How to Fix Misaligned Throttle Levers – TCA Quadrant Airbus Edition

v1.2 by tewky@github.com

Required

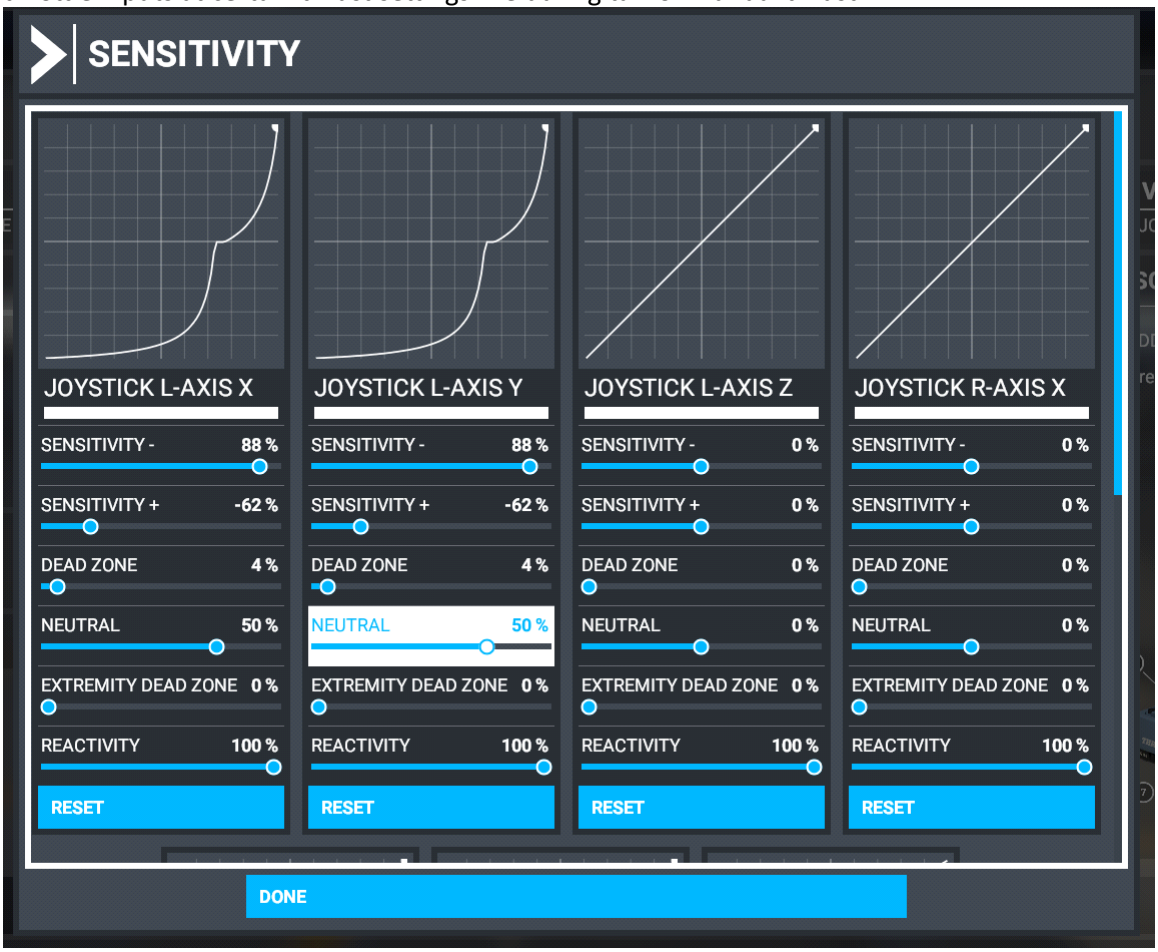
vJoy

Joystick Gremlin

Thrustmaster TCA Airbus Edition drivers

Tested with the A32NX "Fly by wire" edition

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



Default Problem 2: outside of the four detents, when the throttle levers are physically aligned, the otuputs vary by as much as 4%, and much more in-game because of the default sensitivity curves.

At detents: alignment is OK.

Outside of detents: alignment is off.

This leads to different throttle settings between the engines, as much as 10 % N1 with linear sensitivity, and 20 – 30% with default sensitivity curves, which leads to difficult and suboptimal flying.

Why?

Theory:
Within normal manufacturing tolerances, the sensors embedded in the thrust levers don't line up perfectly. 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 with linear throttle sensitivity in FS2020, except during taxi or manual flight where can be frustrating and break immersion. For the A320 setups that use steep sensitivity curves, this misalignment results in very different (20 – 30%) throttle settings. It's also a big problem for GA if you're flying a twin because thrust doesn't match between the engines at many throttle settings.

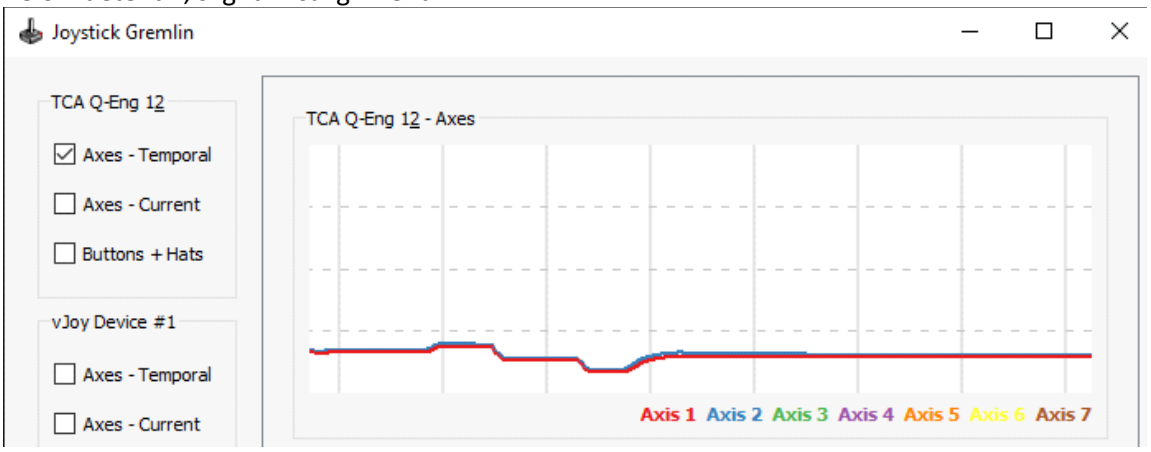
Solution

1. Install the official TCA drivers and update the firmware to the latest (1.61 as of 2/25/2021)
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!

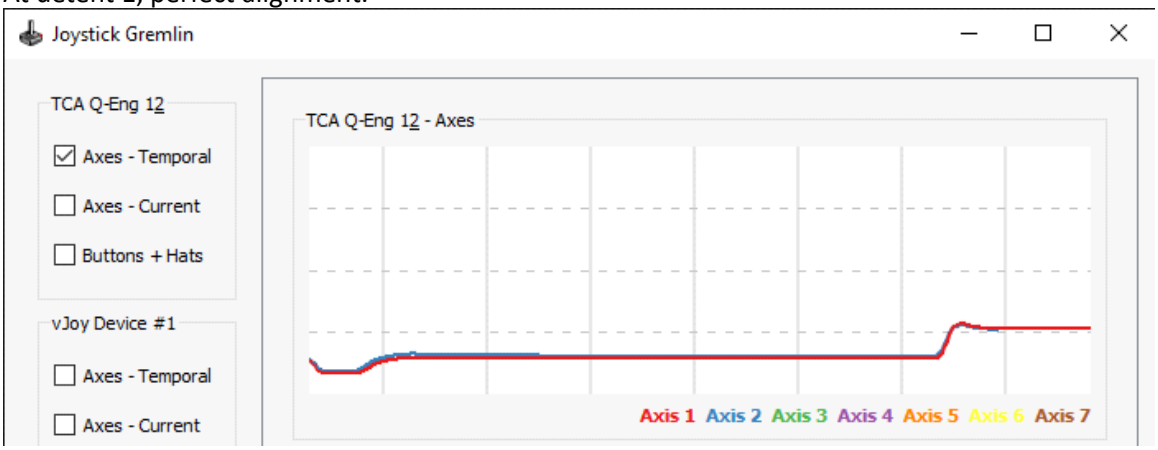
***2**. Calibrate the TCA Quadrant using this official Thrustmaster guide*
https://ts.thrustmaster.com/download/accessories/manuals/TCA_Quadrant/TCA_Quadrant-Throttle_Calibration.pdf
Some people say you have to calibrate it by also pressing the two red buttons at the 5th detent in the picture, i.e. the throttle at 0%. I haven't tested this much, but it seems to work both ways with 1.61 firmware.

3. Install vJoy

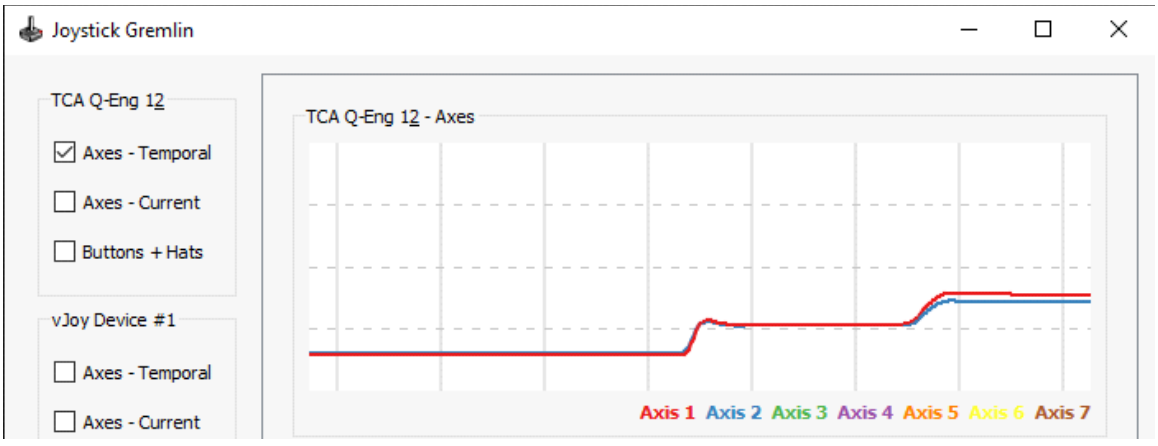
4. Install Joystick Gremlin. Observe "Input Viewer" and see the difference between the two levers in between the detents:
Below detent 1, slight misalignment.



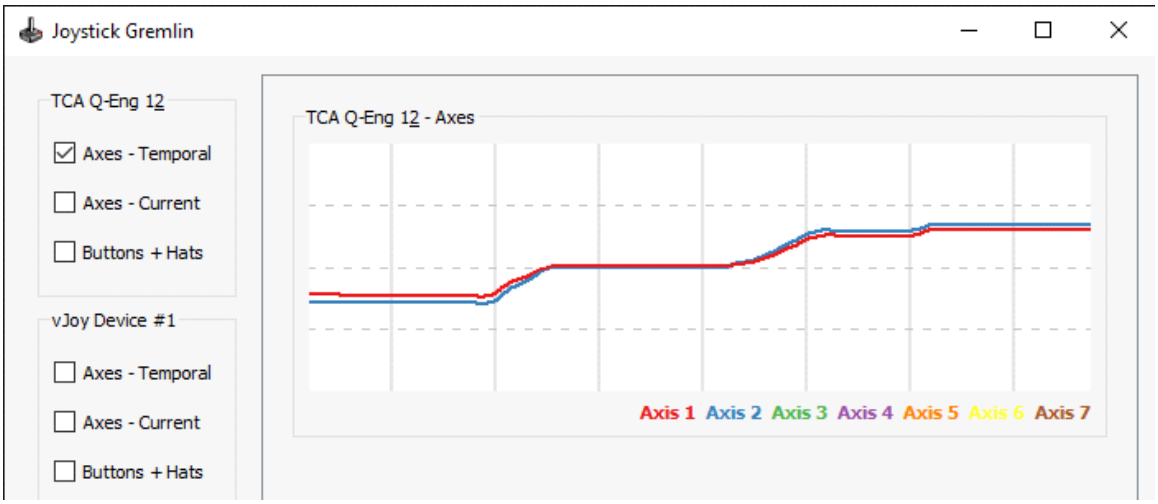
At detent 1, perfect alignment.



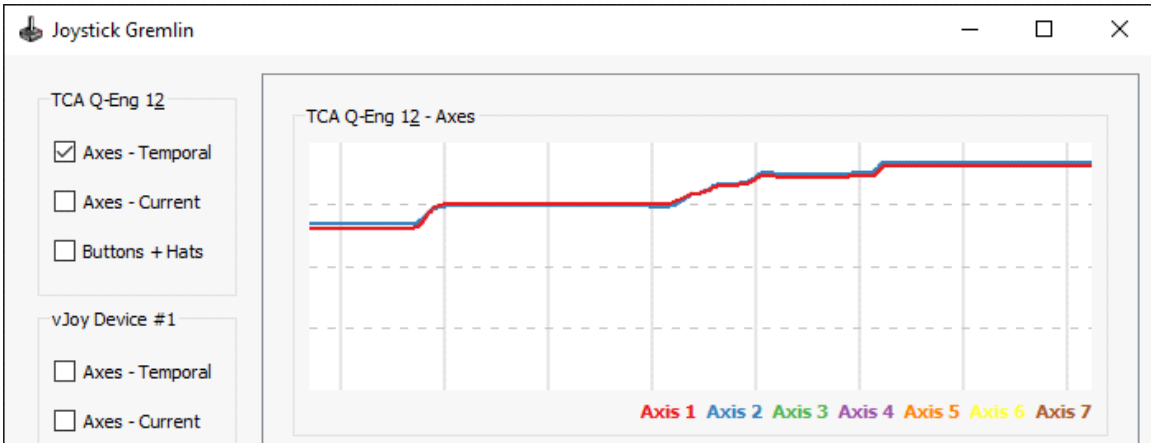
Between detent 1 and 2, large misalignment.



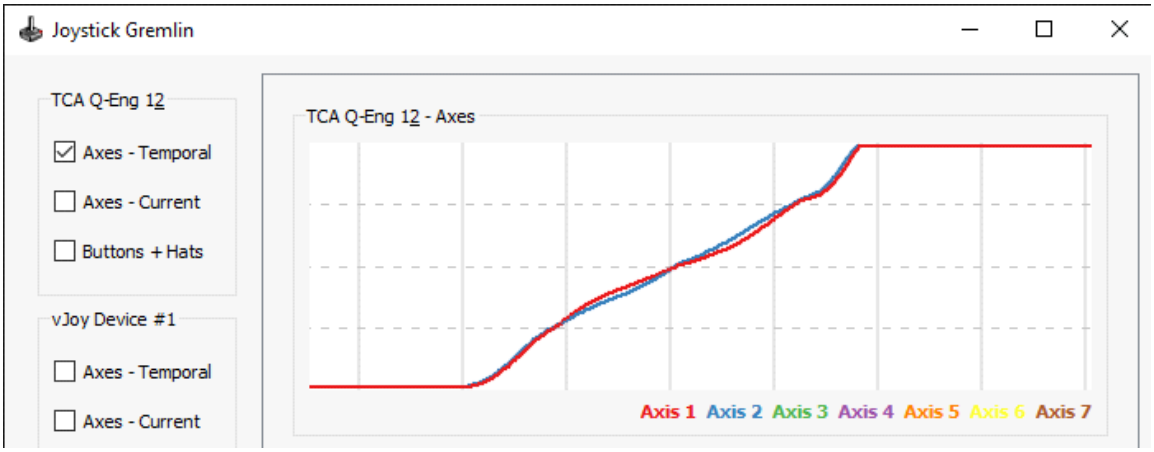
Between 2 and 3, large misalignment.



Above detent 3, slight misalignment.

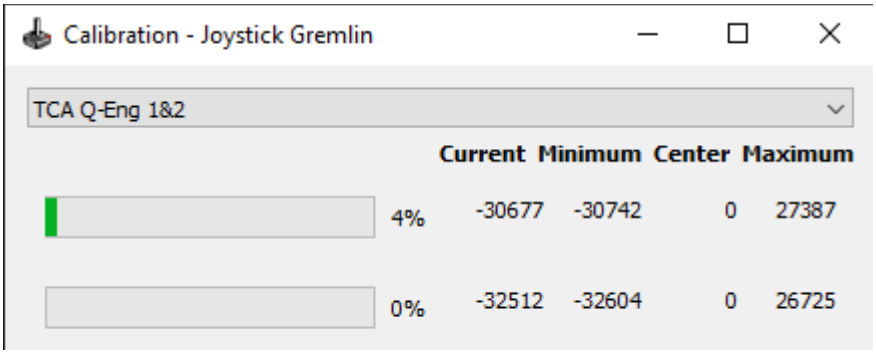


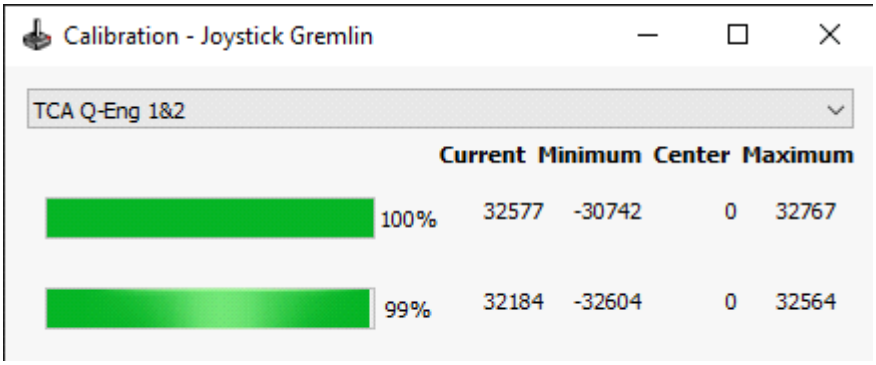
Result: everywhere the lines don't overlap perfectly, and split apart, is a misalignment of the throttle levers at that point. As you can see below, it lines up at the detents, and it seems like a curve is applied by the throttle internally to make this possible.



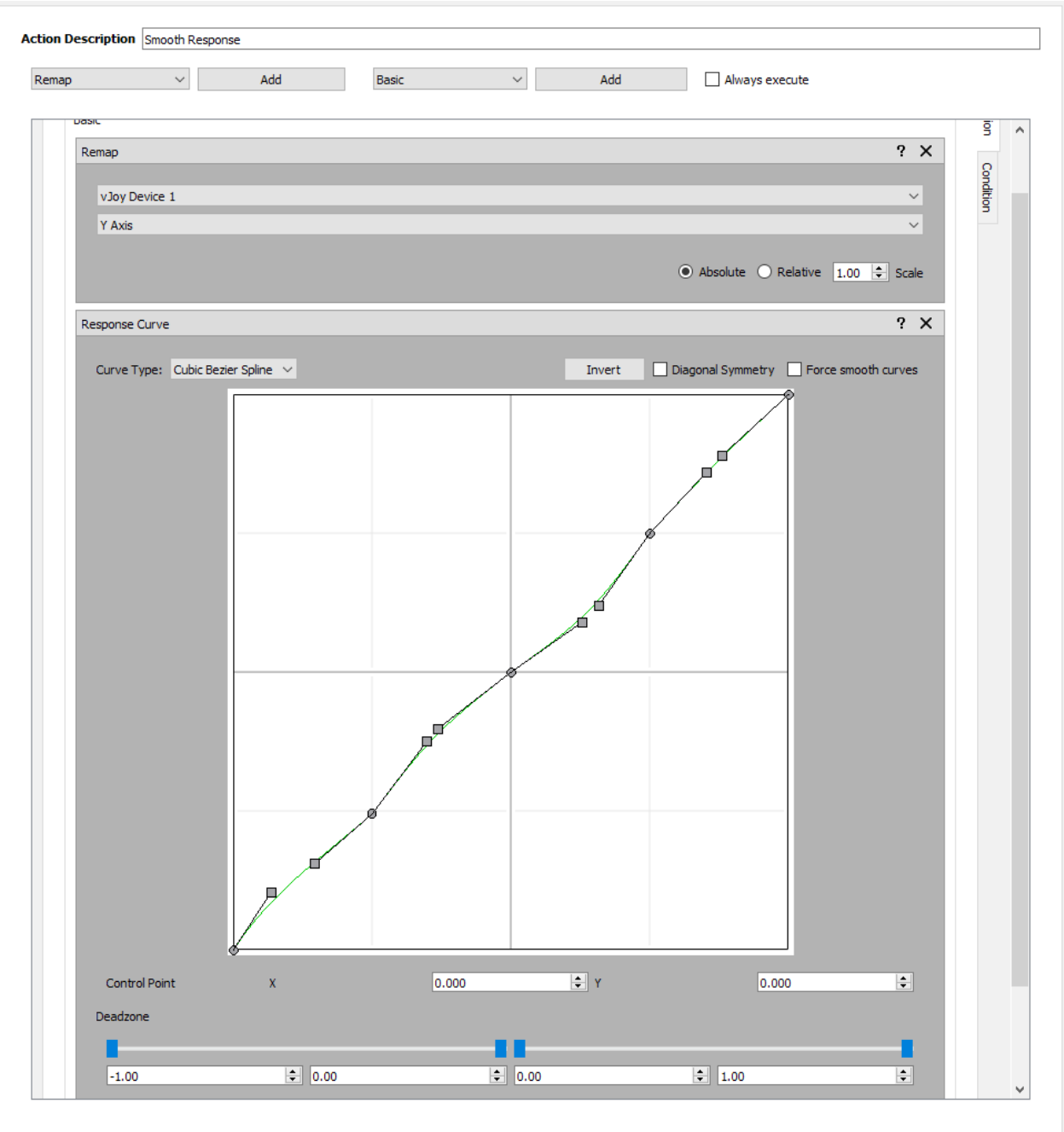
5. Calibrate using Joystick Gremlin, with the locking bar inserted, stopping at each extremity when the first of the two throttles has reached it. This sets the valid zone in which both throttles can travel while aligned.

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.



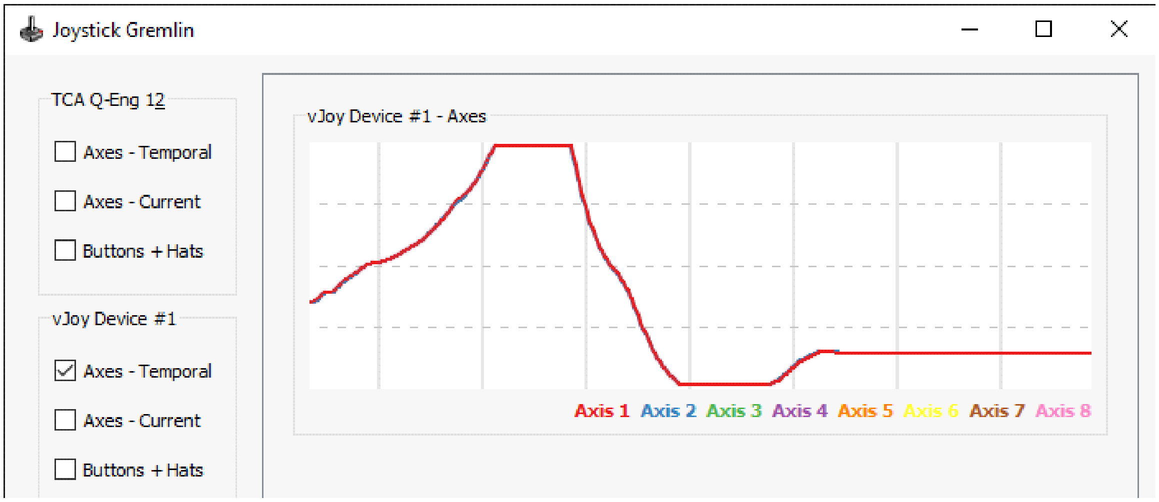


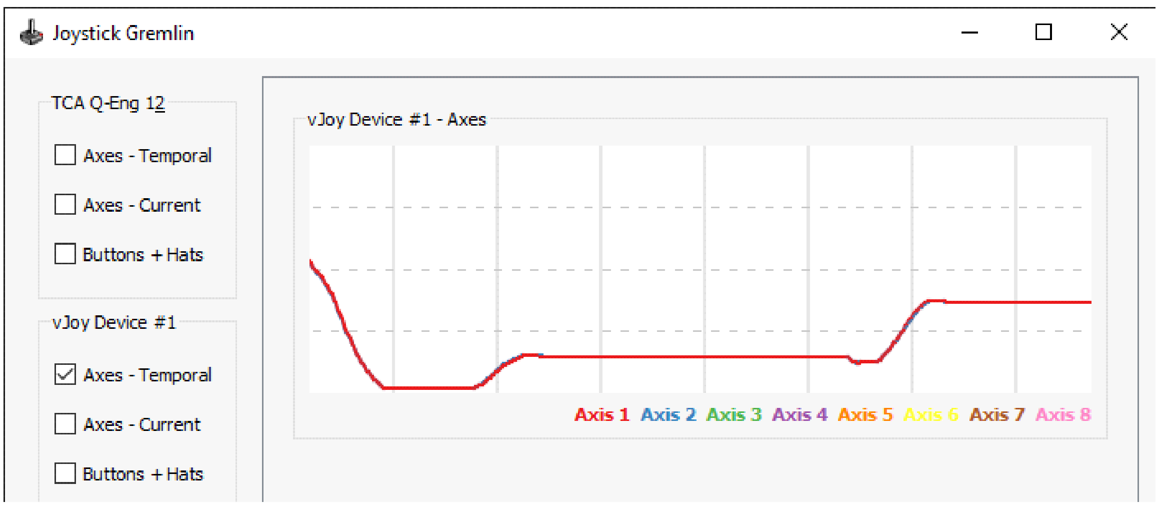
6. On one of the axes, add a cubic bezier spline response curve with points at each quarter (-1, -0.5, 0, 0.5, 1). This curve is to offset the output of one axis so it aligns with the other.

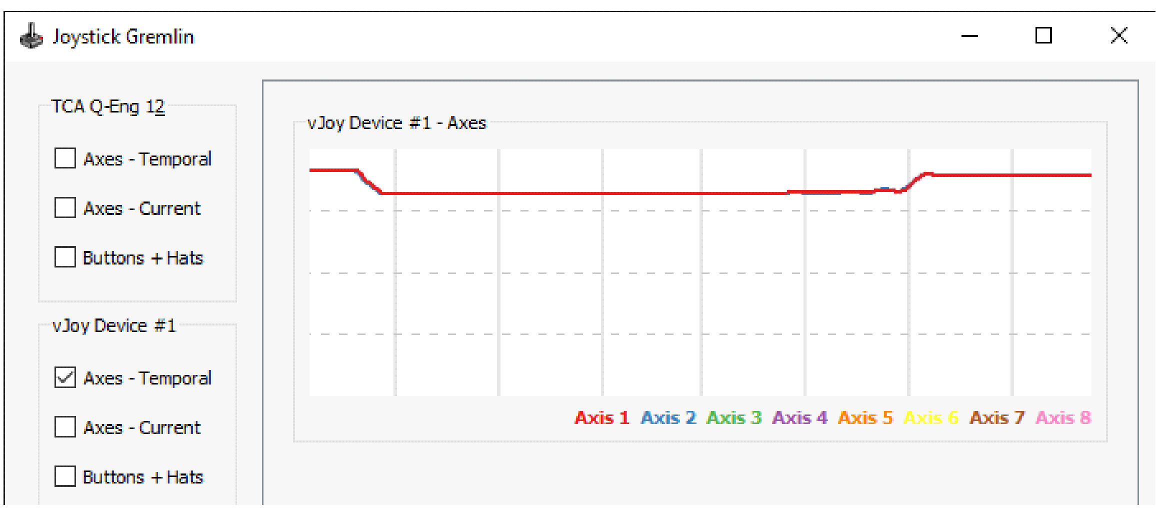


7. Adjust the curve, checking the vJoy device output with the Input Viewer.
This is trial and error. After each curve adjustment you need to deactivate then activate the device in Joystick Gremlin, and re-launch the Input Viewer.

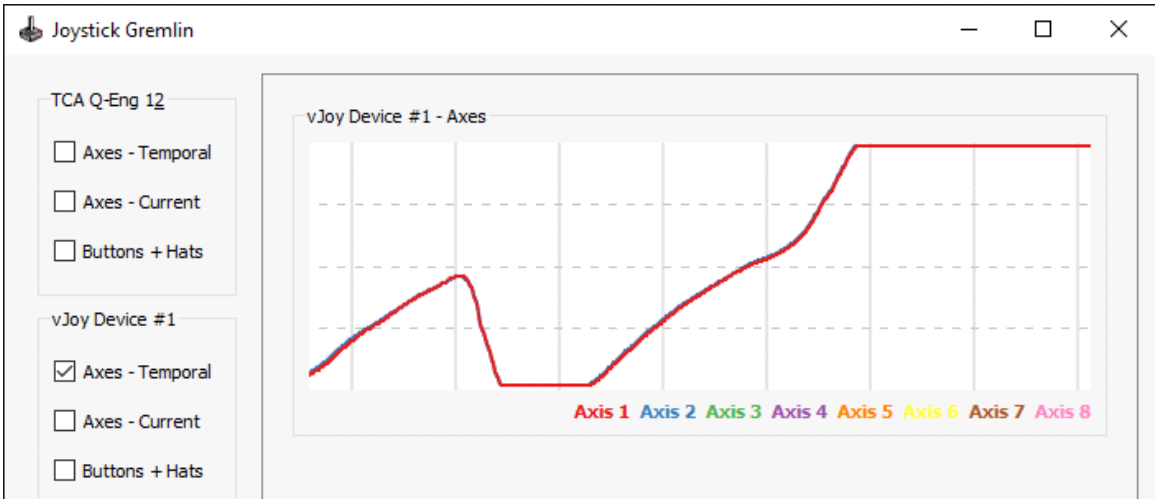
8. Keep adjusting until only one line shows with minimal to no deviation in the overlap at all positions of the throttle lever



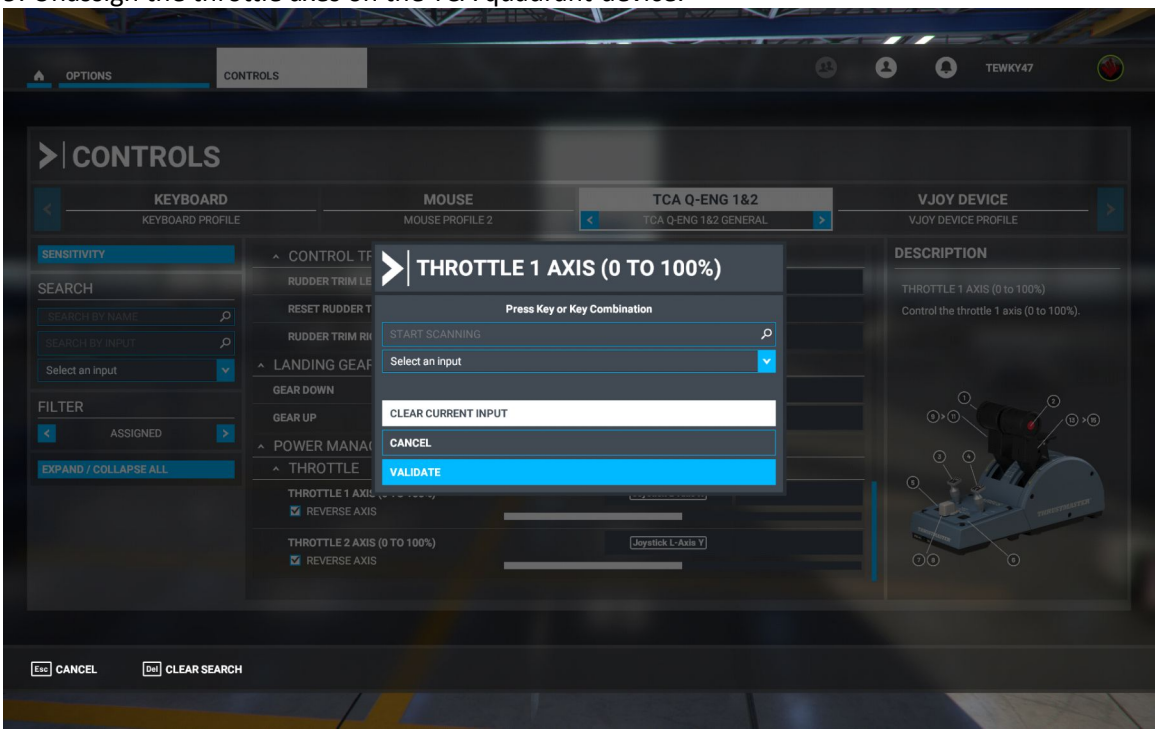




Result: the throttle axes outputs don't separate nearly as much anywhere in the full motion range of the throttle levers. This can be more precise, i.e. the degree to which the throttle levers match depends on how well you fine-tune this response curve. *Note that the wiggle between the two levers with the locking bar installed can lead to a slight difference in the two line positions, so the result will never be perfect.*



9. Unassign the throttle axes on the TCA quadrant device.



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 in-game sensitivity curve based on the A32NX version you have, according to this guide: https://github.com/flybywiresim/a32nx/tree/fbw/docs