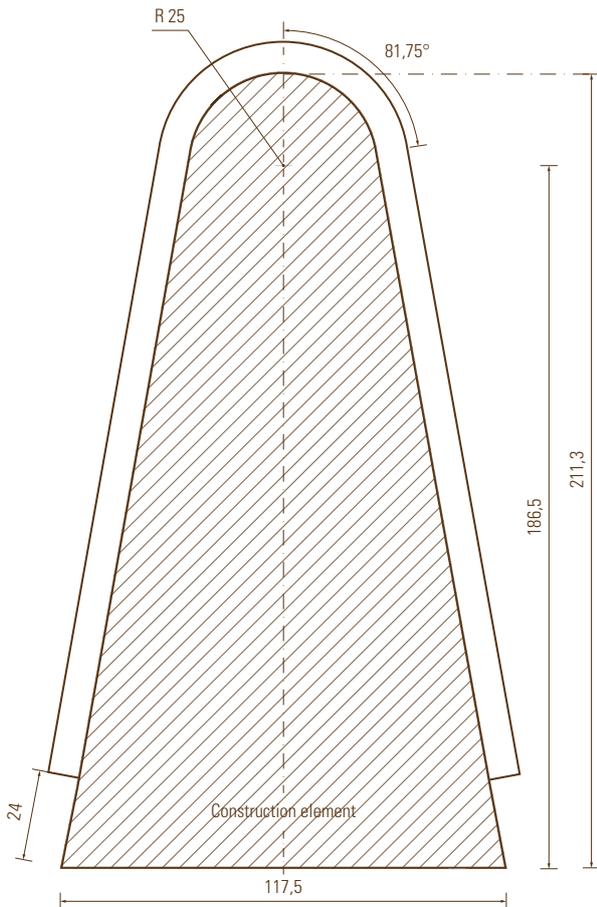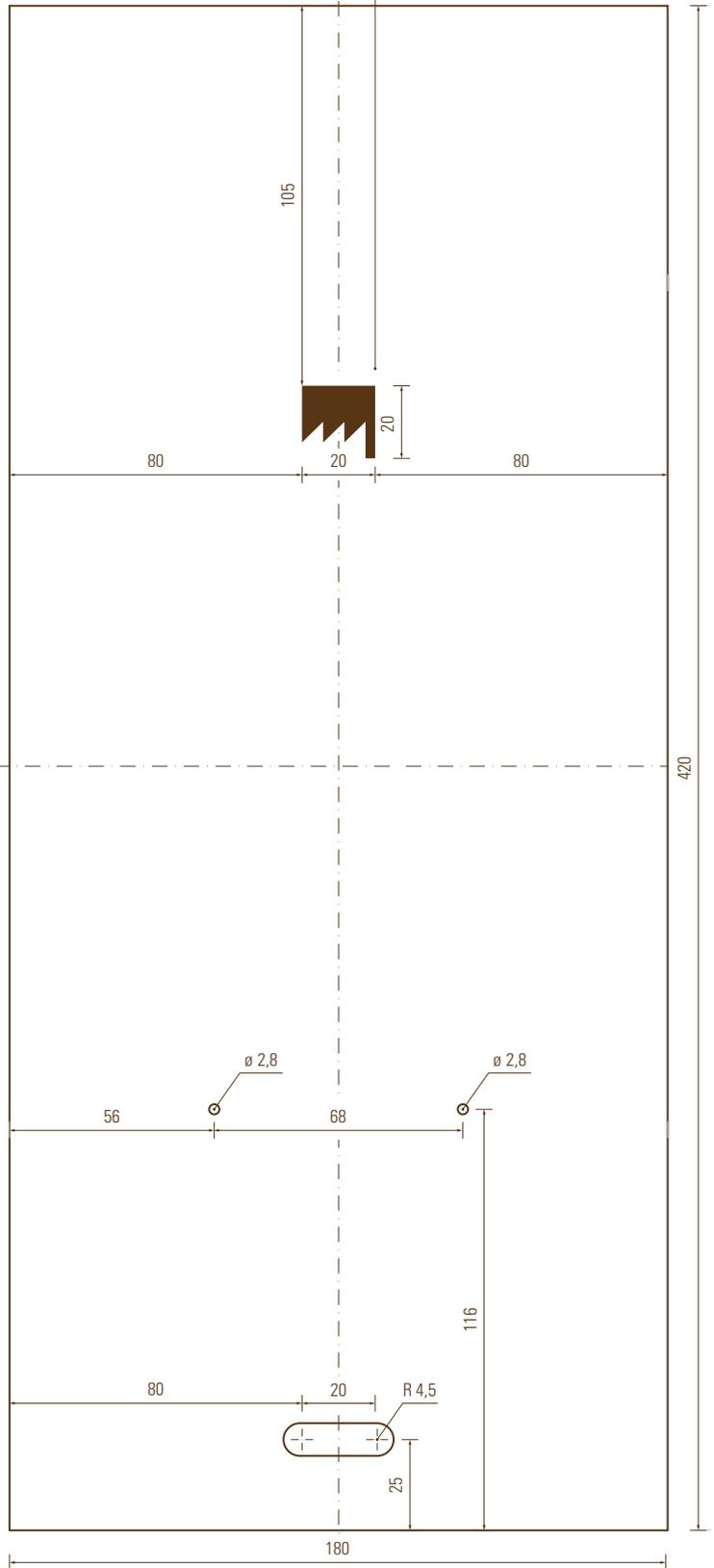Be bold and have a go! You'll be amazed by the results.

^_^

Side view   Front view

ø 4,4

Cavity 2,5

40

20

5   6

Eyes – acrylic glass (2 pieces)
Acrylic glass 5 mm
Screw: M 2,5 19 mm
● Color around: HKS 93 matt

Teye_logo_denkwerk.eps
Logo engraving outside

105

20

80   20   80

420

R 25

81,75°

211,3

186,5

ø 2,8   ø 2,8

56   68

116

24

Construction element

80   20   R 4,5

25

117,5   180

Lid – acrylic glass   Teye_acrylglass_construction_form.dfx

teye

Transparent acrylic glass 8 mm*
Color inside: ● Pink: HKS 27 70% / ● Blue: HKS 50 70%

	18.12.2014	
Units	Scale	Page
mm	1:2	1/4

R 25

81,75°

186,5

117

Right side wood

211,3

+1,4

7,6 7,6 7,6

R 1,5

7,6 7,6 7,6

23

26,7
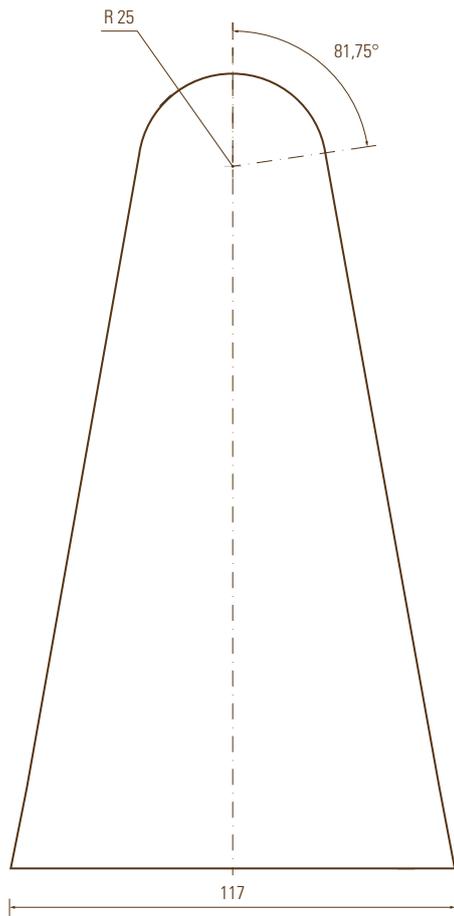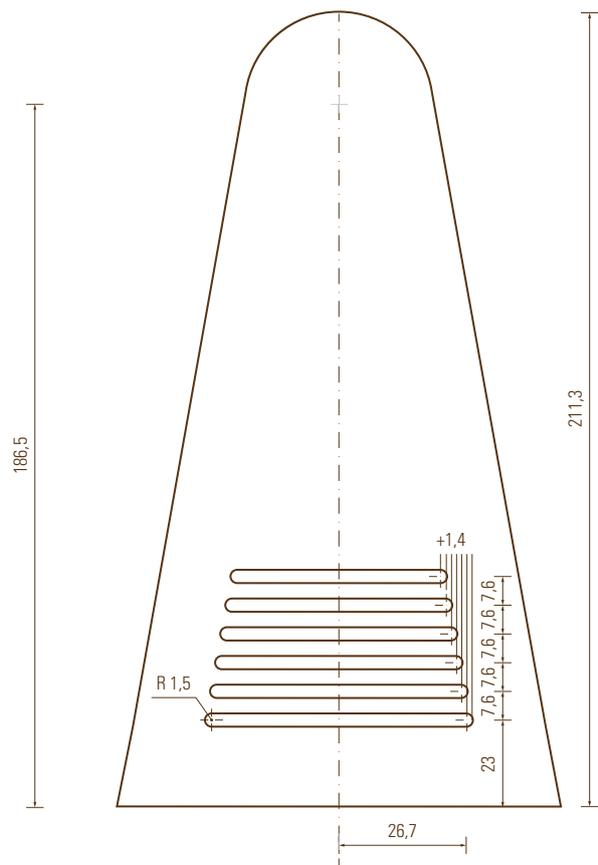
Left side wood

Teye_wooden_parts.eps

75

164

Wooden back part

15

15   R 3

Teye_foot.stl

12

12

ø 30

110

164

Wooden bottom part

46,5   3

37

15

ø 5,5   15

26,8   37,6

23,4

Teye_motor_support.stl

167

30

ø 10

ø 2,6   12

R 5,5

Teye_sensor_support.stl

17,8

9,6

teye

8,8

Logo engraving along path
Outline width: 1mm
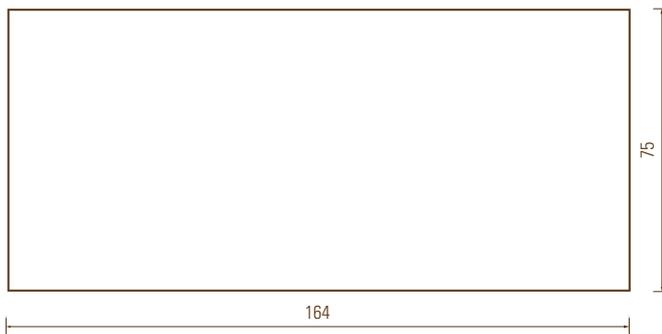Depth: 1mm
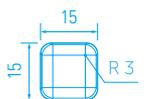Teye_logo.eps

15,5   teye

71,5   10,5

164

Teye_wooden_parts.eps

teye

Wooden parts II
Wood 3mm (laser cutting), 2x wood stain, 2x wood lacquer matt

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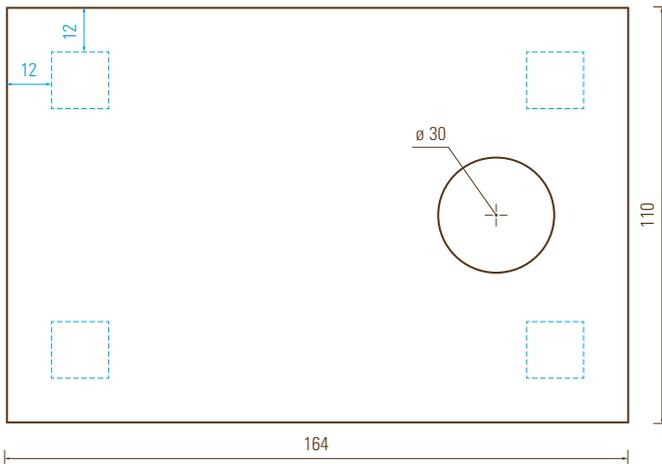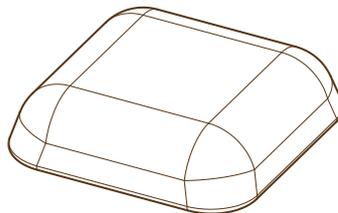| Units	Scale	Page
mm	1:2	3/4
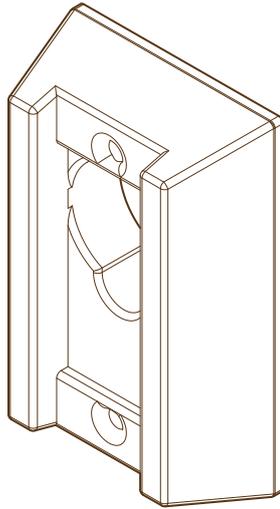
Teye_motor_support.stl
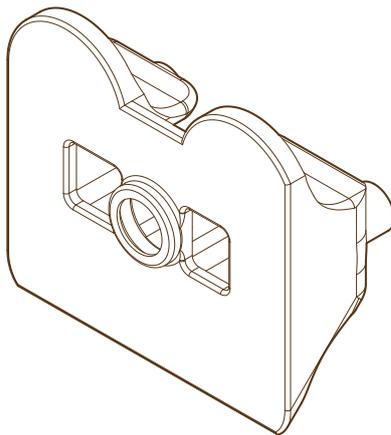
Teye_sensor_support.stl

Teye_foot.stl x 4

3D print parts (*.stl files)
PLA Filament ø 1,75mm (Makerboot replicator 2), motor support: black matt paint

teye

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Units	Scale	Page
mm	–	4/4

Instructions

Step 1

Cut out the five wooden parts as shown in the illustration and stick them to my slender base body. The guys at denkwerk use wood glue for that. If you decide to use a different material, just choose the right glue. Makes sense, right? But take care – glue sticks to your fingers as well. Makes also sense, right?
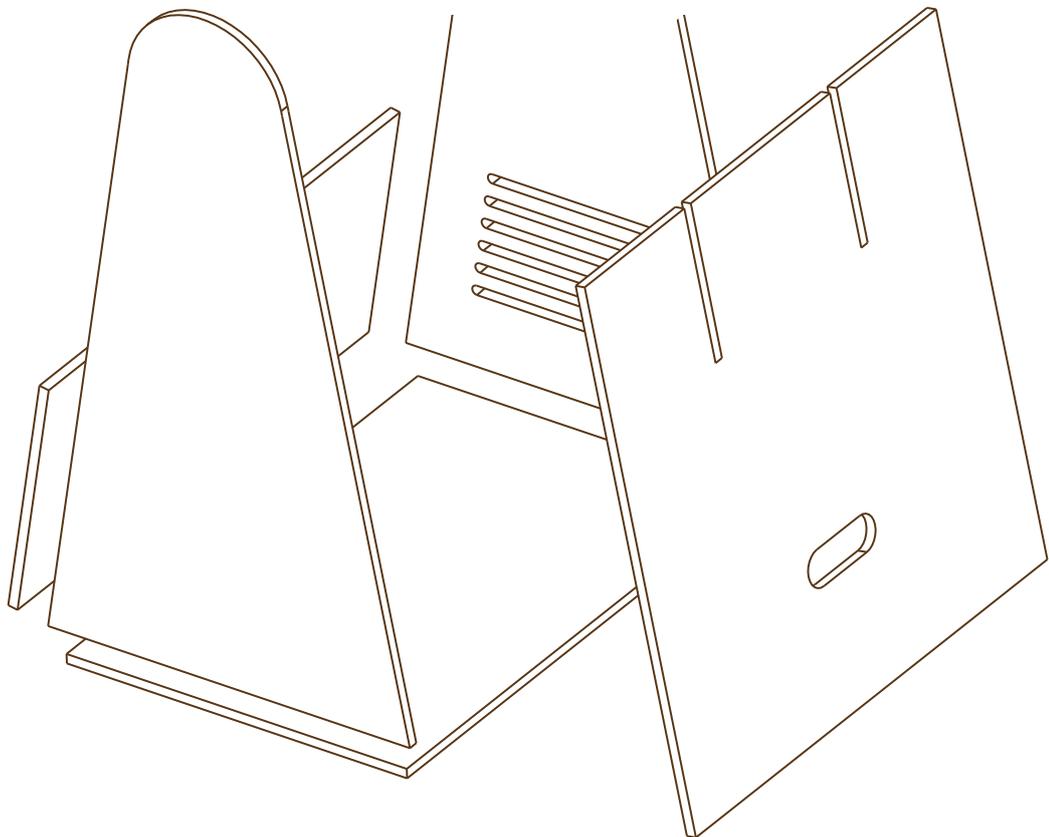
Step 2

Paint the retainers for the sensors in matt black paint. We recommend at least two layers, because everybody will see this part of me. But please! Be careful how you do it, and don't make any mistakes – got that?
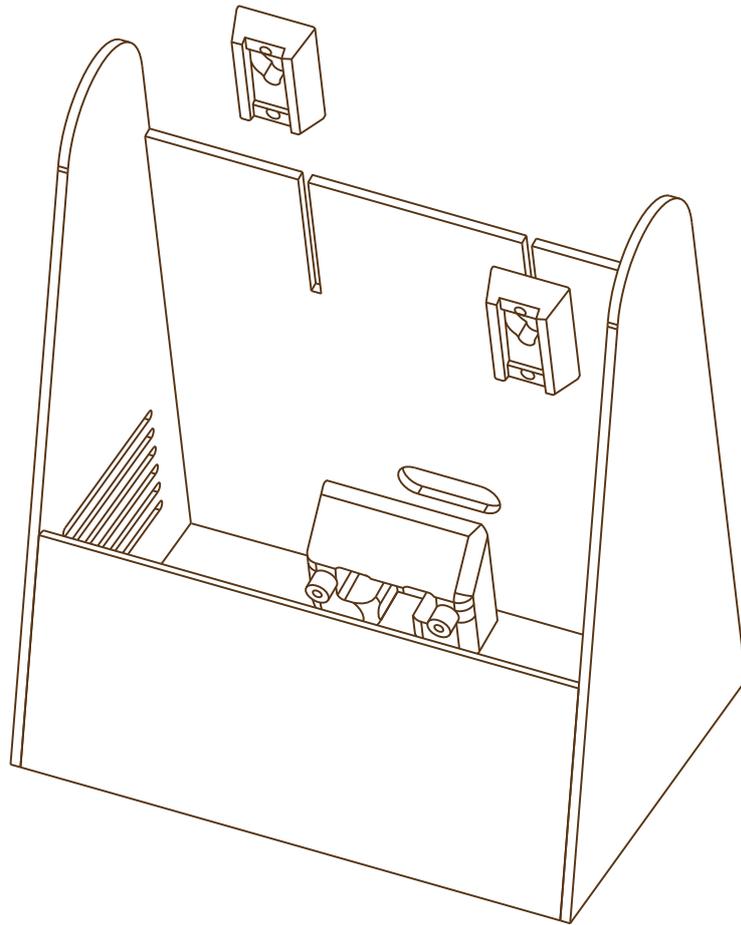
Step 3

Allow the paint to dry and then fix the 3D print parts as shown in the illustration. Put the retainers
for the servos in place with non-permanent tape – you'll probably change their positions again.
And you must have heard that we're all supposed to be really flexible nowadays … The other parts
can be attached with hot glue. Just put them wherever you like. #+?% no, just kidding! Check the technical
drawings for the right positions. That's important if you don't want to create a creepy monster mutant!
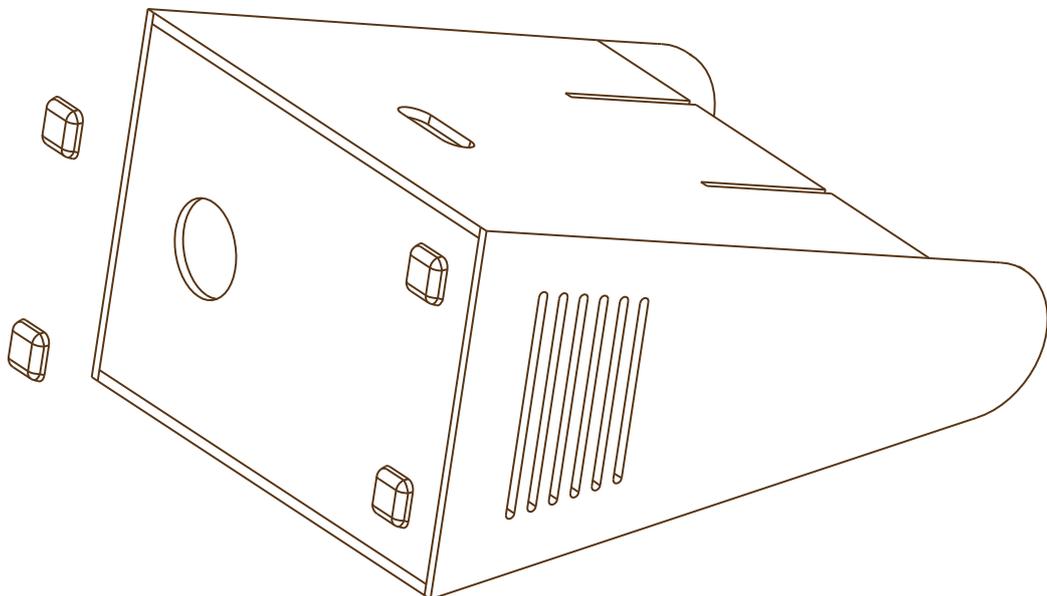
Step 4

Where was I? Ahem, yep! When you've put all the technical components inside me, it's time
to shape the acrylic lid. If you are slow off the mark – and I guess you could be – use the construction
element in the technical drawings. When you've shaped the lid and painted the inside, attach
it to my base body. Make sure that the rotational hub is lined up with the drill holes. If they're not,
adjust them to their final positions. But don't glue the lid. Sometimes my insides need fresh air,
and you'll only have to undo everything.
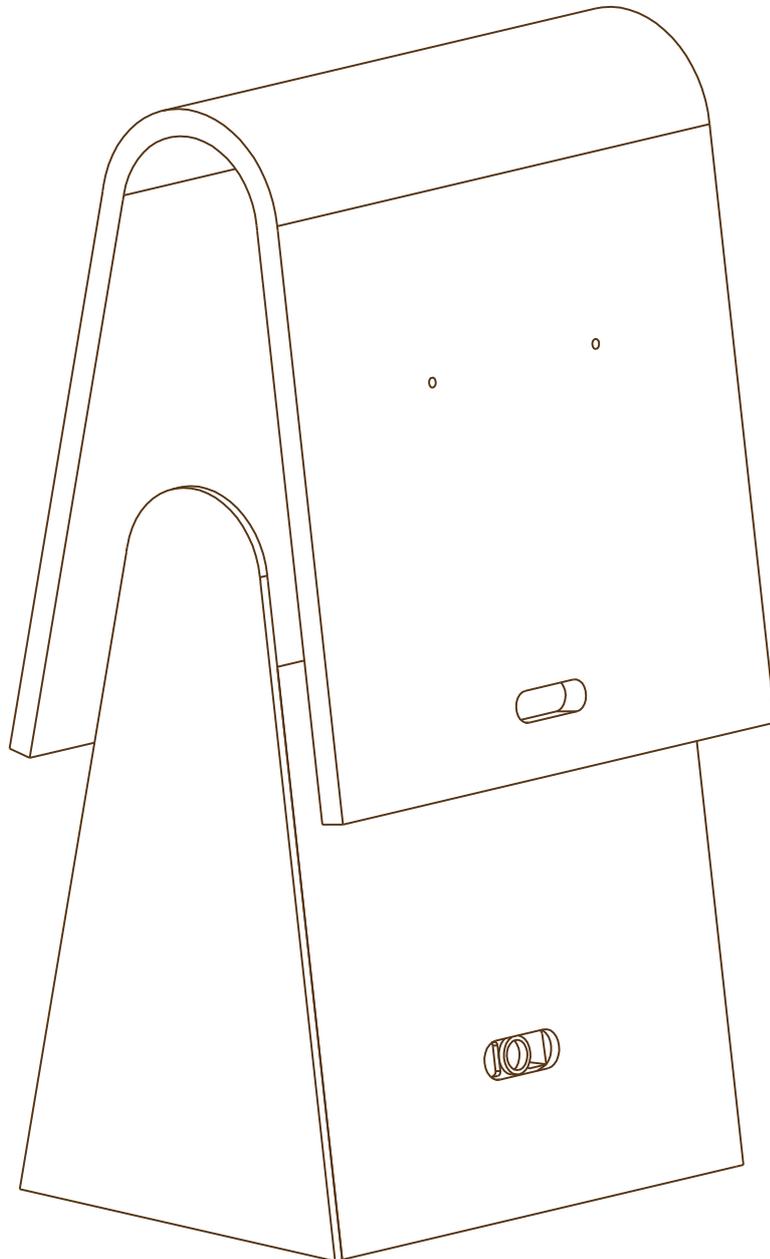
Step 5

What's next? In my (already painted) eyes you'll find indentations which are for screw heads.
Make sure that the M2.5x19 screws are perpendicular to my eyes and super-glue them into place.
Just wait a second … and you're done. After the glue has set, it's time for the main event:
screw in my eyes. As per the servo motors you had to tap earlier.
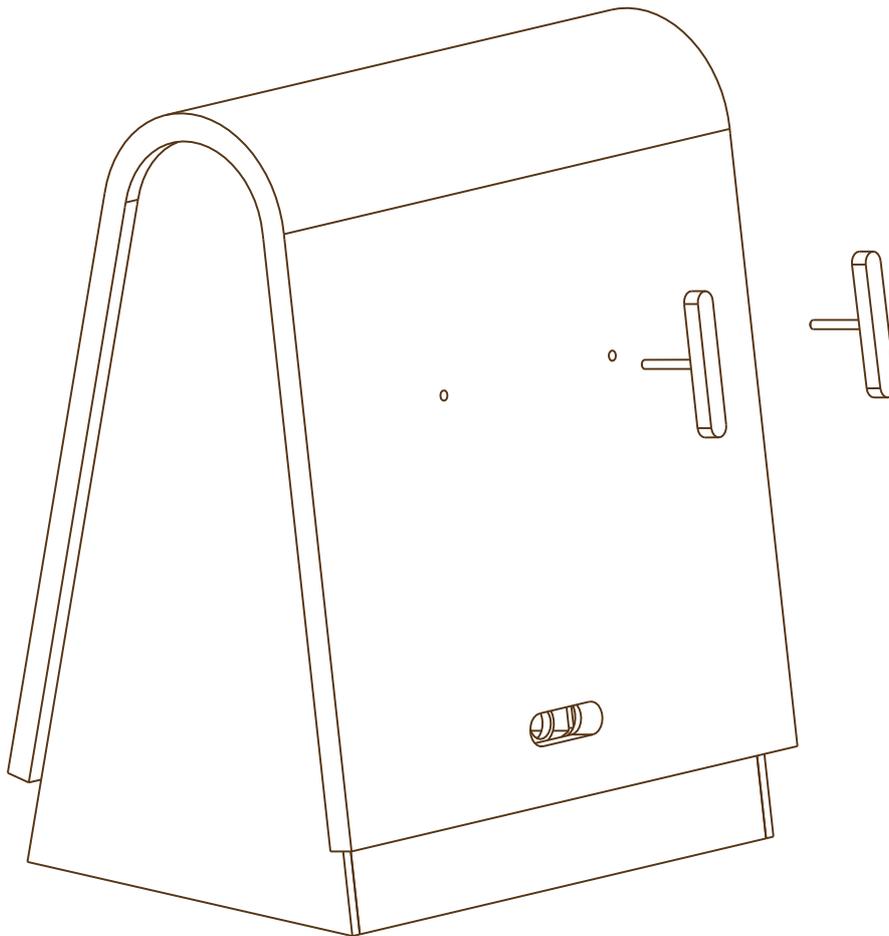
And that's it! Congratulations! You are a real DIY'er! Now do the configuring,
and your handmade Teye will become my exact soulmate.

Call me … maybe?!

Details

- ☐ Raspberry Pi Model B

- ☐ Raspberry Pi connecting cable

- ☐ Transcend Extreme Speed Class
  10 SDHC-Card ≤ 4 GB

- ☐ Raspberry Pi adapter

- ☐ Anker Astro Battery E3 10,000 mAh

- ☐ Modelcraft Mini-Servo Y-3009 (x 2)

- ☐ WLAN stick EDIMAX EW-781 Un

- ☐ Speedlink VIGO USB Soundcard

- ☐ USB cable extension ≈ 10 cm

- ☐ MCP3008 analogue-digital converter

- ☐ Sharp infrared sensor GP2Y0A02YK0F

- ☐ 3.5 mm jack plug, angled

- ☐ Electret microphone CZ034

- ☐ GF-007 audio amplifier

- ☐ Broadband loudspeakers
  8 Ohm, ø 5 cm

Comments

The Raspberry Pi B has only 700 MHz

Challenge: The voice recognition in SIP phone conversations is such a CPU-intensive process that my other functions won't work properly at the same time. My tongue stops working, and I can no longer roll my sexy, servo-motored eyes. That sucks!

Solution: Overclock the processor to at least 1000 Mhz, reduce the SIP compression and use a CPU-protecting codex. I swear this will make life much easier.

The servo motors go crazy

Challenge: These renegade servo motors won't conform! Because their angle of rotation is greater than 180°, they just don't listen to my orders like I want them to. Screwheads!

Solution: Individually calibrate every single servo motor. To trick them, adjust the servos to just below the zero point.

Linux Operating System has too many processes

Challenge: These awkward servo motors are really mad. Now they are unsettled and inaccurate, and are having some kind of nervous breakdown – this time because there are too many processes in the Linux operating system.

Solution: Swap the servo logic into a separate process with higher priority and address the servo only from my software. Yeah, you've done it!

The servo motors are too loud

Challenge: It's depressing. You know what's coming. Right, another problem with my beloved servo motors. I can hear them moving my eyes. Sometimes it sounds like spoken words, and I can't stop trying to interpret them. Because these freaking servos are simply too noisy. So please shut the #+?% up!

Solution: Deactivate the microphone while the servos are active. Do a temporal synchronization of the servo positioning. Screen the microphone input and search for certain sounds. But even the guys at denkwerk don't do that yet — AFAIK!

Infrared motion sensors react on their surroundings

Challenge: Dammit! Not only am I suffering from chronic insomnia, but my whole sleep-wake rhythm has been damaged. It's enough to make you want to run a mile! And why? Because my motion detector is a sensitive plant.

Solution: Re-calibrate the room of capture and "reassure" the incoming data. Set a factor of variance as well. And now I really must catch up on some sleep!

The microphone is listening to the loudspeakers

Challenge: We also had some trouble with my acoustic back coupling. Hello echo, are you still there … still there … still there? The sound is sent back again and again and circulates between my inner devices for a while. Weird!

Solution: Incorporate an Echo Cancellation Module and configure it exactly. Turn down the volume and adjust the intensity of the microphone.

Downloads
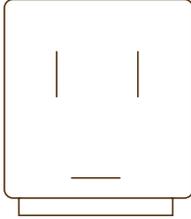
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http://bit.ly/Teye_Logo_denkwerk
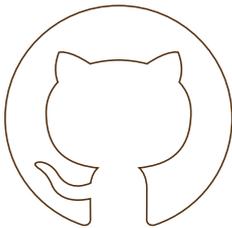
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http://bit.ly/Teye_Logo

🖫 Teye_Wooden_parts.eps
http://bit.ly/Teye_Wooden_parts

🖫 Teye_Foot.stl http://bit.ly/Teye_Foot

🖫 Teye_Motor_support.stl
http://bit.ly/Teye_Motor_support

🖫 Teye_Sensor_support.stl
http://bit.ly/Teye_Sensor_support

🖫 Teye_Acrylglass_construction_form.dxf
http://bit.ly/Teye_Acrylglass
_Construction_Form

↗ Source code on GitHub http://bit.ly/17pBFv3

🖫 Full archive Teye_all.zip with all the files http://bit.ly/Teye_all_zip

Is it working? Let us know!
Please share your experiences at teye@denkwerk.com
or post your comments with the hashtag
#MyTeye

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