



***SERVOS. Not included with this kit.**

Construction kit "VOR1"

Your kit contains all the necessary components (except for servomotors) for building a "VOR1".

Fine-tuning

The calibration software allows you to accurately adjust the instrument (once connected to the Central Control Unit) to the movement of the needles.

Difficulty level

This product can be constructed without technical expertise. Care and accuracy are of utmost importance.

What else do you need?

Three servomotors, types HS300, HS311 or equivalent, are required to make the instrument fully functional. These products can be ordered separately from the SimKits webshop or bought from any retailer of model kits. Additionally you will need some simple tools, such as a small star-shaped screwdriver, a hobby knife, some pliers, a 0.26" (6.5 mm) drill suitable for iron, a soldering iron (suitable for circuit boards), resin solder core, white model kit paint (plastic enamel), a small hammer and glue suitable for plastic model kits.

General hints

Be very careful when using the hobby knife! You can easily hurt yourself when handling sharp objects! Take good care of the amount of glue you apply and to which areas you apply it. Glue for plastics is essentially a solvent. Excessive use can damage the exterior of the instrument.

Preparations before construction

Check if all components are included. During packing, the contents of the construction kit have been inspected several times. Nothing should be missing. Use the hobby knife to remove any irregularities. Be careful when using the sharp hobby knife!

Warranty

Construction kits come without a warranty!

List of components

A - Optical
B - Front ring
C - Upper casing
D - Plate
E - Lower casing
F - Large gearwheel
G - Compass card
H - Small pointer
I - Small fork

J - Large fork
K - Large pointer
L - Faceplate
M - PCBBoard
M1 - Screw
M2 - Screw
N - Indicator plate
O - Small eccentric
P - Large eccentric
Q1 - Small gearwheel
Q2 - Small gearwheel
R1 - Small tilted gearwheel
R2 - Small tilted gearwheel
S - Gearwheel cap
T - Metal shaft
U - Hollow brass shaft
V - Light
W - Insulated wire
X - Sleeve
Y - Metal button
Z - Inbus bolt
Z1 - Inbus key

Twist the servo shafts clockwise until they block.

3 X

1

Mount gearwheels R1 and R2 to hollow shaft U.

5

Remove the discs from the servo shafts and save the screws.

2

Fix shaft T to one of the gearwheels as indicated.

6

0.26" (6.5 mm.)

Drill into the lower left hole in front ring B to give it a diameter of 0.26" / 6.5 mm.

3

Place gearwheel Q1 over the shaft of component S. Use the soldering iron to deform the shaft of component S just above gearwheel Q1, in such a way that the gearwheel can still twist freely but is not in danger of coming loose.

7

Place optical A into front ring B and cement it by sparingly applying glue to the back of the front ring, in the edge where optical and front ring connect.

4

Place component G into the front ring.

8

Plaats nu onderdeel S met gemonteerd tandwiel in het opgeboorde gat van de frontring. **Maar lijm het nog niet vast!**

9

Cut the ears off two servos as indicated in the illustration.

13

Onderdeel S wordt eerst gemonteerd op een wijze dat de tandwielen elkaar nog niet raken.

10

Mount the servos to plate D as indicated.

14

Now carefully twist component S, so the small gearwheel touches the gearwheel on the compass card. Make sure the gearwheels have enough room to turn smoothly.

11

Mind the proper positioning of the servos.

15

3 X

12

Mount small eccentric O in such a way that the pointer is positioned at 09:15 hours. Mount large eccentric P in such a way that the pointer is positioned at 16:00 hours.

16

16:00 uur.

Carefully twist the lower eccentric counter-clockwise, until it is positioned at 08:45 hours.

17

Solder the wires for the lighting onto the circuit board as indicated (mind the proper side!).

21

Place indicator plate **N** over the shaft of the central servo. See drawing **19** for the proper illustration.

18

Guide the servo wires past the servos and through the hole in plate **L**, as indicated in the illustration. Then connect the servos to the print as indicated in the illustration.

22

The indicator plate needs to be mounted onto the servo shaft as indicated in the drawing.

19

Bottom of PCBoard. Make sure the PIHER position sensor is arranged as indicated in the drawing.

23

Strip 0.1" (2.5 mm) of insulation from both ends of wire **W** (included). Solder light **V** onto one end and use sleeve **X** to cover the soldered connection.

20

Top of PCBoard. Make sure the PIHER position sensor is arranged as indicated in the drawing.

24

25

Guide the wire of the light through plate D as indicated in the drawing.

29

F

Insert large gearwheel F into lower casing E and check whether gearwheels F and Q2 can turn freely and drive each other smoothly.

26

Fix circuit board M to plate D, using screws M1 and M2 (included).

30

Now place plate D with mounted servos and upper casing C onto lower casing E, making sure the flattened shaft of gearwheel F fits exactly into the openings of the PIHER position sensors.

The position sensors may only be twisted once the shaft of gearwheel F has been inserted into the opening completely.

27

Q2

E

Place gearwheel Q2 over the plastic shaft near the edge inside lower casing E.

31

Fix the light to the inside of the upper casing, in the position indicated by two small marks. Make sure the light protrudes by roughly 3 mm from the edge.

Make sure excess wires do not touch moving parts!

28

E

Use the soldering iron to deform the plastic shaft on component E in such way that gearwheel Q2 can turn freely but is not in danger of coming loose.

32

H

L

I

Apply white paint to pointer H, covering a space of 1.1" / 28 mm from the tip. Leave the pointer to dry and fix it onto small fork I on faceplate L. There is only one way to mount the pointer!

33

Apply white point to pointer **K**, covering a space of 1.32" / 33 mm from the tip. Leave the pointer to dry and fix it onto large fork **J** on faceplate **L**. There is only one way to mount the pointer!

37

Place the compass card (component **G**) onto the upper casing.
Do not use glue.

34

Now place faceplate **L** on top of the upper casing. Mind the positioning notches and the light when deciding the proper position. There is no need to cement the faceplate. **See 35.**

38

Place the front ring, with components **S+Q1** mounted, onto the upper casing. The gearwheels on **S+Q1** and on the compass card need to fit together properly, and should be able to turn smoothly.

35

Positioning the faceplate requires several very precise operations. Forks **I** and **J** need to be positioned exactly over the pins of eccentrics **O** and **P**, as indicated in the drawing. Then connect the VOR1 to the Central Control Unit and, using the calibration software, test if the pointers can handle the required deflection. Continue assembling the instrument only once the test has been successful!

39

Mount button **Y** using inbus bolt **Z** and inbus key **Z1**.

36

Place the shaft consisting of components **R1, U, R2** and **T** over the built-in shaft of the lower casing.

40

After testing the complete instrument with the calibration software once more, you can cement front ring, upper casing and lower casing together.

Cable-Outlet