Installation & Set-up of Trio Avionics Gold Standard AP Servos

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“From experience so far received please take the following into account when installing your servos and setting up the system:

The active control range of the Trio servo is approximately +/-40 degrees from center position. Install your linkage such that this equates to no more than 50% of the active control range of the control surface (or as close as you can get it).

Use the servo test and checks menu function to check your control range and center position. The center position is not critical in this system as it will engage at whatever you give it, but try and get close so the control range is about equal for each direction.

If your control range is too large - it has the effect of giving the servo too much gain. The Trio servo has finite accuracy and repeatability and you will be amplifying this making life for the autopilot very difficult.

During the servo tests you may notice a somewhat halting (or stuttering) movement of the servo (it gets better with load on the surfaces). This is normal and is related to the internal position feedback mechanism of the servo. This does not seem to have an effect during flight as far as we can establish.

When your installation is done - engage the servos and try moving the control surfaces by hand to check for play and tolerance. If there is too much play - your autopilot will find it difficult to fly the aircraft.

Follow the instructions in the autopilot document when you setup your system. Bank tends to be quite easy - pitch can be more difficult depending on how your aircraft reacts.

Once you have adjusted the pitch servo magnitude (and you are happy with the result - you will probably have a setting of 3 to 4), you need to do the pitch control magnitude. This setting controls how much control to give to try and chase a given VSI. If it is too low, the result is bad - the autopilot will be "behind" the aircraft as you are not allowing the control to move fast enough. If it is too high you will cause the autopilot to give too much correction - much like a rookie pilot would and the whole thing will oscillate out of control. Using our aircraft as a reference, I find a value of 15 just about right (with a pitch retard of 6).

Before you do your first calibration flight, ensure that you can disconnect the autopilot by simply taking over control of the stick.

You can leave the autopilot setup menu open during the adjustment which makes this fairly easy.

During calm conditions the autopilot must be able to fly the aircraft at a given altitude with very little deviation. In normal (slightly disturbed air) you will find the system to allow slight altitude deviations before attempting a correction - that eases the workload of the servos. In heavier turbulence the control becomes more agressive and your setup becomes more critical.”