

## Roll/pitch P-tuning:

**Set** the gains and limits to the following values:

Roll/Pitch P-gain: 30 (For a small 25cm size **set** to 20)  
Roll/Pitch P-limit: 100  
Roll/Pitch I-gain: 0  
Roll/Pitch I-limit: 20

Yaw P-gain: 50  
Yaw P-limit: 20  
Yaw I-gain: 0  
Yaw I-limit: 10

Now, Increase Roll/Pitch P-gain by 10 (5 or less for a small aircraft) at a time, and test your aircraft response by hovering and move the left stick in short and fast movements.

As you increase the gain you will notice:

- 1: The aircraft reacts faster and feels more connected to the stick movement and wander less on its own.
- 2: The aircraft may oscillate for a short time. Usually a few oscillations, but may be more if gain is high. If it oscillates continually the gain is too high.
- 3: The aircraft may be harder to land, it bounces back when touching down.
- 4: The aircraft may climb.

When the aircraft has a good response and does not oscillate or climb when testing, P-gain is good.

## Roll/pitch I-tuning:

- 1: Trim it level.
- 2: Fly fast forward and center the stick.

If it level itself, increase I-gain.

If it stays in attitude, I-gain is good.

Alternatively setting I gain to 50-100% of P-gain does the trick.

## Yaw P-tuning

Increase Yaw P-gain by 10 (5 or less for a small aircraft) at a time, and test your aircraft response by hovering and move the Yaw control stick until it have yawed about a quarter of a circle, and then center it.

As you increase the gain you will notice:

- 1: The aircraft start and stops faster.
- 2: The aircraft overshoots less.
- 2: The aircraft may start to climb or descend.

When the aircraft has a good response, has a minimum of overshoot and does not climb or descend, P-gain is good.

Alternatively, **set** it to 100% of Roll/Pitch P-gain

## Yaw I-tuning

Increase Yaw I-gain by 10 (5 or less for a small aircraft) at a time, do the same test as above.

When the aircraft overshoots even less, I-gain is good.

Alternatively, **set** it to 100% of Yaw P-gain.

If you have a small and not dangerous aircraft, you can disturb it around the yaw-axis and see if it returns. increase if not. **It is** generally good to keep the gain values in the low range. Excessive gain may introduce vibration and control issues.