

Using a (shhh!) gyro stabiliser, and details of the Freewing E51

Generally I am philosophical about crashing models, which happens a lot less often now. They are after all only money, however much I like them. There are few greater pleasures than taking all of my models home intact. Recently I have been spending time building and renovating a couple of aircraft. They are heavy scale machines so will be more difficult to fly and to land without breaking the retractable undercarriage.

So my thoughts turned to using a gyro for early flights. Instinctively I disapprove of gyros, thinking they are like climbing a mountain with a Stannah stairlift. A lot of the fun of flying is the challenge of defying gravity and of flying smoothly when I want to. But our field often has crosswinds and turbulence, so landing can be fraught. Once sure of the flying and landing characteristics of the models I will take the gyros out. Or will I leave them in, but switched off, just in case?

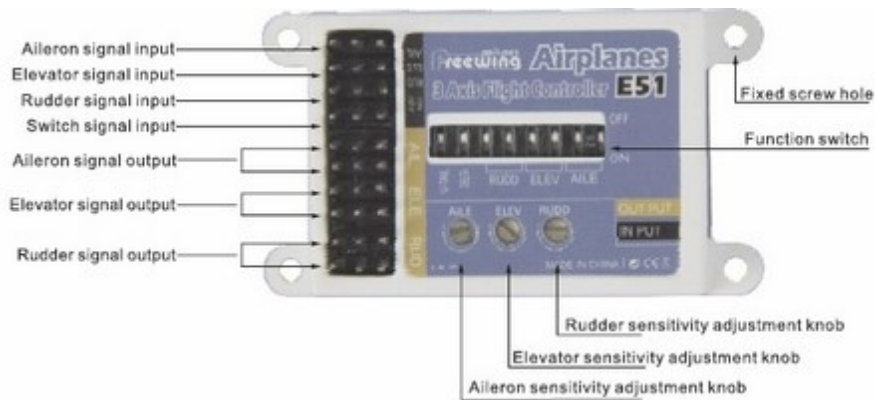
A bit of research showed that gyros are surprisingly cheap. In the end I settled on the Freewing E51 3 Axis device. It isn't the cheapest but it seemed most flexible and best value for money. It has two output connectors for each function and uses screws to fix to the mounting plate rather than velcro. It can be switched on and off in flight through the switch signal input. There is only one aileron input channel so I had to use a single receiver channel. Zeroing was done by adjusting push rods, which is best anyway. The one thing that a more expensive device had was an overall sensitivity control allowing all channels to be adjusted at once in the air.

I bought my first one from MotionRC, which was much more expensive than direct from China. (£34 including postage against £16). However I didn't want to wait a month.

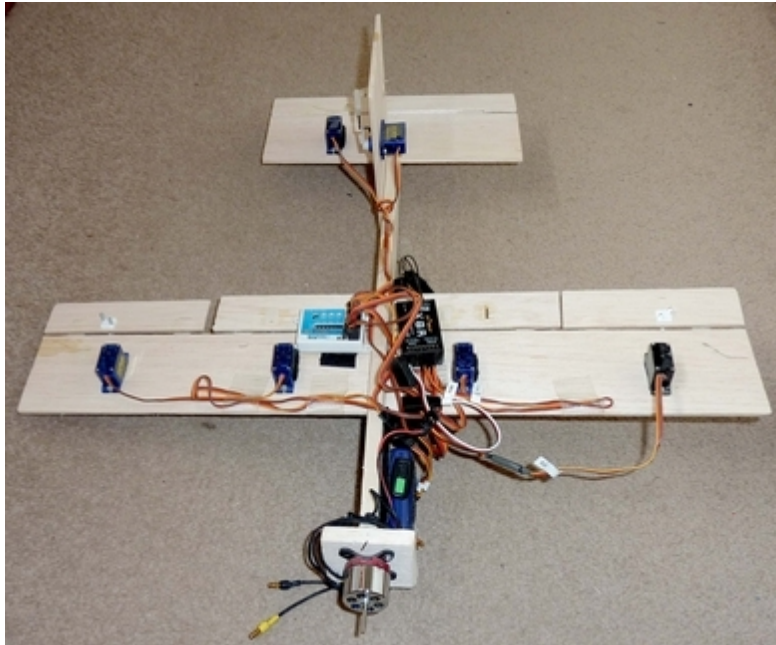
The manual was in reasonably comprehensible English so I didn't bother with my usual translation. The design is slightly different from the one shown in the manual. The main change is the red and blue LEDs positioned to the right of the sensitivity controls. As you see the device is small and the weight is low at 11.5g. A tiny screwdriver is supplied to adjust the sensitivity controls and to set the DIP switches. The blue LED is only on when you choose delta or V-tail models using the DIP switches.



This is the picture in the manual.



I already had a tryout model rig that I have used to test out something new to me such as full-house glider. I decided to try out the gyro on that.



First discoveries and mistakes were:

- Don't forget to switch on the channels you are using on the gyro using the tiny DIP (Dual In-line Package) switches.
- Make sure you plug the leads in the right way round. The markings on the gyro are annoyingly minute. Signal pins are on the inside, away from the edge.
- Take care with channel setting. If you have a flexible transmitter like my Taranis it is easy, for example, to find the elevator channel controlling the ailerons.
- Set the sensitivity up to maximum for playing. If you don't it isn't easy to see if the control surfaces are moving as they should.
- The corrections are ferocious at maximum. I can't see that it will ever be needed or desirable. I imagine the more agile the model the less sensitivity you use.
- At first, turn the model on one axis at a time to check direction of control movement.
- Expect a lot of servo noise unless the model is completely stationary.
- You need even more wires to connect it all up. I believe some gyros work on S.BUS, but not this one.

All worked as it should, so the next thing was to set up a switch channel to turn the gyro on and off. I set switch F to switch channel 7. Then I connected 7 to the switch signal input on the gyro. And it worked. The steady red LED was off until I pulled the switch forward, when the LED came on steady and the gyro started whirring the servos.

One thing I am not clear about is the position that the model should be in when the gyro is switched on and locks. The manual says, 'Put the airplane in steady, and prevent shaking'. Hmm. I guess this means 'put it on the ground and don't touch it' until the LED shows red meaning the gyro is locked. It doesn't seem to matter if it is level. We'll see.

For flight testing I will install the gyro in a model that I have flown a lot, a Wot Trainer. This stable model doesn't need the gyro but I want to see how it would feel before risking it in a new model. I will start with the settings at about 30% as suggested in the manual. In any case I will take off with the gyro off and switch it on at three mistakes high. It will be interesting to see if the gyro trims automatically when flaps are lowered. It should, as the stick is saying fly level and the nose is pitching up. That will have to wait until I fly my new P51 as the Wot has no flaps.

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