



XTEN

0:00 / 5:43

A Guide on How to FPV Drone Race

<https://www.youtube.com/watch?v=Pg-sgY1RbTA>

Getting Started



The First Thing You Should Do

If you're new to flying quadcopters, the first thing you should do is buy a **Hubsan X4**:

Yes, I know... it looks like a toy, right? Don't be fooled by the appearance or low price. The **Hubsan X4** is an impressive quadcopter that will allow you to practice a range of flight maneuvers before you move onto a bigger quad. This is very important for a number of reasons:

- Flying a quadcopter isn't as easy as great pilots like you see on youtube.
- You will crash a lot whilst you are learning to fly.
- Crashing a full-size quadcopter can be dangerous and expensive.

So please, take our advice and the advice of every seasoned quadcopter pilot who answers this question on a forum: Start with a micro quad. You will have fun and learn how to fly in a safe and inexpensive way. Most of us started with a micro quad like the Hubsan X4. And those who didn't probably wish they had.

Ready-to-fly (RTF) Almost-ready-to-fly (ARF) quadcopter 250-280 size

IMMERSION RC VORTEX
MINI RACING QUAD



Emax NightHawk Pro 280



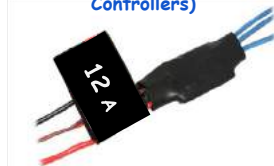
250 Class Racer



250 Quadcopter Frame

250 Class Racer

4 ESC
(Electronic Speed
Controllers)



4 Motors
1430-2280kv



LiPo batteries
preferably high C rating



The most common power system used on a 250 class racer consists of:

- 4 12 amp ESCs driving 4 brushless motors (1430-2280 kv)
- Running on 1300 mAh to 1800 mAh Battery in the 3 to 4s lipo range.

Caution: 4S lipos may require a bigger ESC

Personally I like to have a power distribution board to keep all my wires clean and simplified



Power Distribution Board

250 Class Racer - Flight Controllers

Naze32 & CC3D

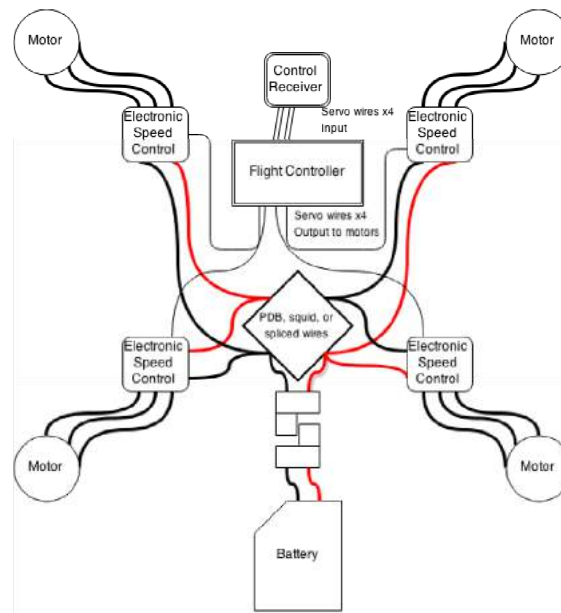


Control Board For Nighthawk Pro 280



- The Naze32 & CC3D boards are currently the two most popular flight controllers. They have a large, supportive community and the software is constantly updated.
- Nighthawk has a All in One control board which carries All your speed controllers and flight controller all on one board to keep it clean and simple and low profile design

Final wiring and set up



Radio and Receiver



- A 4 channel radio is required at a minimum
- 5 channel or more radios provided added functionality and customizability of your flight modes and other options (i.e. acrobatic, stabilized or horizon hold)

Cleanflight - Baseflight



Resources

Orleans Multirotor Group

(<https://www.facebook.com/groups/OttawaMultirotorGroup>)

CanadaUAV - Canada Multirotor Club

(<http://www.meetup.com/canadauav-canada-multirotor-club>)

FPVRacing.tv

(<https://fpvracing.tv/guides/beginners>)

National Geographic Article

(<http://voices.nationalgeographic.com/2015/05/25/so-you-want-to-fly-an-fpv-racing-mini-quadcopter>)



FPV Video Frequencies

MAAC Safety Document MSD 17 - Radio Spectrum

M.A.A.C. FPV (First Person View) Video Frequency Chart

Available Frequency Bands	Frequency Allocation
900MHz Band	910Mhz
1.2 - 1.3Ghz Band	1258Mhz
	1280Mhz
2.4Ghz Band <small>** The 2.4Ghz band should not be used for FPV when other RC pilots are operating 2.4Ghz RC radios (Spectrum, Futaba Fast, JR, etc.) The operation of 2.4Ghz RC radios in parallel with 2.4Ghz FPV will interfere with the video signal and will render the video link unusable.</small>	2370Mhz
	2390Mhz
	2410Mhz
	2414Mhz
	2430Mhz
	2430Mhz
	2432Mhz
5.8Ghz Band <small>** There are a total of 32 channels organized in 4 channel banks. Channels marked with RED should not be used - they fall outside the frequency spectrum assigned for amateur radio use. If more than one FPV aircraft flies simultaneously, a separation of at least 40-50MHz will be required between frequencies used to avoid signal overlap.</small>	5725Mhz
	5726, 5733, 5645, 5740Mhz
	5745Mhz
	5746, 5763, 5665, 5760Mhz
	5765Mhz
	5765, 5771, 5685, 5780Mhz
	5785Mhz
	5785, 5790, 5705, 5800Mhz
	5805Mhz
	5805, 5809, 5885, 5820Mhz
	5825Mhz
	5825, 5828, 5905, 5840Mhz
5845Mhz	
5845, 5847, 5860Mhz	
5865Mhz	
5865, 5866, 5880Mhz	

**Please follow the M.A.A.C. guidelines for FPV flying.
Spotter is required for all FPV flights.**





MAAC Safety Document # MSD 8 - USE OF FIRST PERSON VIEW DEVICES

Definition: First Person View or FPV is a video system consisting of a video camera and video transmitter installed in a radio control model aircraft which transmits wirelessly to a ground station display or monitor a streaming video image generated by the camera. The camera is positioned near the front of the model and facing forward so that the FPV pilot views an image which provides him or her with the illusion of actually flying an aircraft from an on board pilot's perspective.

All members flying a radio control model aircraft by means of an FPV device shall adhere to all Safety Code Documents pertaining to the class of model he or she is flying in the same manner as if the model were being controlled by conventional R/C line of sight control.



**MAAC Safety and Policy Documentation
FPV**



While not all conclusive, the following MAAC Documentation would be good starting points.

Category	Applicable MAAC Safety Codes (MSDS) - FPV																						
	1	2	3	4	5	6	7	8	9	10	12	13	14	14	16	17	18	19	20	21	22	23	
RC General	X	X	X			X	X									X							
FPV	X	X	X			X	X	X								X							
Park Flyer	X	X	X			X	X									X			X				
Multicopter	X	X	X			X	X	X								X		X				X	

MSD 8 - Use of First Person View Devices

MSD 17 - Radio Spectrum

MPPD 13 - Flying First Person View



Transport Canada Advisory Circular (AC) No. 600-002
General Safety Practices – Model Aircraft and Unmanned Air Vehicle Systems



MAAC Policy and Procedures Document MPPD # 13
FLYING FIRST PERSON VIEW (FPV)


All members flying FPV must, according to Industry Canada regulations have a basic amateur radio operators license (HAM License) in order to use any of the FPV frequencies (see FPV Frequency Chart in MSD 17) for analog video transmission or as an alternative fly FPV only when another MAAC member, who is licensed is present at the same location and is willing to be responsible for the operation of the member's video transmitter.

This is because there are currently no analog video transmitters available that are Industry Canada certified to the RSS-210 standard for license free operation on the license free bands.



Certain combinations of frequencies used to control the model and transmit the analog video signal may not be compatible and may result in interference to the video signal from the model or with the video signal from other FPV equipped models. It is important to check for compatibility before flight.

Clubs and Event organizers wishing to promote FPV at their venues should first make themselves familiar with FPV systems, their current capabilities and limitations and make the necessary adjustments to their venue to accommodate their special needs.



The image shows a YouTube video player interface. The video content area is black with a gold-colored logo of a fleur-de-lis containing a drone. Below the logo, the text "LOUISIANA DRONE ENTHUSIASTS" is displayed in gold. Underneath that, a smaller line of text reads "facebook.com/groups/LouisianaDroneEnthusiasts". The video player controls are visible at the bottom of the video area, showing a play button, a progress bar at 0:08 / 3:26, and icons for settings, full screen, and share. Below the video player, the video title "Krieger (4s) - FPV Racing - Stay Low" is displayed. Below the title is the URL <https://www.youtube.com/watch?v=plIUz4JVz2k>.

Krieger (4s) - FPV Racing - Stay Low

<https://www.youtube.com/watch?v=plIUz4JVz2k>