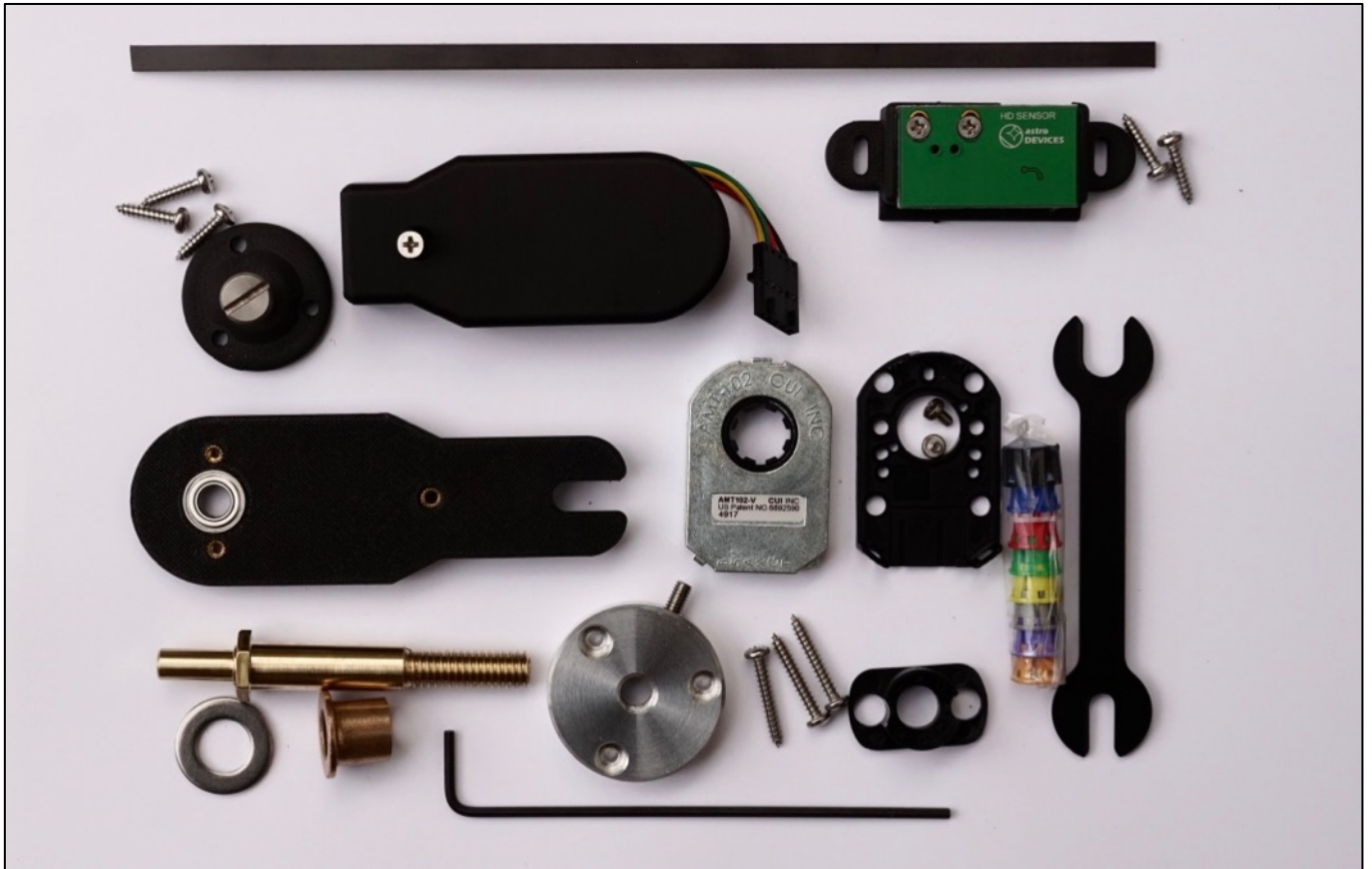


# GSO Dobsonian Telescopes: Encoders Installation

Please make sure that you have all the parts included in the kit:



## Specifications:

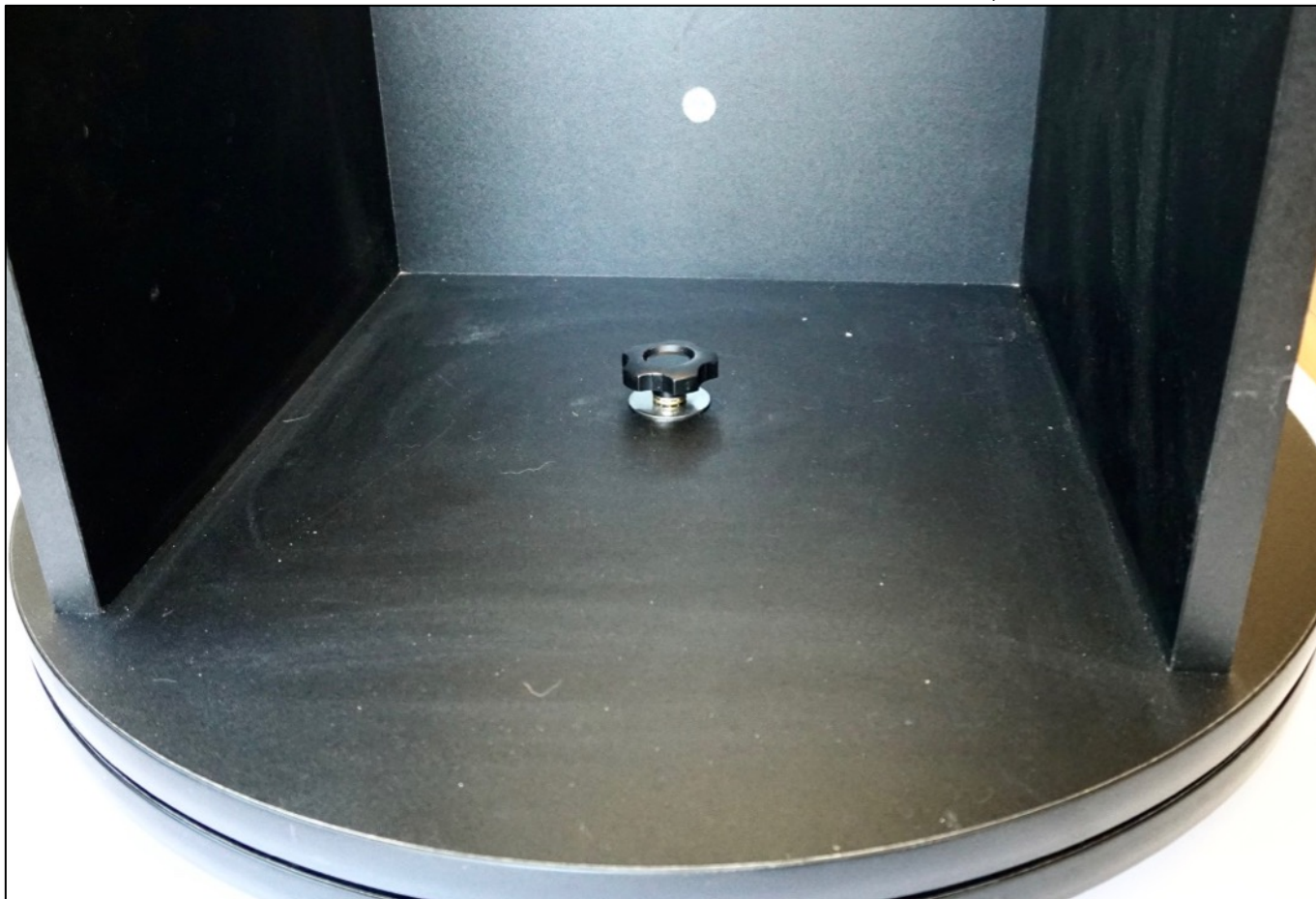
Azimuth Encoder resolution: **8192** steps per revolution

Altitude Encoder resolution: **716000** steps per revolution

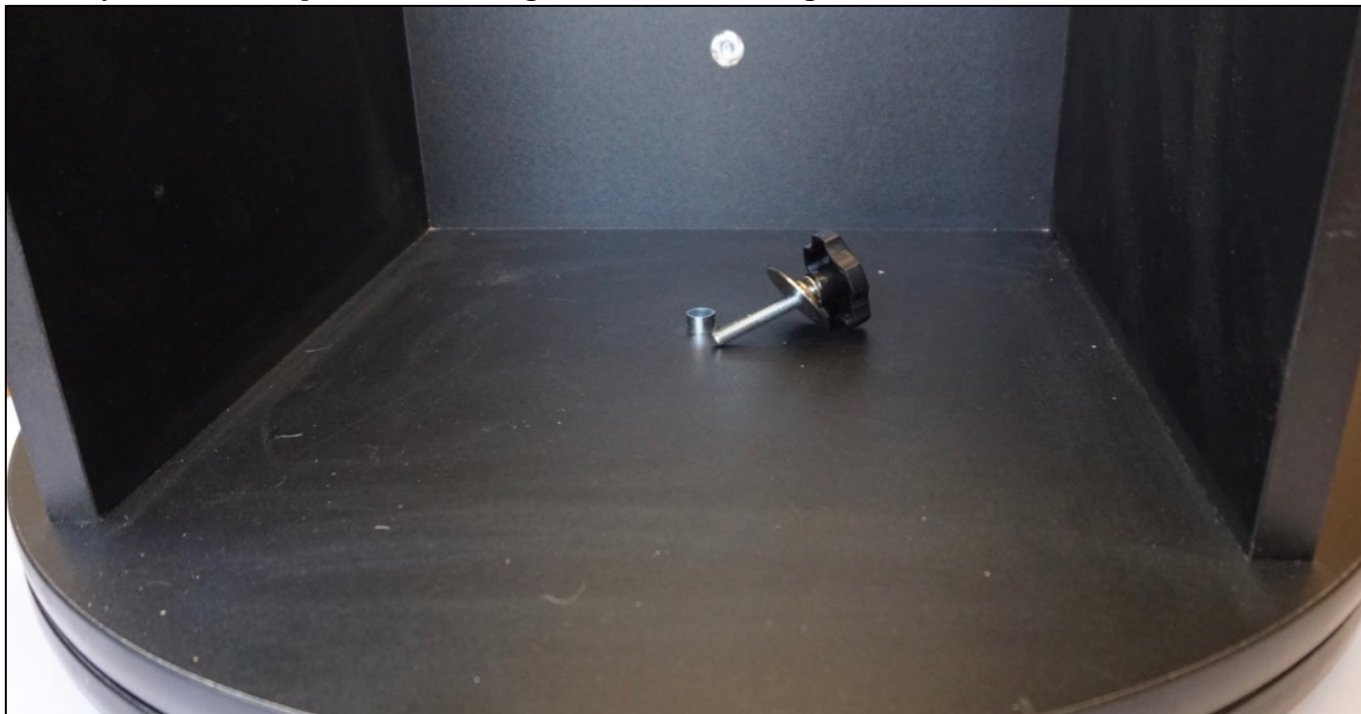
Current consumption: 10mA – Azimuth encoder, 20mA – Altitude encoder

## Azimuth encoder installation

Please remove the OTA from the base. Then remove the azimuth tension adjustment knob.



You will see a metal insert. You can either keep it or you can remove it and replace it with the bushing supplied. Please note that the bushing supplied is either plastic or a brass bushing. In case you want to replace the bushing start with removing the metal insert:





Then insert the bushing provided and push it into the hole. You need the washer and the pivot bolt:



Put the washer on the bushing:



And insert the pivot bolt making sure that you screw it into the threaded insert in the ground board:



Now put the base on its feet and use a ½” spanner (or 13mm) or an adjustable wrench to adjust the tension so the telescope does not rotate freely (as you will not be able to adjust the tension due to the lack of the knob):



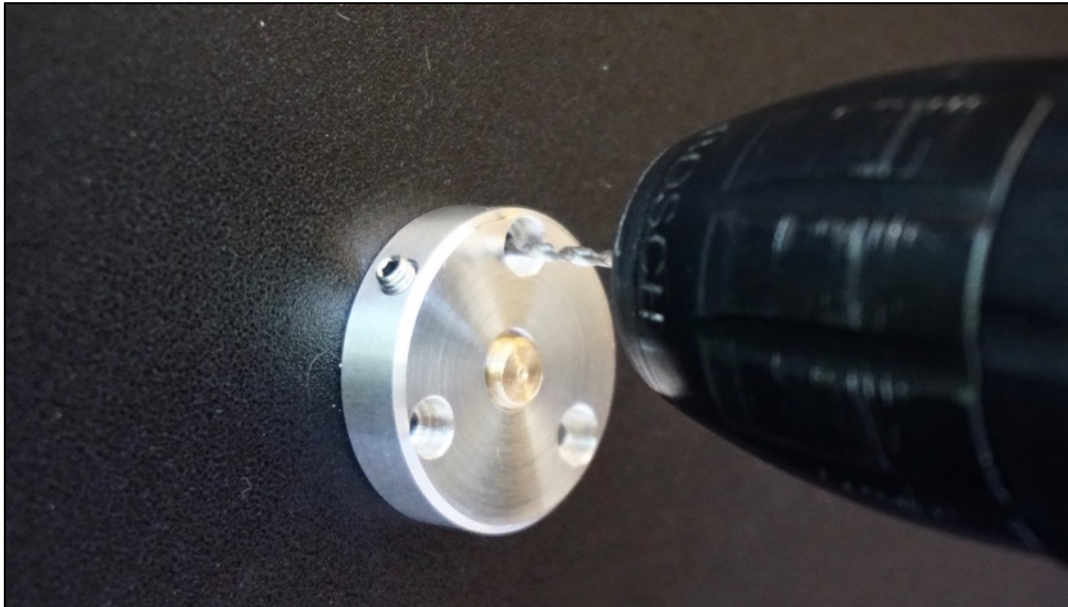
Now turn the base around or put the whole base on a side:



Now thread the plate onto the pivot bolt until the plate cannot be rotated:

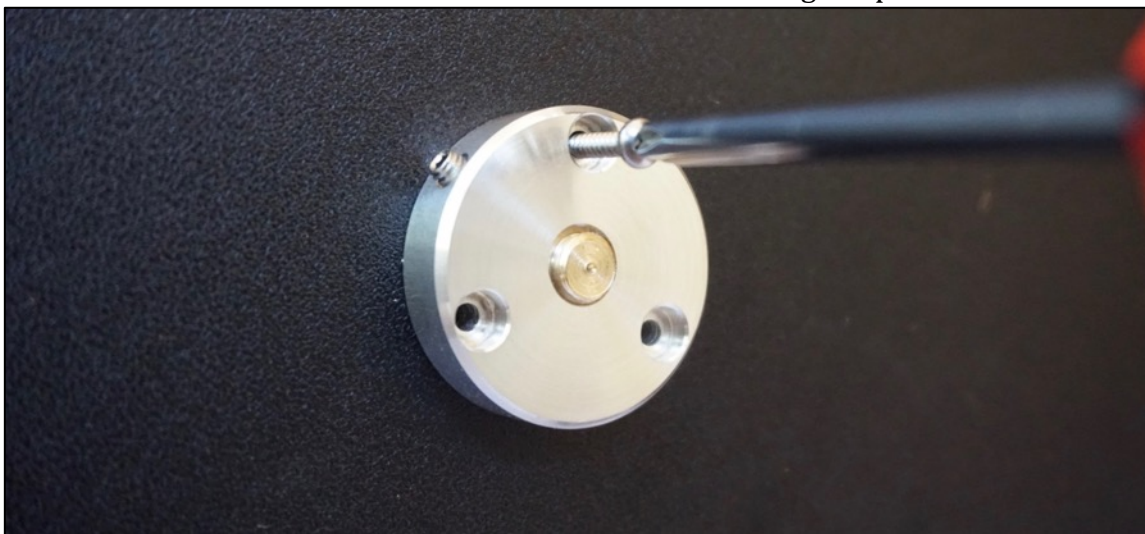


Now you need to drill a small hole using a 2mm or so drill bit:

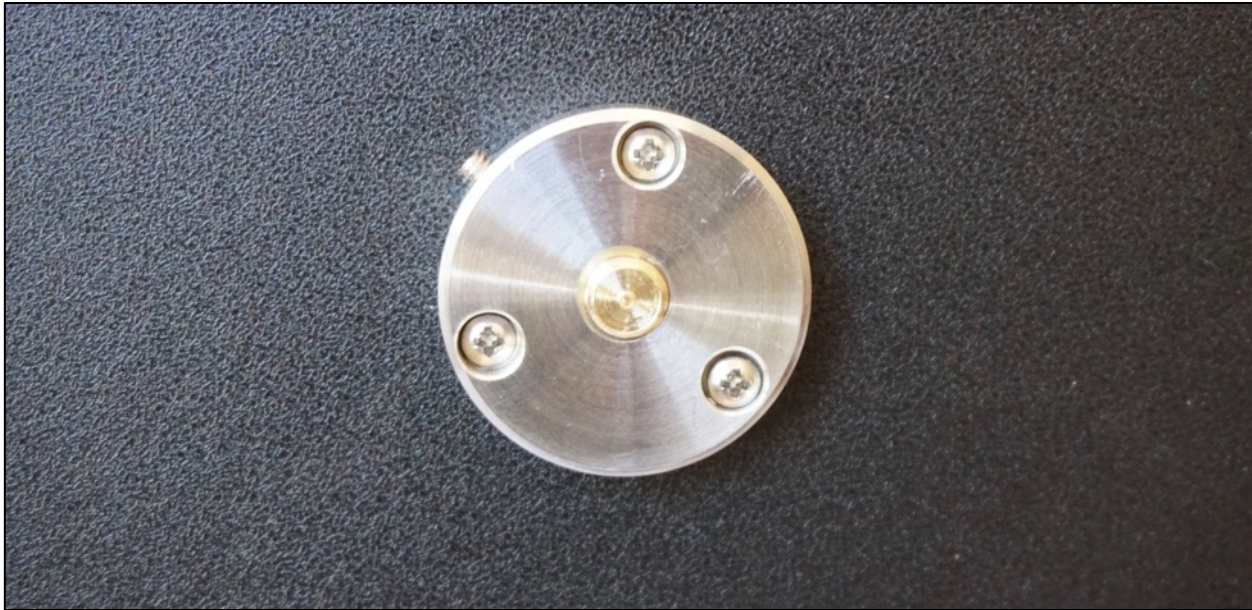


Drill three holes – for each screw.

You now need a screwdriver and three screws for mounting the plate:



Use the screwdriver to fix the plate in place and then tighten the set screw using the supplied Allen key:



Now you need the encoder tangent arm:



Put the tangent arm on the pivot bolt:



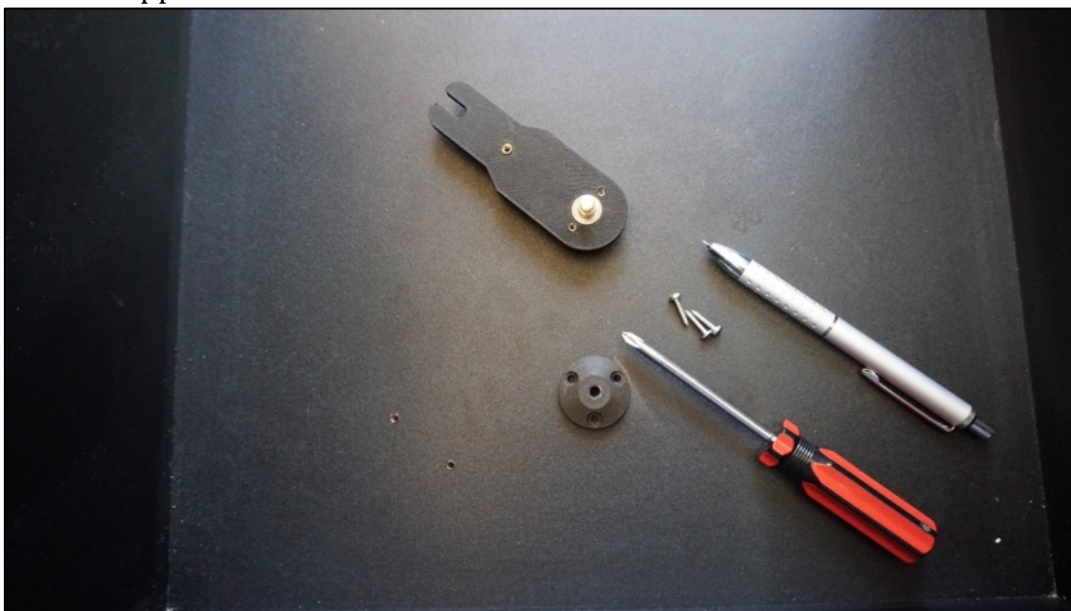
You will need to install the anchor bolt:



Mark the position with a pencil:



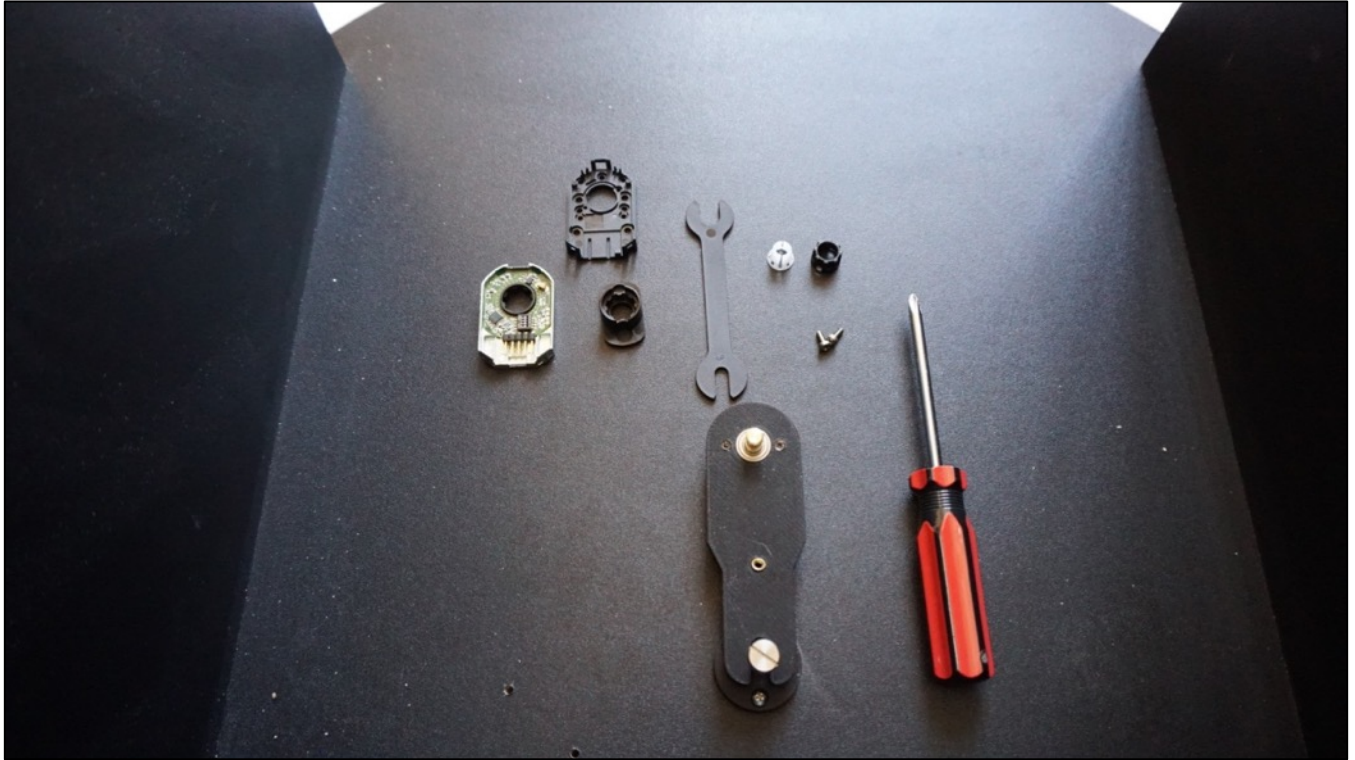
Use the supplied screws to install the base of the anchor bolt:







You will need the following parts for the next step:



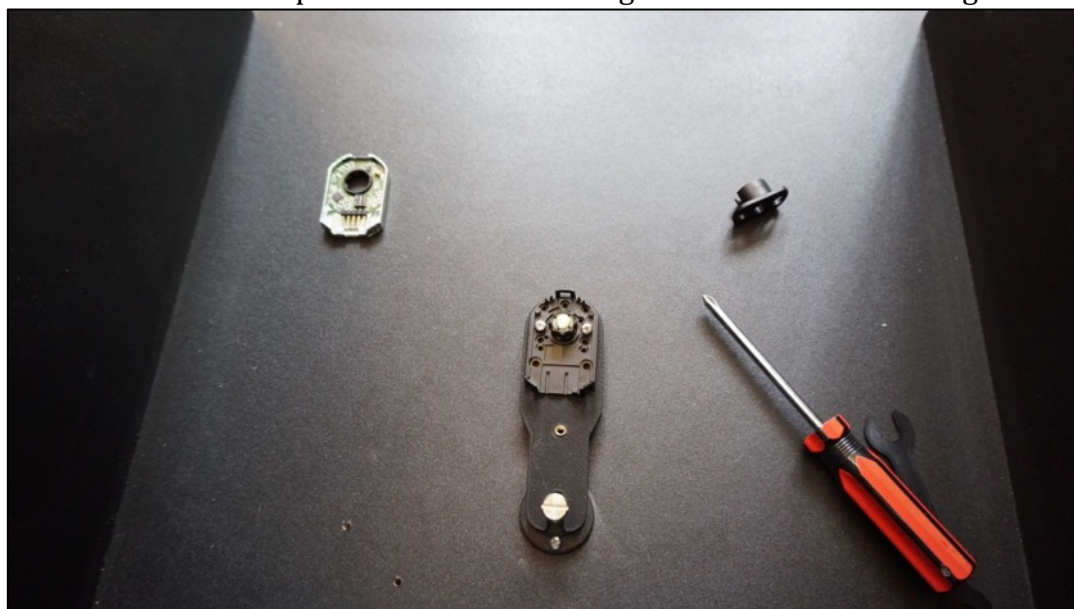
Use the spacer to slide the white shaft adapter:



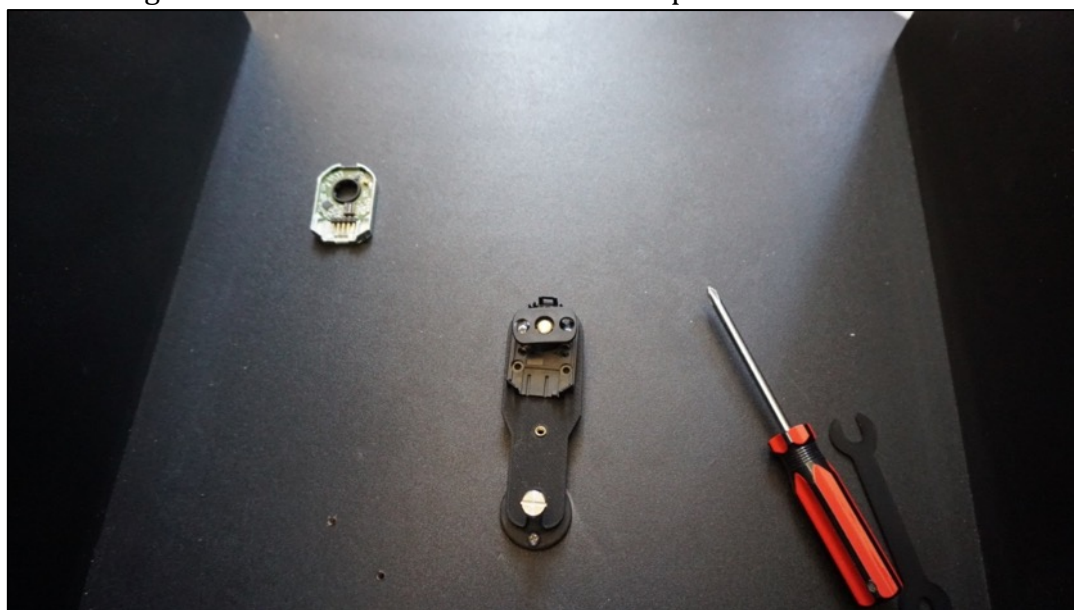
Install the black shaft adapter over the white adapter:



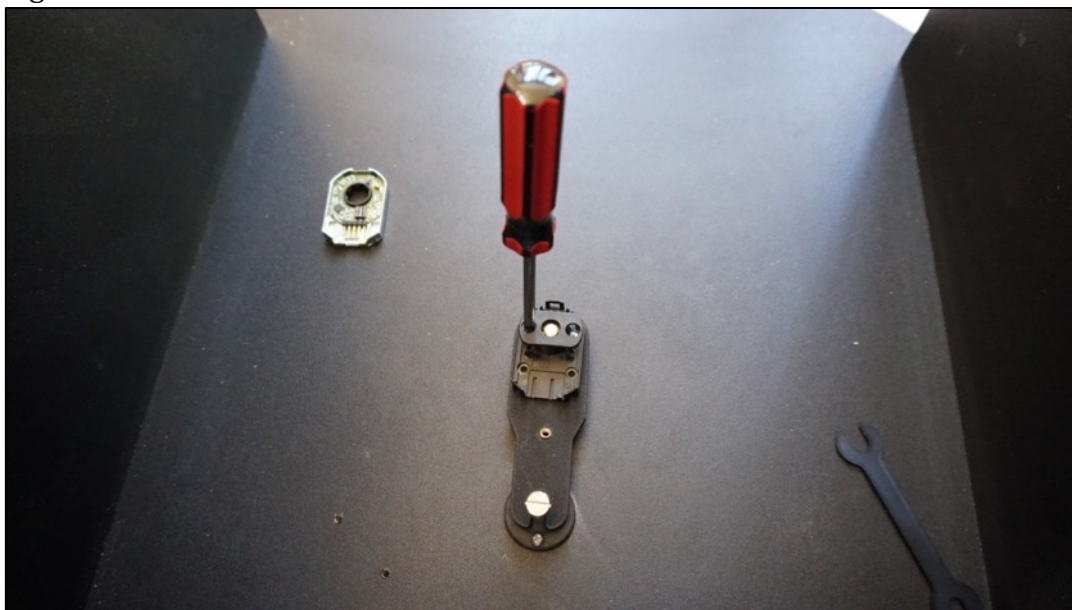
Put the encoder base plate and start threading the screws but do not tighten them yet:



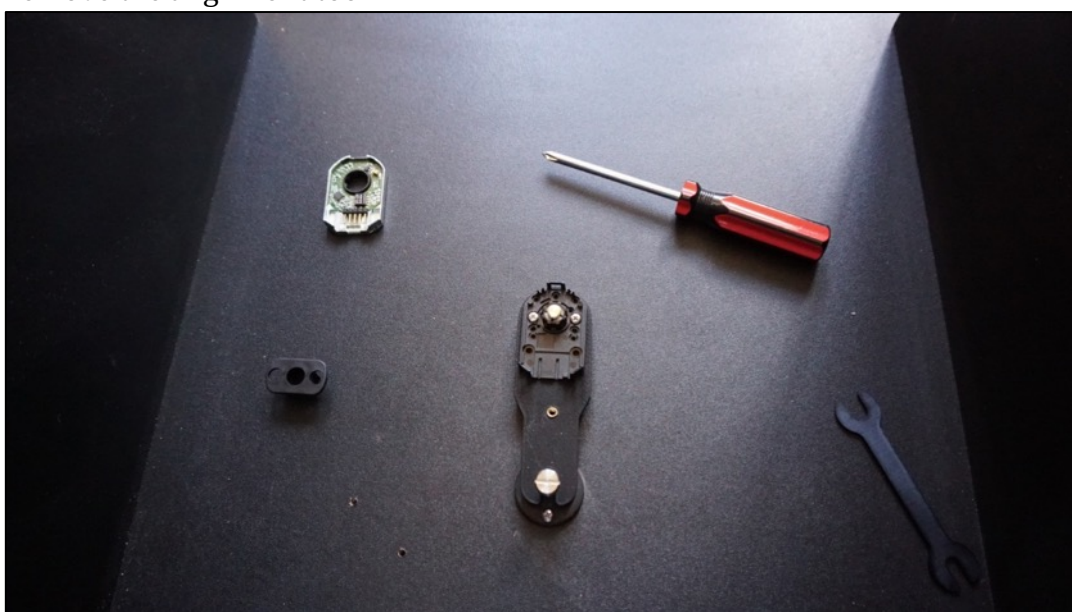
Use the alignment tool to centre the encode base plate:



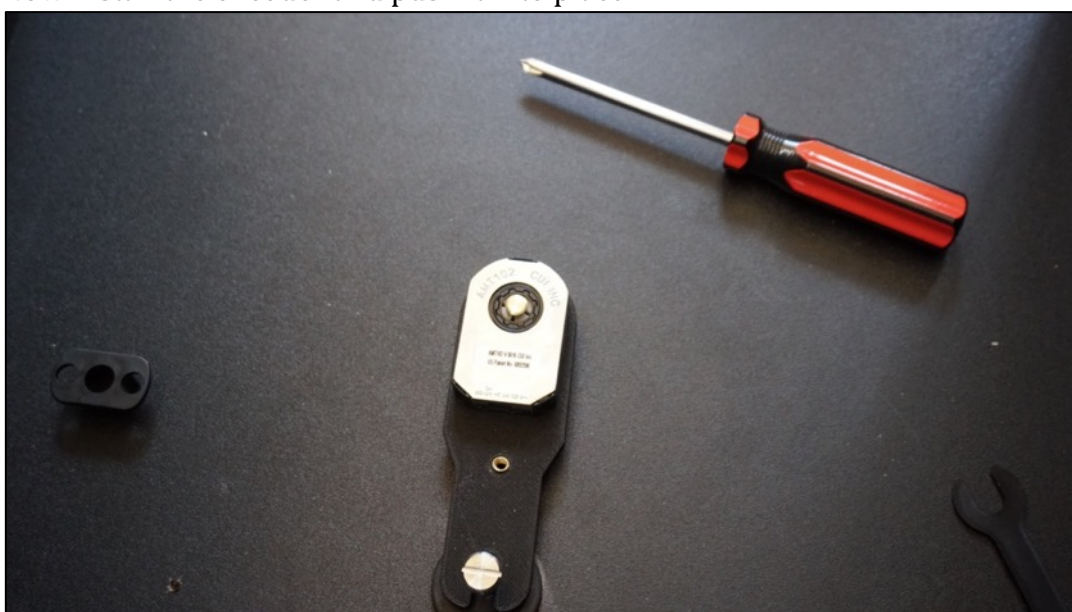
Tighten the screws:



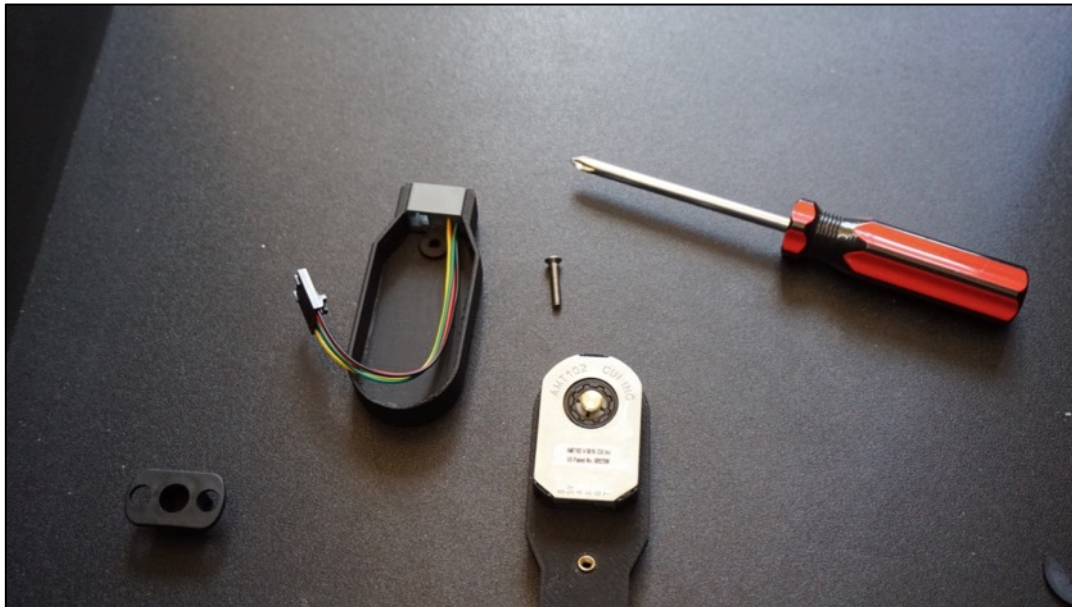
Remove the alignment tool:



Now install the encoder and push it into place:



You will need the encoder housing now:



Plug the connector into the encoder:



Put the housing onto the encoder and fix it with the supplied screw:



## Altitude encoder installation

It is important to follow the steps described here in the exact order it is described.

You will need the following parts – one of altitude bearings (please remove it from left side of the OTA – same side as where the focuser is), 5 minutes epoxy (not supplied) and a knife:



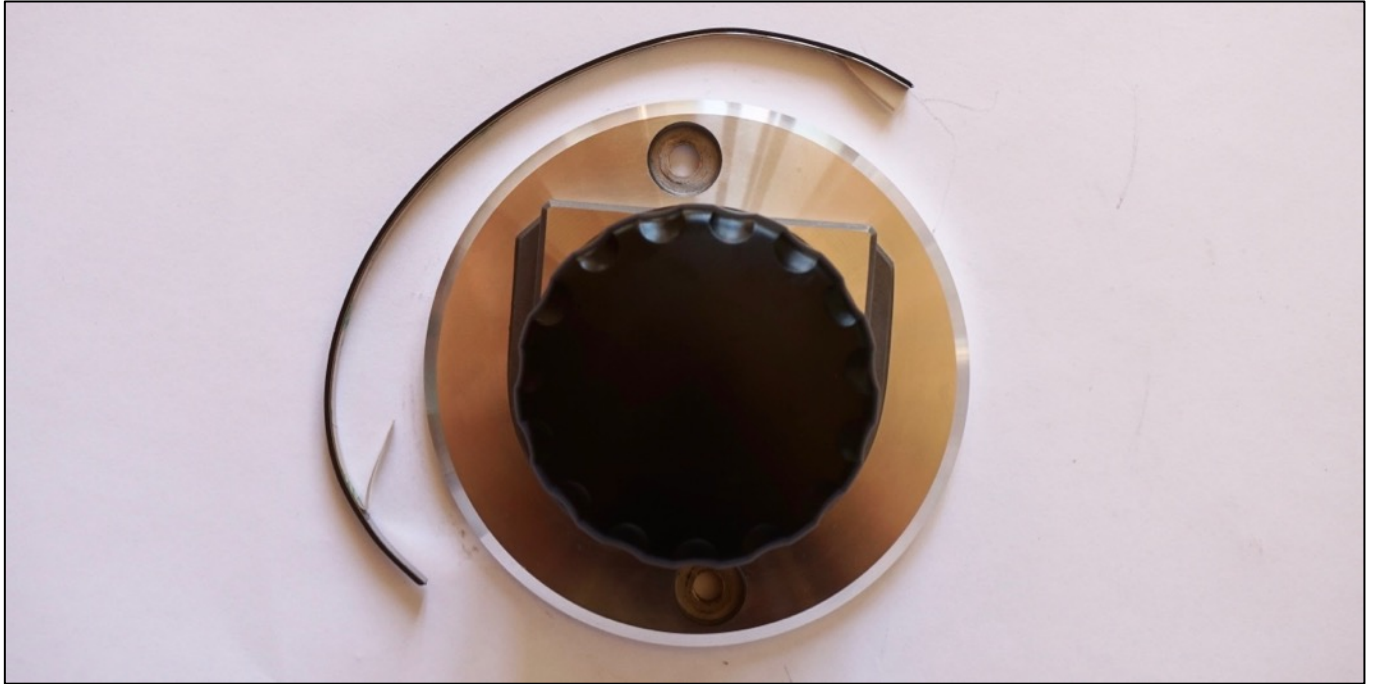
You will need to glue the magnetic tape onto the altitude bearing. The tape supplied is enough to cover approximately 180° even though only 90° coverage is require for the altitude encoder. The tape has an adhesive layer under the protective film. The best way is to fix the ends of the tape with an epoxy glue (5 minutes or 10 minutes epoxy is enough).

You will need to clean the altitude bearing with isopropyl alcohol.

If you chose to use the epoxy then clean ~10mm off the adhesive on each end of the tape with the knife:



The tape is glued on the following part of the bearing:

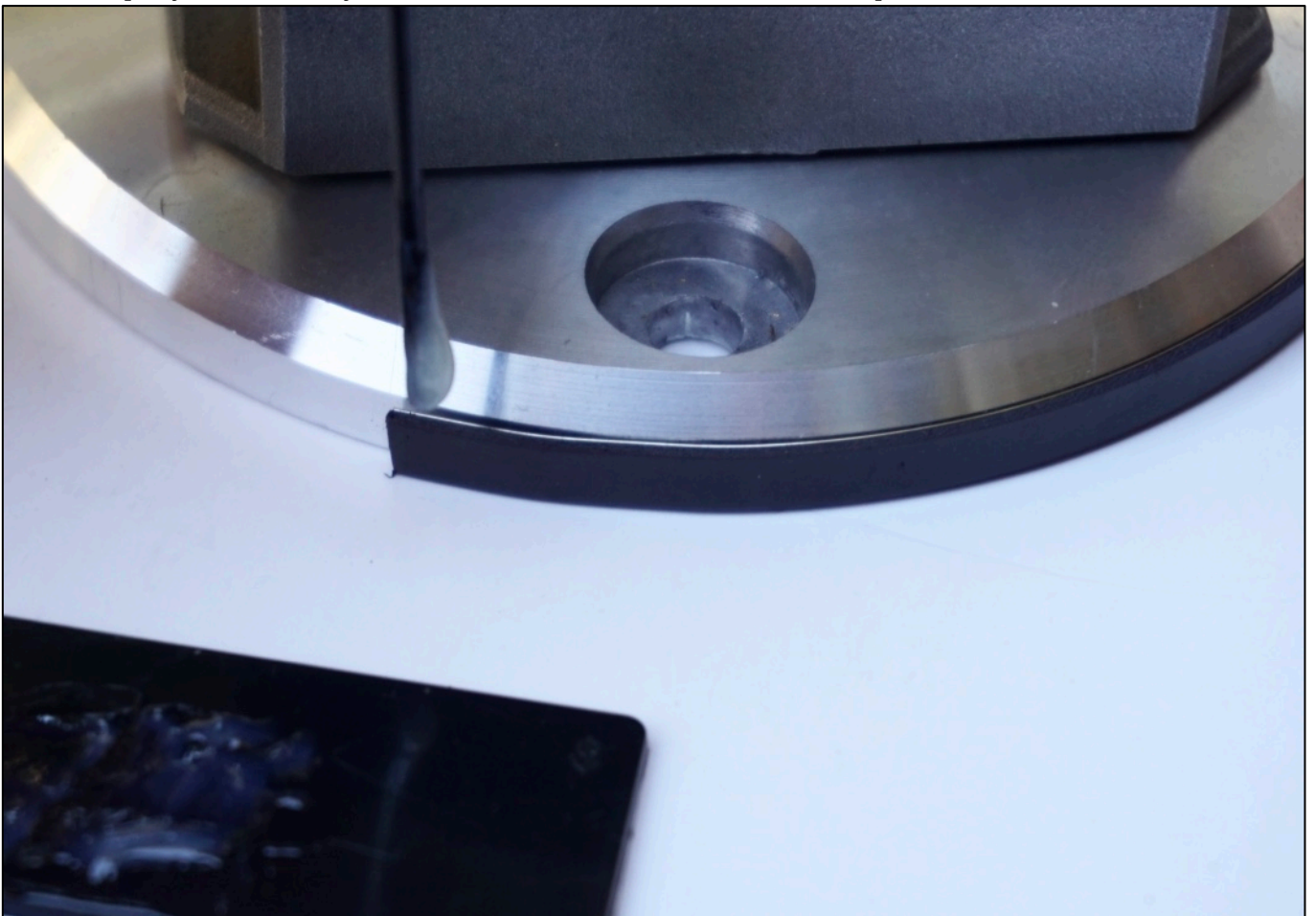


Remove the protective film and carefully glue the tape making sure there are no air bubbles:

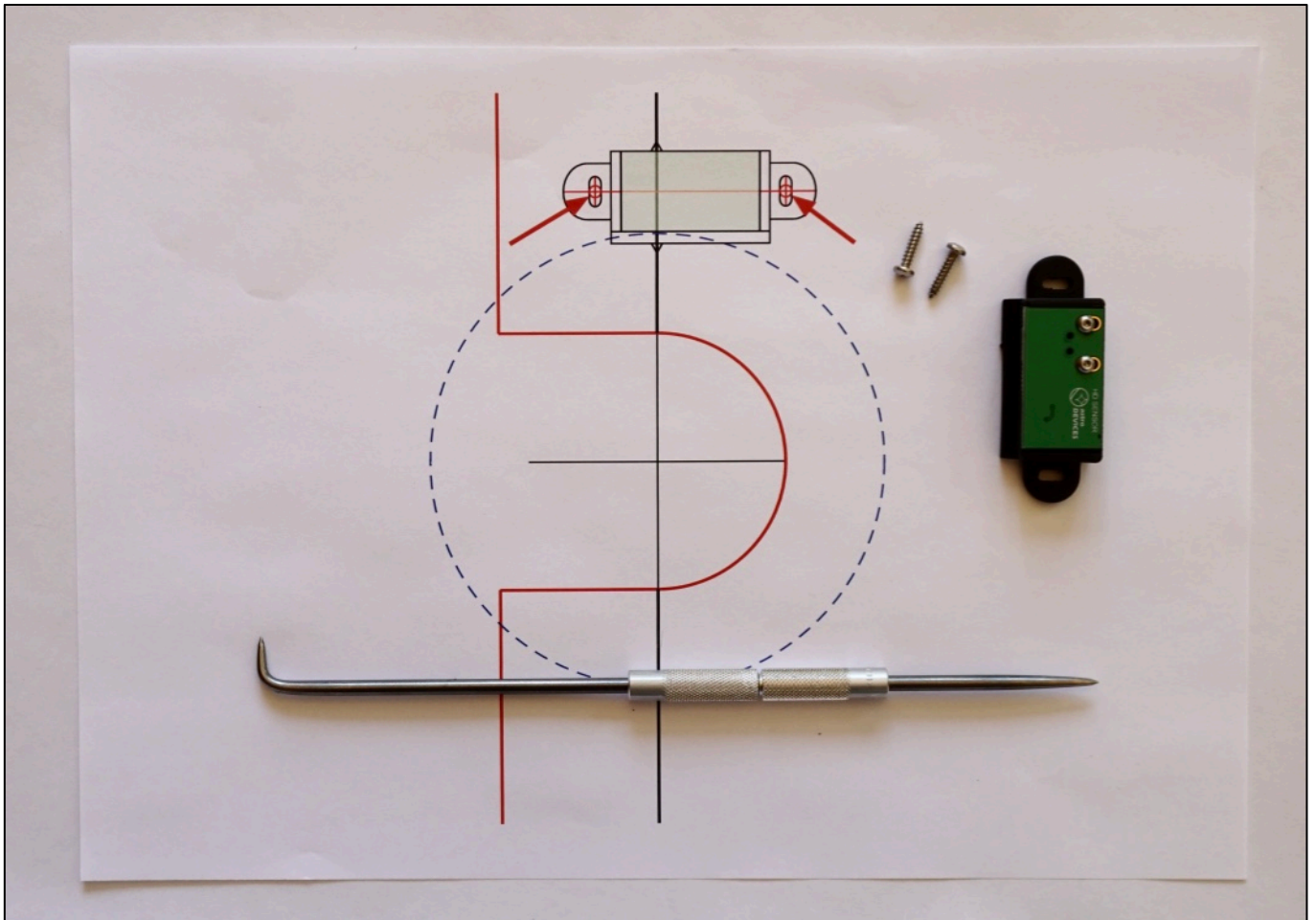




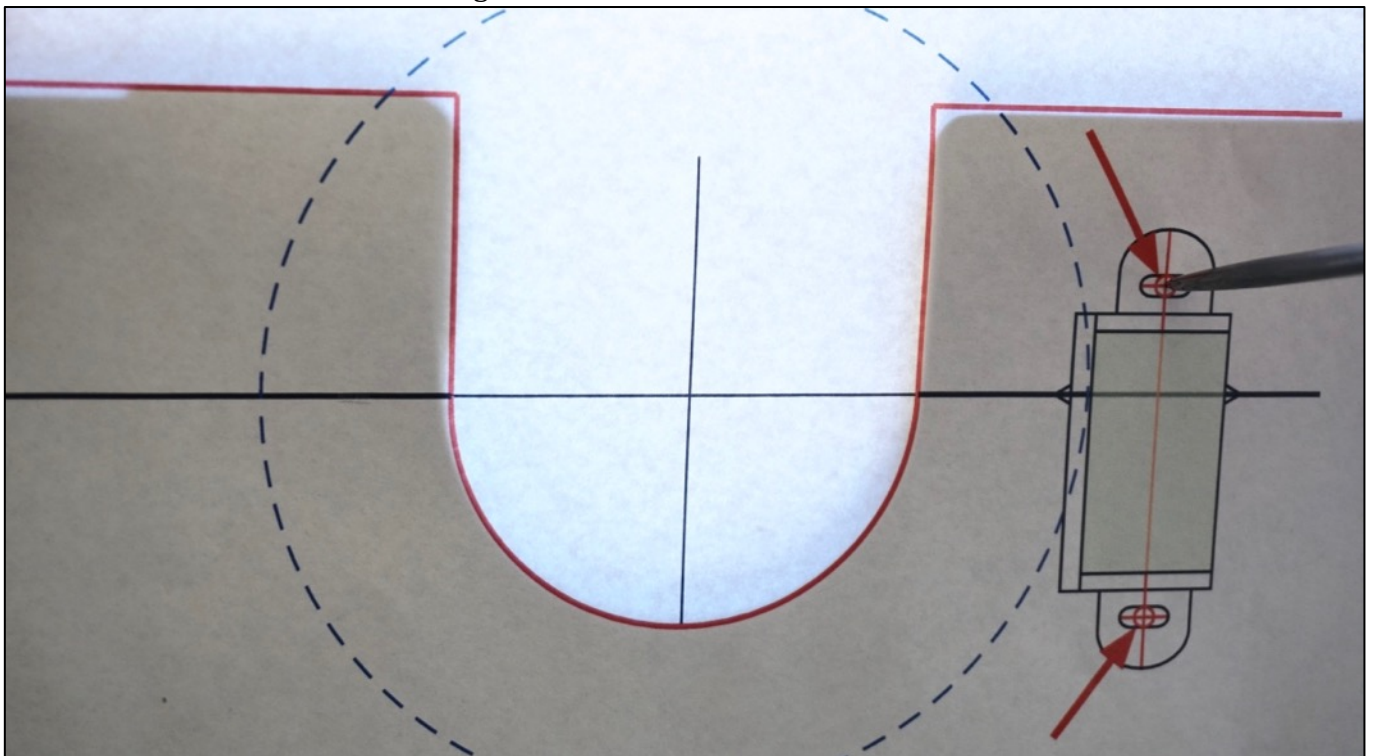
Mix the epoxy and use only a small amount to fix each end of the tape:



Now the following parts will be required (reader placement template, reader, two screws and a sharp tool to mark holes for drilling):

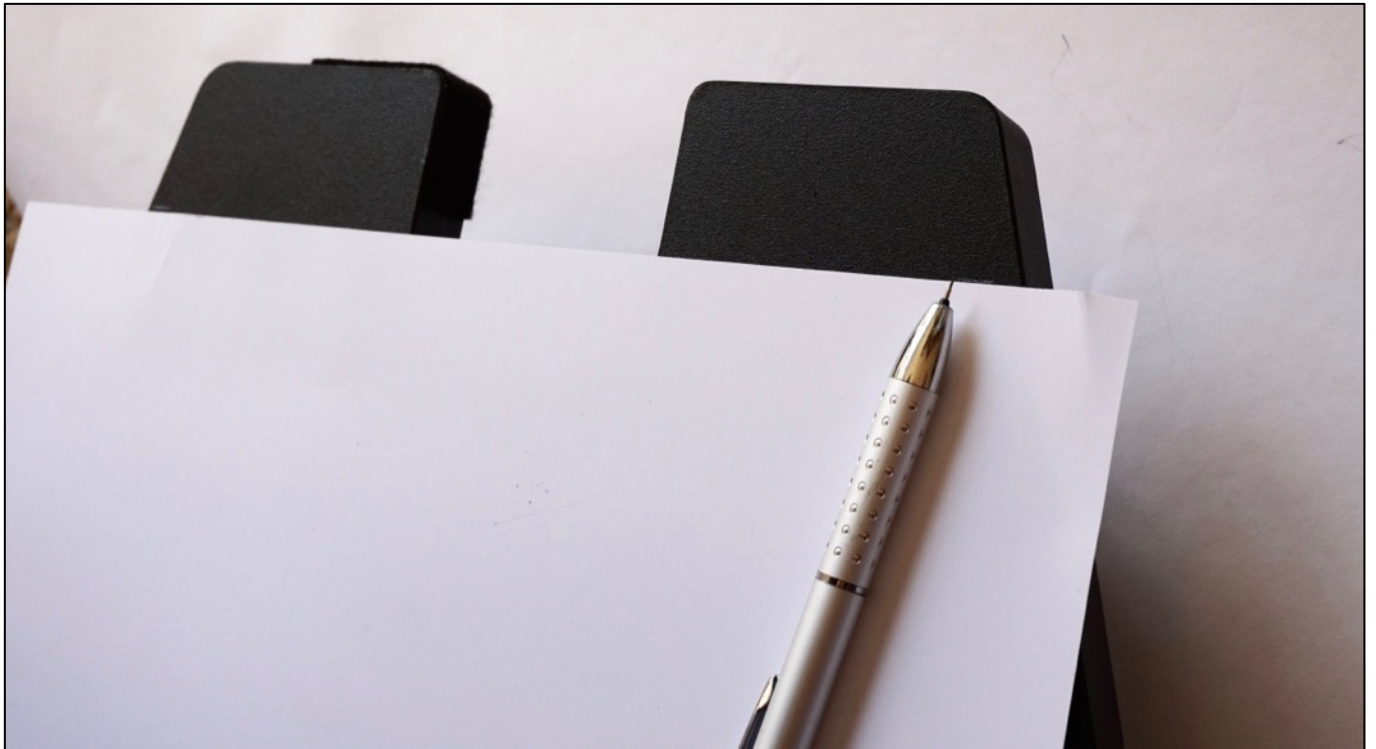
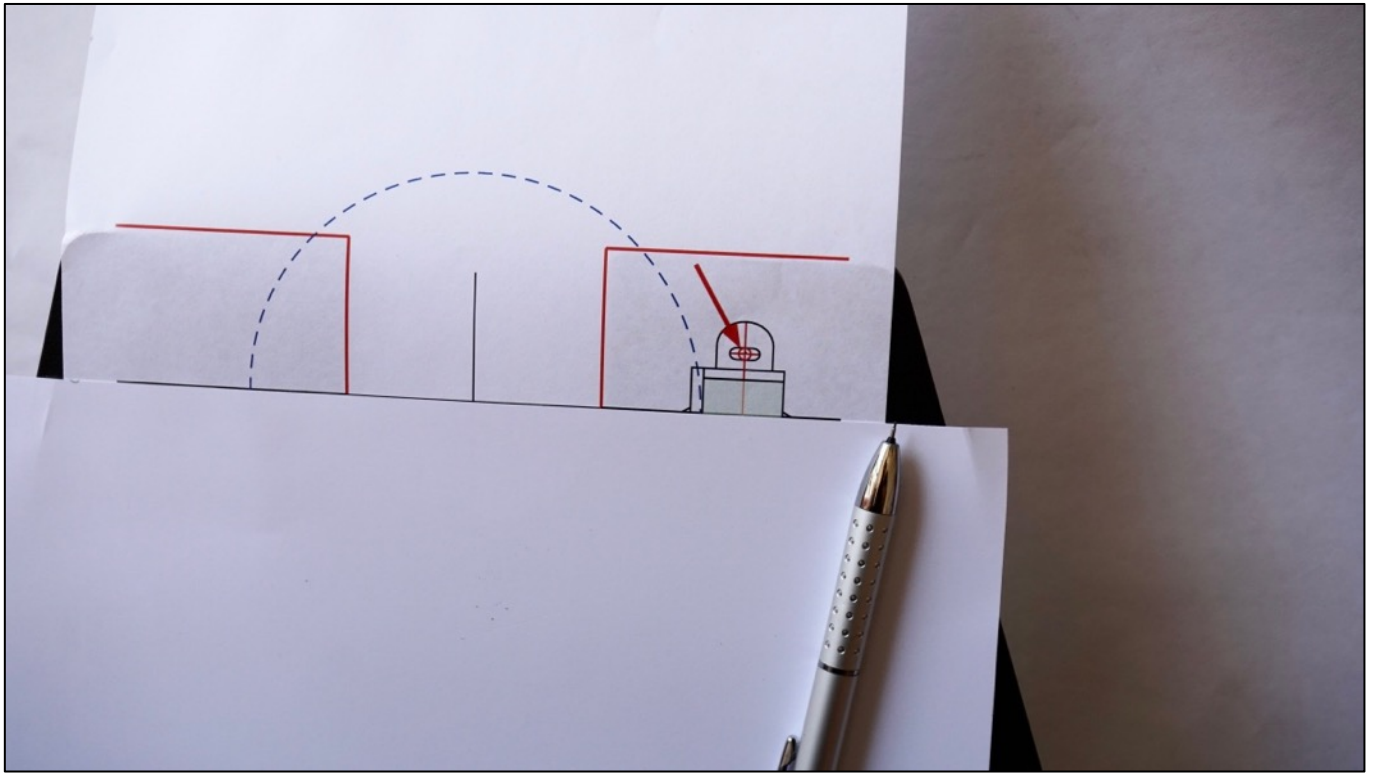


Put the template against the inside of the left wall of the rocker box and use a light to align it as shown here and mark the mounting holes for the encoder reader:

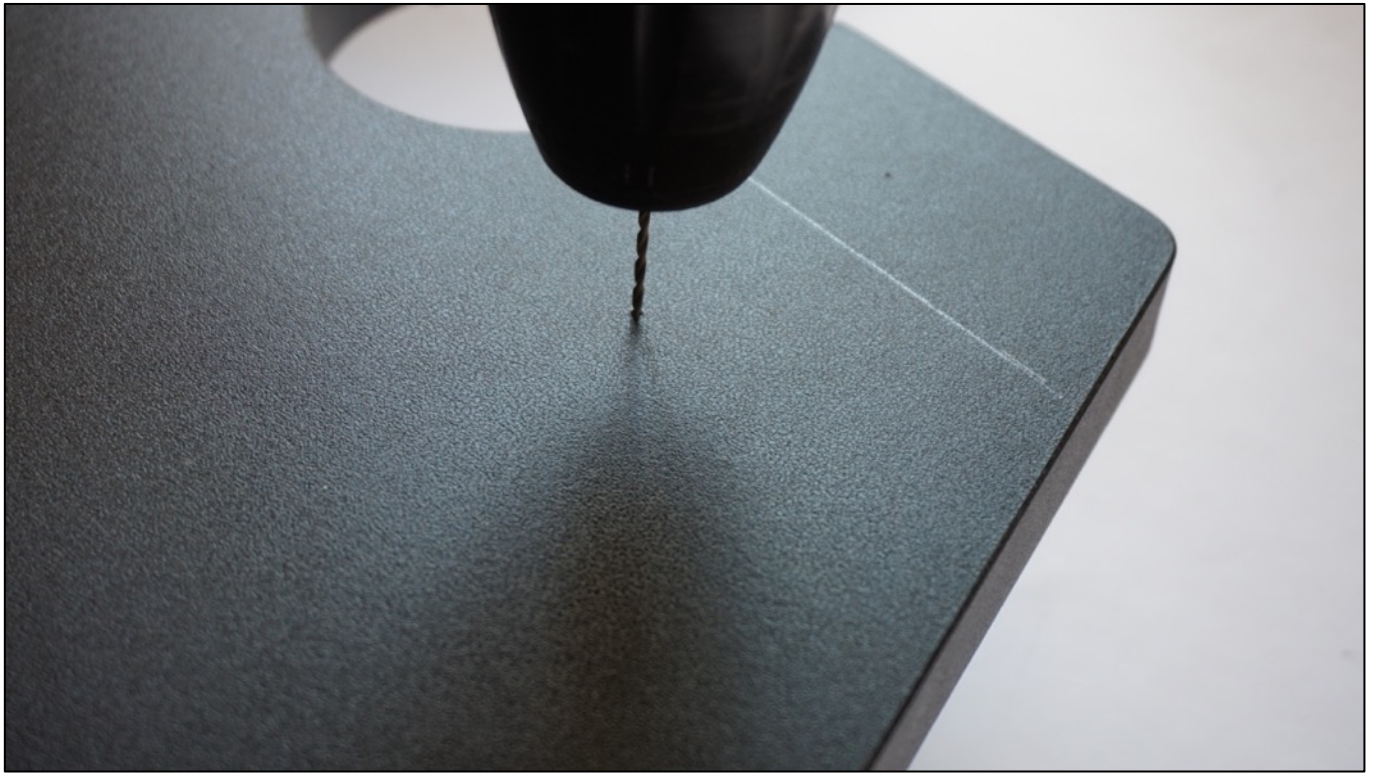


It will also be helpful if you draw a horizontal centre line on the wall:

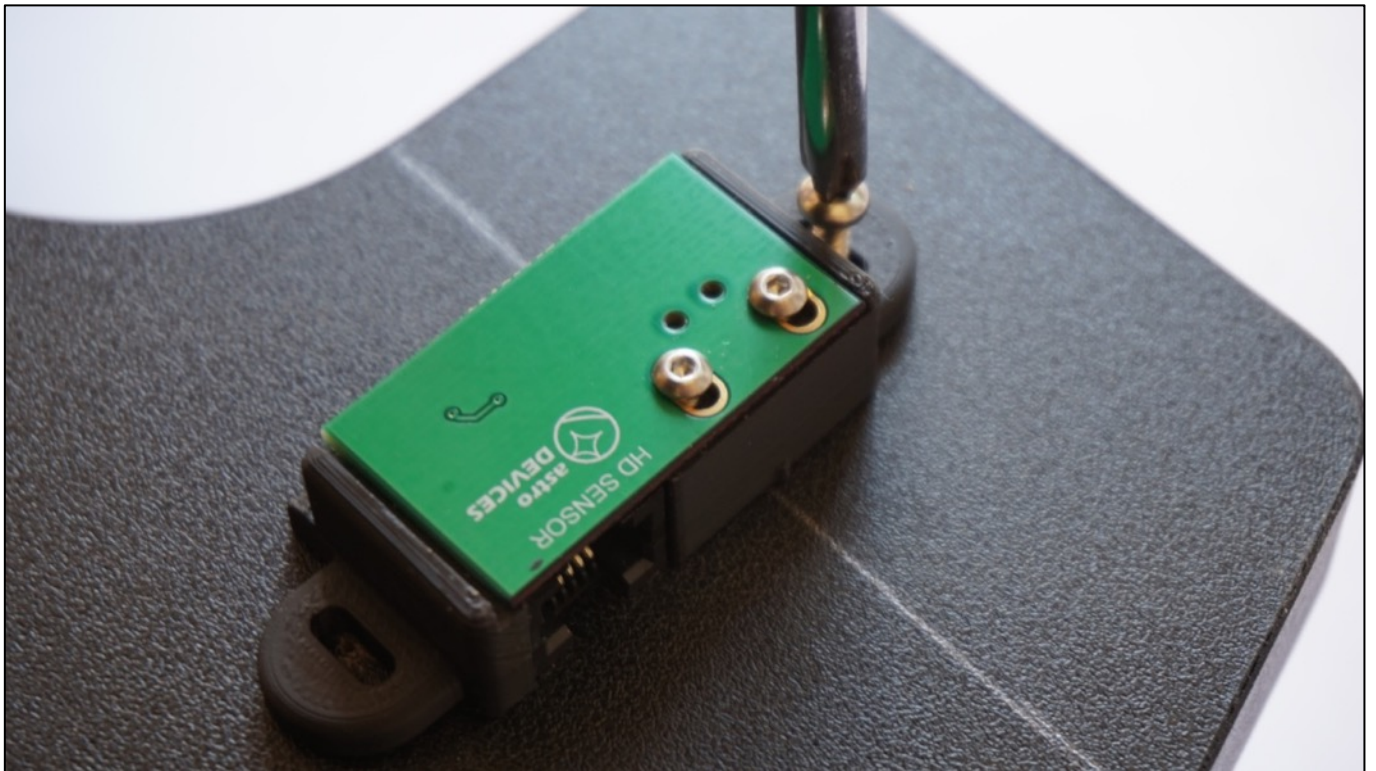




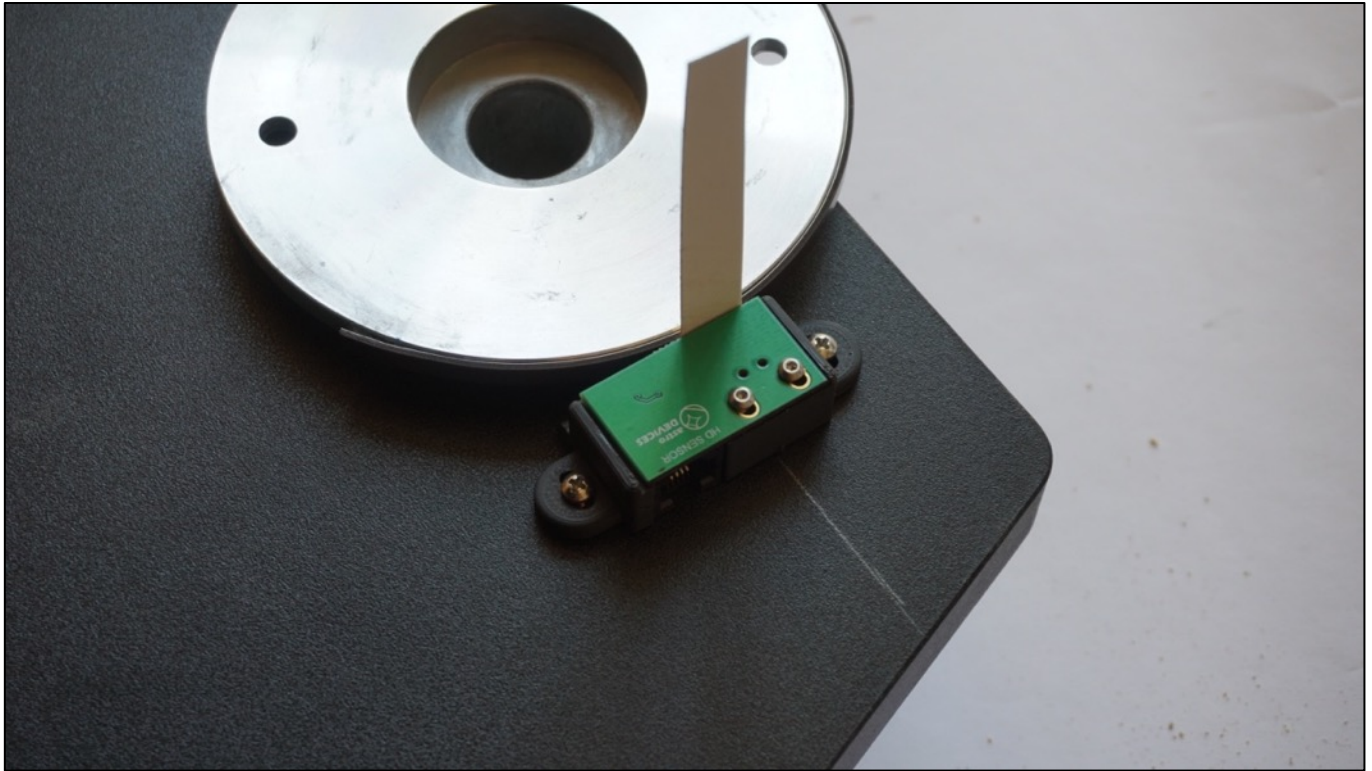
Now drill small holes at the marked locations (make sure you do not drill through the particle board - ~7-10 mm deep only):



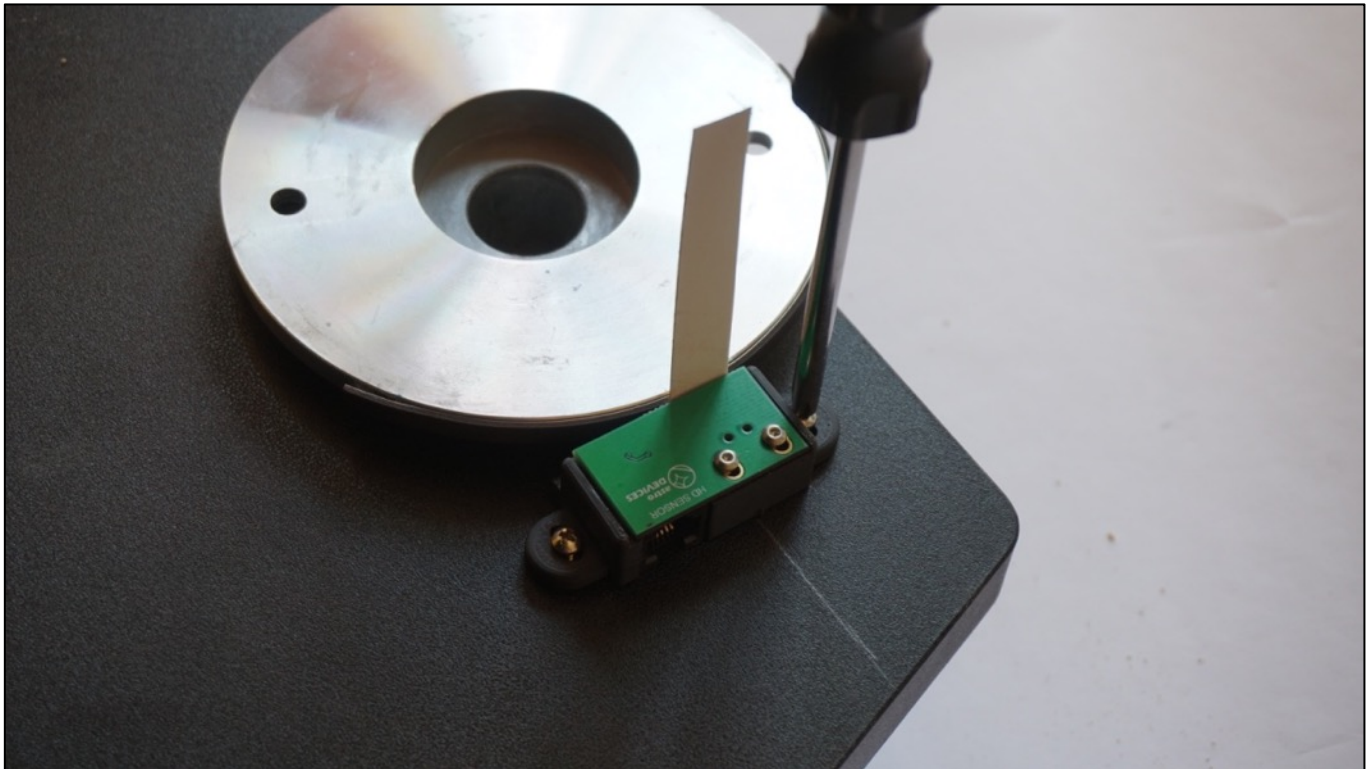
Install the encoder reader the reader but do not tighten the screws yet:



The distance between the magnetic tape and the reader should ideally be 0.4mm. You can use a piece of a card to set the gap:



Now tighten the screws:



Install the bearing on the OTA now.

**DONE! Now plug the encoder cable into the jacks of the encoders and connect it to the DSC!**

Please set the azimuth encoder steps to 8192 and altitude encoder steps to 716000 and follow the instructions of your DSC on setting the signs for the steps correctly.