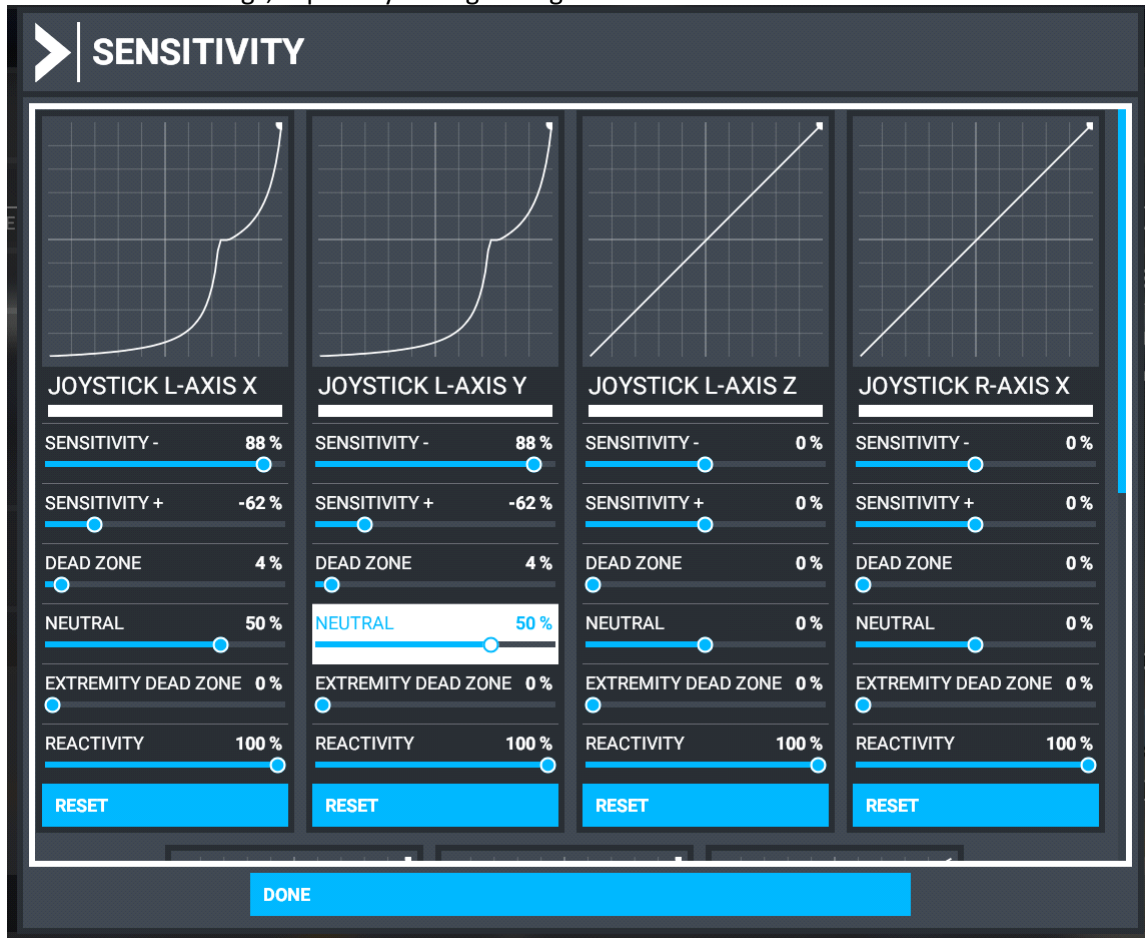# How to Calibrate the Thrustmaster TCA Airbus Throttle Quadrant

v1.0 by tewky@github.com

Tested with the A3NX "Fly by wire" edition

Default problem 1: sensitivity curves are modified for the A320 detents, leading to wild throttle inputs at certain thrust settings, especially during during taxi or manual thrust.

Default Problem 2: outside of the four detents, when the throttle levers are physically aligned, the inputs are not and vary by as much as 4% raw values, and higher in-game.

Outside of detents: alignment is off.

At detents: alignment is OK.

This leads to very different throttle settings between the engines, as much as 10 - 15% N1, which leads to difficult and suboptimal flying.

Why?

Normal manufacturing tolerances, the sensors embedded in the thrust levers don't line up perfectly.

Theory: the internal calibration done by the unit modifies the rate of movement of the levers at certain points such that they line up at the detents, despite having different REAL positions at those points. This leads to uneven response curves between the two levers when they are not aligned at the detents.

This is not a major issue for the A320 except during taxi or manual flight where it becomes frustrating and breaks immersion.
It's a huge problem for GA / non-airbus if you're flying a twin because thrust doesn't match between the engines and this throws out the planes trim characteristics, makes it harder to control, and reduces immersion.

Solution

1. Install the official TCA drivers and update the firmware to the latest (1.61 as of writing)

Observe the X and Y sliders in controller options. If they are near-perfectly aligned at all major positions, skip this guide, you've got a golden unit!

**2**. *Calibrate the TCA Quadrant using this official Thrustmaster guide*
https://ts.thrustmaster.com/download/accessories/manuals/TCA_Quadrant/TCA_Quadrant-Throttle_Calibration.pdf

Some people say you have to calibrate it by also pressing the two red buttons at the 5th detent in the picture, i.e. the throttle at 0%. I haven't tested this much, but it seems to work both ways with 1.61 firmware.
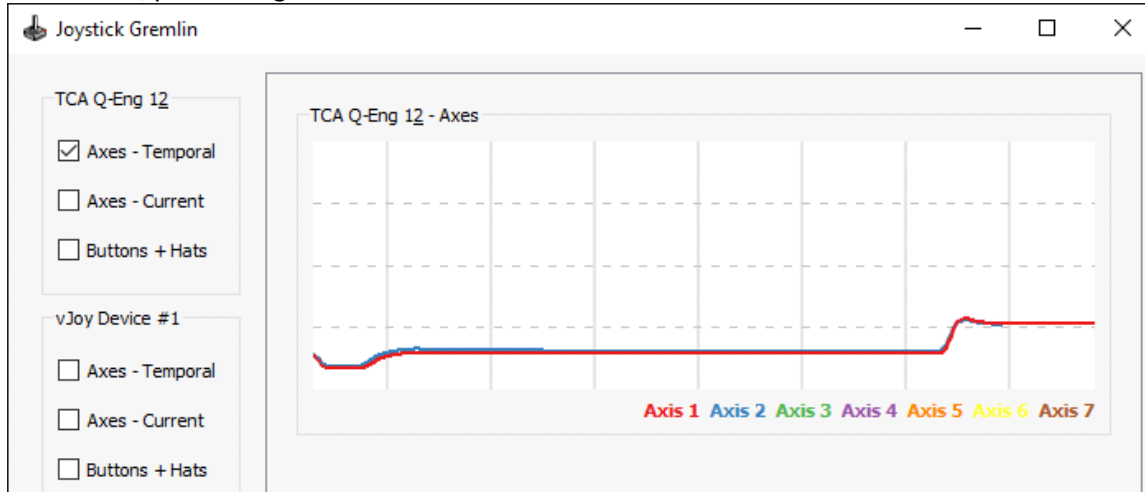
3. Install vJoy

4. Install Joystick Gremlin. Observe "Input Viewer" and see the difference between the two levers in between the detents:
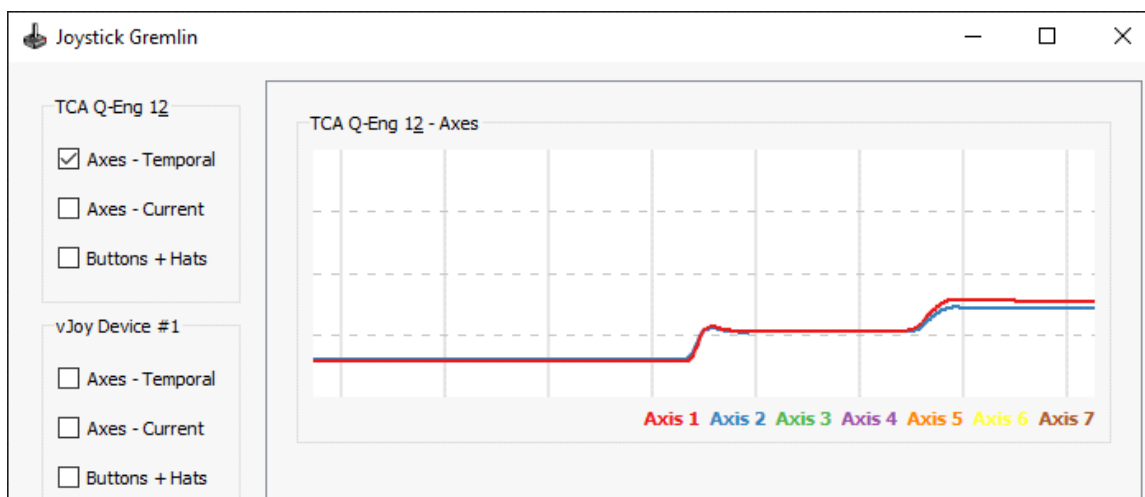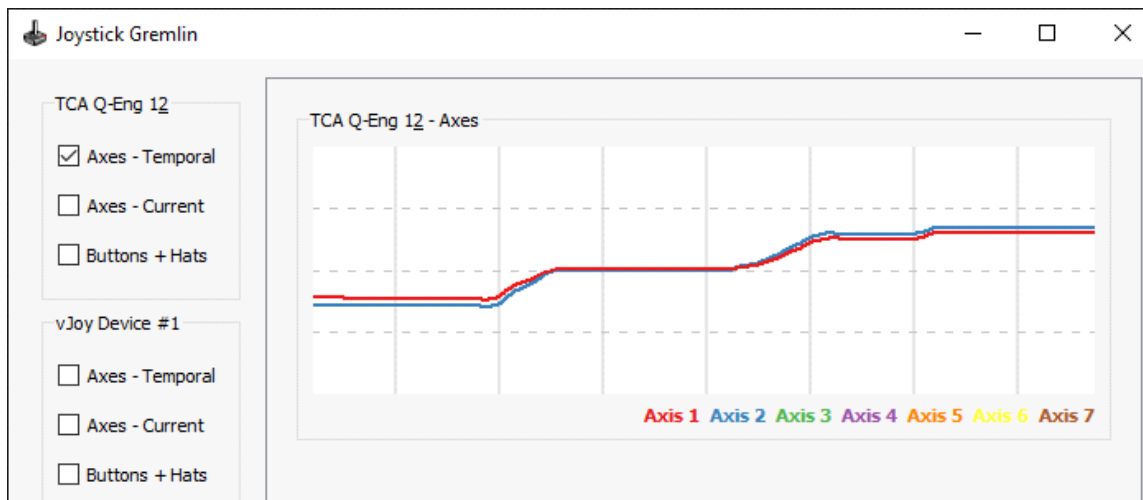
Below detent 1, slight misalignment:
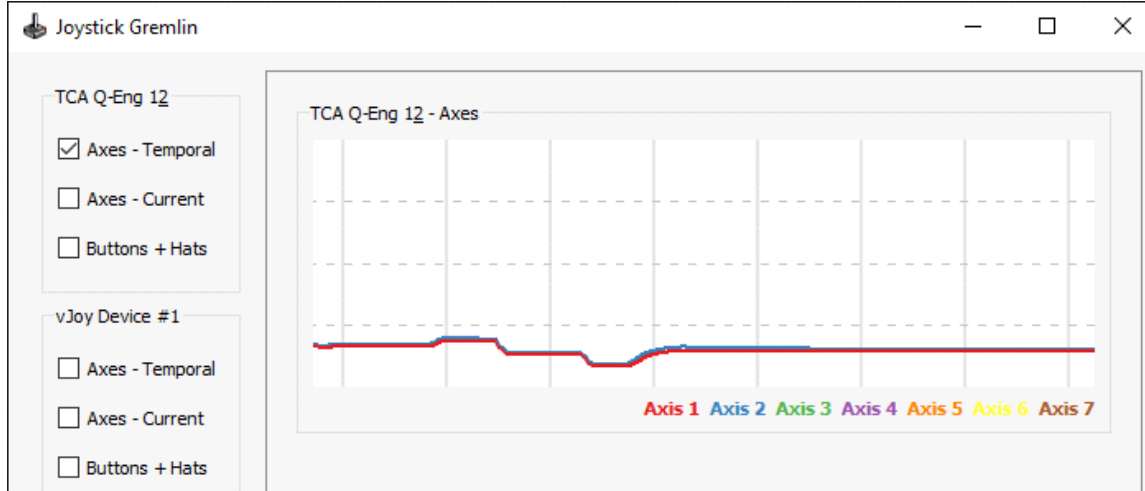
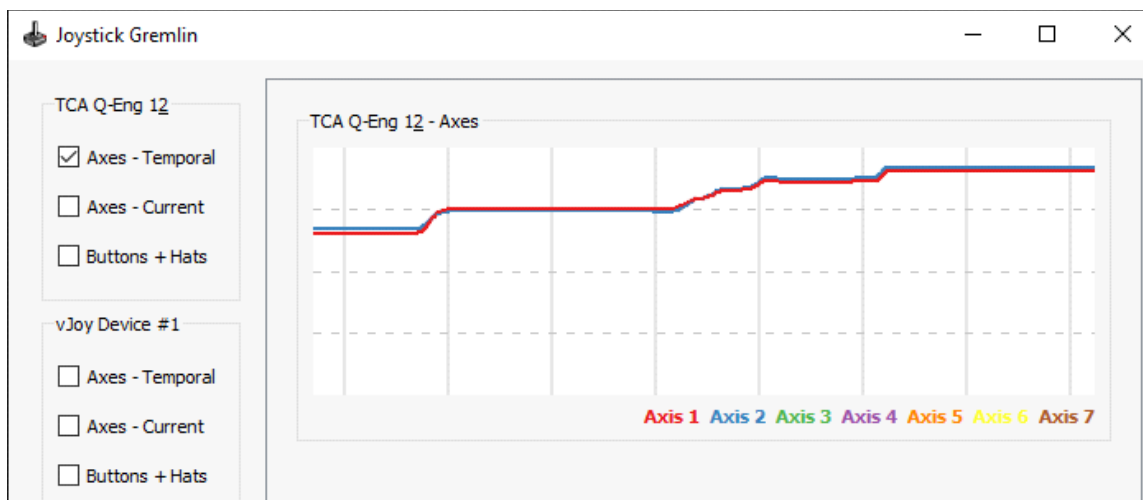
At detent 1, perfect alignment:


Between detent 1 and 2, large misalignment:

Between 2 and 3, large misalignment:


Above detent 3, slight misalignment:

Result: everywhere the lines don't overlap perfectly, and split apart, is a misalignment of the throttle levers at that point. As you can see below, it lines up at the detents, and it seems like a curve is applied by the throttle internally to make this possible.
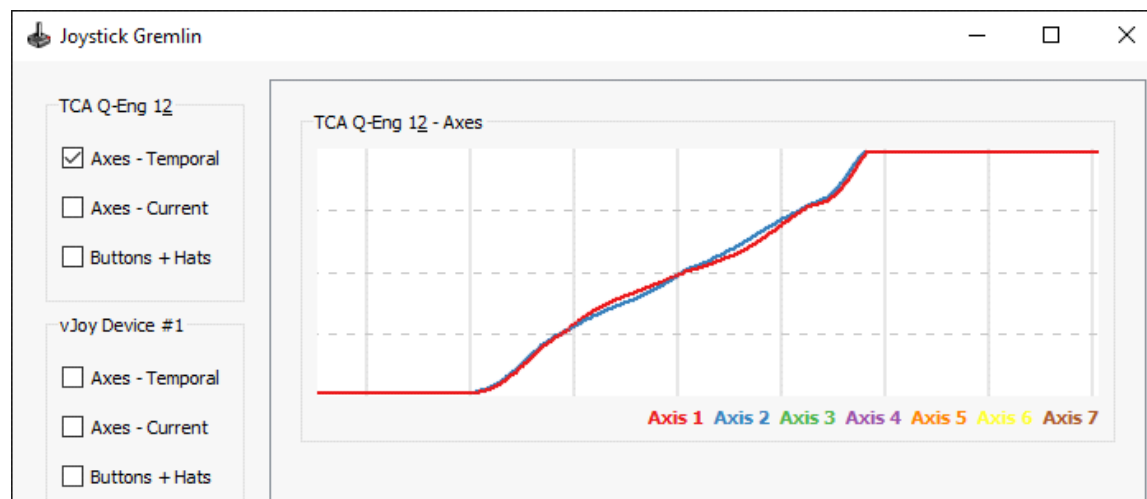

5. Calibrate using Joystick Gremlin, with the locking bar inserted, stopping at each extremity when the first of the two throttles has reached it -> this sets the valid zone in which both throttles can travel while aligned.

As you can see the base lever difference is 4% at one end, and 1% at the other. By not moving the throttle into these ranges the calibration adds a deadzone here.
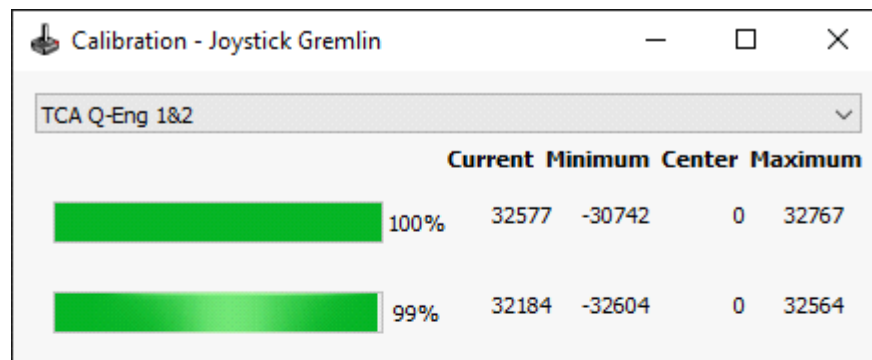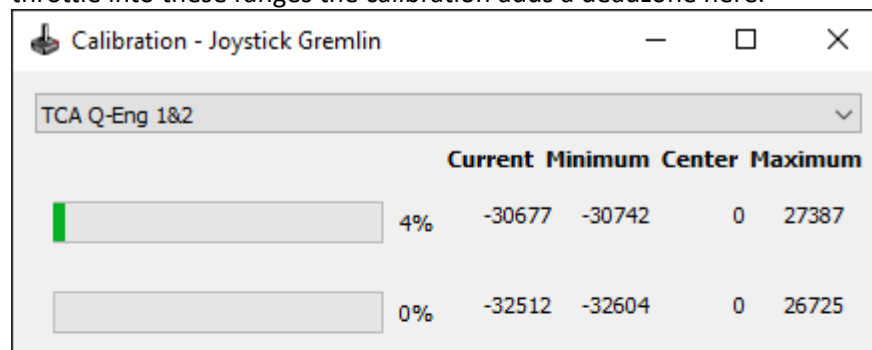
6. Add response curve, bezier spline, with points at each quarter (-1, -0.5, 0, 0.5, 1)
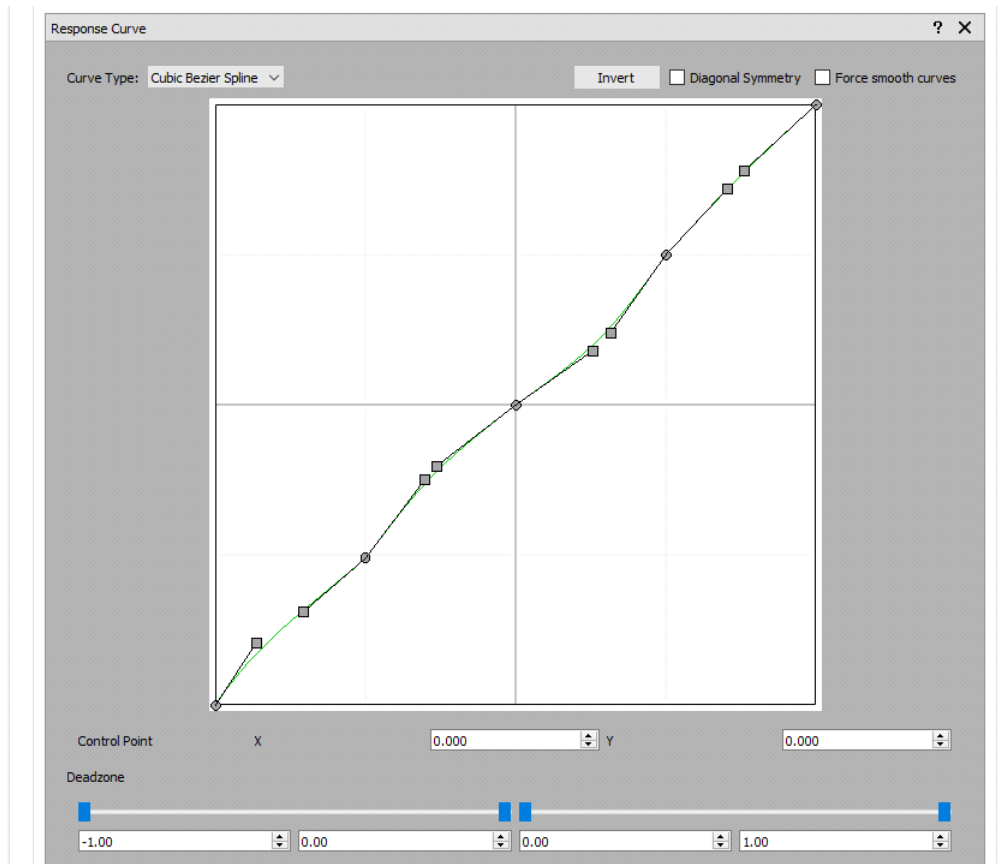
**7**. Adjust the curves, checking the device output with the Input Viewer.
This is trial and error. After each curve adjustment you need to deactivate then activate the device in Joystick Gremlin, and re-launch the Input Viewer.

8. Keep adjusting until only one line shows with minimal to no deviation in the overlap at all positions
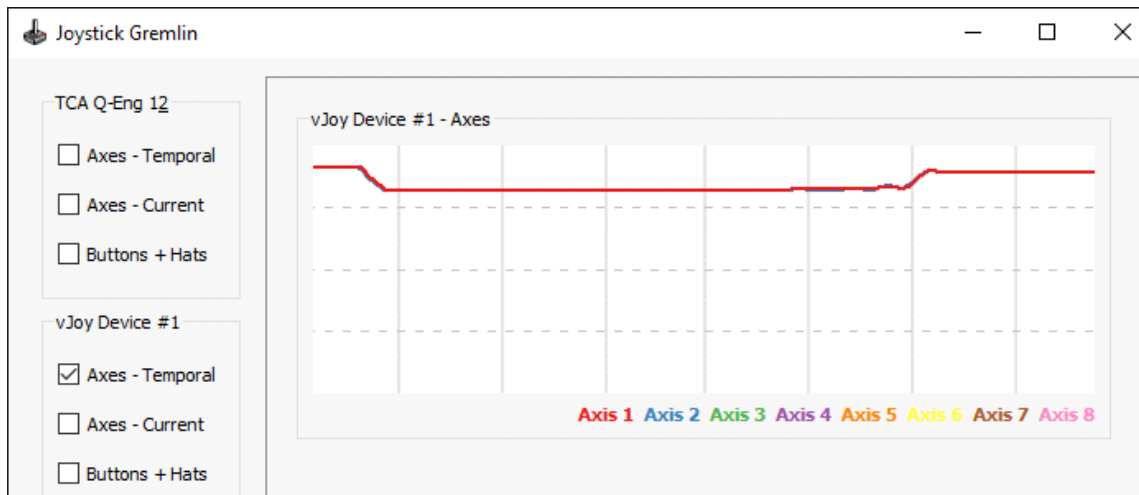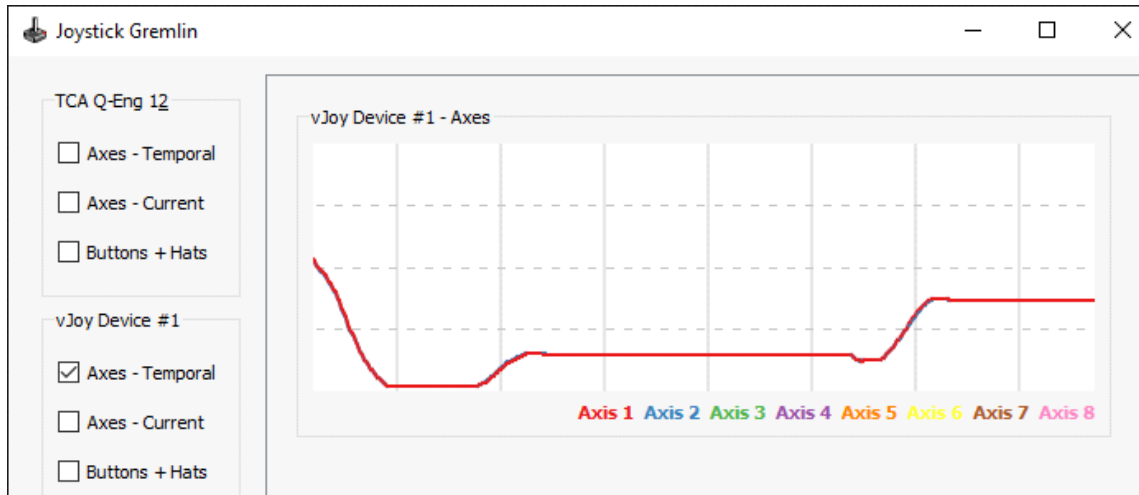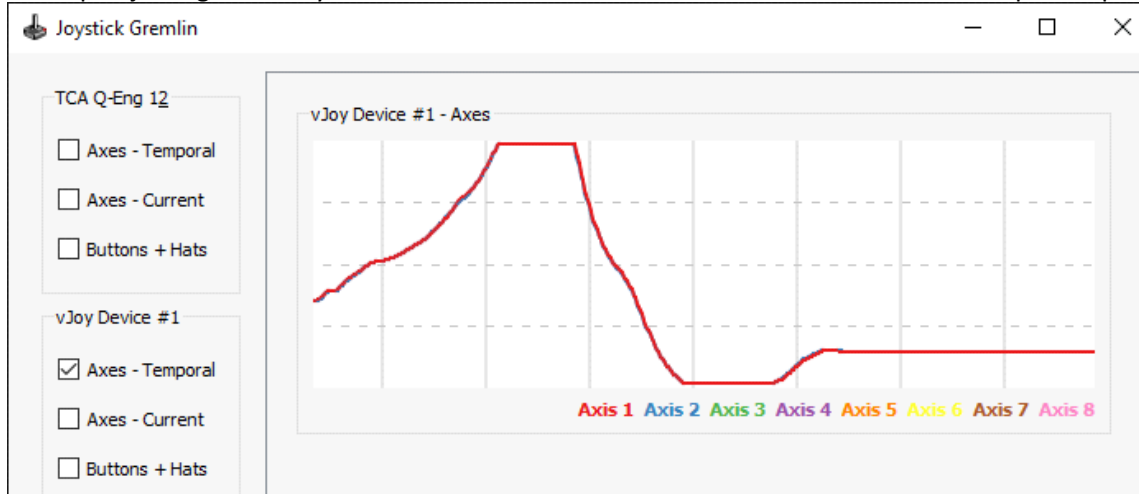
Result: the curves no longer separate as much during the full motion of the throttle. This can be more precise, the degree to which you want the levers to match depends on how well you fine-tune these sensitivy curves. I'm happy with a very minor deviation but it's possible to eliminate it completely. *Note that the wiggle between the two levers with the locking bar installed can lead to a slight difference in the two line positions.*
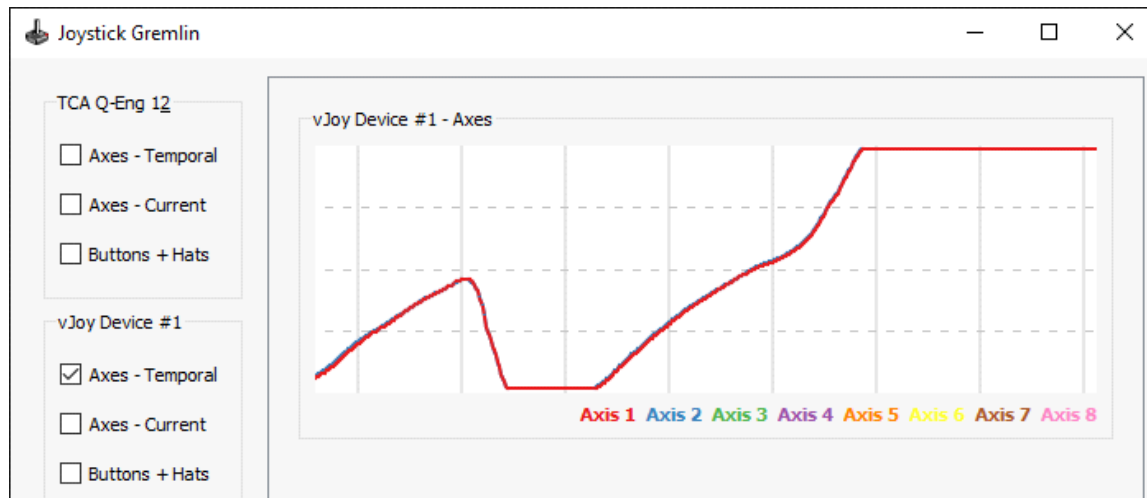
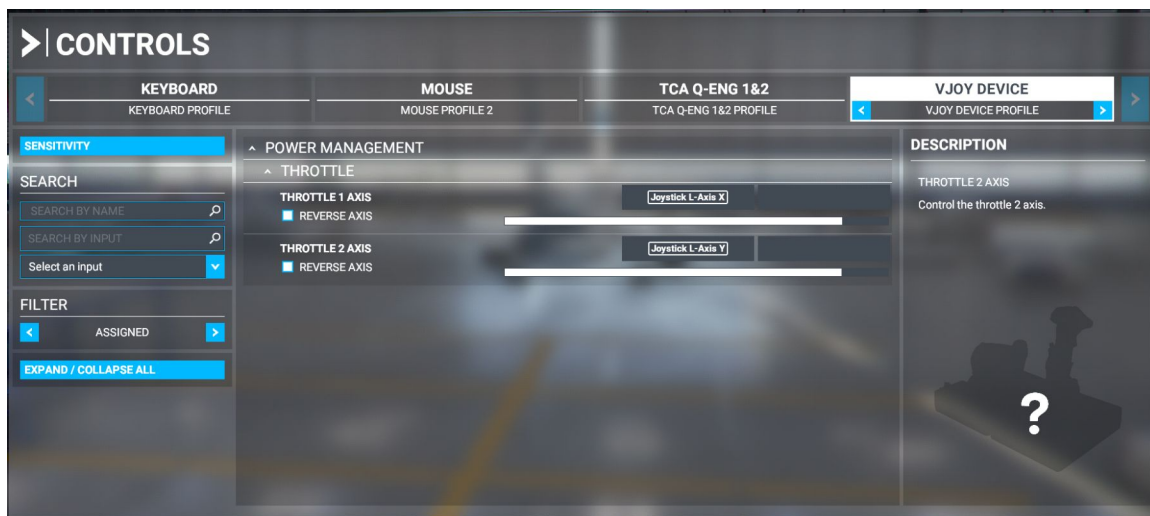**9**. In FS2020 unassign the throttle axes on the TCA quadrant
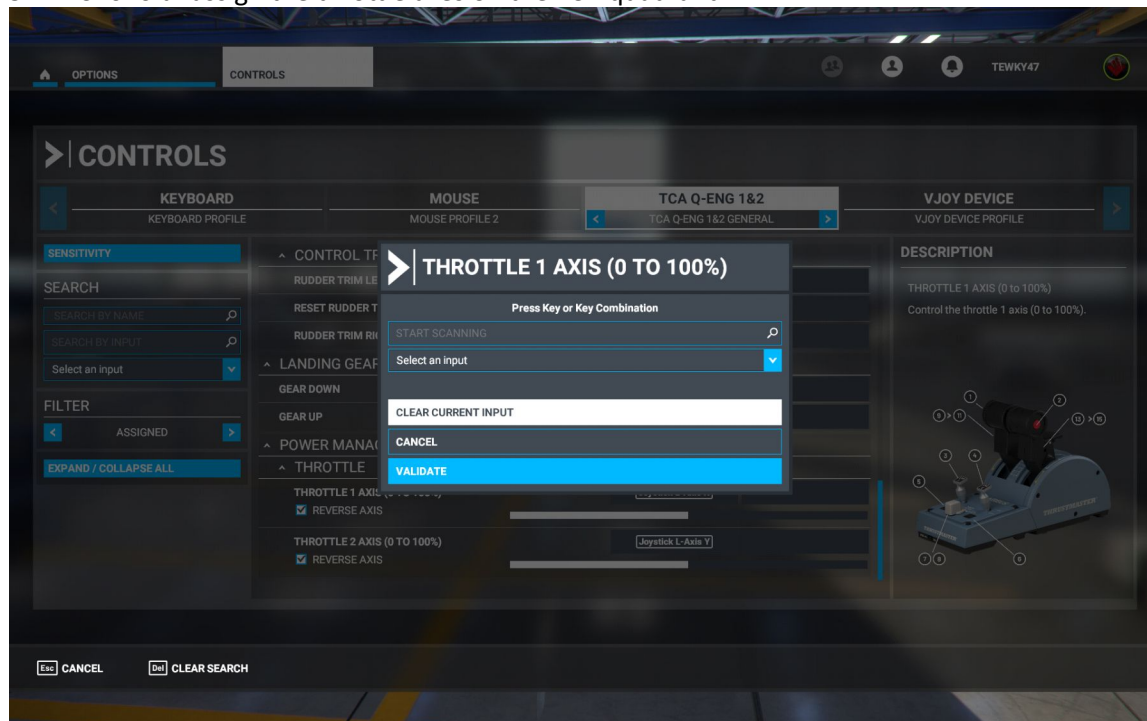
10. Assign throttle axes to the vJoy device that you have customized

11. Your throttle levers now line up in between the detents. Happy flying!

12. Set your sensitivity curve according the A3NX version you have. Use this guide
https://github.com/flybywiresim/a32nx/tree/fbw/docs