Illustrated construction manual: The Sextant

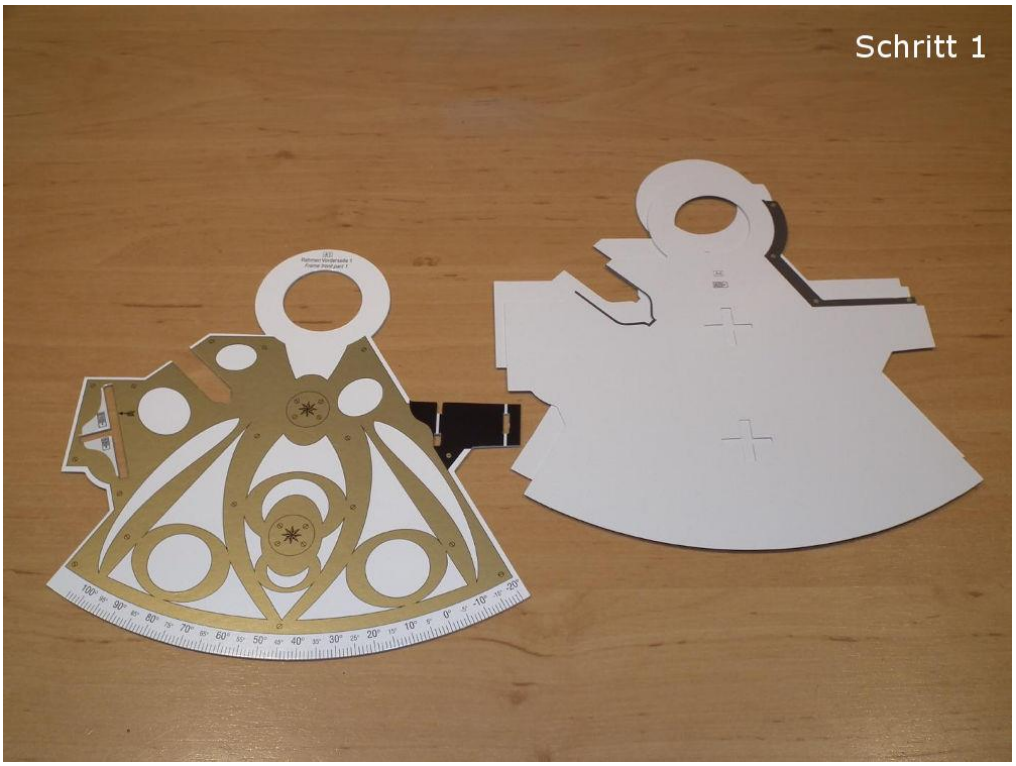
https://michelswunderland.de/solderiron/sextant.html

Freshly unpacked - cardboard boxes, instructions, mirror, and solar filter.

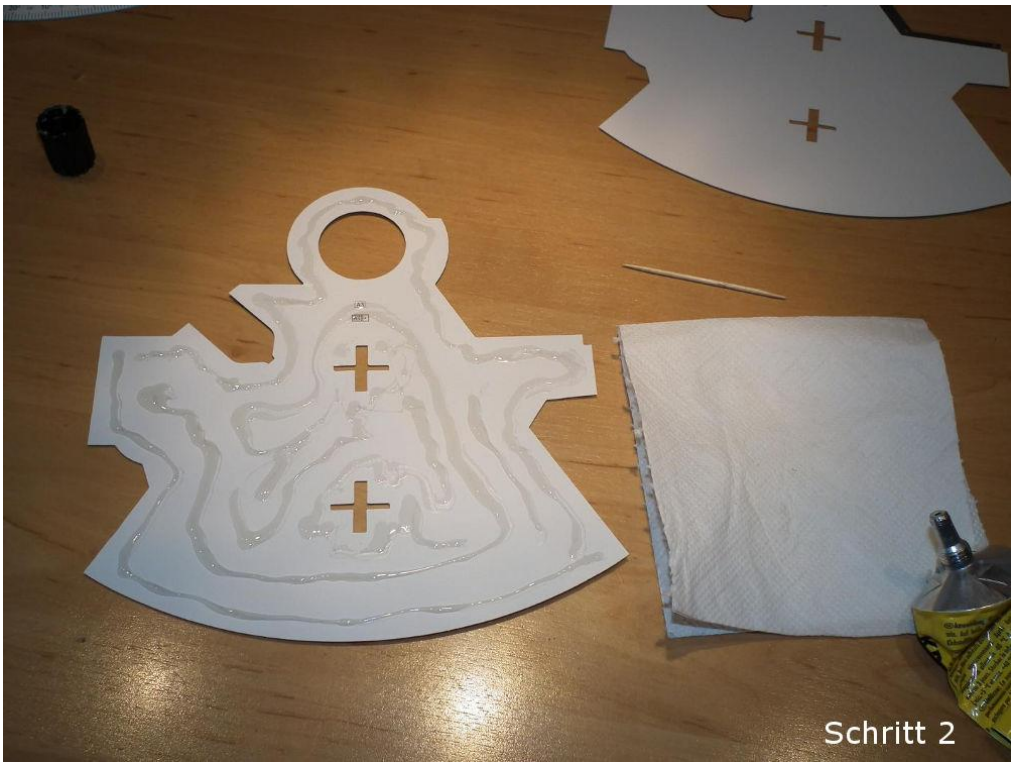
Tools required and other useful aids, the use of which is shown or described below: ruler, scissors, solvent-based glue, tweezers for placing small pieces, key file, fibre pencil, cutter, rectangular tool, isopropyl alcohol, superglue, toothpicks, and pins for spreading glue, kitchen paper for wiping off too much glue applied, and gold and black paint for colouring edges using a brush.

Instruction Part "A" - The Frame

The four parts needed for **steps 1-3**.



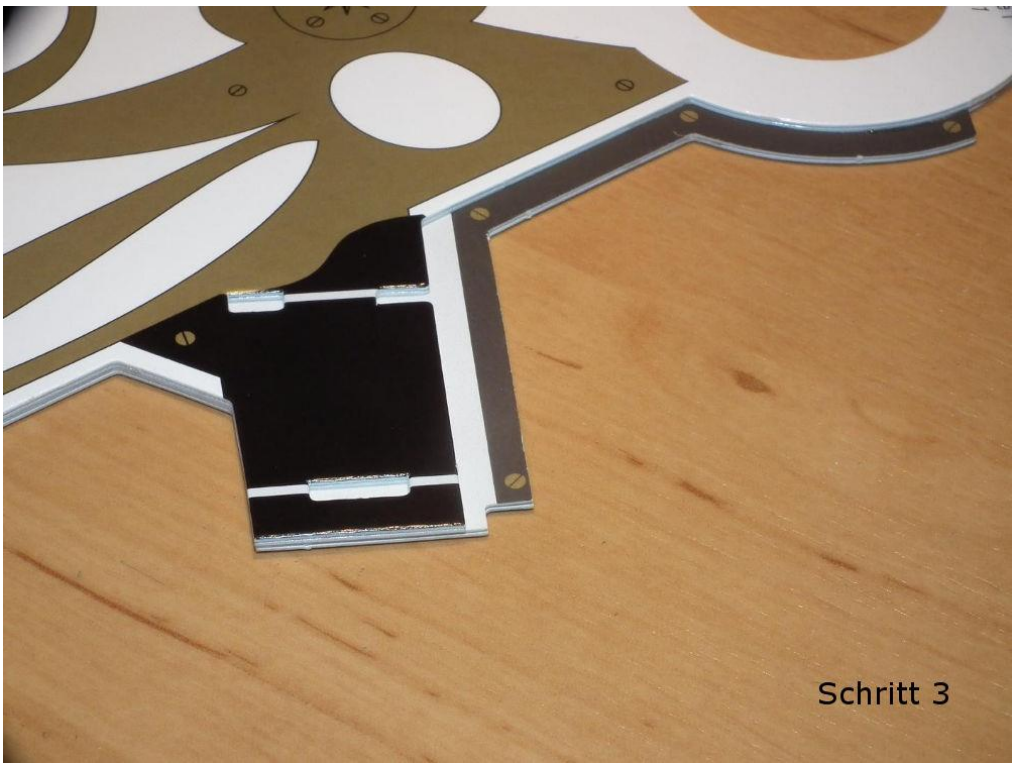
The front sides of the frame are glued according to **step 1**, the back sides are glued in step 2.



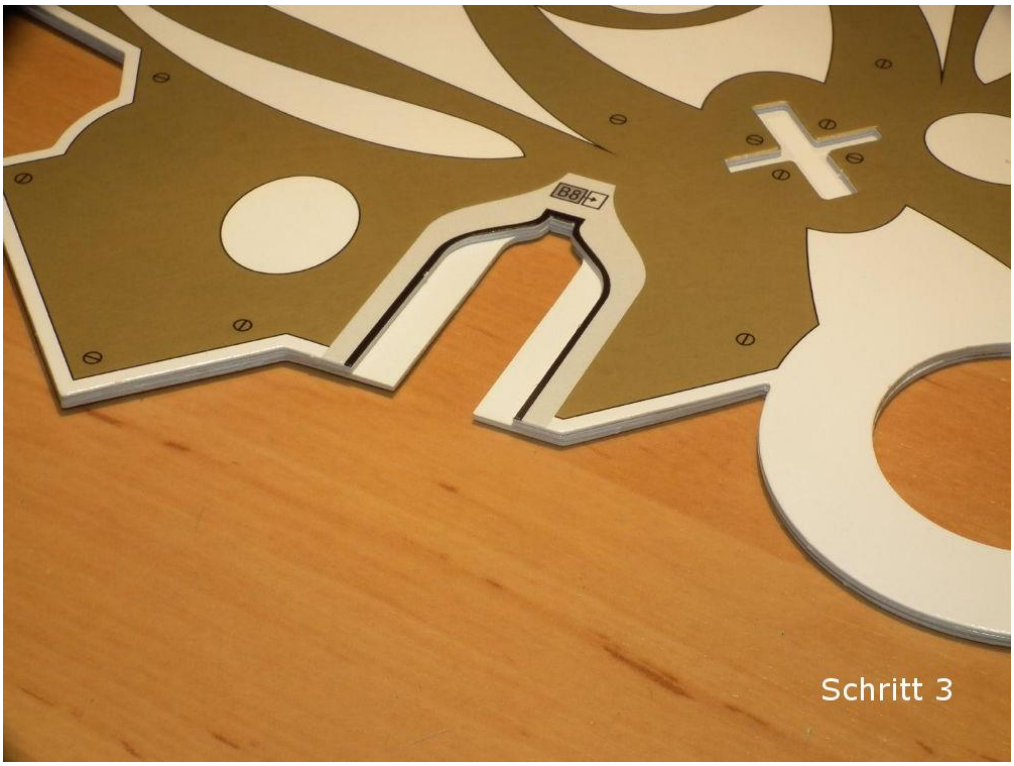
In **step 2** the frame backs are glued together. If glue leaks out when pressing them together, a toothpick and a piece of kitchen paper will help to remove it.

Step 2: The front and back of the frame, each consisting of two layers of cardboard.

After completing **step 3**, all four layers of cardboard of the frame are glued together.



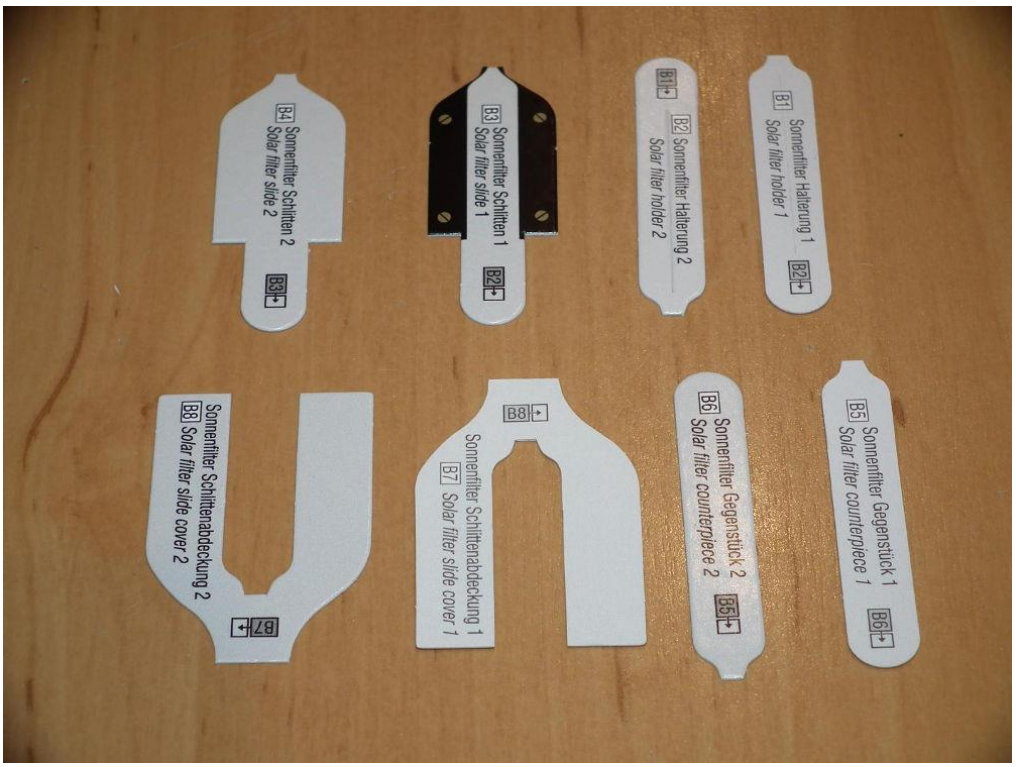
Step 3: The detailed view of the base for the bearing housing shows that the front and back sides of the frame are not congruent and where accordingly no adhesive may be applied.



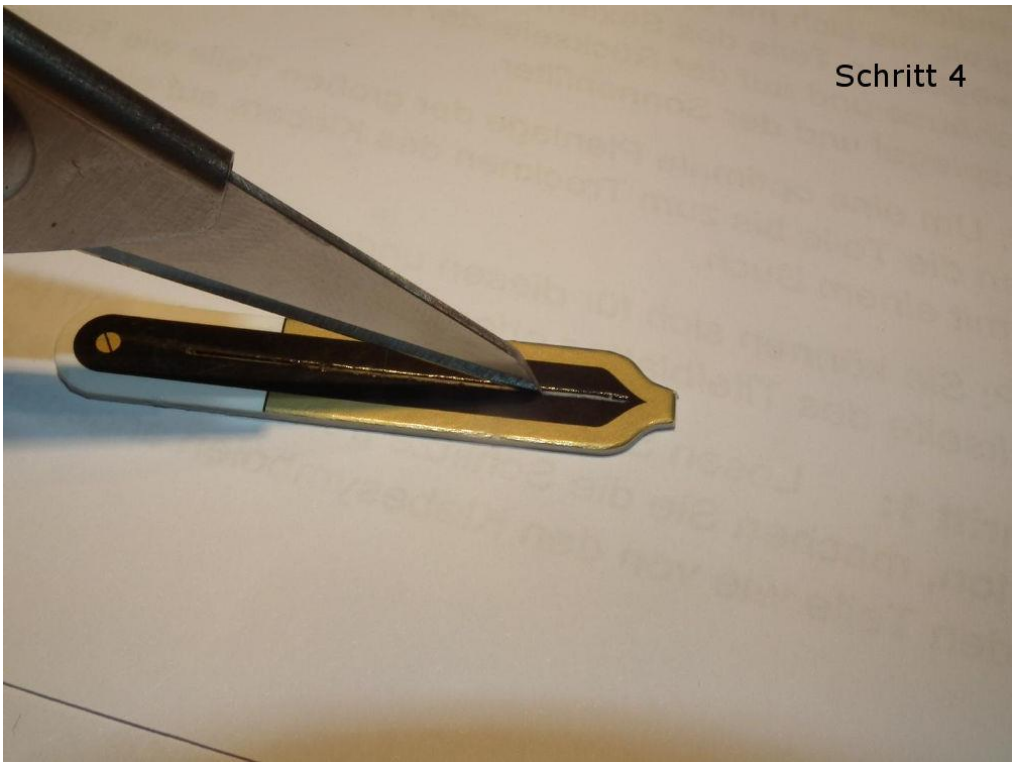
Step 3: The same can be seen when taking the picture for the solar filter.

Step 3: The frame should be pressed during the drying phase (preferably overnight) to prevent the parts from warping. A thick book, for example, is suitable for this purpose. A sheet of paper should be placed on the top and bottom of the frame to protect both the book and the backing from any glue that may escape from under the weight.

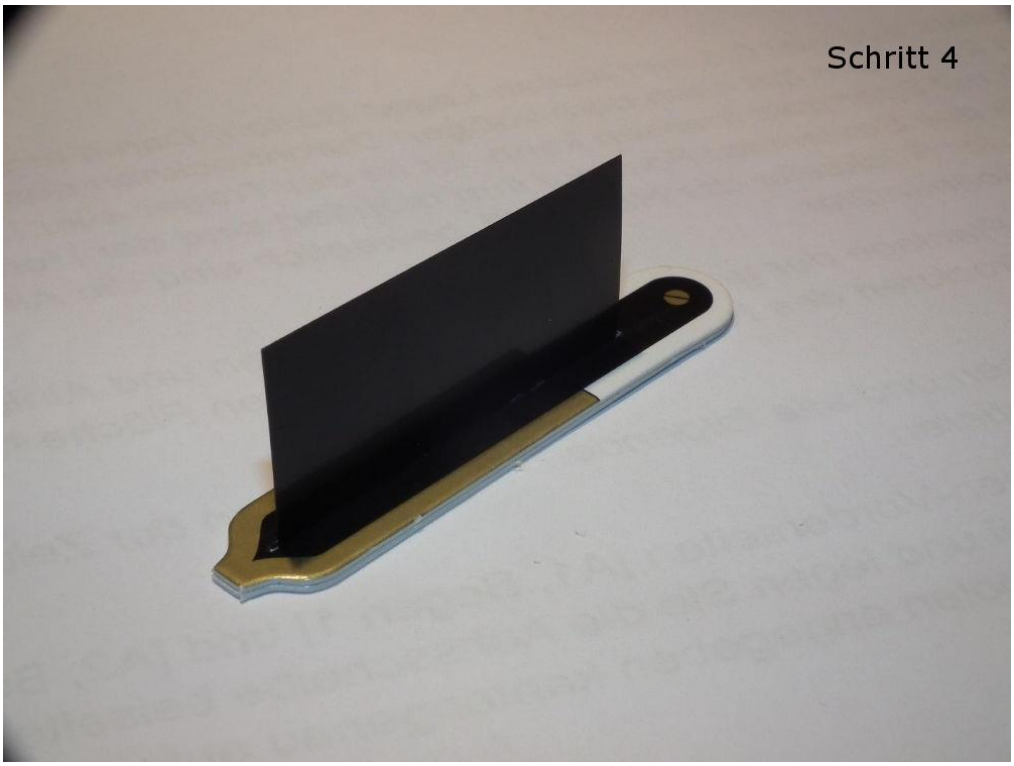
Instruction Part "B" - The Solar Filter



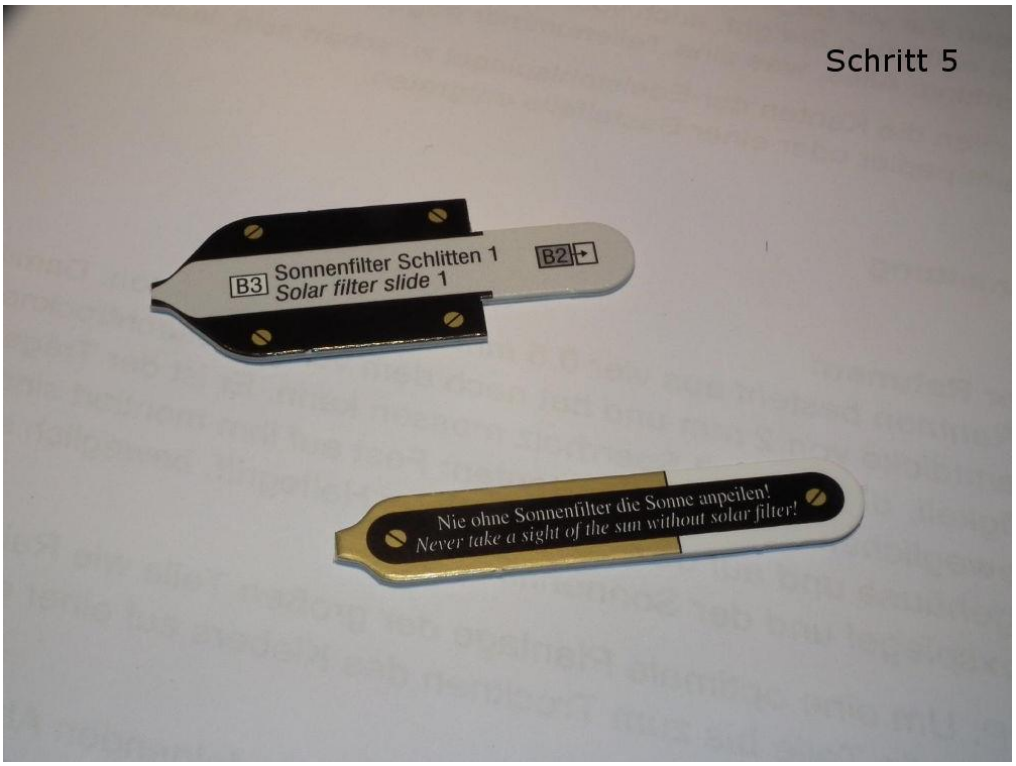
The eight parts needed for **steps 4-6** - In fact, two of them will be needed later.



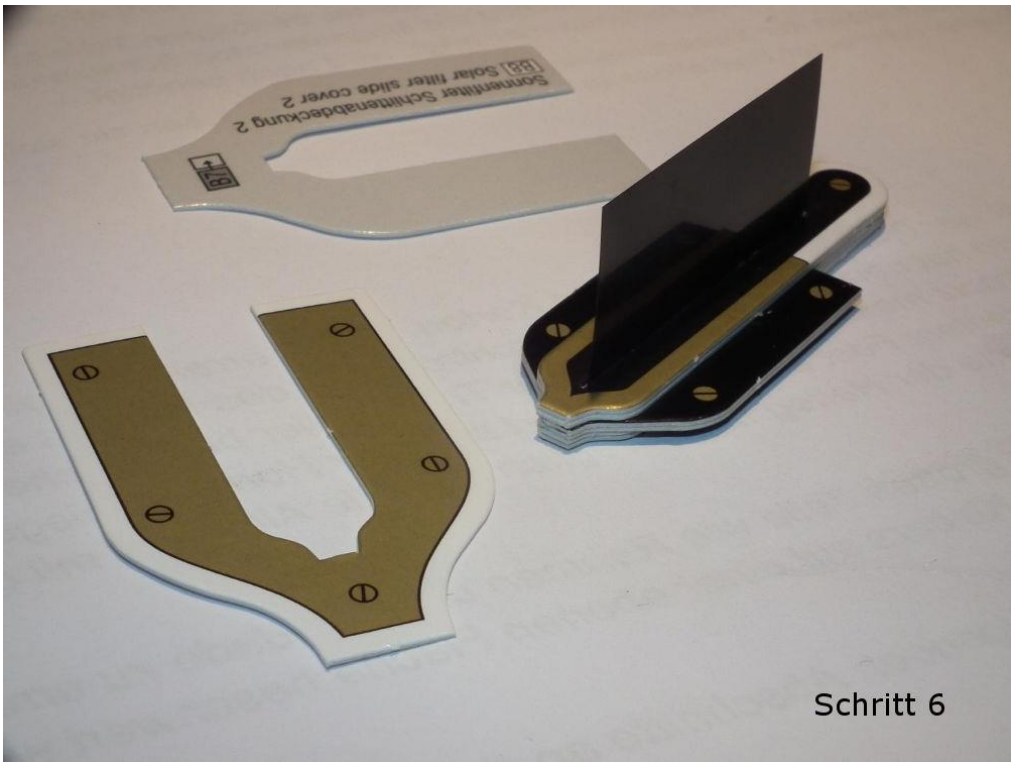
Attach the slot in the parts of the sun filter holder glued according to **step 4**.



Step 4: Filter foil glued in after fitting.

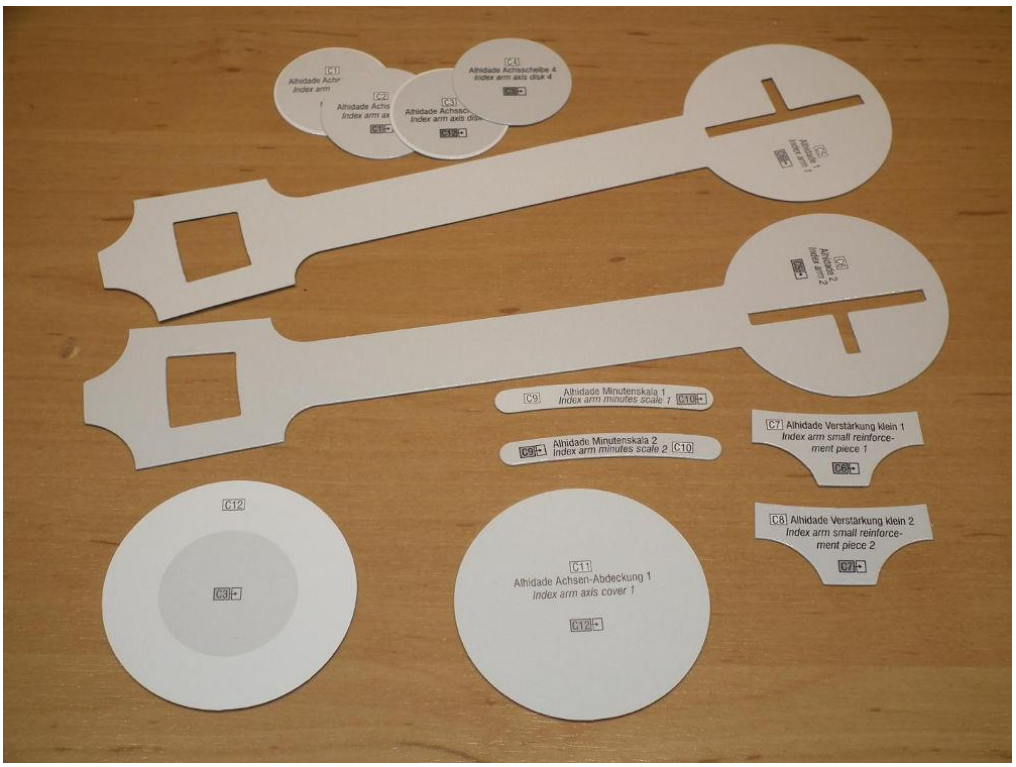


Sun filter sled and counterpart created according to **step 5**.



The sun filter completed according to **step 6**. The covers are only attached in part C, step 14.

Instruction Part "C" - The Alhidade

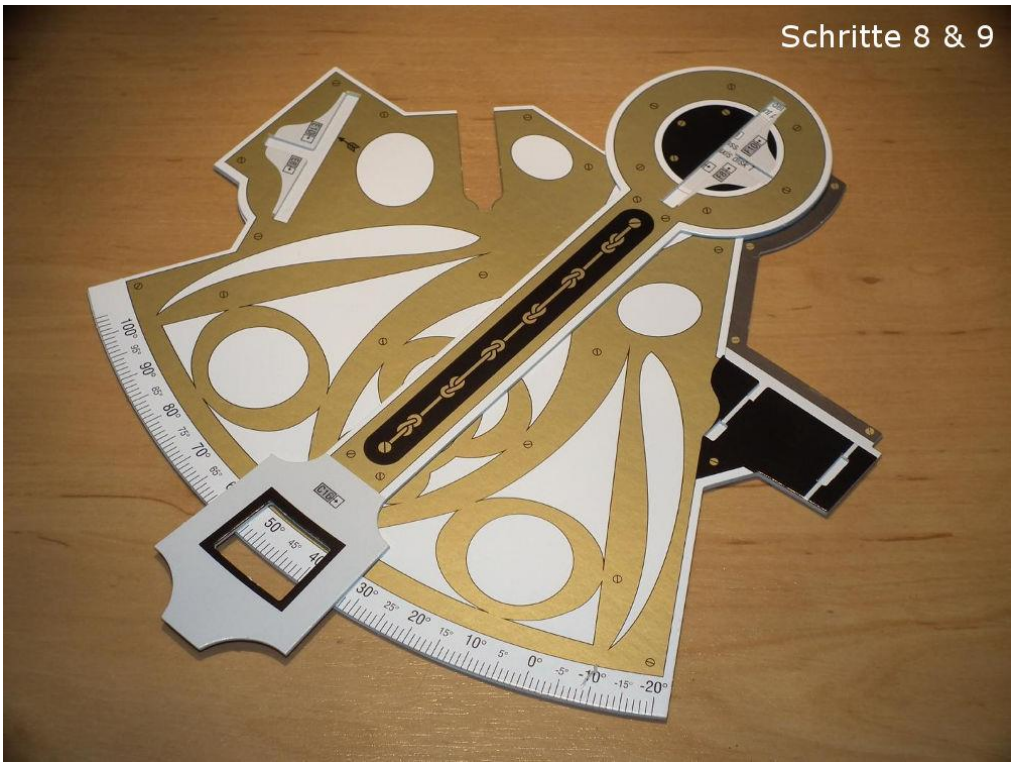


For **steps 7 to 14**, 12 parts are needed.

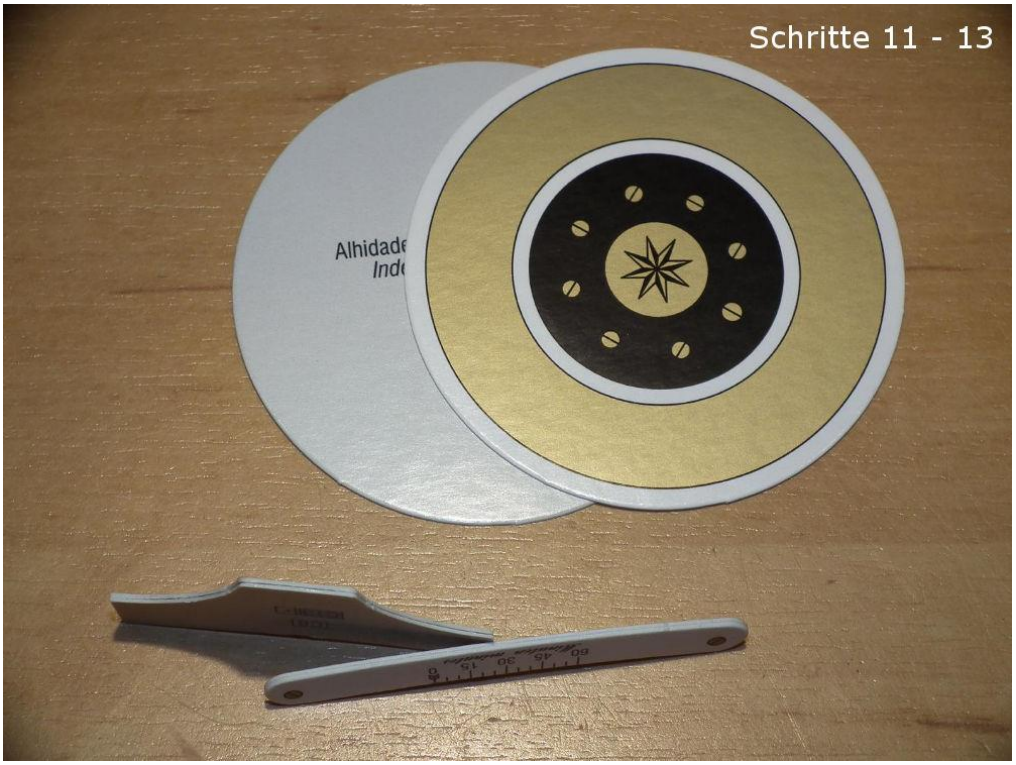
Step 7: The four axle discs glued together to form an axle.

Step 7: Adjusting the axle to the bearing diameter using a key file.

Step 7: Trying on the axle in the warehouse.



Steps 8 & 9: In step 8 the two parts of the alhidade are glued together, which are glued to the axle in step 9.

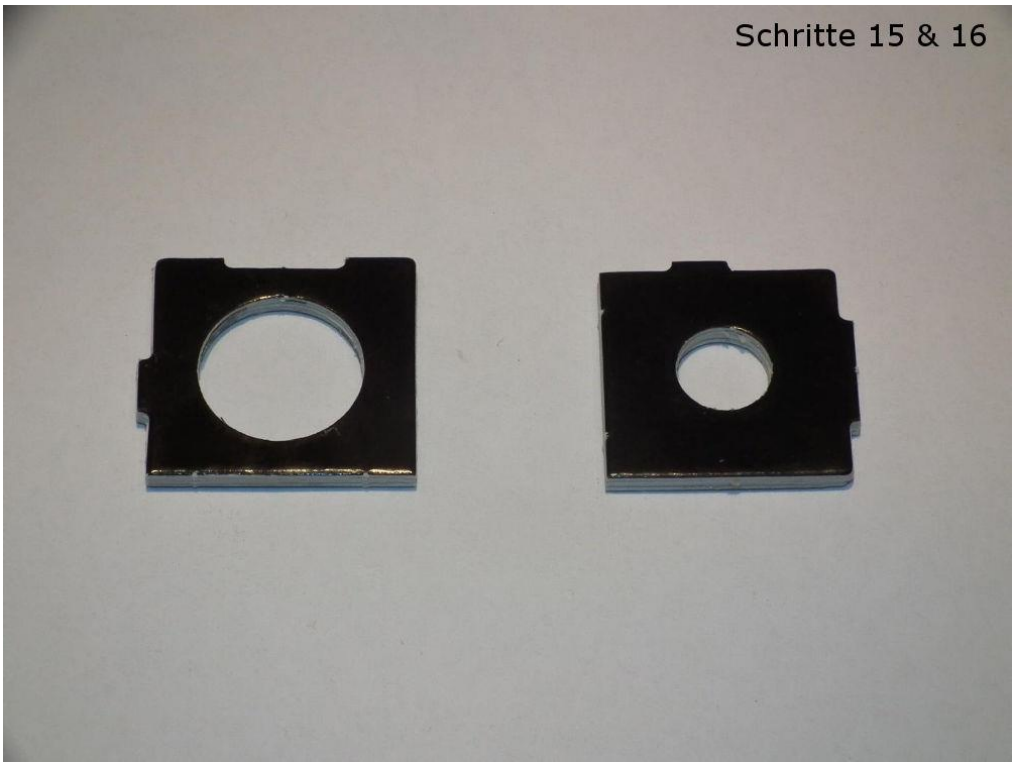


Steps 11 – 13: The parts of the axle cover still to be glued as well as the already made minute scale and the reinforcing part for the alhidade back.

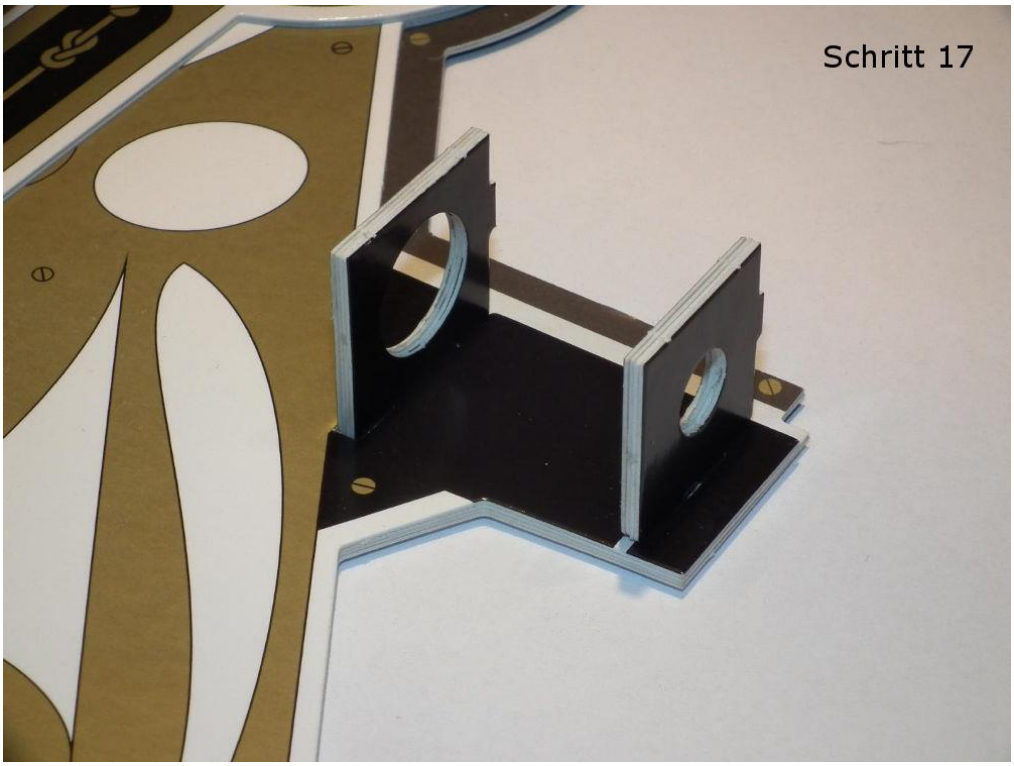
Step 14: Ready mounted guide of the sun filter slide.

Instruction Part "D" - The Bearing Housing

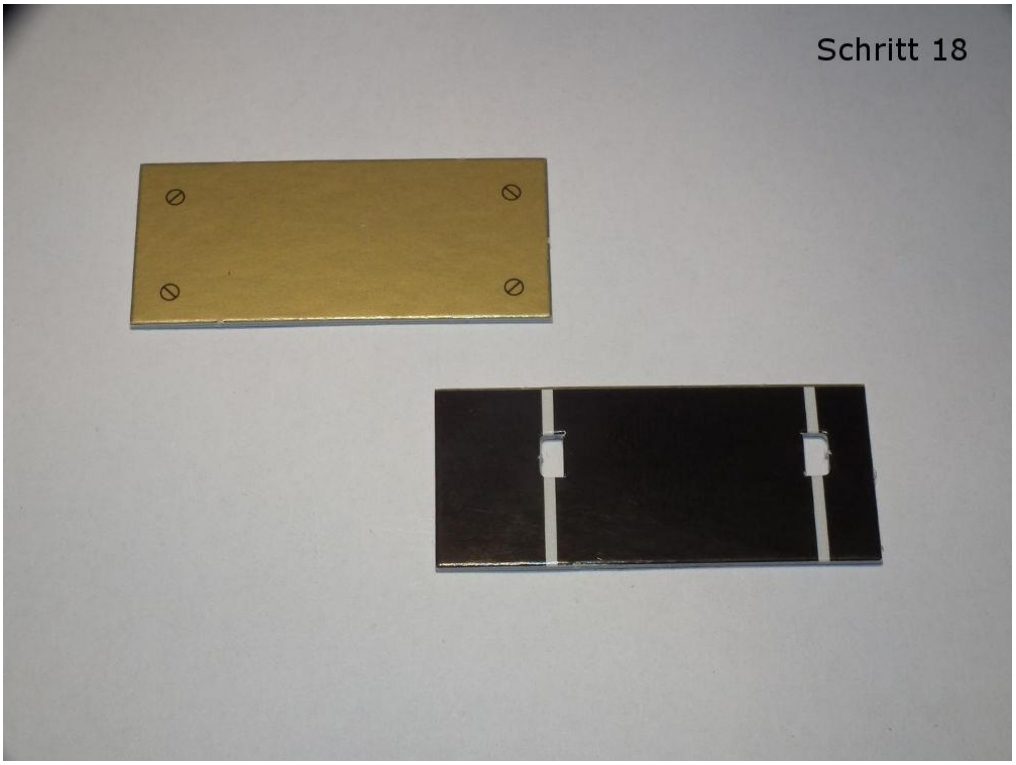
The 16 parts needed for **steps 15 to 19**.



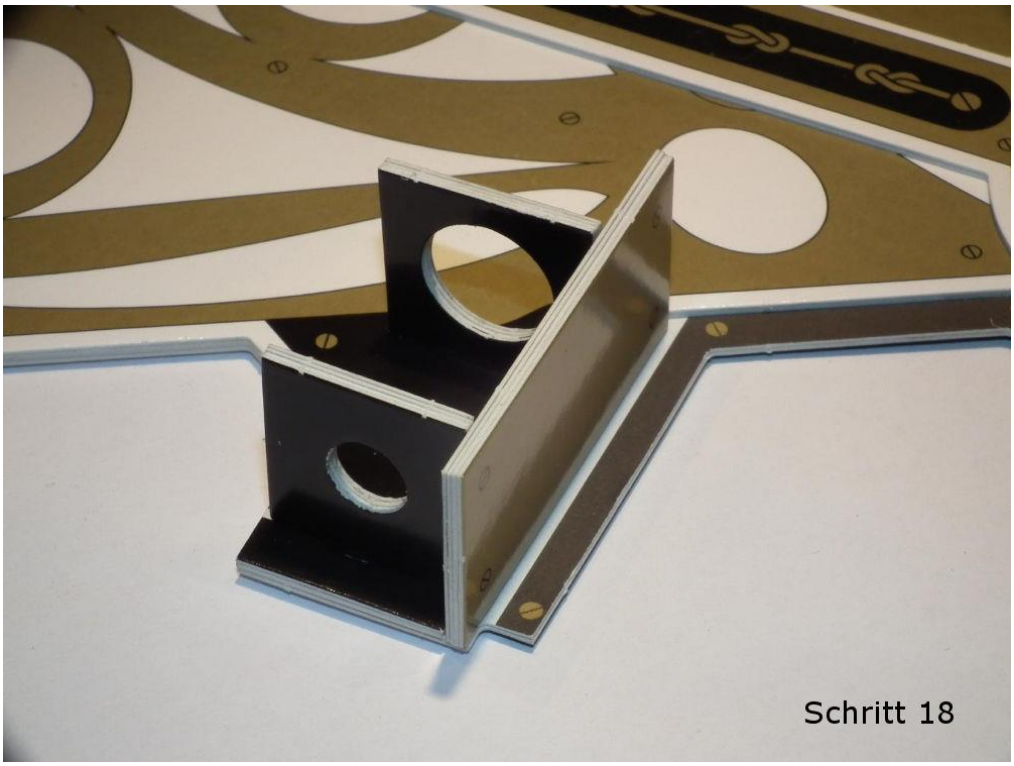
The front and rear windows of the DF housing consist of 4 parts each, which are glued according to **steps 15 and 16**.



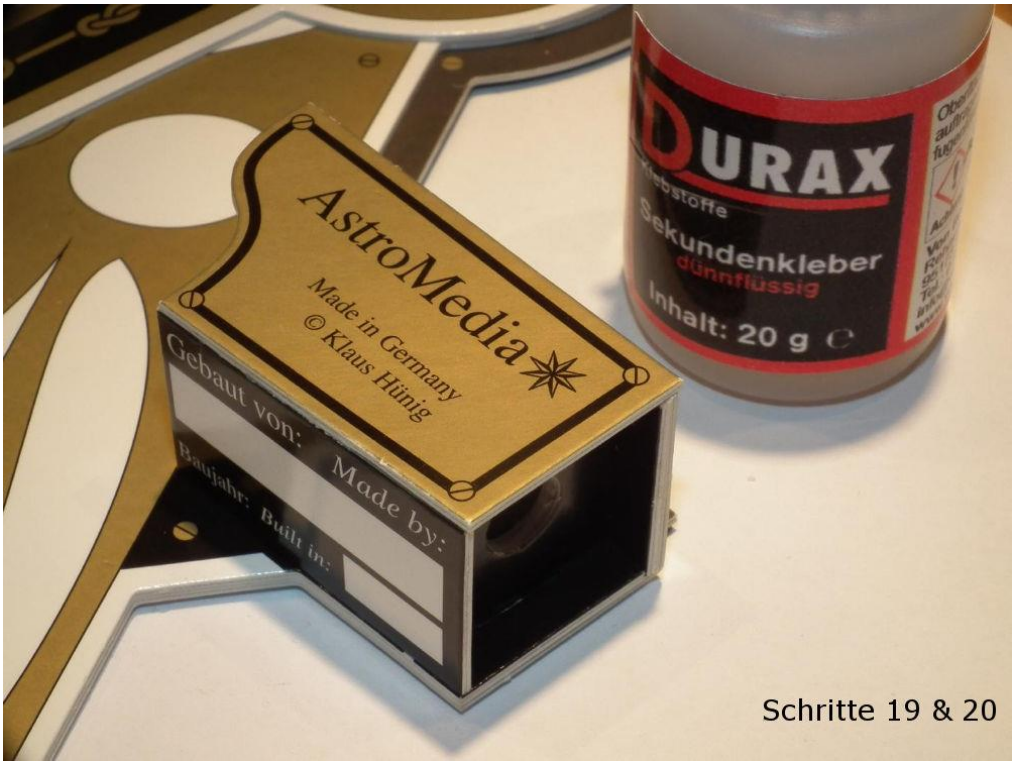
Step 17: Mounting the windows on the frame.



Step 18: The outside and inside of the top cover consist of two parts each.

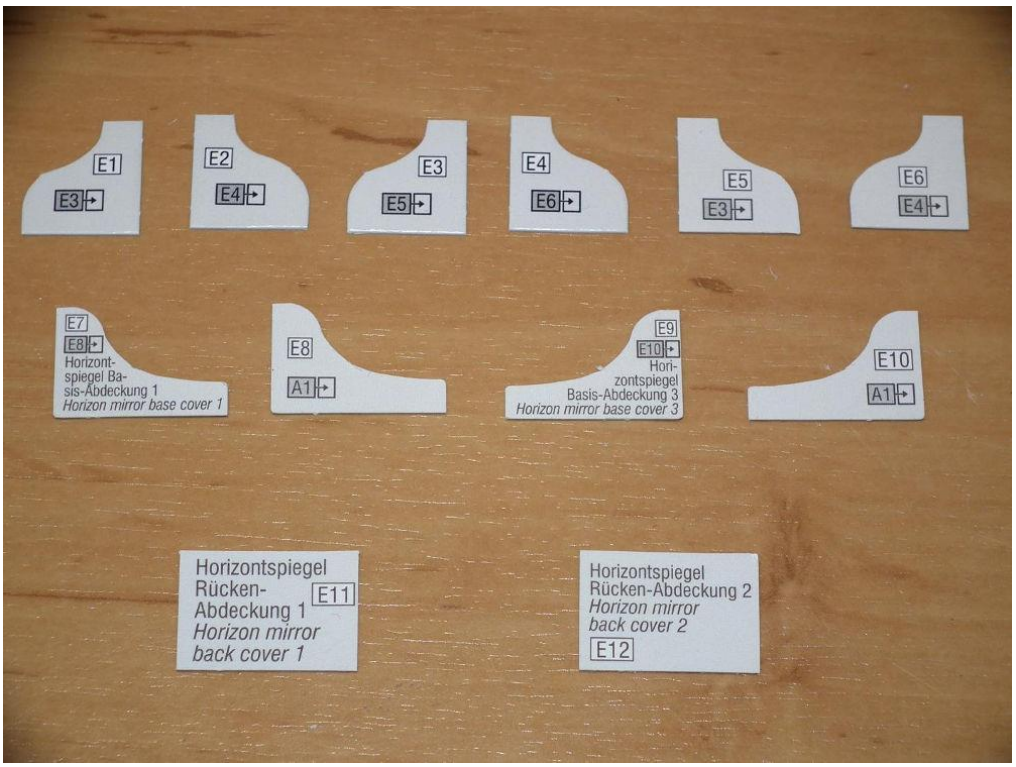


Step 18: Mounting the top cover.

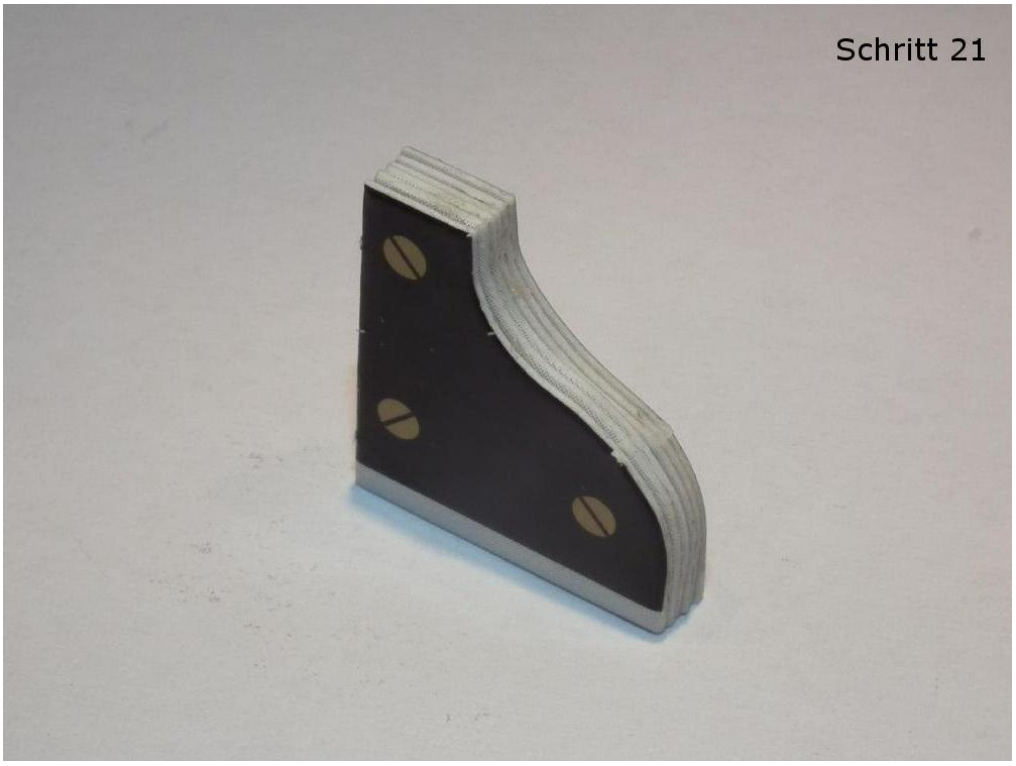


Steps 19 & 20: The finished bearing housing after mounting the base and the side cover. The housing was glued together with superglue to shorten the drying time. If you want to handwrite your name and the year of manufacture, you should do this before mounting the housing. Alternatively, printed stickers can be applied later (see step 38 below).

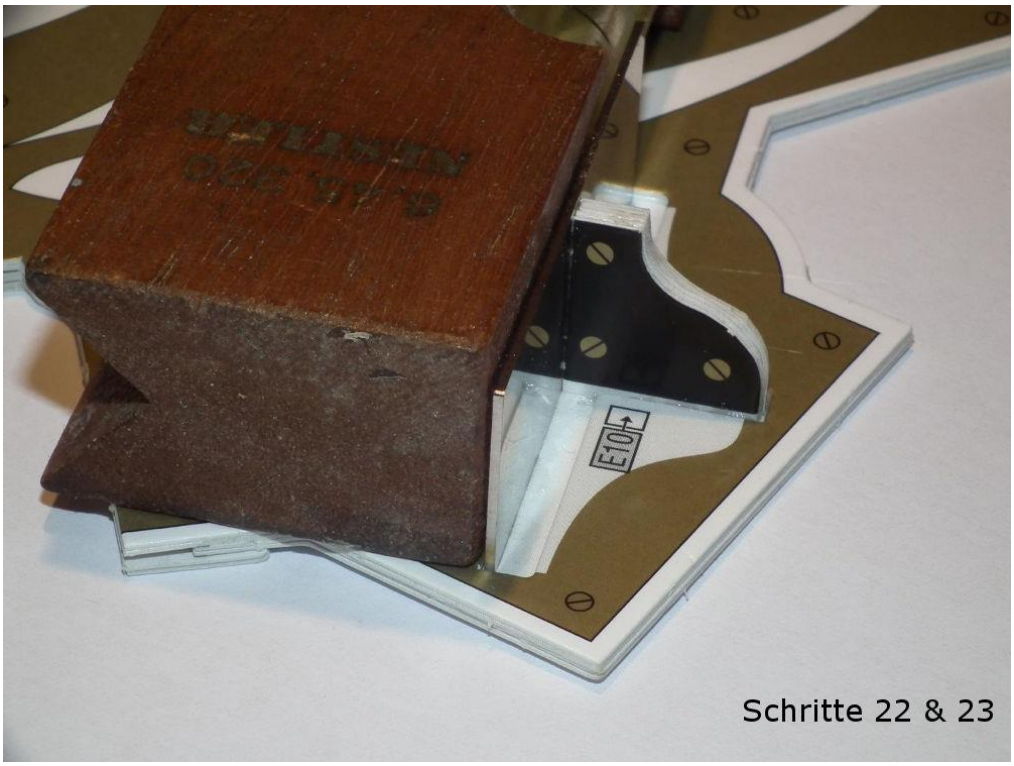
Instruction Part "E" - The Horizon Mirror



For **steps 21 to 25** you need 12 parts and a mirror.

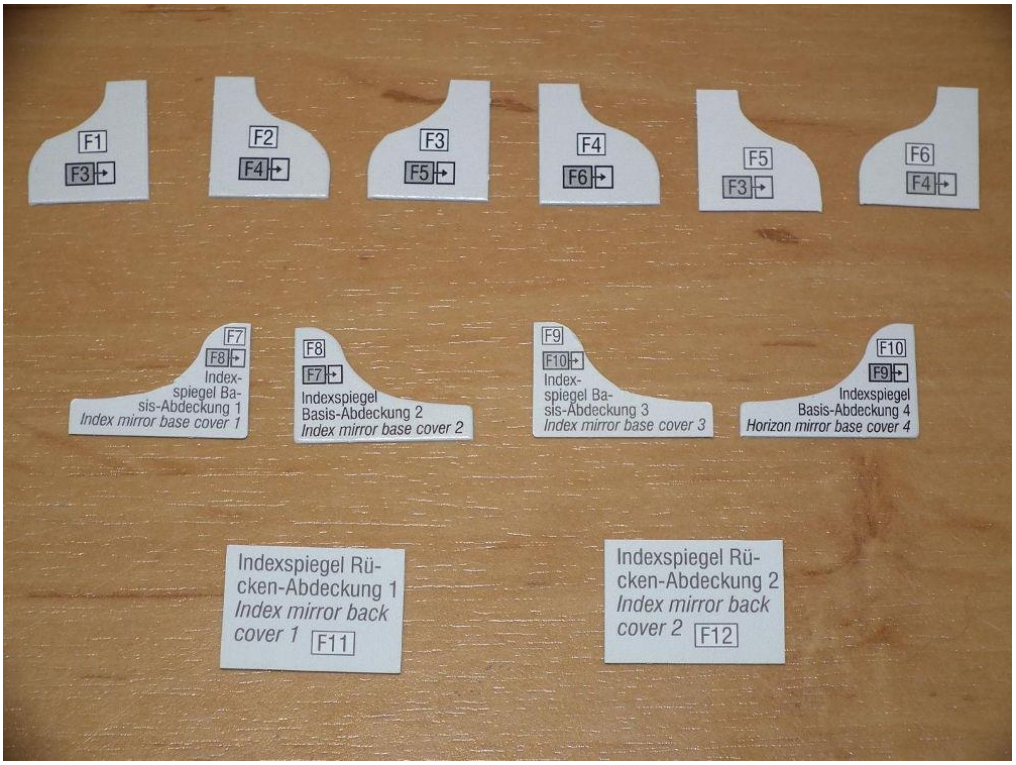


Step 21: The support of the horizon mirror consists of six parts.

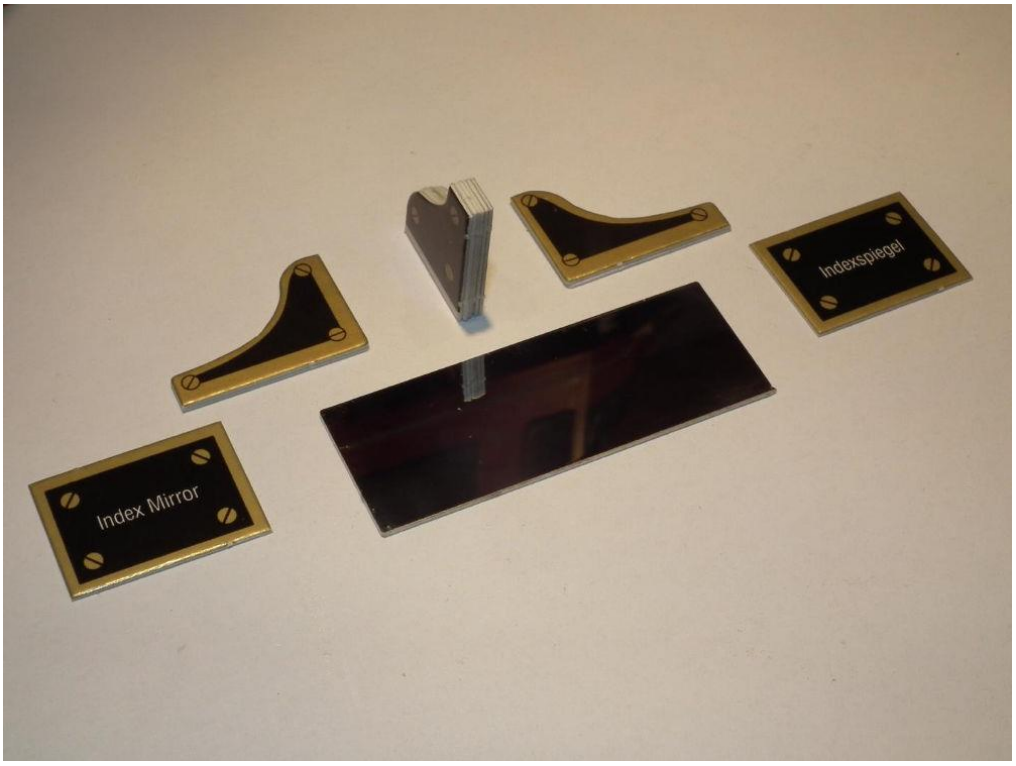


Assemble the mirror according to **steps 22 and 23** using a right-angled object. The base and back covers are mounted as shown in steps 29 and 30..

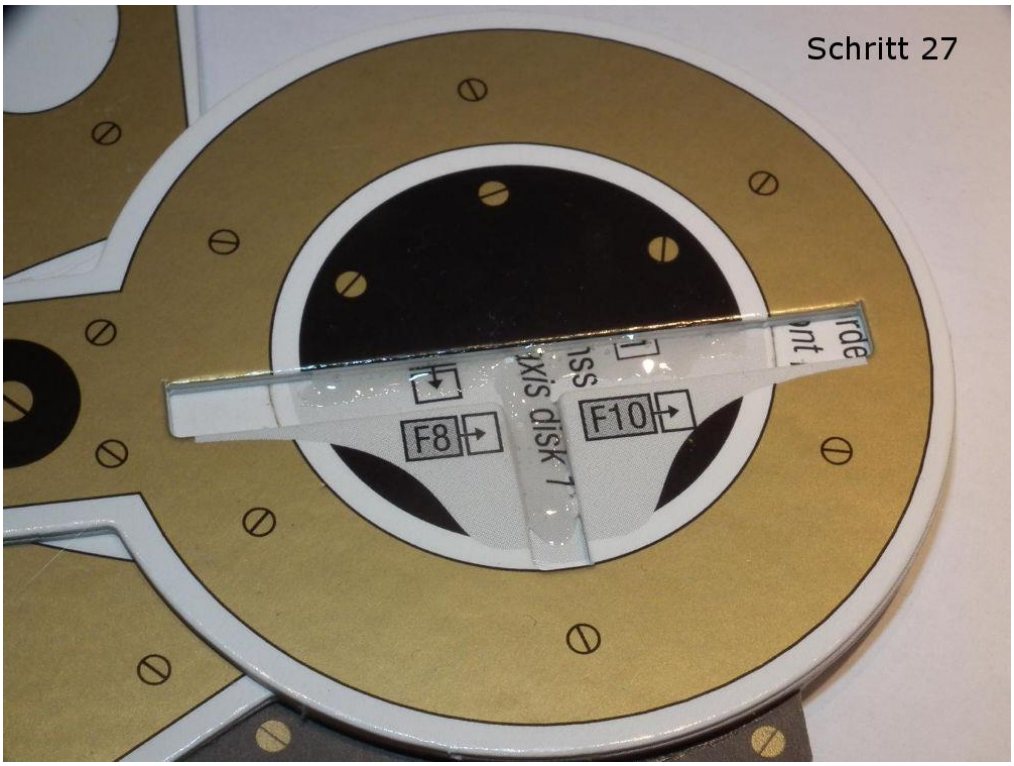
Instruction Part "F" - The Index Mirror



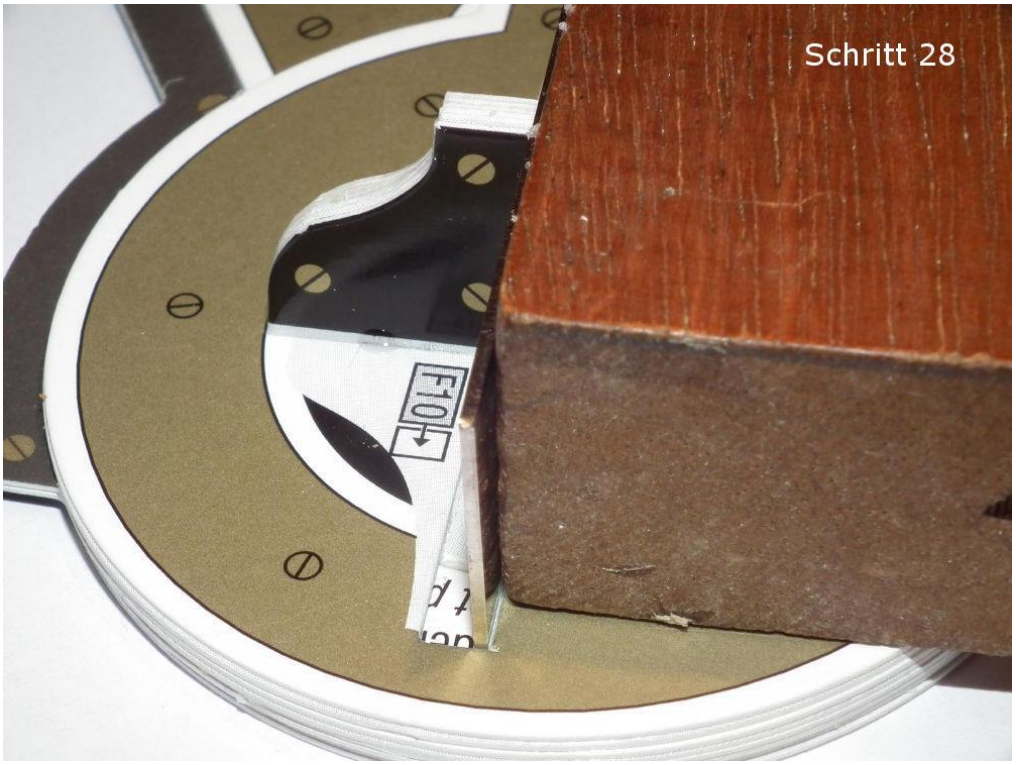
Steps 26 to 30 also require 12 parts and a mirror.



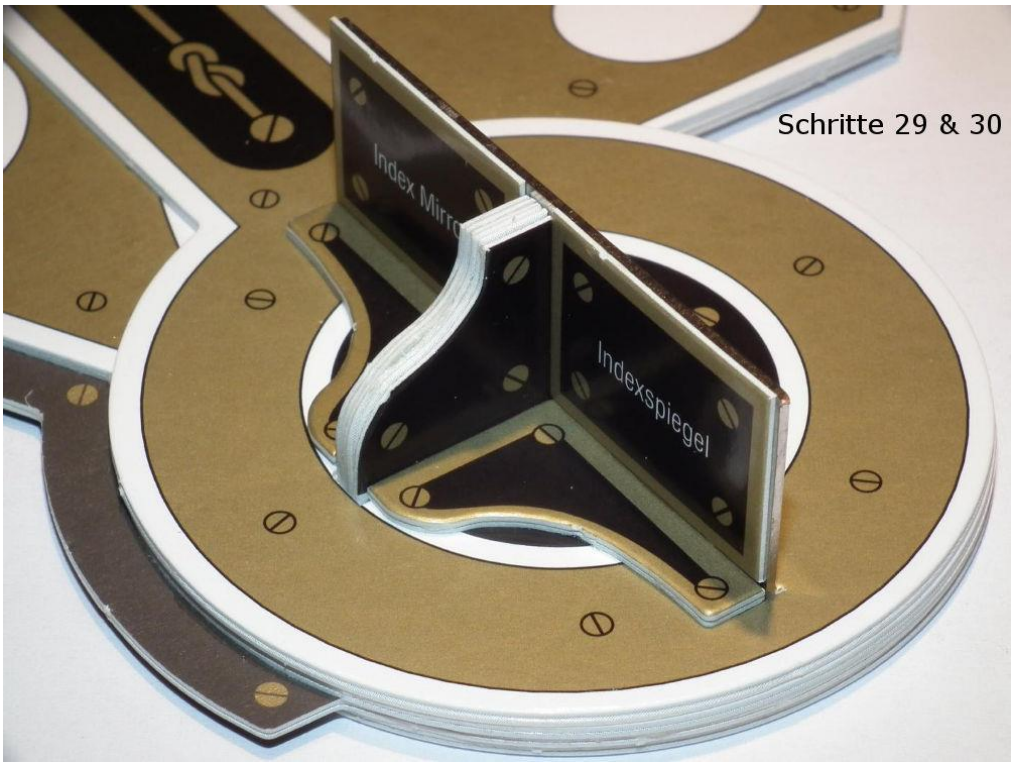
Prepare supports, side and rear covers for assembly according to steps 26 to 30.



Step 27: The gluing of the index mirror must only be done on the axis, otherwise the alhidade cannot be moved. A toothpick helps to place the glue appropriately.

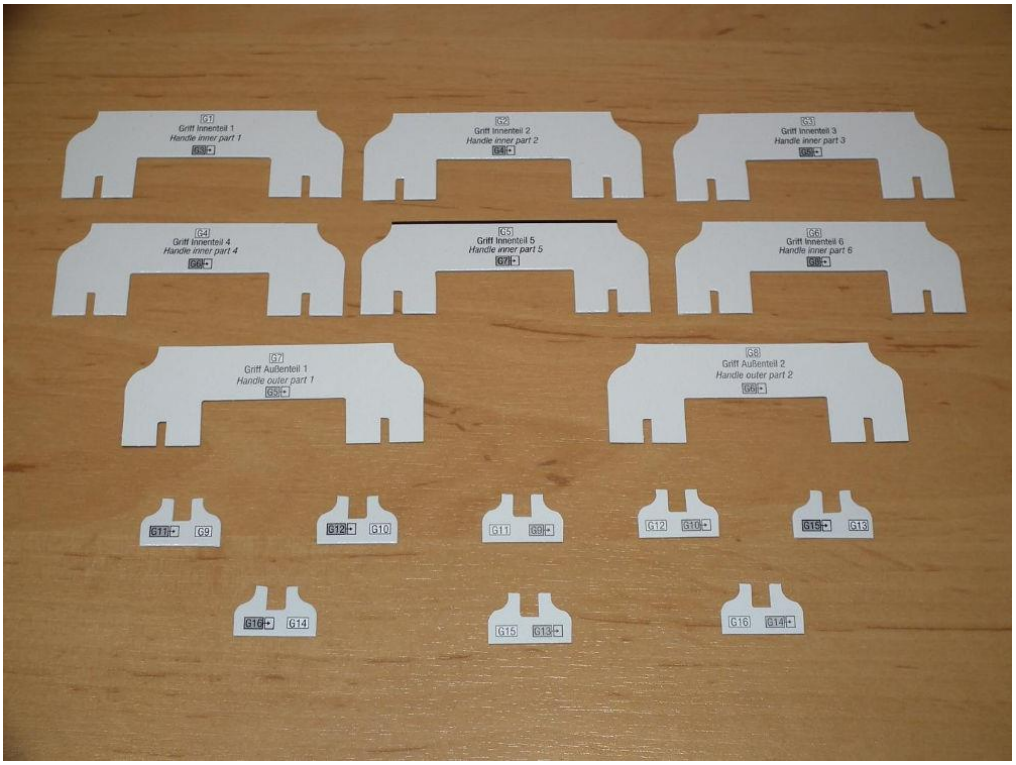


Step 28: Alignment of the index mirror.



In **steps 29 and 30**, the base and back covers of the index mirror are assembled.

Instruction Part "G" - The Handle

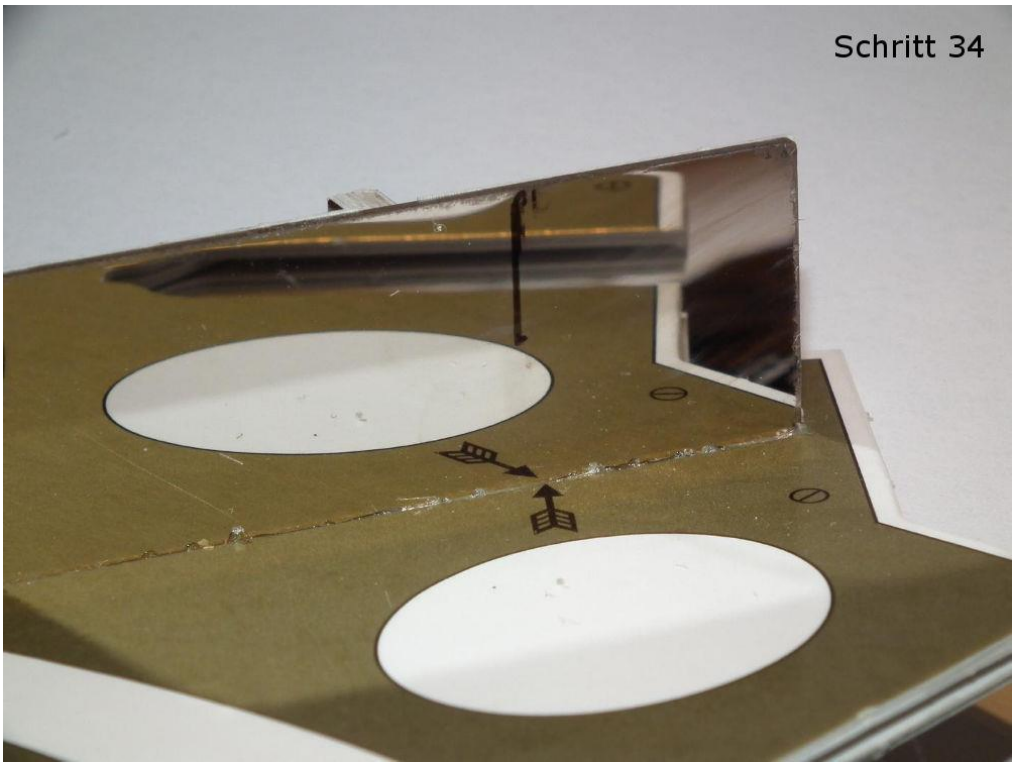


A total of 16 parts are used in **steps 31-33**.

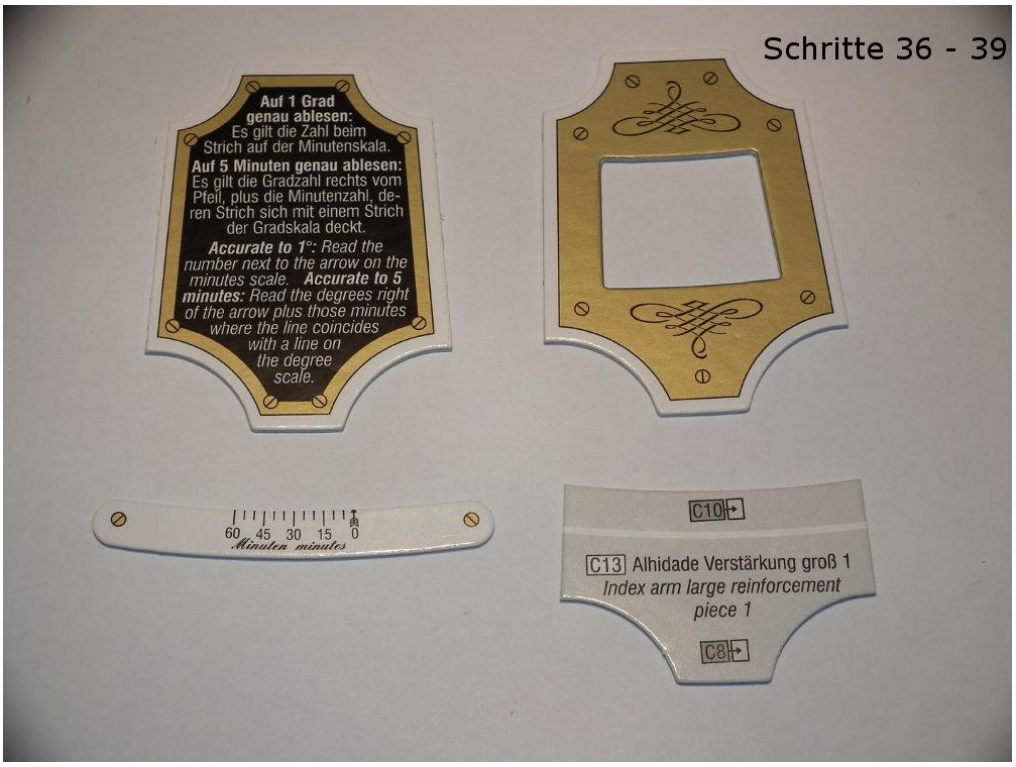
Steps 31 & 32: The handle, assembled from eight parts according to step 31, and the two supports, glued together from four parts each according to step 32.

Step 33: Mounting the handle on the back of the frame.

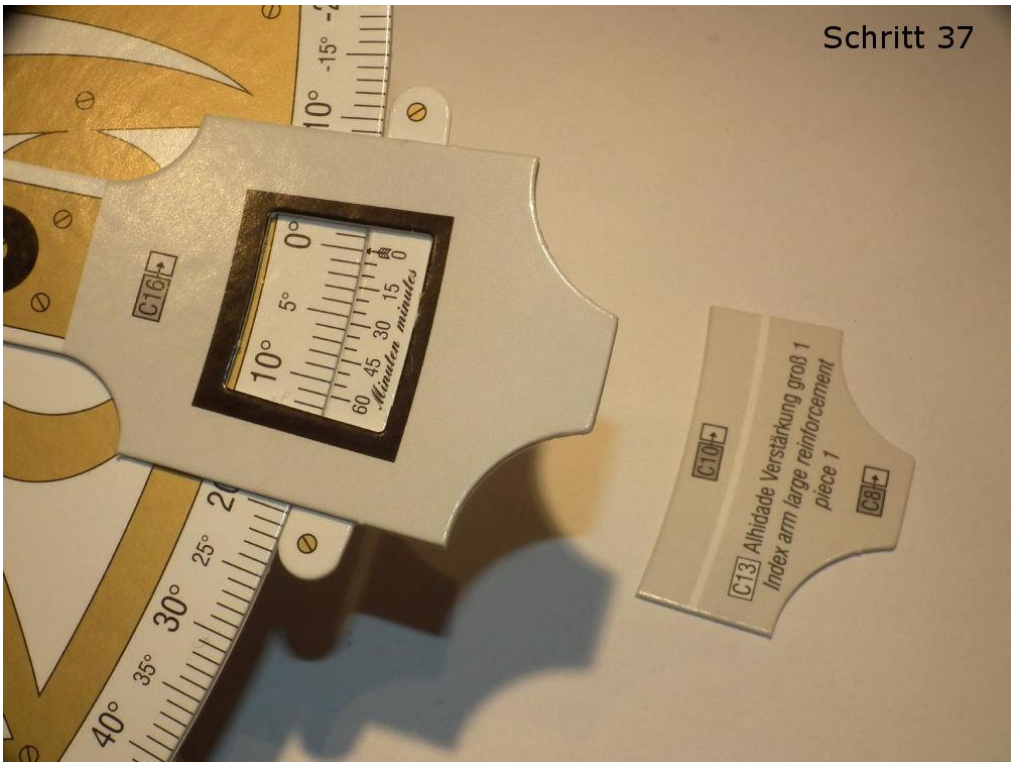
Instruction Part "H" - The Calibration of the Minute Scale



Step 34 describes the application of the marking line. Here the steel ruler shown above was used as an aid, which was placed with the long side perpendicular to the frame.



Minute scale and amplification (from section C) as well as reading window and alidade back (both consisting of two parts each) prepared for assembly according to **steps 36 to 39**.



Assemble the minute scale and the amplification as described in **steps 36 and 37**.

Step 38: The reading window is glued to the front of the foot of the Alhidade.

Printed stickers with the name of the builder (31x6mm) and the year of construction (11x4mm) can be affixed to the underside of the gauge housing. Open cardboard edges can be coloured in black or gold.

Step 39: Finally, the back of the Alhidade is glued to the back of the Alhidade foot, which allows the Alhidade to be guided on the frame.

An amazingly simple and therefore ingenious construction, which makes it possible to measure angles (e.g. for positioning), distances and heights even in case of power or electronic failure....