

# AEROGAMESNEXT

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## 2019 AeroGames

### Parts List and Information Manual

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Please check the Rogers State University AeroGames website for contact information, forms, and any updates throughout the competition.

<https://www.rsu.edu/academics/youth-academic-programs/aerogames/>

# Instructions and Pointers: read well, read often!

## Safety:

### READ THIS BEFORE CONTINUING

- Use extreme caution when working with the propellers while they are attached to the motors. They can and will hurt you. DO NOT attach propellers until proper operation of the quad has been verified!
- Lithium polymer batteries: Batteries must not be charged while unattended. Fires have resulted from battery failures.
- Do not fly the quadcopter without eye protection.
- Always turn the transmitter on first and THEN power your quad. If you do not do this, your quad could fly away or injure you. The quad failsafe could kick in, or the autopilot could be on and cause your quad to fly away.

## Parts List:

- 4x NTM2826-1000/71758 NTM Prop Drive 28-26 1000KV / 235W ○ These are motors. They have three power connections.
- 4x Afro ESC 30Amp Multi-rotor Motor Speed Controller ○ These are electronic speed controllers. They take the signal from the flight controller and a +/- power source from the battery and send power to the motors to make them turn at variable speeds. **The polarity of the battery connection on these controllers is very important. Red-to-red and black-to-black. Plugging these in backwards to the power distribution board WILL destroy them.**
- 1x CC3D 32 bit Flight Controller in a Plastic Protective Case Container Shell Yellow ○ This is a flight controller. It takes a signal from the RC receiver, measures the movement of your craft, and sends signals to the speed controllers to adjust the attitude of the quadcopter. It is powered by the connection to the electronic speed controllers.
- 4x NTM Prop Drive 28 Series Accessory Pack ○ Parts to attach motors and props
- 1x SF 9047R Props 9"x4.7cm 4pc CW (Green) ○ Propellers • 1x SF 9047 Props 9"x4.7cm 4pc CCW (Green) ○ Propellers • 1x SF 9047R Props 9"x4.7cm 4pc CW (Black) ○ Propellers • 1x SF 9047 Props 9"x4.7cm 4pc CCW (Black) ○ Propellers
- 1x Hobby King Quadcopter Power Distribution Board ○ Distributes power from the battery to the speed controllers
- 4x 3.5mm Male/Female Bullet Brushless Motor Extension Lead 200mm ○ Leads to extend the power from the distribution board to the electronic speed controllers (ESCs) – **NOT INCLUDED BUT AVAILABLE UPON REQUEST**

- 1x 10CM Male to Male Servo Lead (JR) 26AWG (10pcs/set) ○ Connectors to attach receiver to flight controller
- 1x IMAX B6 OEM Battery Balance Charger for 6 Cells ○ Charger for the drone batteries
- 1x GK135560 adapter charger ○ AC adapter for the battery charger
- 2x Turnigy nano-tech 2200mah 3S 45~90C Lipo Pack ○ Batteries for the drone
- 1x OrangeRx R620 DSM2 Compatible Full Range 6Ch 2.4 GHz Receiver w/Failsafe ○ Receiver: This receives signals from the transmitter and relays them to the flight controller
- 1x Nylon XT60 Multi-Plug Adapter Set (T-Connector/EC3/TRX/Tamiya) ○ Adapter to allow you to plug your battery into the charger
- 1x DX6(x) 6-Channel DSMX® Transmitter Only, Mode 2 (SPMR6630) ○ Transmitter

## Props and Spin Configuration:

- You probably are wondering why you have 4 bags of props. There are green and black props (to help you keep which direction is forward on your quad) and left and right spin props. The quad adjusts its yaw (clockwise - CW and counterclockwise - CCW rotation) by adjusting the speeds of two sets of props (left and right rotating).
- It is **IMPERATIVE** that you have both motor spin and prop rotation correct before trying to fly your quad.

**You will destroy what you have built if you do not get this right!**

**Front left motor (CW)**

**Rear right motor (CW)**

**Front right motor (CCW)**

**Rear left motor (CCW)**

- The three motor connections can be connected in any order. To reverse the rotation, swap any two wires and the motor will rotate the opposite way. To check motor rotation, turn on quadcopter **WITHOUT PROPS ATTACHED**.
- Motors that have CCW rotation need CCW propellers and vice versa.
- Flipping a propeller over is not the same as reversing rotation.
- The lettering on the prop should face up.

## Basic One line Connection Diagram

