

3DR PREFLIGHT



RC Control

Calibration

Failsafes

Tunning

Telemetry Radio

Checklist

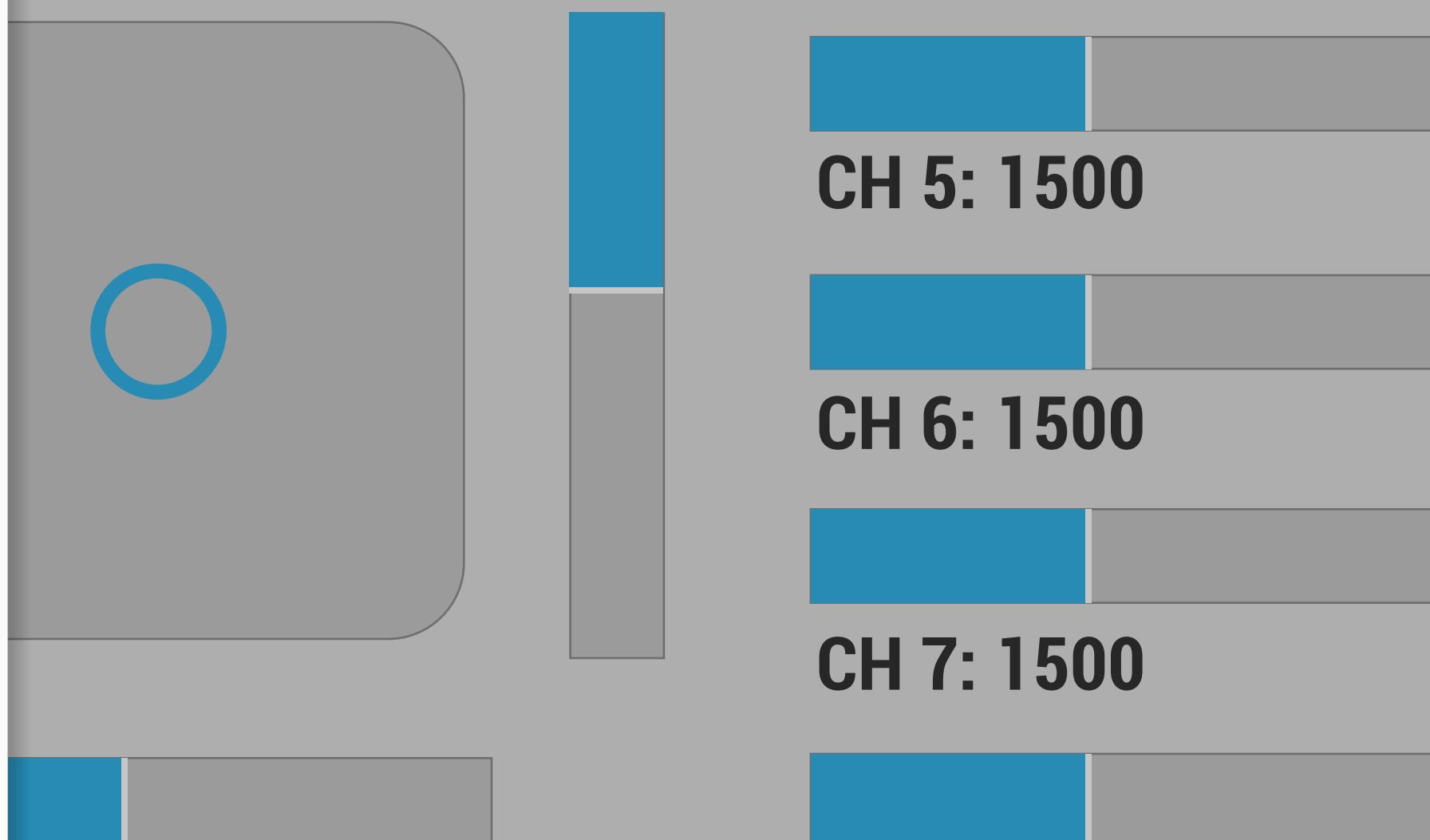
Parameters

Channel Options

Servo Functions

RC radio calibration

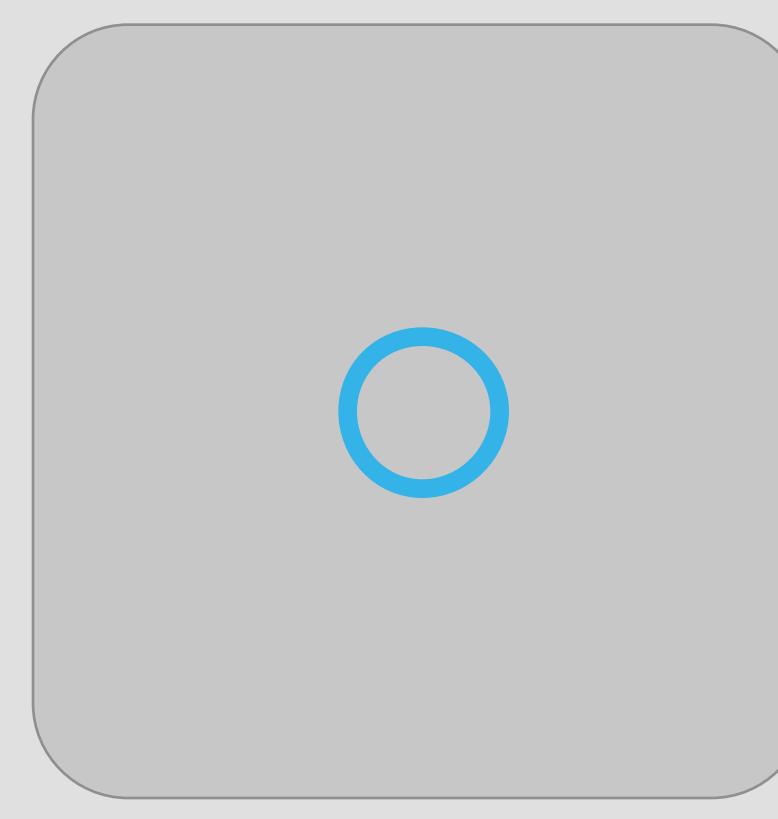
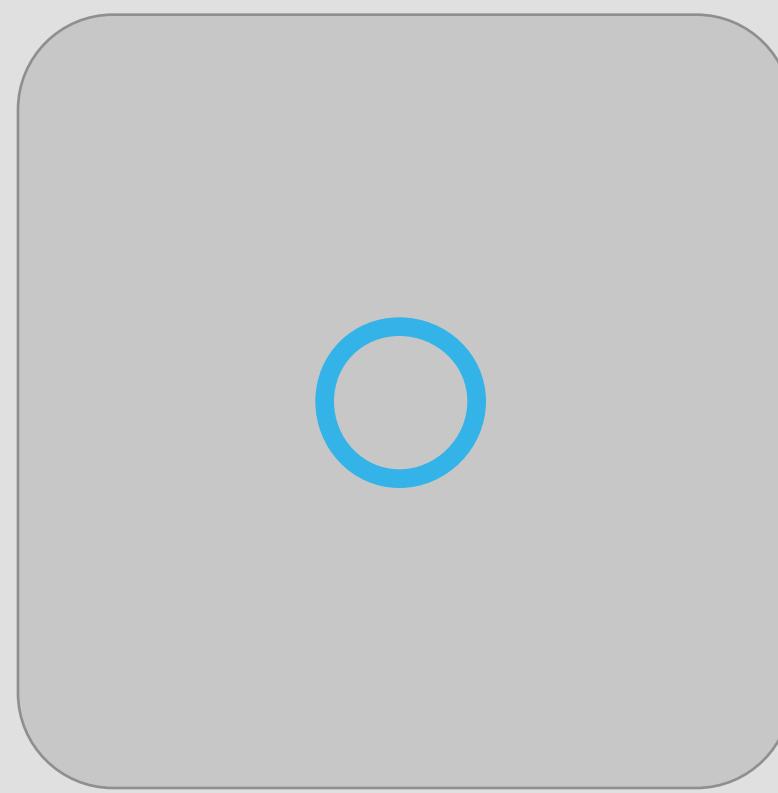
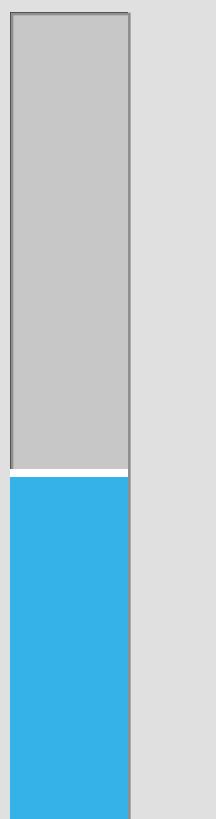
Make sure the radio transmitter is switched on and connected to the vehicle.



1500
: 1500

Calibrate

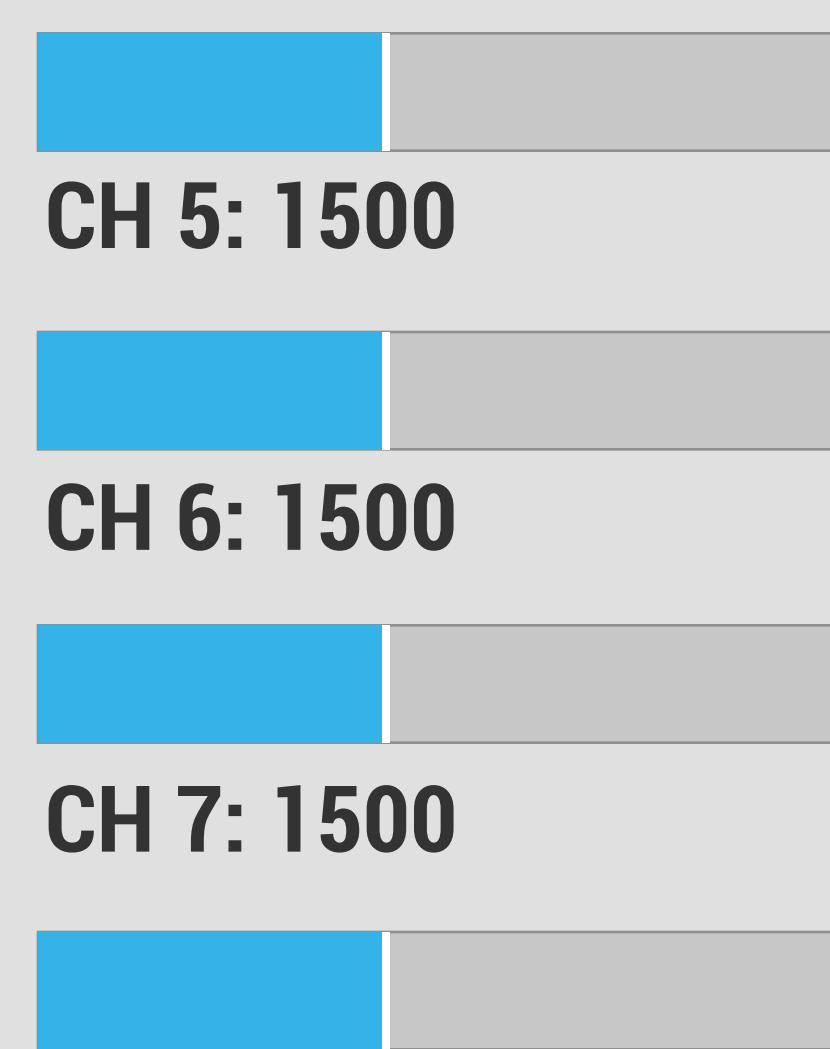


[Calibration](#)[Flight Modes](#)[Channel Options](#)[Servo Functions](#)

Throttle: 1000
Yaw: 1500

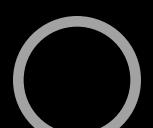


Roll: 1500
Pitch: 1500



RC radio calibration

Make sure the radio transmitter is switched on and connected to the vehicle.

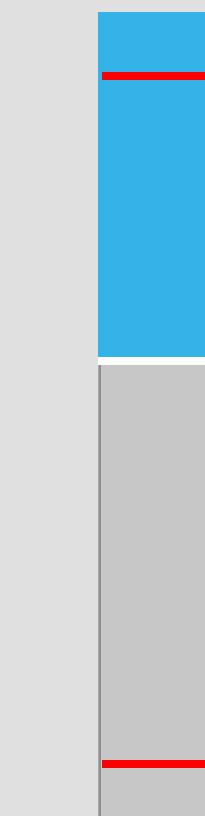
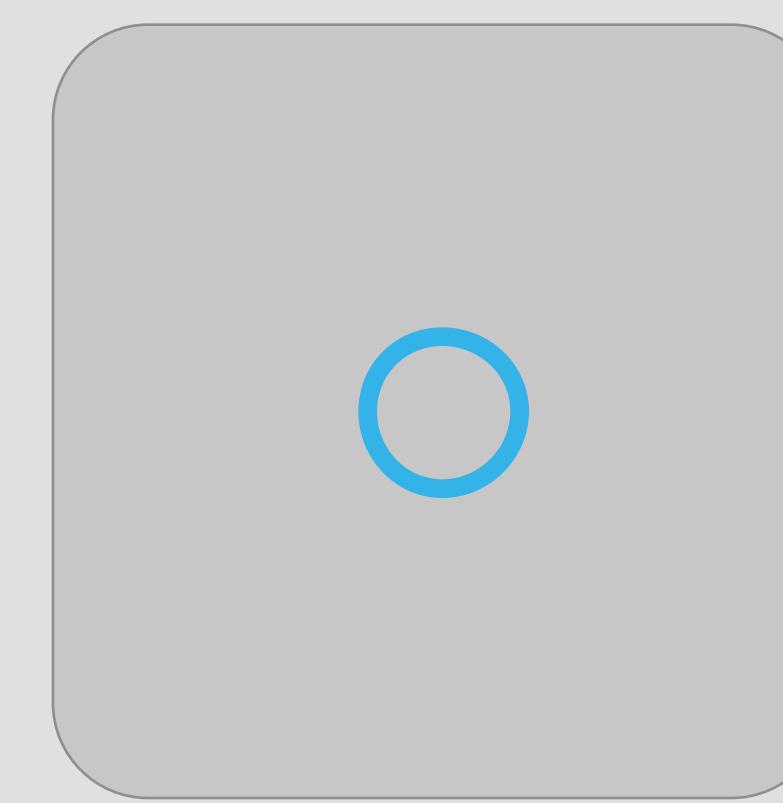
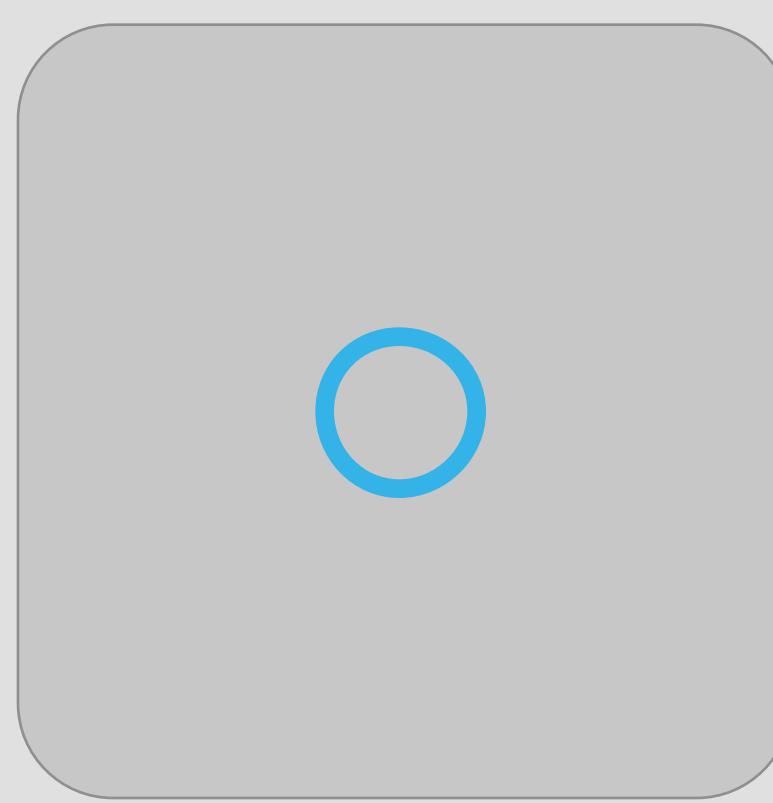
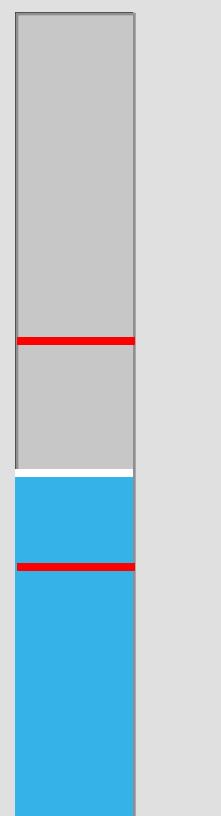
[Calibrate](#)

Calibration

Flight Modes

Channel Options

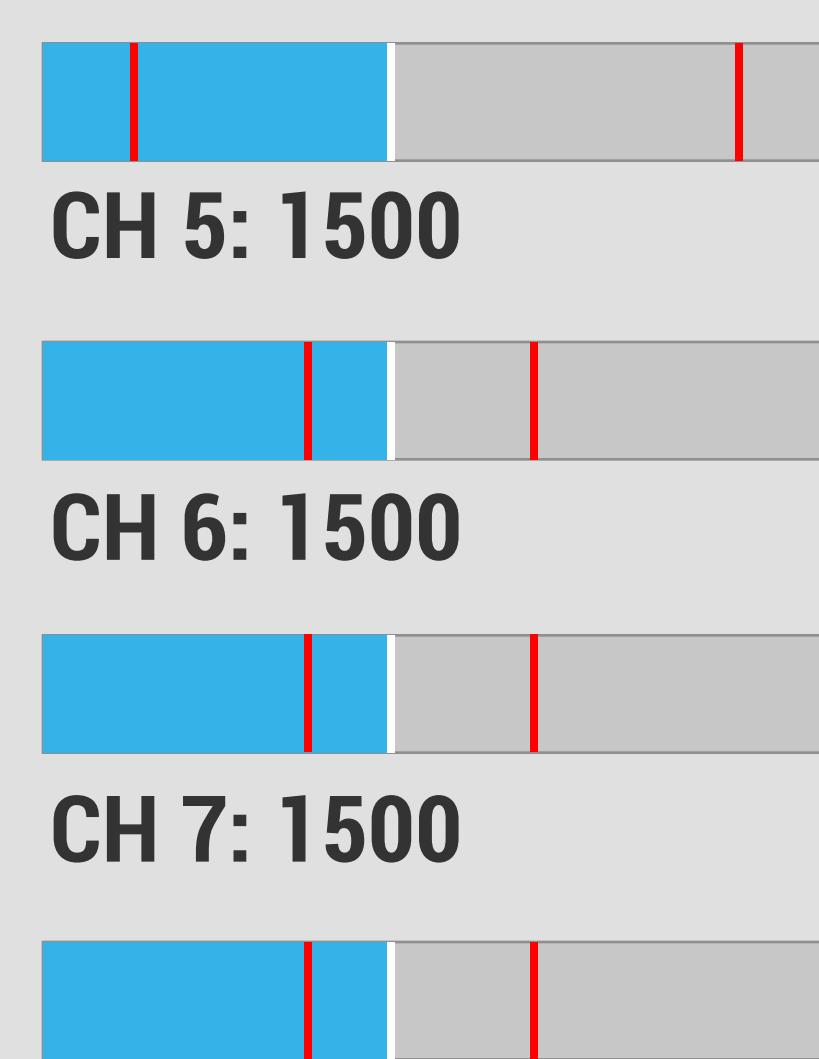
Servo Functions



Throttle: 1000
Yaw: 1500



Roll: 1500
Pitch: 1500



Step 1 of 2

Set Min & Max values

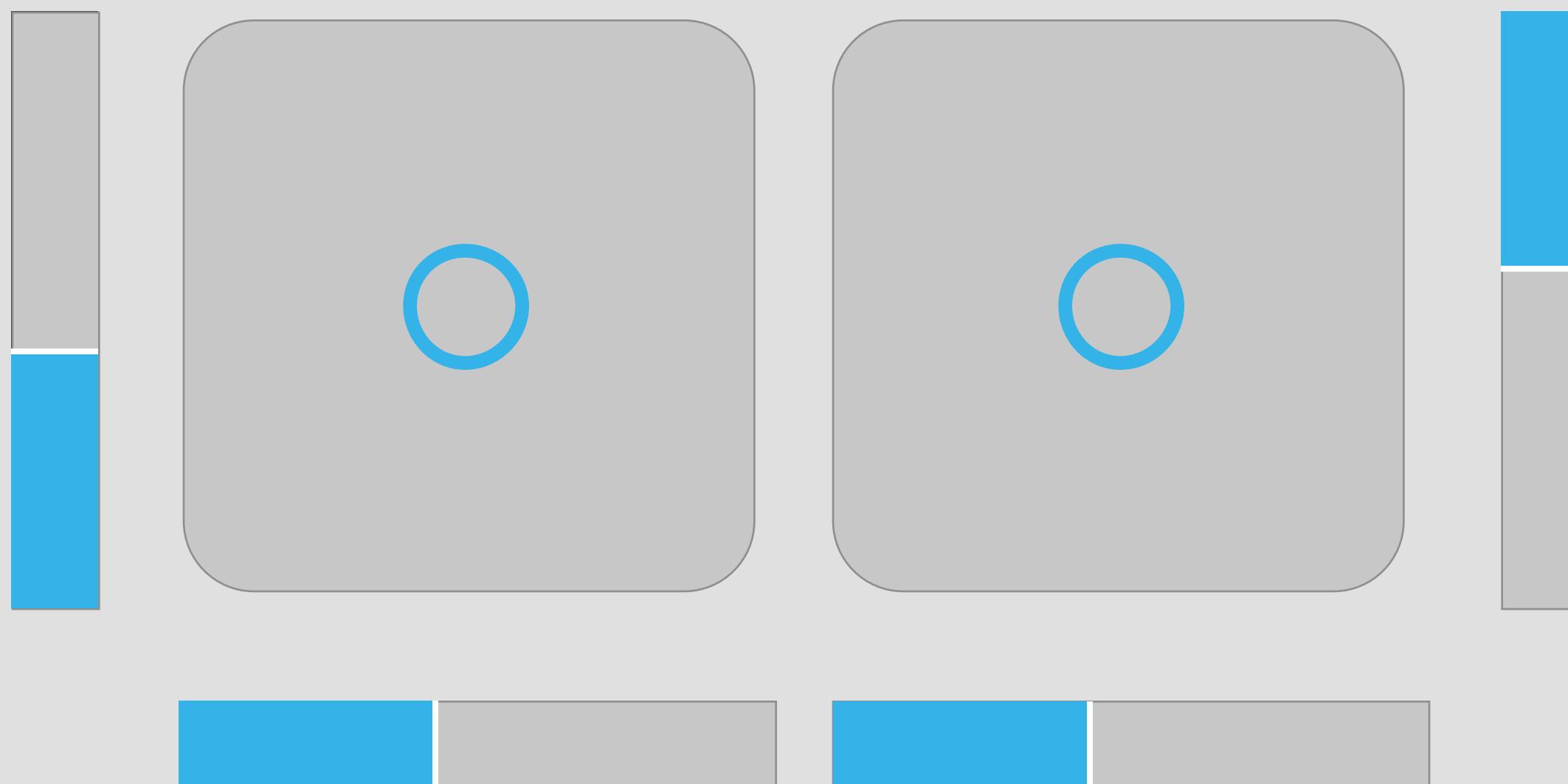
Move the joysticks all the way out several times and toggle the switches, levers and knobs to all possible positions.

Calibration

Flight Modes

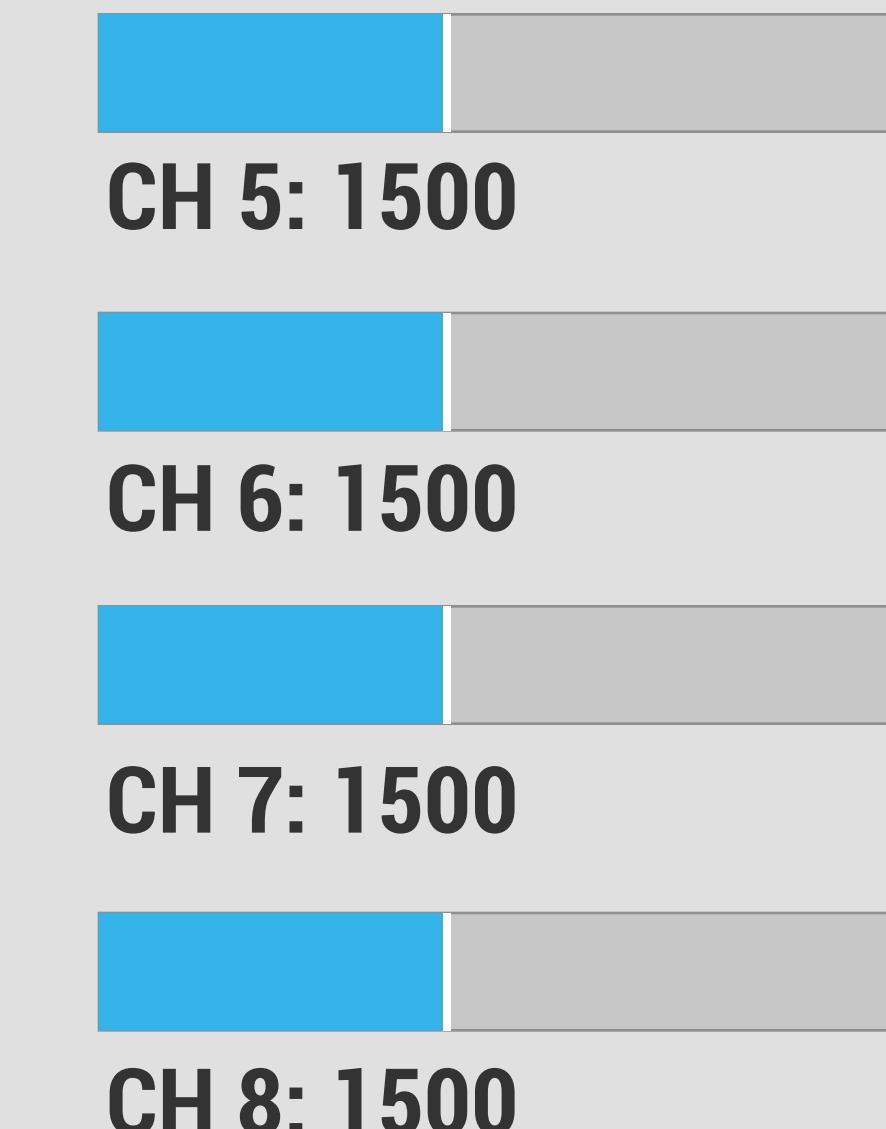
Channel Options

Servo Functions



Throttle: 1000
Yaw: 1500

Roll: 1500
Pitch: 1500



Step 2 of 2

Set center values

Move sticks to their neutral positions and press Save to send the calibration to the vehicle.

Cancel

Save

[Calibration](#)[Flight Modes](#)[Channel Options](#)[Servo Functions](#)**Switch Position 5:****Stabilize**

Pilot's roll and pitch input control the lean angle of the copter. When the pilot releases the roll and pitch sticks the vehicle automatically levels itself.

Flight mode options: **Simple**

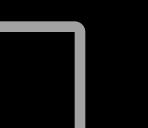
Remember orientation when arming copter and translate user input during flight.

 Super Simple

Update orientation relative to home when flying farther than 10 meters.

Configure flight modes

Move RC Channel 5 to each switch position and adjust the desired flight mode.

[Revert](#)[Save](#)

[Calibration](#)[Flight Modes](#)[Channel Options](#)[Servo Functions](#)

Channel 6 - Tuning:

Roll & pitch rate P

High Value:



Low Value:



Channel 7 option:

Save waypoint

While flying, store the current position
and altitude as a mission item.

Channel 8 option:

Do nothing

Switch is disabled

Configure Aux Channels

Assigns special functionality to
channels 6, 7, and 8 on your RC radio.

[Revert](#)[Save](#)

[Calibration](#)[Flight Modes](#)[Channel Options](#)[Servo Functions](#)

Aux 1 (CH 9):

[Gimbal Tilt](#)

Aux 3 (CH 11):

[Disabled](#)

Aux 5 (CH 13):

[Disabled](#)

Aux 2 (CH 10):

[Parachute](#)

Aux 4 (CH 12):

[Disabled](#)

Aux 6 (CH 14):

[Disabled](#)

Configure Aux Output

Assigns special functionality to the auxilliary servo out channels.

[Revert](#)[Save](#)

IMU

Compass

ESC



IMU Calibration

The Inertial Measurement Unit is the heart of the autopilot and essential to maintaining orientation in flight and location for navigation.

Ensure the vehicle is on a flat surface before beginning the calibration process.

Calibrate

IMU

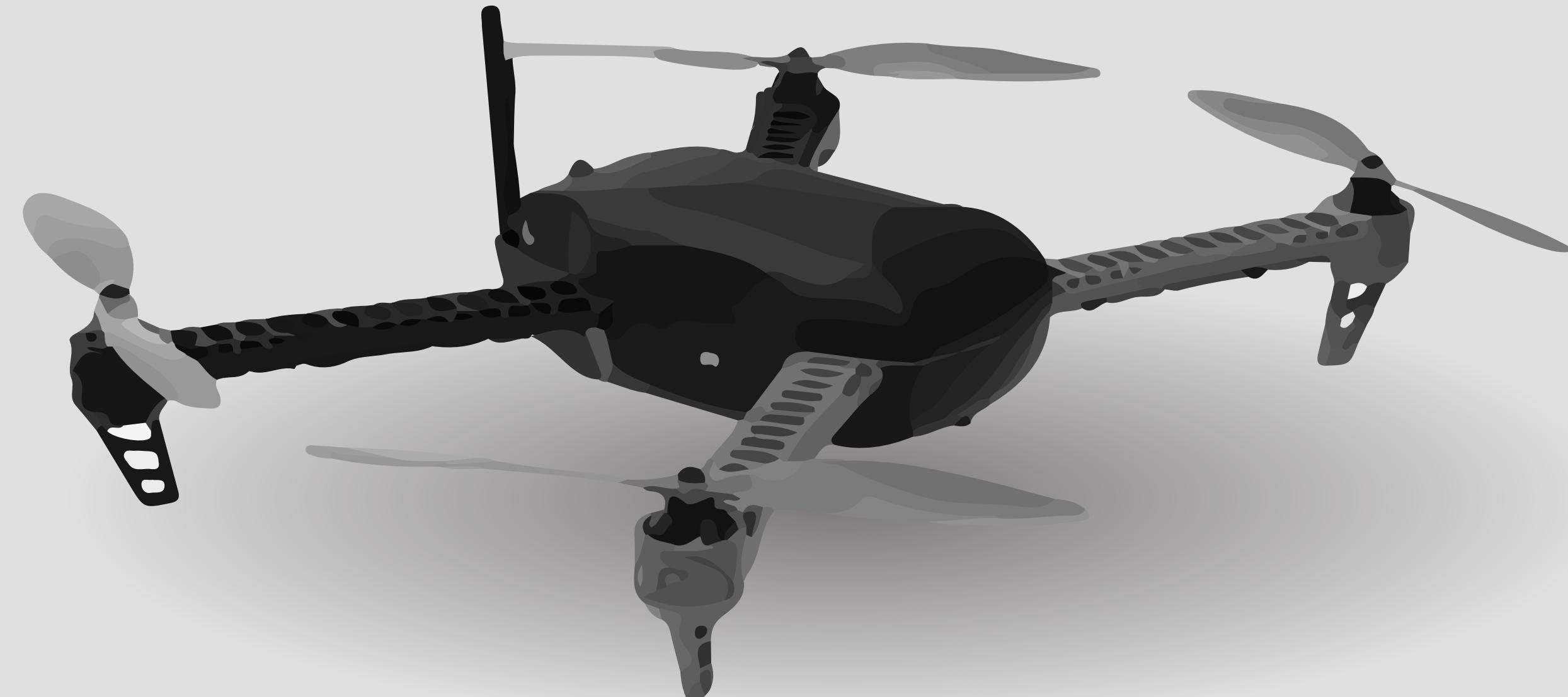
Compass

ESC

Step 1 of 6
Set copter level

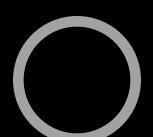
Place the vehicle on a level surface
ensuring very minimal movement.

Press Next to continue.



Cancel

Next



IMU

Compass

ESC

Step 6 of 6**Save calibration**

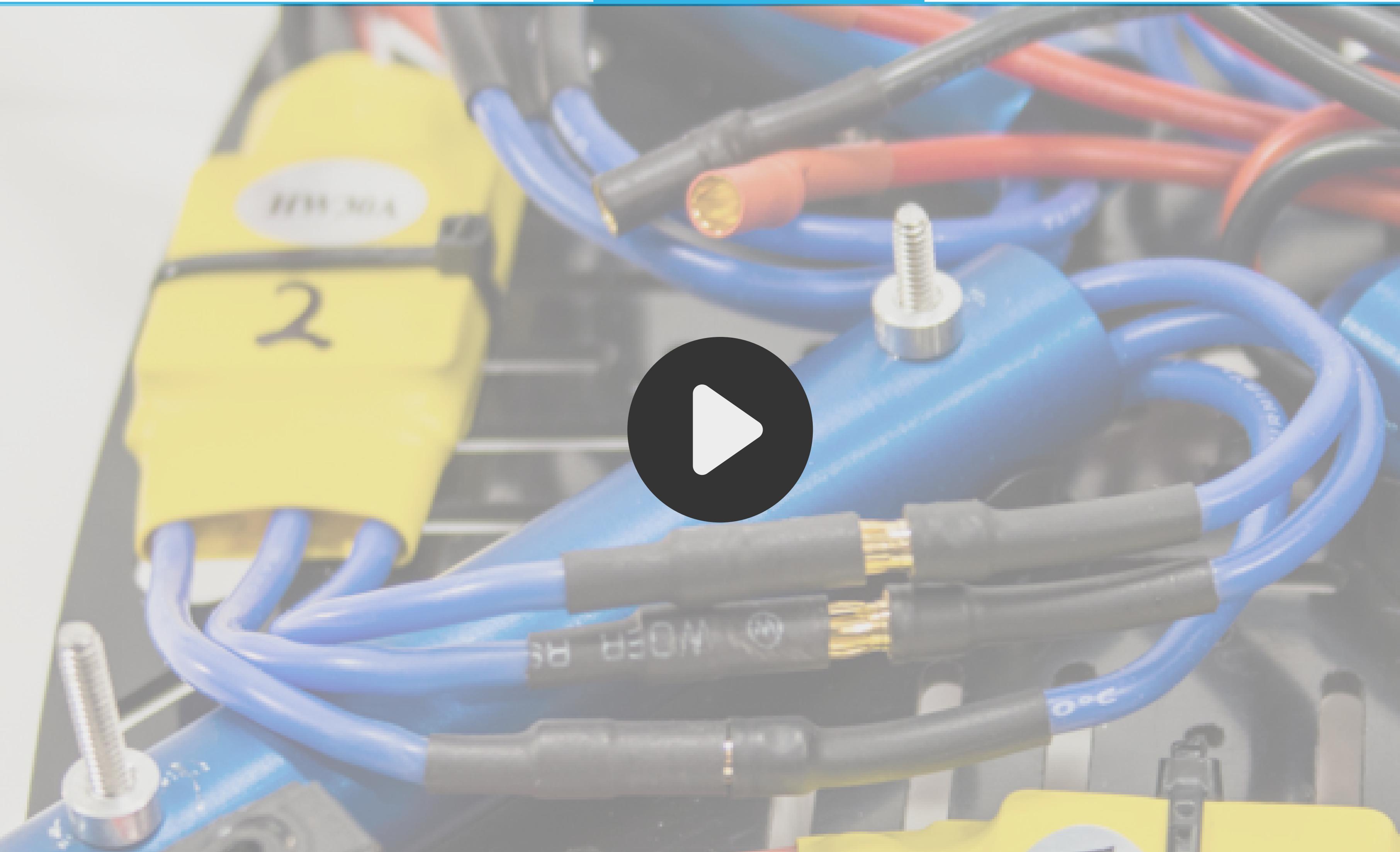
Press Save to upload calibration to
the autopilot.

**Cancel****Save**

IMU

Compass

ESC



ESC calibration

Ensures all Electronic Speed Controllers are working in parallel, giving equal thrust.

Calibrate the RC Radio before calibrating the ESCs.

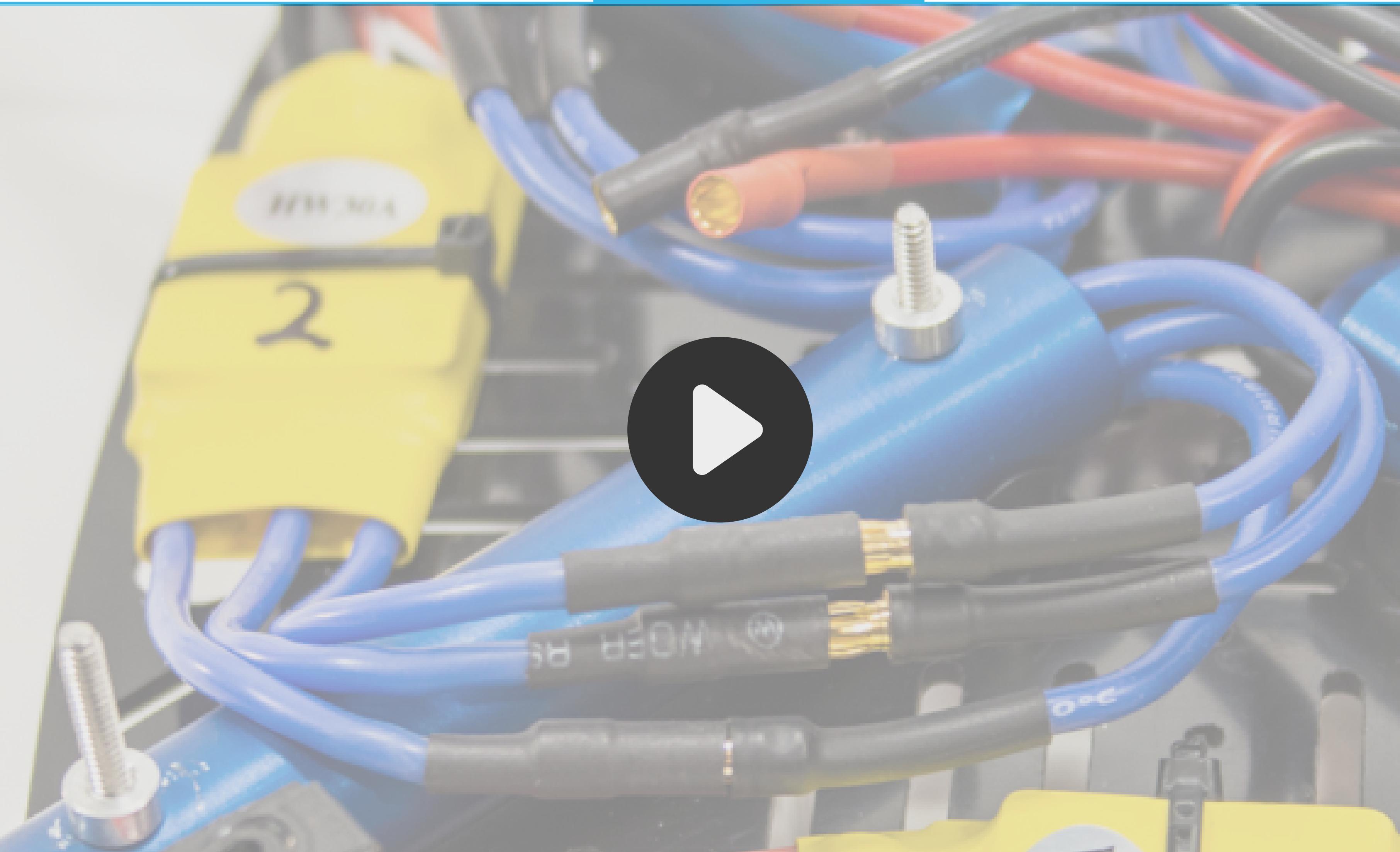
Remove propellers before you begin.

Calibrate

IMU

Compass

ESC



Restart

Unplug any USB connection and flight battery. The vehicle must be completely power off.

Wait 5 seconds, then plug in the flight battery.

Listen for the ESC tones indicating a successful calibration.

Restart Vehicle.

IMU

Compass

Failsafes



Compass calibration

Run this calibration routine if the vehicle cannot hold a reliable position in the air with GPS.

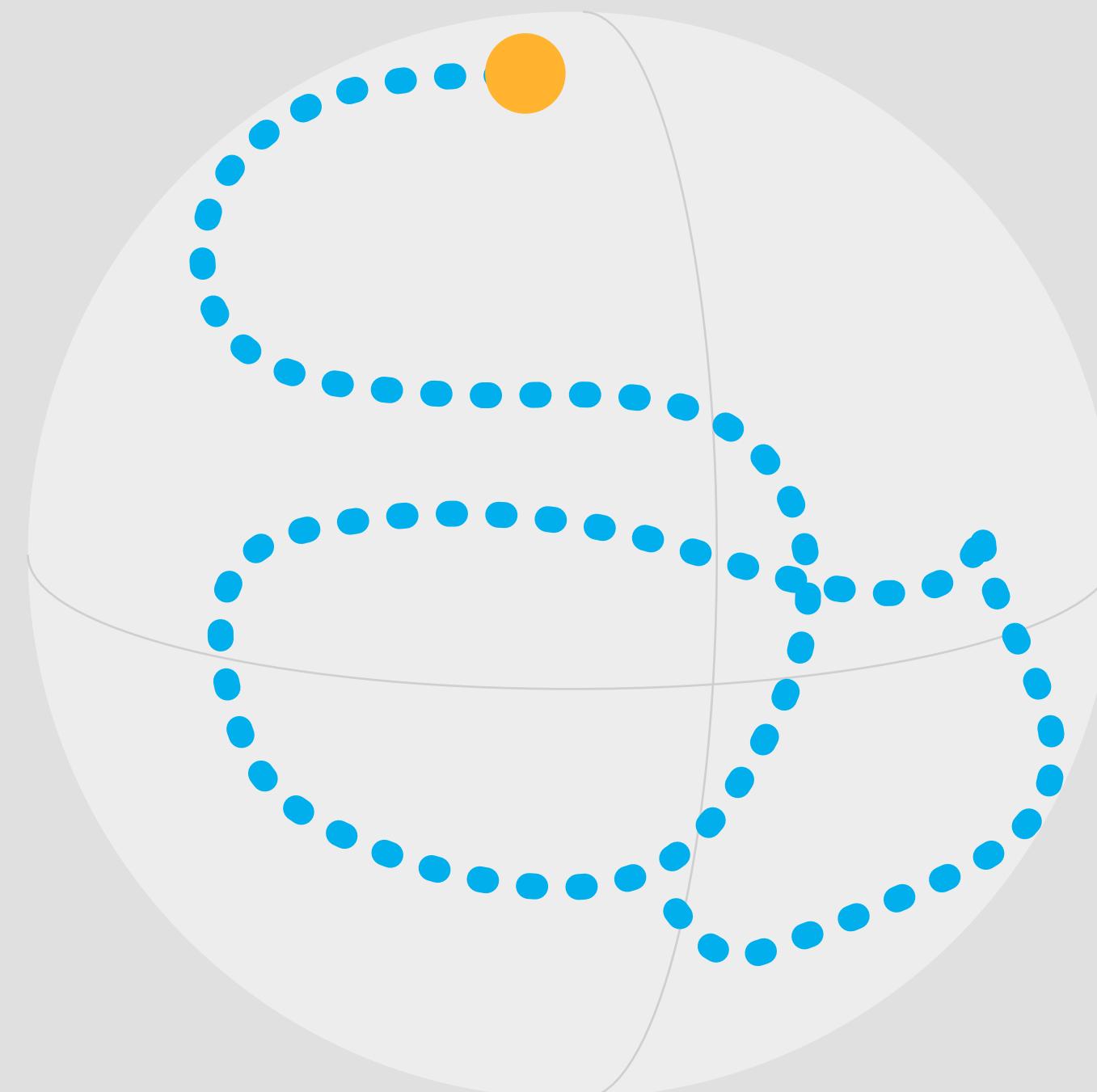
Avoid indoor spaces or locations with concrete or metal as this will throw off the compass readings.

[Calibrate](#)

IMU

Compass

Failsafes



Rotate Vehicle

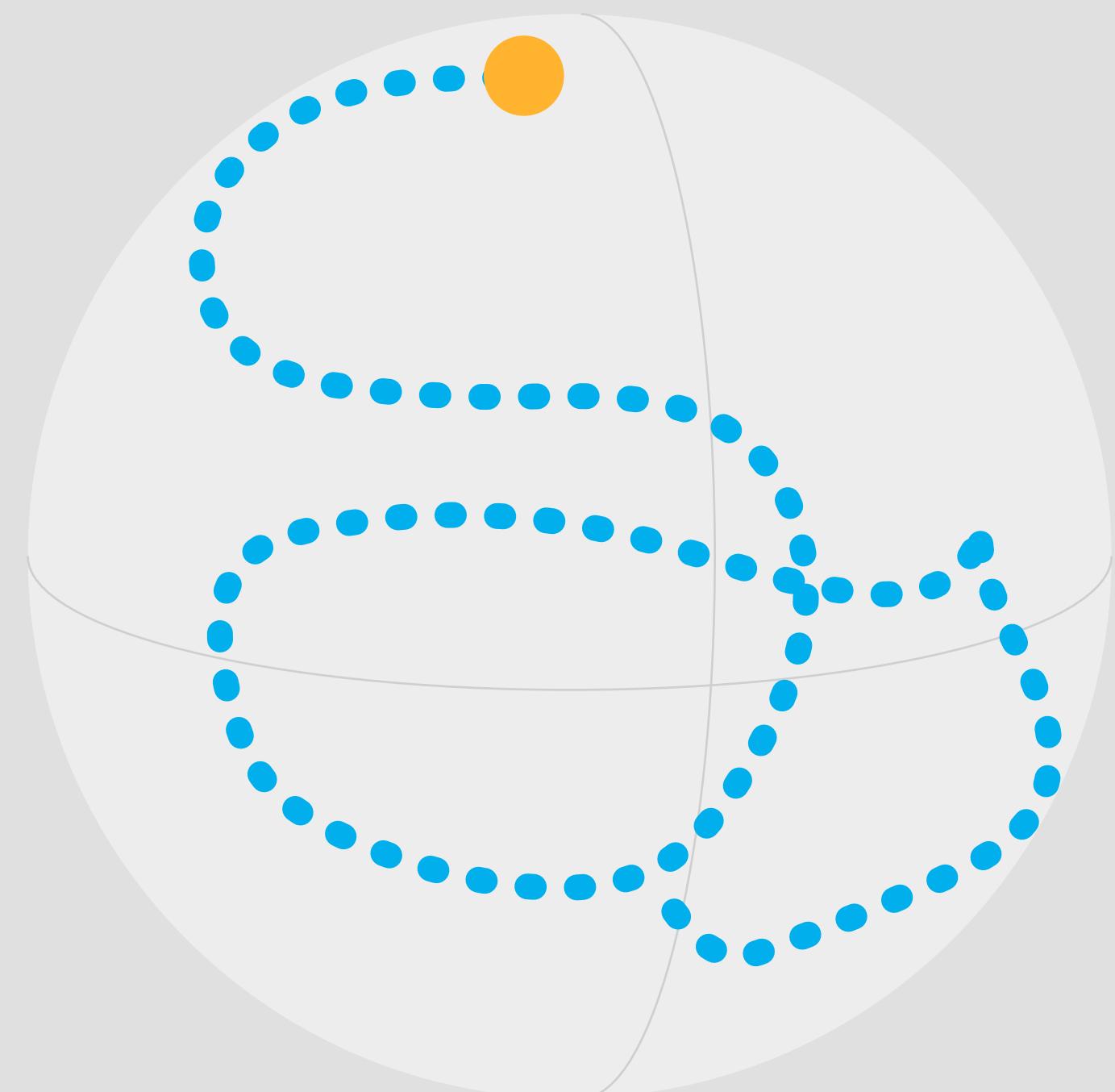
Rotate the vehicle in all directions until the compass is calibrated.

CancelSave

IMU

Compass

Failsafes

**Calibration complete**

Press save to store your new settings to the vehicle.

Cancel**Save**

RC

Battery

GPS / GCS

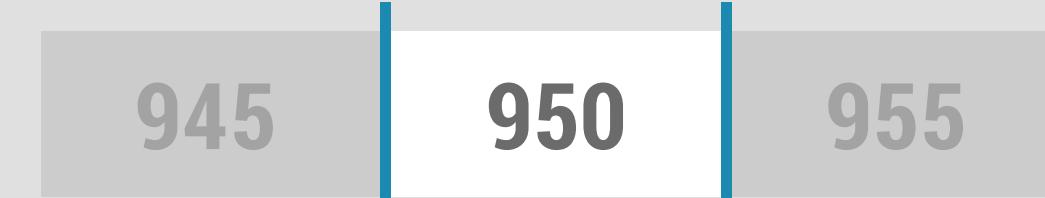
GeoFence

 Enable RC failsafe

RTL unless in AUTO

Vehicle will return to launch and auto-land unless it is in an autonomous mission.

Low throttle trigger value:



(Current throttle input: 1100)

Configure Failsafe

Assigns Sending a low throttle value or no RC signal at all will trigger failsafe.

Revert

Save

RC

Battery

GPS / GCS

GeoFence

 Enable Battery failsafe

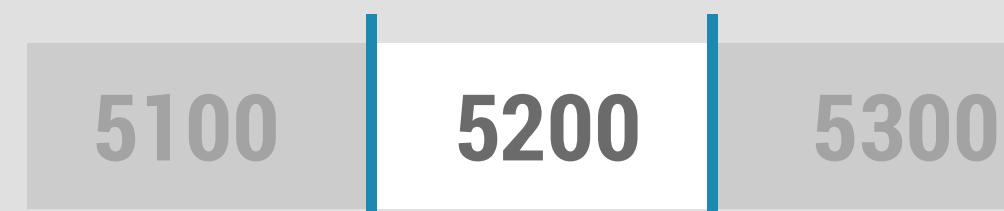
Land

The land command can be overridden by switching to another flight mode, but battery damage may occur. Land as soon as possible.

Battery Configuration:



Battery Capacity (mAh):



Low cell voltage trigger:



Configure Battery

Blah blah blah

RevertSave

RC

Battery

GPS / GCS

GeoFence

 Enable GPS failsafe Enable GCS failsafe

Alt Hold

Enters Alt Hold when the GPS is lost or become unreliable.

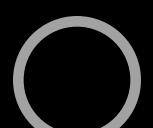
You must re-enter an alternate flight mode manually once GPS become available again.

RTL

If the connection to the ground control station is lost when using RC overrides (virtual joystick) the vehicle will automatically return to launch.

Configure GPS / GCS

Blah blah blah

RevertSave

RC

Battery

GPS / GCS

GeoFence

 Enable Circle Fence

Maximum radius in meters

 Enable Altitude Fence

Maximum altitude in meters

Failsafe behavior:

RTL and Land

Return to launch and, if that fails,
land immediately.

Configure GeoFence

If the vehicle strays outside these
borders it will switch into RTL or LAND.

Revert

Save

Feel

AutoTune

Roll / Pitch

Yaw

Throttle

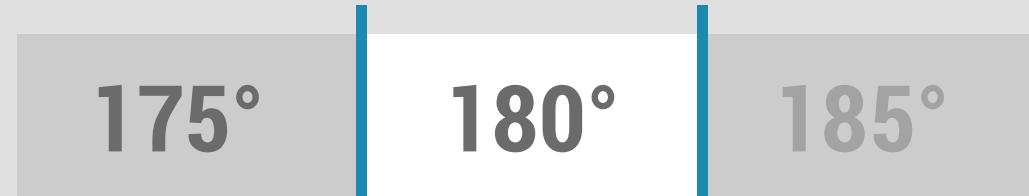
Navigation

Crisp (100%)

Choose from more crisp (100%) to
more soft (0%) user input.

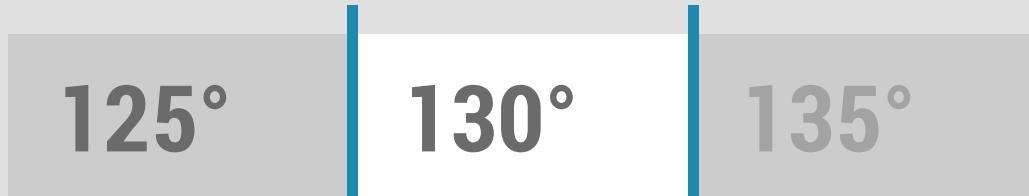
 Enable Feed Forward

Roll and Pitch limits:



Degrees/s/s acceleration

Yaw limits:



Degrees/s/s acceleration

Vehicle Feel

RC feel will smooth user input from an RC controller.

Feed forward will enable the ability to limit the rotational acceleration of the vehicle which can lead to smooth or agile flight depending on your preference.

Revert**Save**

Feel

AutoTune

Roll / Pitch

Yaw

Throttle

Navigation

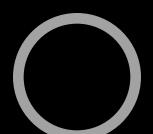


AutoTune

AutoTune will automatically calibrate your vehicle to fly great without needed to know how PIDs or other gains affect the system.

If you want to dig in and fine tune your vehicle, you can adjust each parameter individually.

To use Autotune, assign it to a flight mode, then follow the instructions in this video.



Feel

AutoTune

Roll / Pitch

Yaw

Throttle

Navigation

 Lock Roll and Pitch values

Roll / Pitch

Stabilize P:



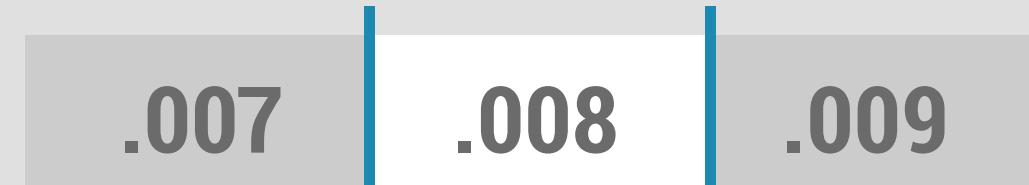
Rate P:



Rate I:



Rate D:



Roll/Pitch tuning

Stabilize P controls how fast your vehicle returns to level.

Rate P controls how much thrust you use to rotate the vehicle.

Rate I should be 1x to 2x the value of Rate P.

Rate D should be lowered to remove small oscillations and raised to increase accuracy of maneuvers.

RevertSave

Feel

AutoTune

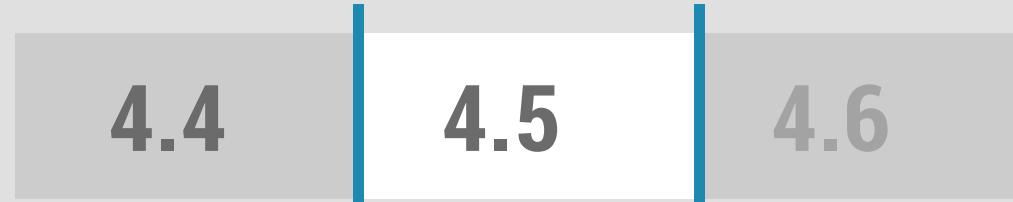
Roll / Pitch

Yaw

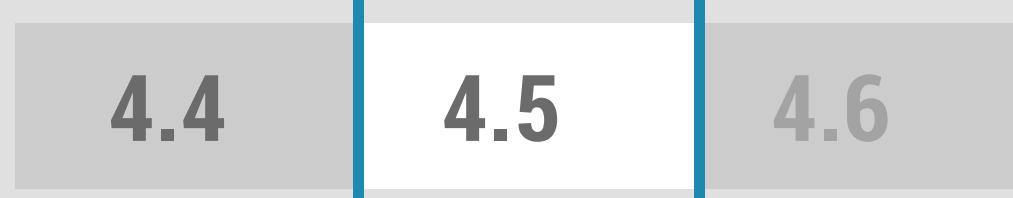
Throttle

Navigation

Acro P:



Stabilize P:



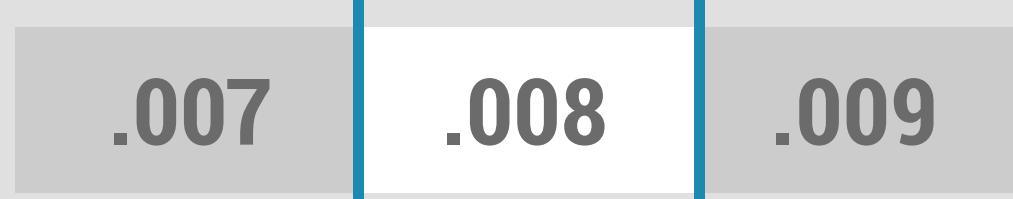
Rate P:



Rate I:



Rate D:



Yaw tuning

Acro P is used to determin how fast the vehicle will yaw based on user input.

Stabilize P is used to determin how fast to recover from Yaw error.

Rate P controls how much thrust to use to rotate the vehicle.

Rate I should be .5 the value of Rate P.

Rate D should be adjusted as needed to increase accuracy of manuevers.

RevertSave

Feel

AutoTune

Roll / Pitch

Yaw

Throttle

Navigation

Throttle-mid (throttle to hover)



Alt Hold dead zone



Alt Hold P:



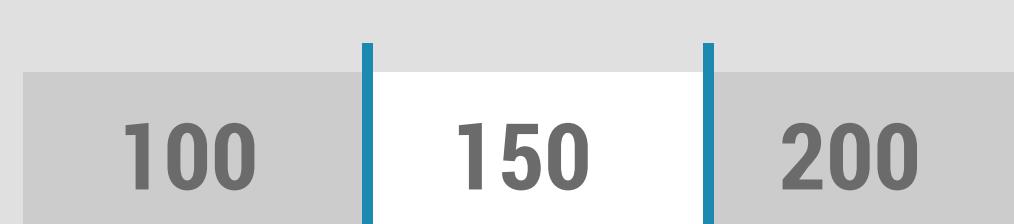
Accel P:



Accel I:



Accel D:



Throttle tuning

Adjust Throttle-mid higher or lower to ensure your vehicle hovers at mid-stick.

Adjust the alt-hold deadzone to control how much movement is required to move the vehicle up or down while in all autonomous modes.

Adjust accel P to control how much thrust is used to change altitudes.

See the Arducopter wiki for more detailed tuning tips.

RevertSave

Feel

AutoTune

Roll / Pitch

Yaw

Throttle

Navigation

Waypoint Speed (cm/s):



Climb rate(cm/s):



Descent Rate:



Waypoint radius:



Loiter Speed (cm/s):



Yaw tuning

Use this table to fine tune your vechicle after running AutoTune.

Acro P is used to determin how fast the vehicle will yaw based on user input.

Stabilize P is used to determin how fast to recover from Yaw error.

Rate P controls how much thrust to use to rotate the vehicle.

Rate I should be .5 the value of Rate P.

Rate D should be adjusted as needed to increase accuracy of manuevers.

Revert

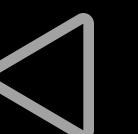
Save



3DR Parameters



WP_YAW_BEHAVIOR	blah blah blah blah blah blah blah	250
RTL_LOIT_TIME	blah blah blah blah blah blah blah	103
LAND_SPEED	blah blah blah blah blah blah blah	0
PILOT_VELZ_MAX	blah blah blah blah blah blah blah	10.5
PILOT_ACCEL_Z	blah blah blah blah blah blah blah	1
THR_MIN	blah blah blah blah blah blah blah	1
THR_MAX	blah blah blah blah blah blah blah	1
FS THR_ENABLE	blah blah blah blah blah blah blah	975
FS THR_VALUE	blah blah blah blah blah blah blah	0
TRIM_THROTTLE	blah blah blah blah blah blah blah	1.027
THR_MID	blah blah blah blah blah blah blah	103
THR_DZ	blah blah blah blah blah blah blah	0
FLTMODE1	blah blah blah blah blah blah blah	10.5
FLTMODE2	blah blah blah blah blah blah blah	1
FLTMODE3	blah blah blah blah blah blah blah	1



WP_YAW_BEHAVIOR: 2	blah blah blah blah blah blah blah	250
RTL_LOIT_TIME: 5000	blah blah blah blah blah blah blah	103
LAND_SPEED: 50	Amp Offset <i>Controls what actions will be taken if the GPS signal is lost for at least 15 seconds.</i>	0
PILOT_VELZ_MAX: 250		10.5
PILOT_ACCEL_Z: 250		1
THR_MIN: 130	BATT_AMP_OFFSET (volts)	1
THR_MAX: 1000	0 .1 .2	1
FS THR_ENABLE: 3		975
FS THR_VALUE: 910		0
TRIM_THROTTLE: 512	Revert	1.027
THR_MID: 480	Save	103
THR_DZ: 100	blah blah blah blah blah blah blah	0
FLTMODE1: 0	blah blah blah blah blah blah blah	10.5
FLTMODE2: 2	blah blah blah blah blah blah blah	1
FLTMODE3: 5	blah blah blah blah blah blah blah	1



User checklist

Camera connected and switched on

Frame

All propellers tight

All motors and mounts tight

All wires checked

System

Telemetry connection



Battery Level

14.3v

GPS 3D Lock

8 sats

Flight safety checklist

- Never fly with a low battery
- Do not fly above people or built up areas
- Do not fly above 400ft or 122m AGL
- Check for do not fly areas
- Do not fly near airports or near other airborne vehicles.

Radio Network ID:

24 25 26



ECC Error Correction

ECC should be off by default to maximize bandwidth. Only enable ECC for long distance flight where communication is critical.

Copy settings to all radios

Allows you to configure a connected Telemetry radio and keep both in sync.

Telemetry radios

Both radios need to be on the same Network ID number to communicate. Be sure to set copy settings to ensure both the connected radio and the remote radio are updated at the same time.

Save

