



*** (SERVOS, WHEREOF ONE MODIFIED, ARE NOT INCLUDED IN THE KIT)**

Construction kit "Altimeter"

Your kit contains all the necessary components (except for servomotors) for building an "Altimeter".

Fine-tuning

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

Difficulty level

This product can be constructed without technical expertise. Knowledge of electronics soldering is required. Care and accuracy are of utmost importance.

What else do you need?

A normal and a modified servomotor, types HS300, HS311 or equivalent, are required to make the instrument fully functional (for modifying a servomotor, see the separate manual). This product can be ordered separately through 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 small hammer, a 1/16" (4 mm) drill, a 0.26" (6.5 mm) drill, a soldering iron (suitable for fine electronics), tin solder, insulating adhesive tape, superglue 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 beginning 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 - Metal knob
AA - Inbus key
B - Bolt (inbus)
C - Strain relief
D - Printed Circuit Board
E - Lower faceplate
E1 - Bearing
F - Faceplate
G - Pressure scale
H - Outer shaft
I - Plate
J - Central shaft
K - Inner shaft

L - Double gearwheel (2 x)
M - Upper cap rotary encoder
N - Propeller shaft
P - Gearwheel with shaft, short
Q - Hollow gearwheel (2 x)
R - Gearwheel with shaft, long
S - Fastening cap 1
T - Fastening cap 2
U - Bush rotary encoder
V - Gearwheel shaft
W - Shaft
X - Indicator 10.000 foot
Z - Indicator 1.000 foot
Y - Indicator 100 foot
A1 - Front ring
A2 - Front optical
A3 - Upper casing
A4 - Lower casing
A5 - Light
A6 - 2-Wire cable
A7 - Heat shrink sleeve
A8* - Rotary encoder assembly or R1, R2, R3
A9 - Self-tapping screw for mounting PCB
R1* - Rotary encoder
R2* - Rotary encoder fitting
R3* - Rotary encoder wire

*(A8 or R1, R2, R3 is included)

Carefully tap shaft W into cap U until it blocks.

1

Solder the wires onto the rotary encoder R1, as indicated in drawing 5 and 6.

5

2

6

If you find a rotary encoder assembly A8 inside this construction kit, you can continue with drawing 7. Insert the wires of R3 into the openings of component R2 as indicated in drawing 4, respecting the colour indications.

3

Place component W/U as assembled in drawing 1 onto the rotary encoder shaft. There is a small indentation in the rotary encoder shaft. The opening of component U contains a small ridge, which fits exactly into this indentation. Make sure ridge and indentation fit completely.

7

4

Connect component M to component A8, making sure no glue comes into contact with the rotary encoder, with the rotary encoder shaft or with component W/U.

8

Normal SERVO
Twist the servo clockwise by hand until it blocks.

9

Place optical F into front ring A1 and cement it by sparingly applying glue to the back of the front ring, in the edge where optical and front ring connect.

13

-Normal SERVO
-Modified SERVO
Remove disc and screw. These parts are no longer required.

10

Connect cord A6 to light A5 by soldering. Use sleeve A7 to insulate the soldered connection, but leave roughly 8 mm's worth of wire free at the base of the light. The sleeve shrinks when heated.

14

Modify an HS300 or HS311 servo, or order a modified servo through the SimKits webshop. See separate manual for instructions on modifying a servo.

11

Connect the wires to the circuit board. Polarities are not important.

15

0.26" (6.5 mm.)

Boor het linker-benedengat (van voren af gezien) van front-ring A1 op, totdat dit een maat heeft van 0.26" / 6.5 mm.

12

Place the rotary encoder assembly's connector onto the circuit board as indicated.

16

CAUTION! The servos cannot be connected as shown in picture 17, 18 and 19. The connector of the servos has to be cut off and the isolation of the wires should be removed somewhat to enable the wires to be soldered directly on the PC-Board, due to lack of space for connectors!

17

Check if the PIHER position sensors, present on both sides of the circuit board, are in proper arrangement, as indicated in drawings 20 and 21.

21

Normal servo

Modified servo

See comment at illustration 17!

18

Mount plate I onto circuit board D, using the positioning notches. Do not use screws just yet.

22

Modified servo

Normal servo

See comment at illustration 17!

19

In this drawing the connections between servo and circuit board as well as between the rotary encoder and circuit board, have been omitted for the sake of clarity. For the remainder of the assembly it is assumed that these are connected to the circuit board as indicated in drawings 16 through 19.

23

Mind the proper arrangement of the PIHER position sensors.

20

Insert gearwheels R (longer shaft) and P (shorter shaft) into the caps on the plate.

24

Make sure the PIHER position sensors are properly arranged as indicated in drawings 20 and 21. Once the shafts of gearwheels **P** and **R** are in position, you can carefully check whether they can twist freely.

25

Cut the ears from the **unmodified** servo as indicated in the drawing.

29

Using superglue, cement caps **S** and **T** onto gearwheel shafts **P** and **R**. **TAKE NOTE:** Under no circumstances should the PIHER position sensors come into contact with glue!

26

Place the servos into lower casing **A4** as indicated in drawings 30 and 31. Use the screws you previously unfastened from the servos (see drawing 28) to lock them into position. **Take note: do not wind the screws too tightly! It's easy to damage the thread**

30

Screw the circuit board onto the plate using screw **A9** (included).

27

Normal servo.
Modified servo.

31

Unfasten two diagonally placed long screws from each servo casing as indicated in the illustration.

28

Place the plate with circuit board onto the lower casing, and guide out the rotary encoder assembly and the light between the casing and the circuit board. Mind the proper positioning of the plate. Use the positioning notch to find the right position. Cement the plate to the lower casing by applying a few drops of glue.

32









