



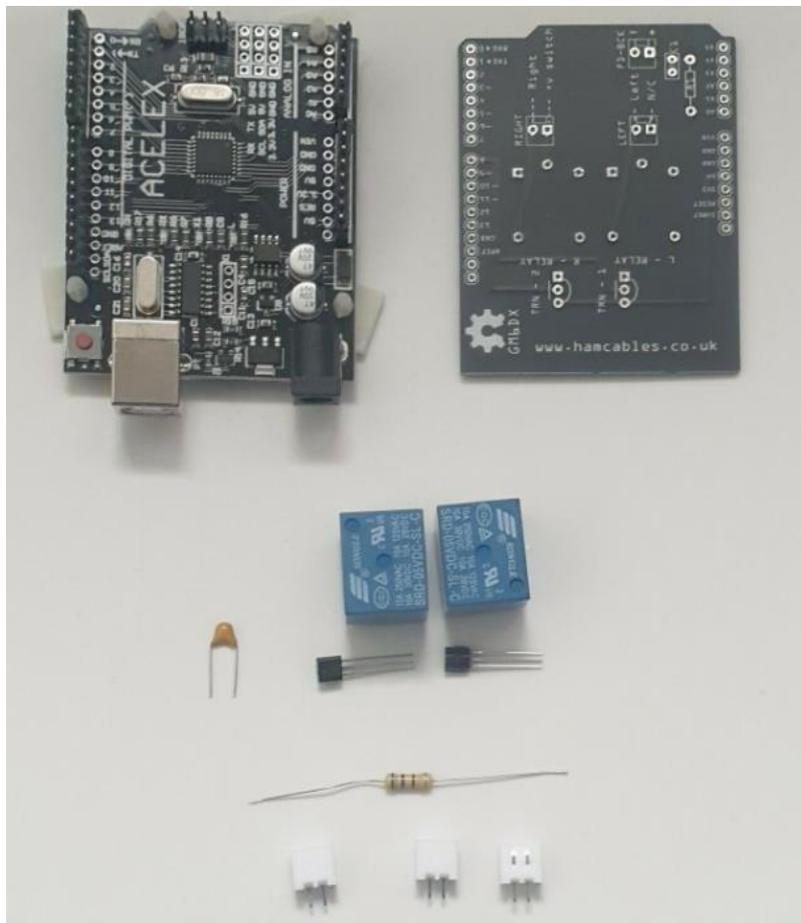
You have purchased a **K3NG Arduino** design rotator controller, constructed by GM6DX. This controller is constructed using an Arduino Uno R3 and Custom shield.

For more technical information please visit:

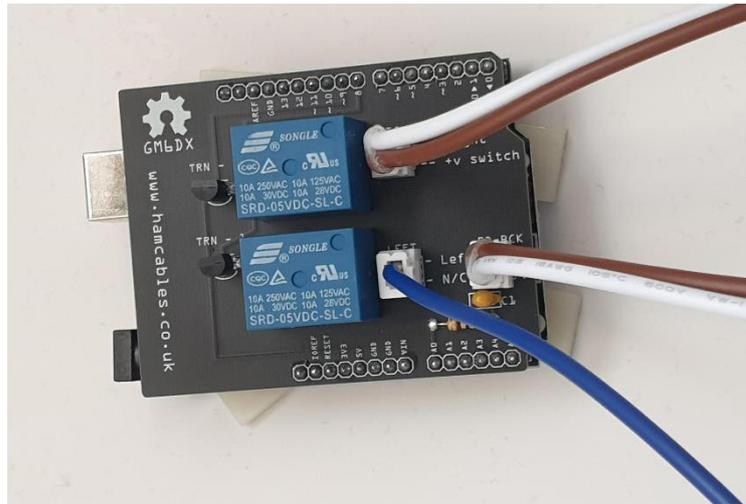
<https://blog.radioartisan.com/yaesu-rotator-computer-serial-interface/>

NOTE: Prior to purchase or install. The accuracy of these controllers will depend on your controller – on some occasions this may be 20 degree out (even when calibrated). The reason for this is that the controller uses 1v for reference (divide this by 450 degrees we have 0.002v per degree) – when your controller drops some mV then the accuracy will be affected.

You should have the following with some pre-cut wire (approx. size only)



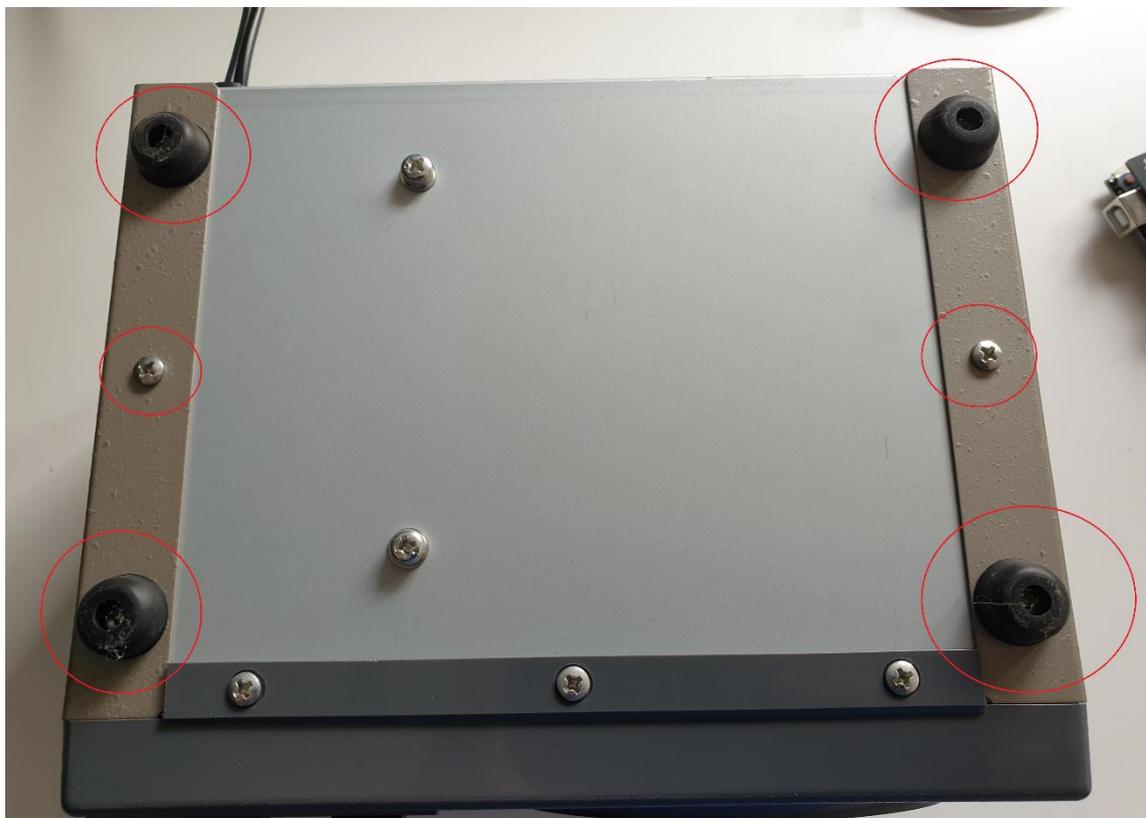
First step is to solder all the pieces on as per the photo. (2x transistors, 2x relays, 1 x resistor, 1x capacitor and 3x JST connectors).



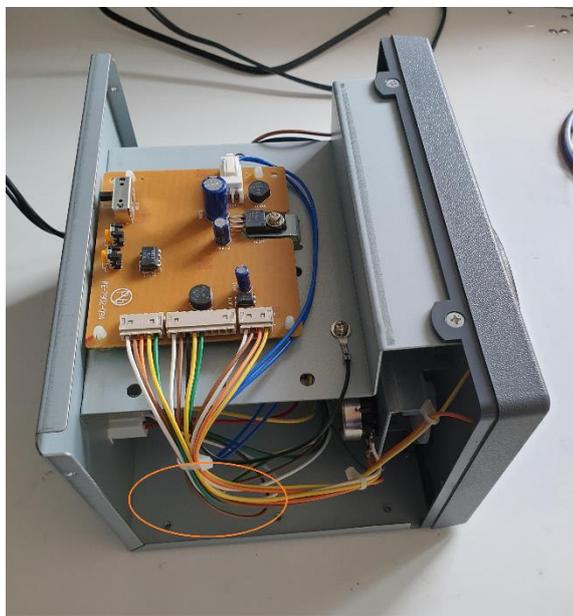
YOU MUST ensure that the brown and white wire set is installed as per this photo

If you do not then the controller will not work correctly.

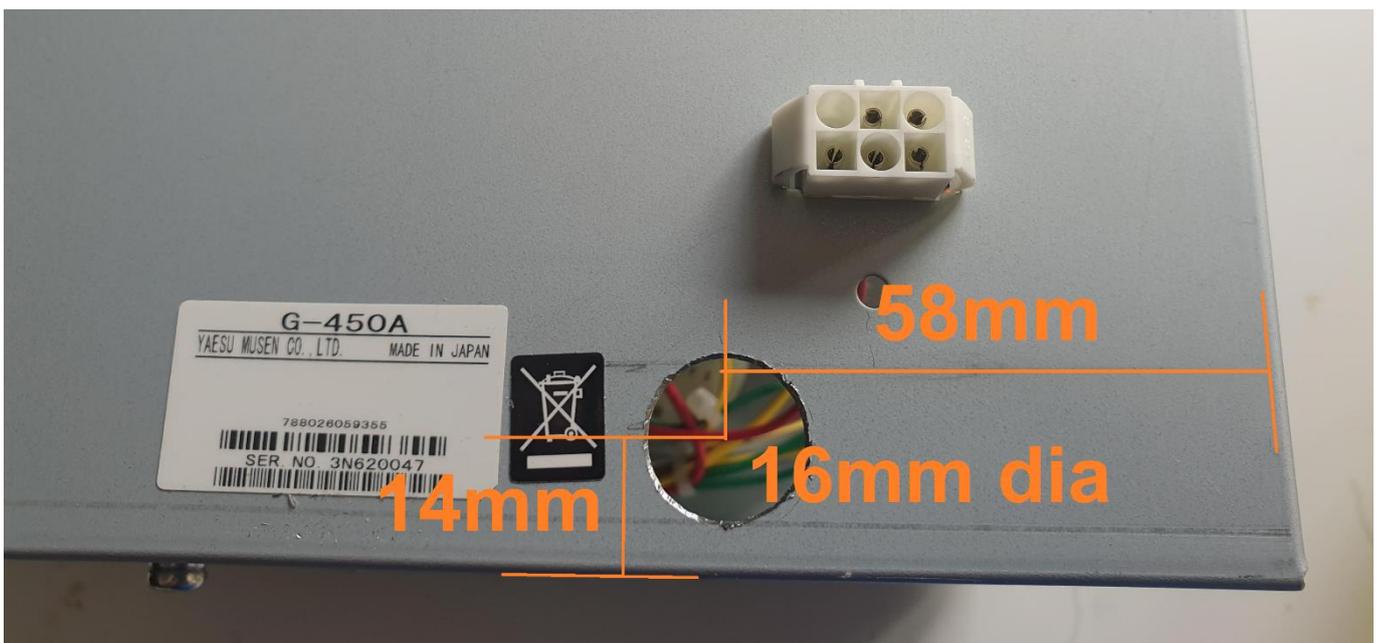
Now turn the G-450/650 Controller upside down and remove the screws as shown



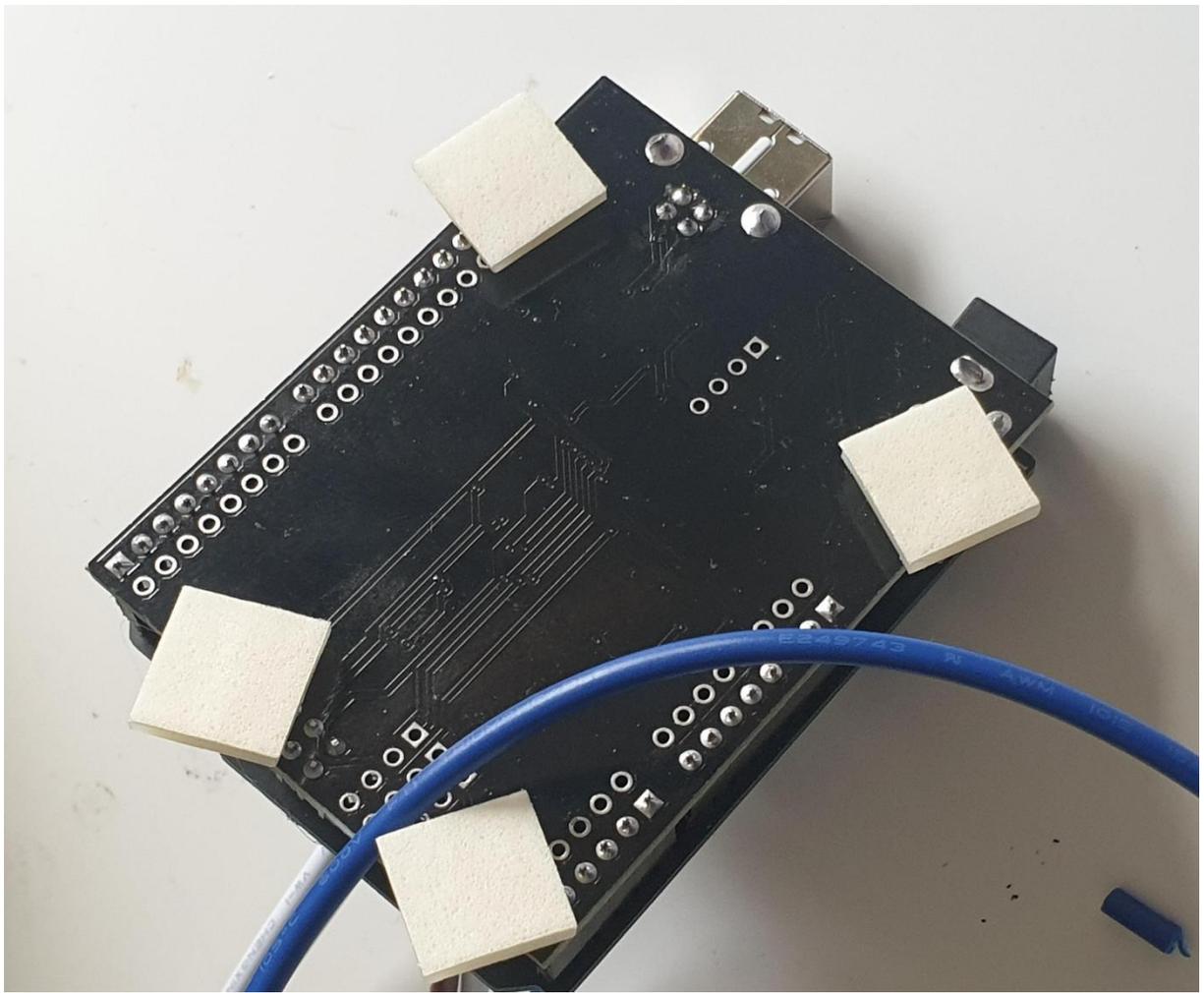
Then remove the only two screws at the side of the controller (one on the right and one on the left)



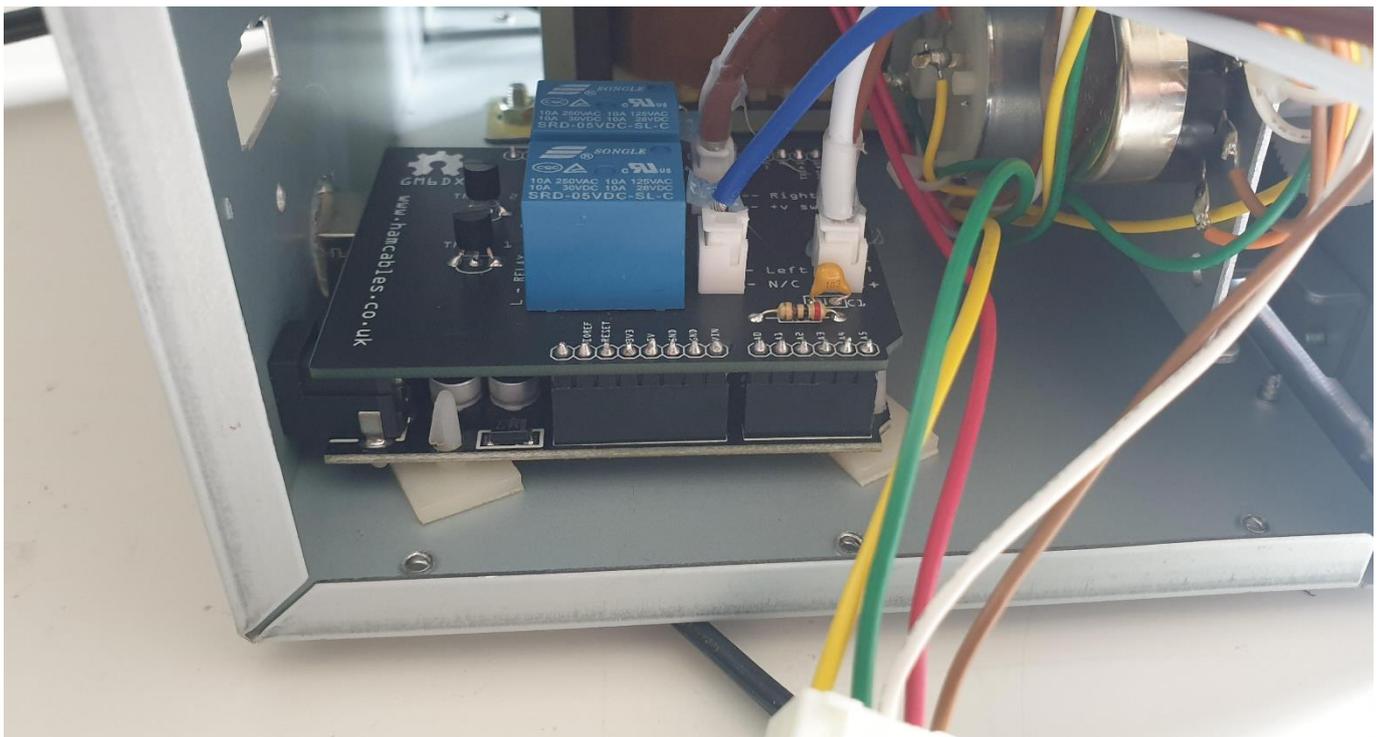
The red circle indicates where the USB controller will fit



Now drill a **16mm** hole in the bottom right (as you look at the controller from the back)
Measure **58mm from the right** and **14mm up from the underside** of the controller unit, then where they meet is the centre for the 16mm hole.



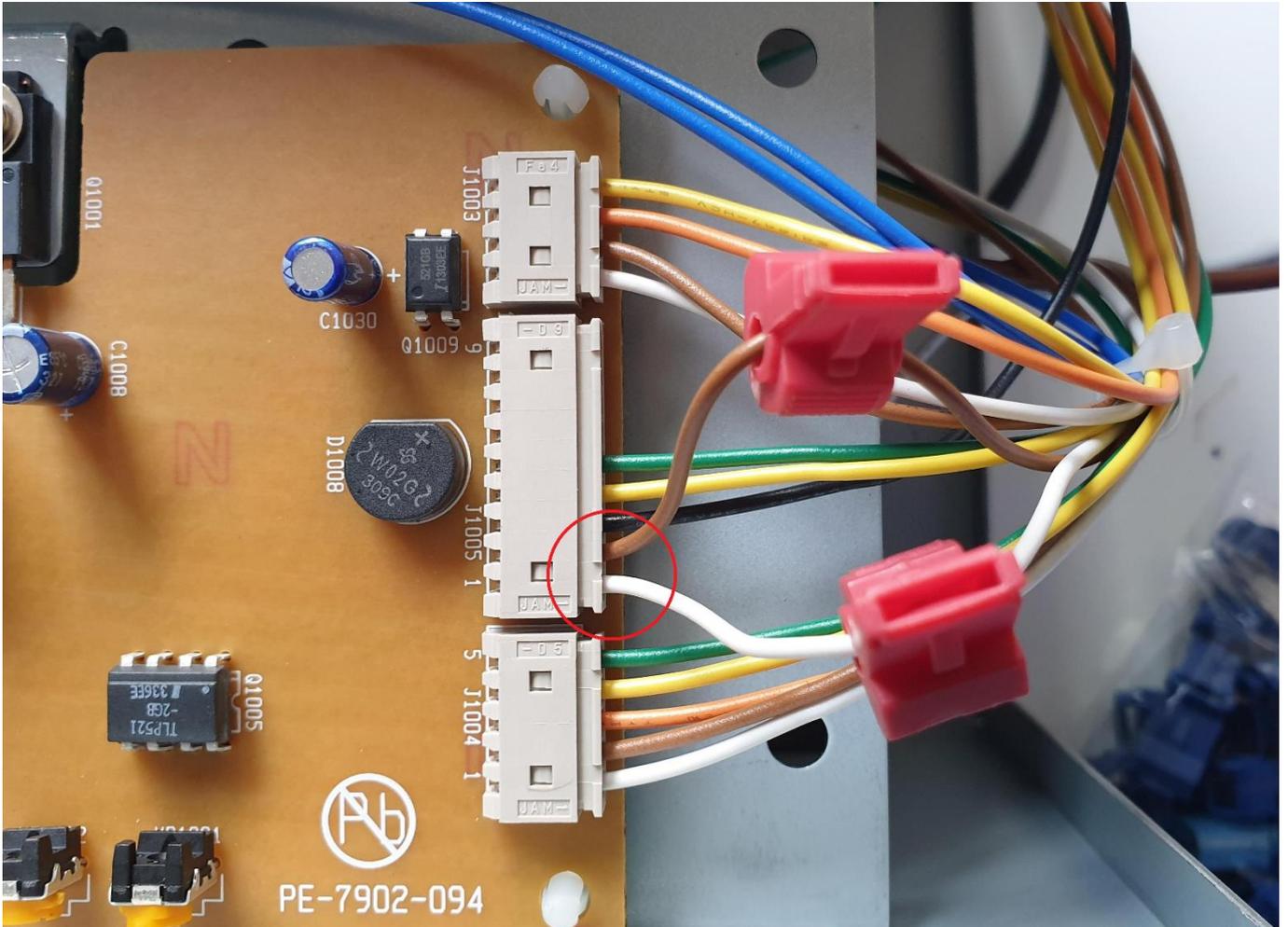
Peel of the covers on the bottom of the stick pads on the USB controller



Now stick the USB controller down on the pads. I had to pull through the white 6 pin rotator cable connector, just to give some extra space to get my hand in when sticking it down. This is very easy as the connector has push in sides which allow it to be pushed back into the controller very easily.



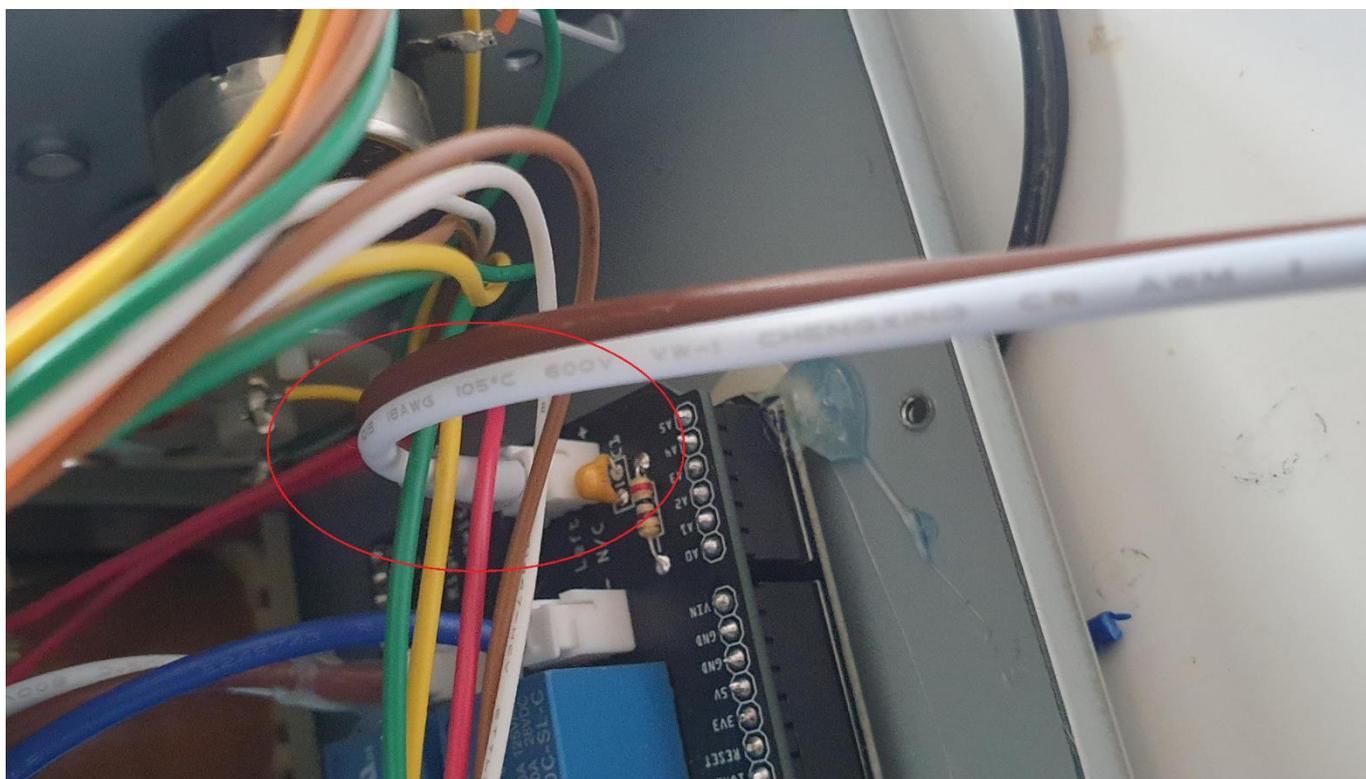
Now feed the white, brown and blue wires as shown through the space at the back over to the other side of the controller.



Install T connectors to the brown and white wires on the top controller PCB shown as per the photo. Note if you want to splice the wires and then solder, this is also fine.

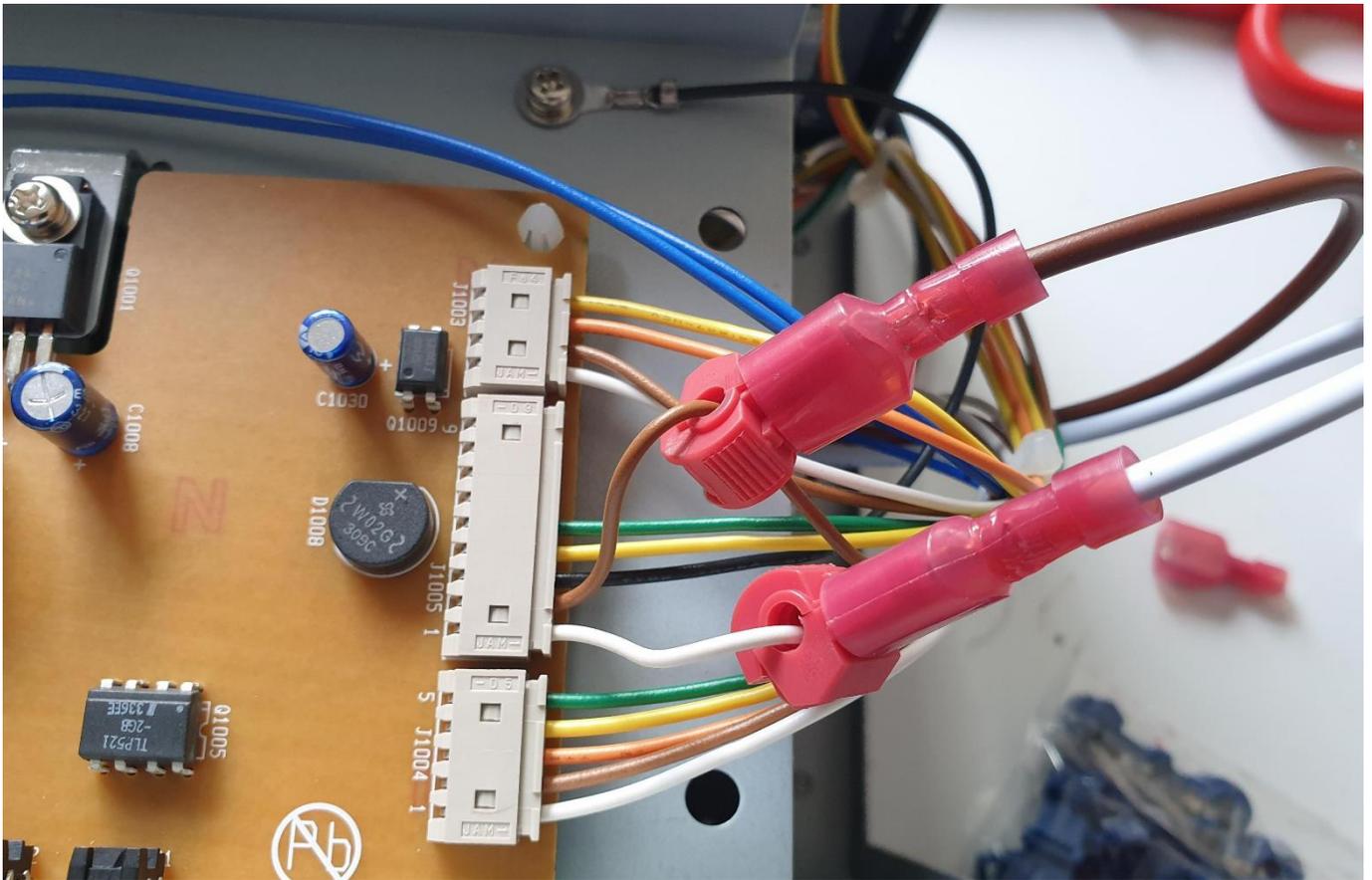


Now install crimp on spade connectors to the brown and white wire. (Or solder)

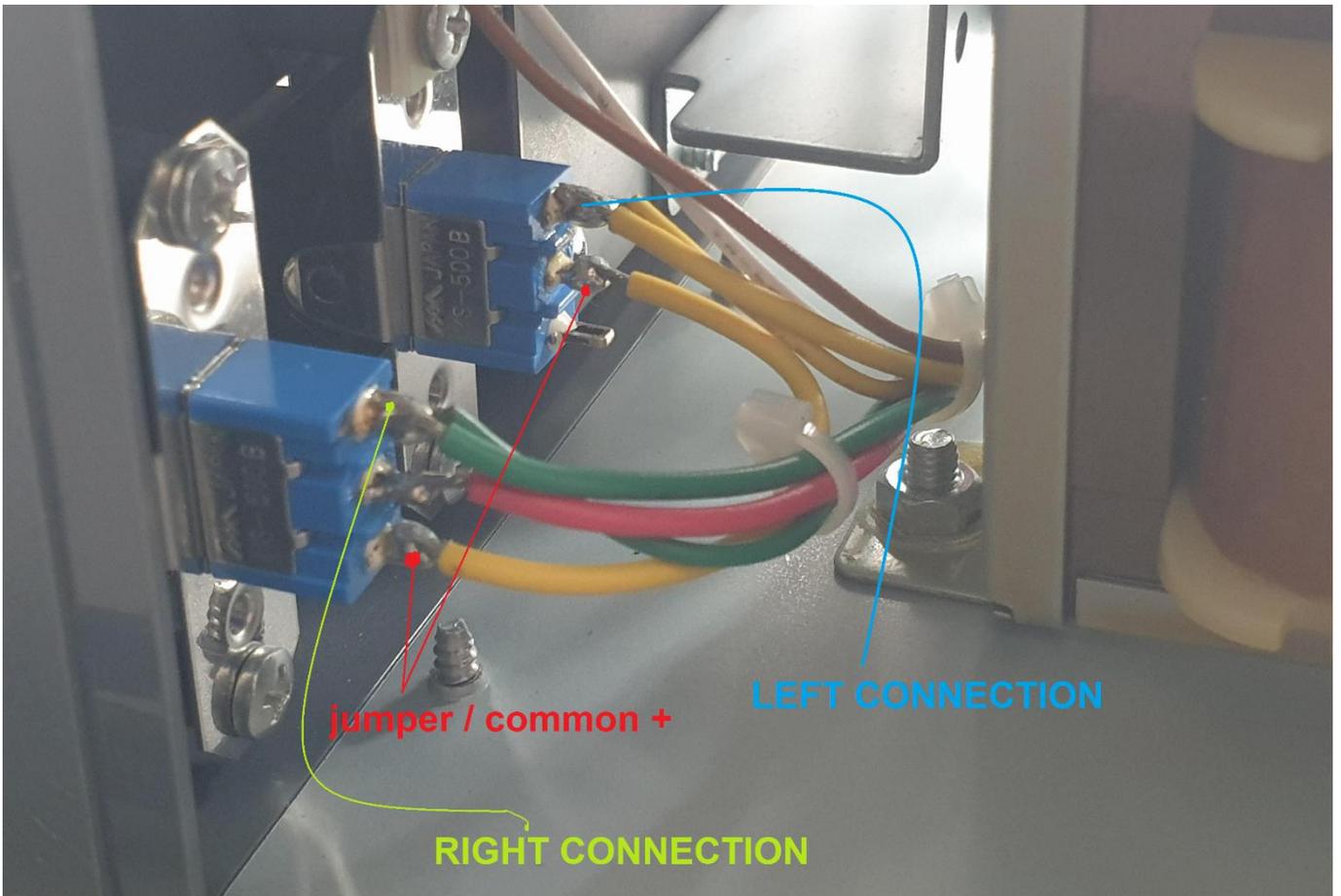


Make sure it is the correct white and brown wires that you are fitting the red spade connectors to.

Once you have done this you can connect the white wire to white wire and brown wire to brown wire

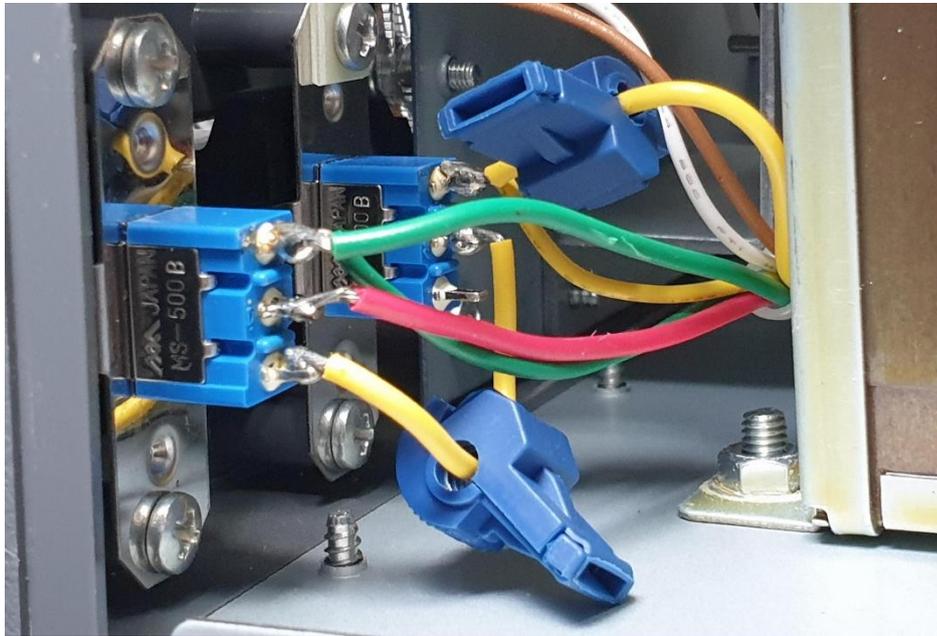


Move over to the other side of the control unit



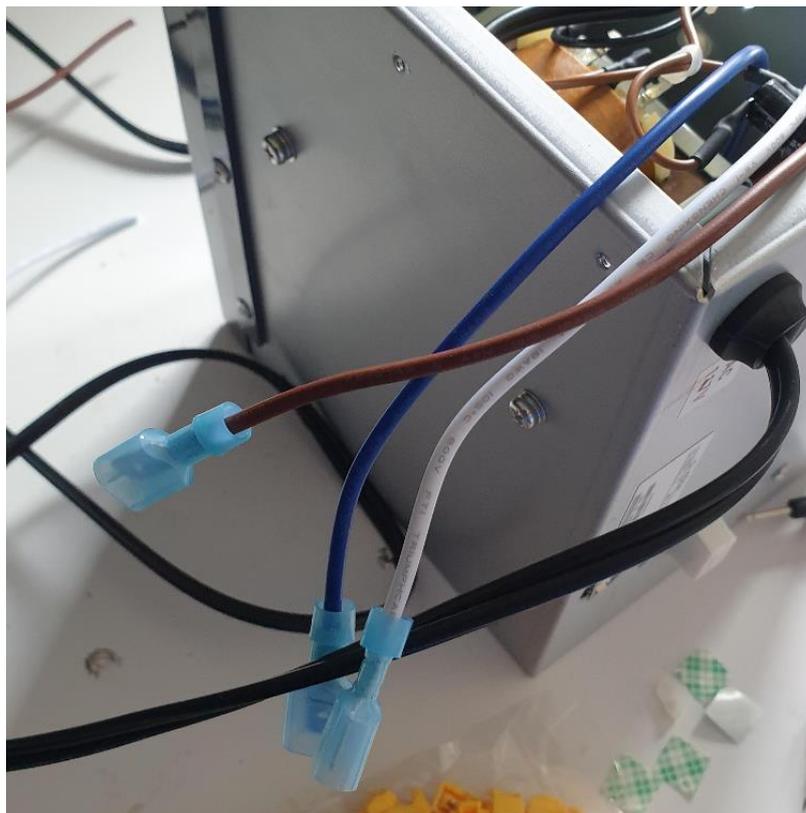
Your wires may differ in colour to mine however what we are after is to identify the common + voltage feed to both switches this will be the wire that “jumps” between the two switches.

Next we are looking for the wire which goes to the LEFT and RIGHT switches in my case it is the Green and Yellow wires. You will see that those wires are doubled up. You can connect the T connector on to anyone.



MAKE SURE YOU USE T CONNECTORS HERE OR SOLDER ONTO THE SWITCHES

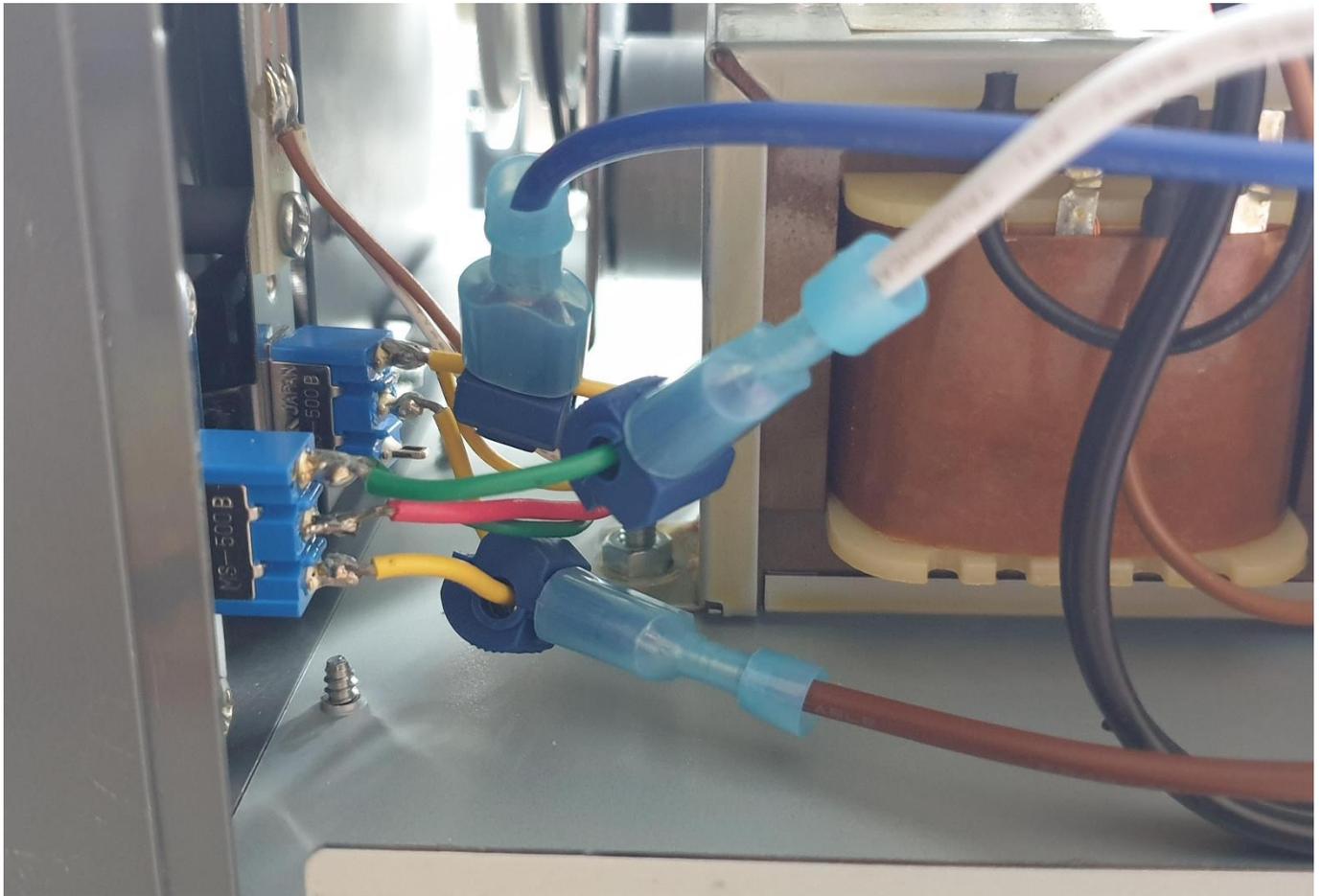
Once you have done this step now fit spade connectors / crimp on connectors to the WHITE, BROWN AND BLUE wires (if you have not soldered it)



NOW connect the BROWN wire to the common + voltage wire

The WHITE wire to the RIGHT switch

The BLUE wire to the LEFT switch



Remember if you can solder, then it will just be as easy to solder on to the switch tabs than use the T connectors.

That is the USB controller interface installed.

Few things to note

- **If you can solder then you might find it easier just to solder the wires in**
- **You can use a bit of hot glue to hold the interface to the base along with sticky pads**

NOW SCREW THE COVER BACK ON.



USB – B connection ready for PC USE

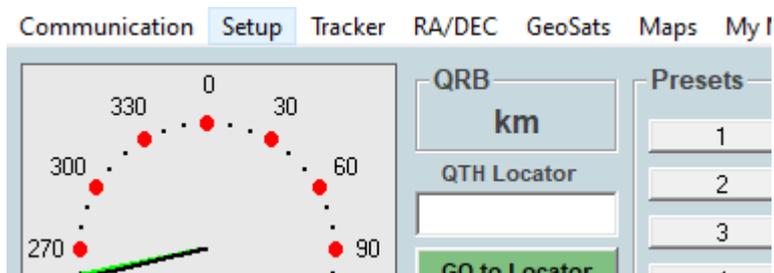
Continue reading below for basic software procedure.

The software use and calibration is the same as my other controller – here is the information from that manual which shows basic set up with PST ROTATOR and calibration.

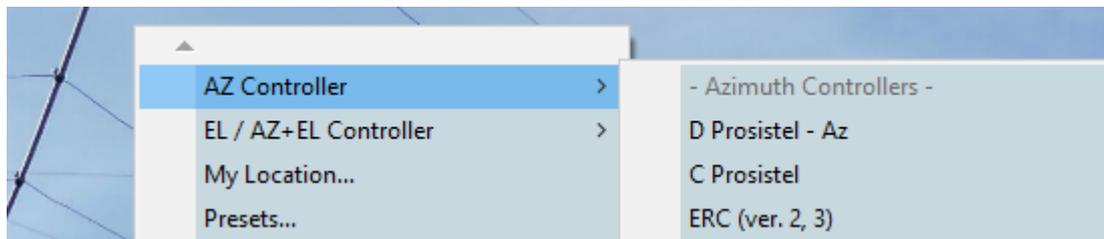
Step 1 – plug in your USB controller to the PC.

Step 2 – Let your PC install the drivers or have the drivers installed onto your PC via the link above.

Step 3 – Set up your controller software for the Arduino K3NG design.



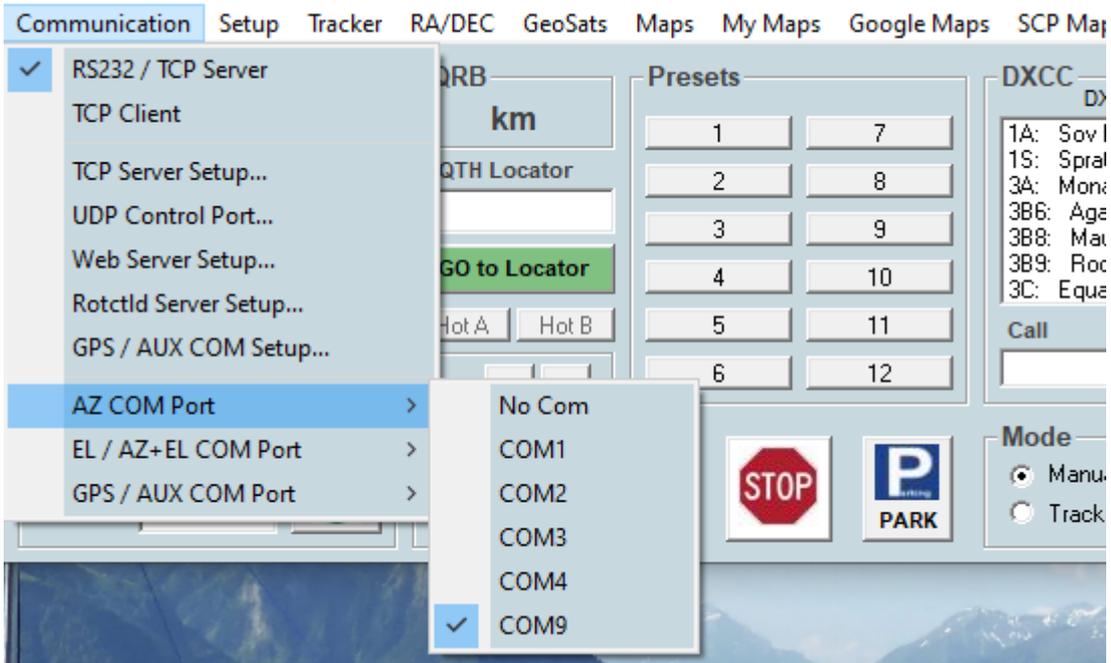
Select Setup



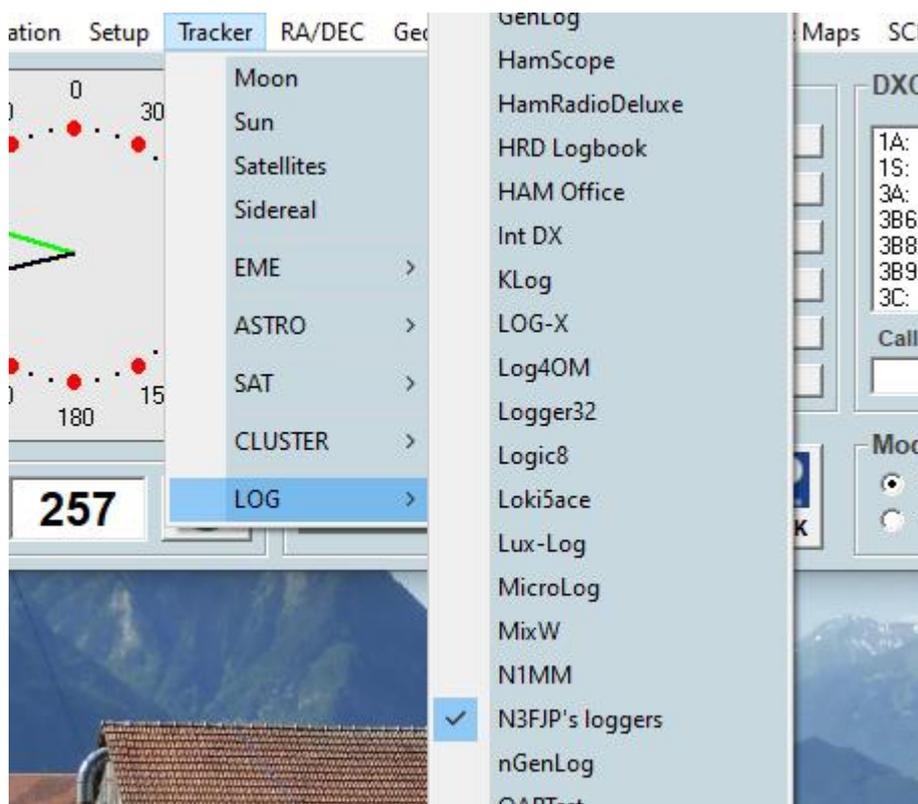
Select AZ Controller



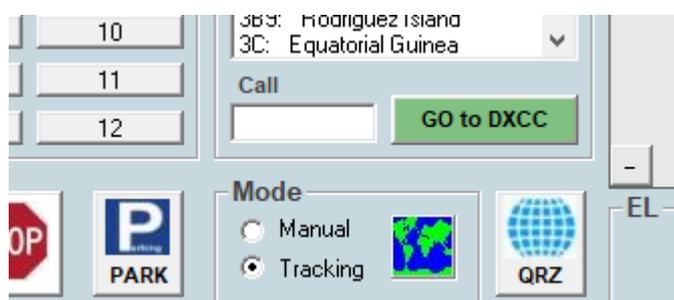
Select K3NG Arduino (or you can select GS-232 450 deg – as the controller is a Yaesu clone)



Select the correct COM port for the Arduino Controller



Select the tracker - I use my N3FJP ACLOG rather than satellites

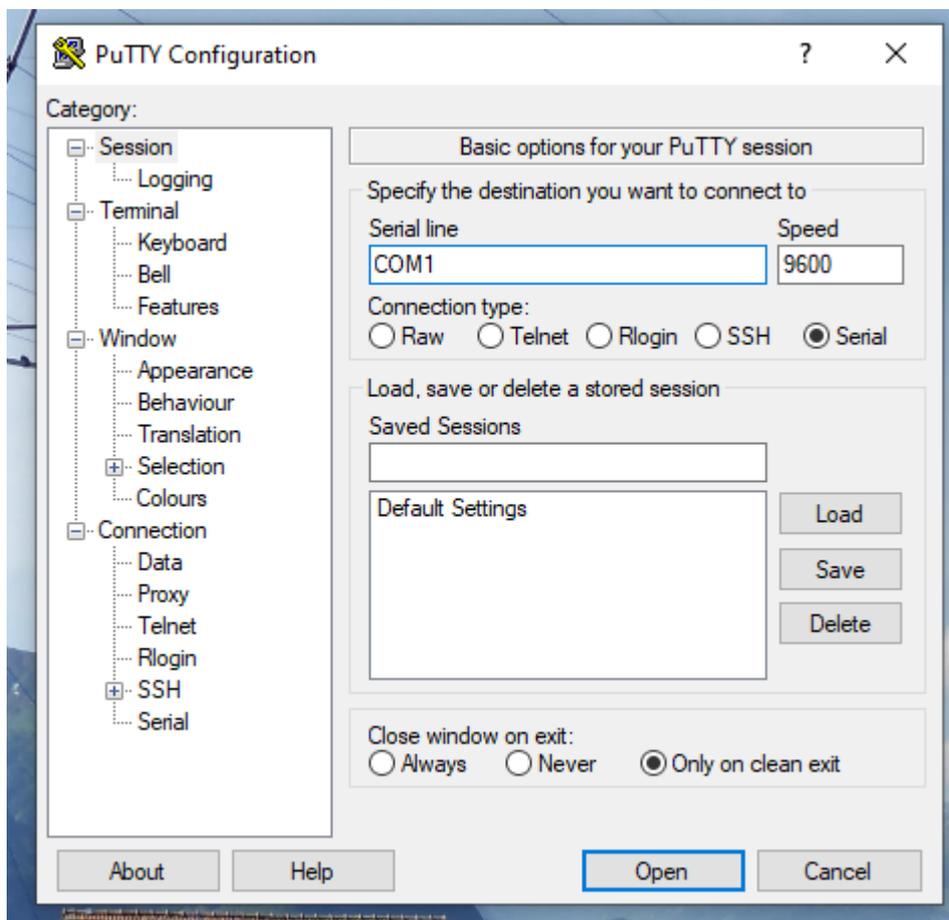


Ensure the tracking button is selected or you will need to put the locator in manually etc.

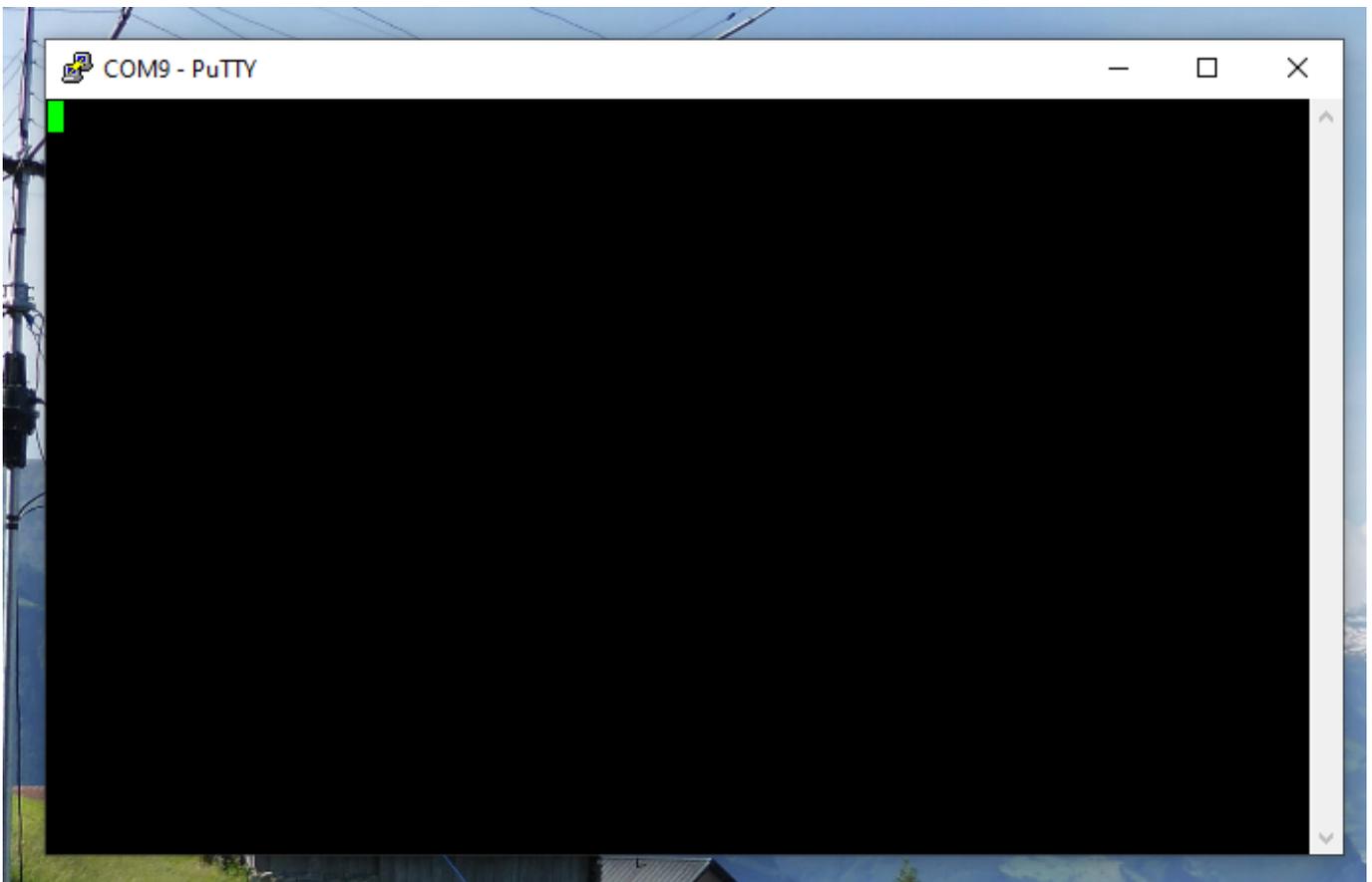
You can calibrate the device by using software called PuTTY

<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>

Once you download the software run it



Select serial and the COM port number that the controller uses

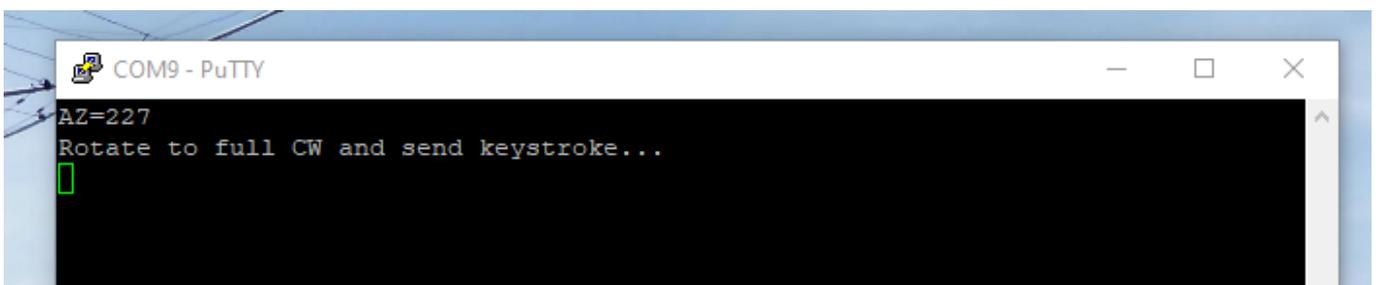


Then use the following commands

C

THEN ENTER

Then you will get a reading something like



Then press F it will tell you to turn the rotator all the way clockwise then press ENTER

Then it will say wrote to memory

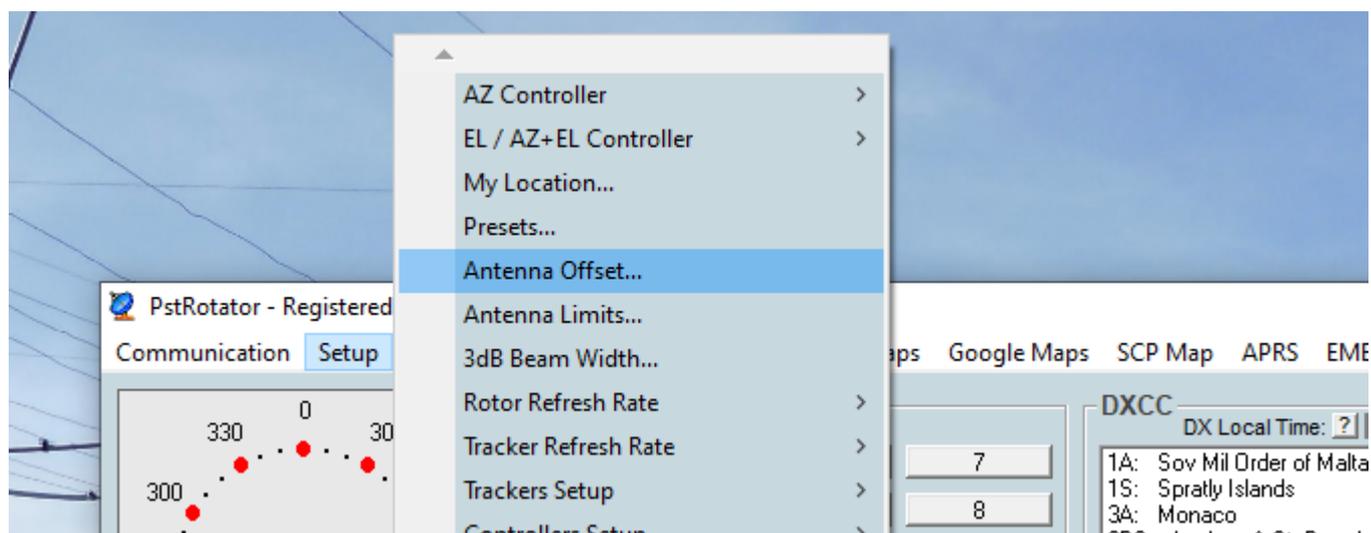
Then press O it will tell you to turn the rotator all the way counter clock wise Then press ENTER

That should be you done

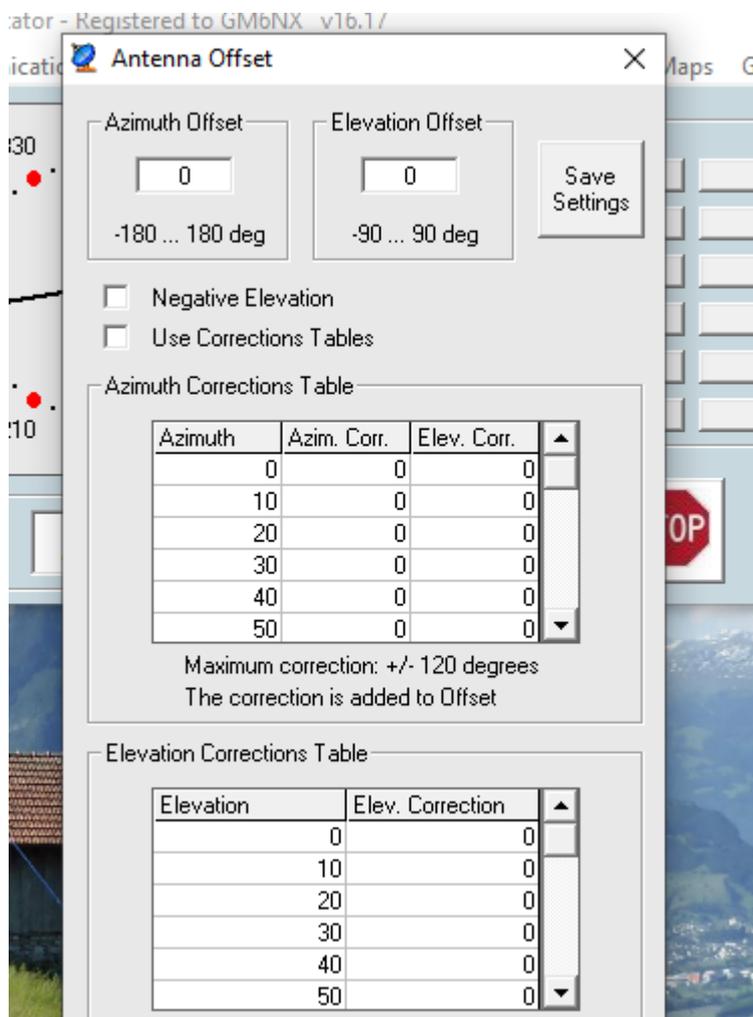
FULL LIST OF COMMANDS FOR PUTTY BELOW:

B	- Report elevation
C	- Report azimuth
C2	- Report azimuth and elevation
S	- Stop all rotation
A	- Stop azimuth rotation
E	- Stop elevation rotation
L	- Rotate azimuth left (CCW)
R	- Rotate azimuth right (CW)
D	- Rotate elevation down
U	- Rotate elevation up
Mxxx	- Move to azimuth
Wxxx yyy	- Move to azimuth xxx and elevation yyy
X1	- Change to azimuth rotation speed setting 1
X2	- Change to azimuth rotation speed setting 2
X3	- Change to azimuth rotation speed setting 3
X4	- Change to azimuth rotation speed setting 4
O	- Azimuth offset calibration
F	- Azimuth full scale calibration
O2	- Elevation offset calibration
F2	- Elevation full scale calibration
P36	- Switch to 360 degree mode
P45	- Switch to 450 degree mode
Z	- Toggle north / south centered mode
H	- Help

You can also go SETUP > ANTENNA OFFSET



Allowing you to make minor adjustments there



For further instruction on this software refer to the manual. This is a clone of the Yaesu USB controller interface. The G450 series controllers only uses 1v so it relies on mV's for needle position. Due to this the G450 controller series needs calibrated more regular than the other Yaesu rotator controllers, please be mindful of this.

YOU SHOULD HAVE BASIC TECHINAL KNOWLEDGE BEFORE YOU PROGRESS

Any further questions please ask

gm6dx@outlook.com

Thanks

GM6DX