

LEGO DRONE

kit instructions

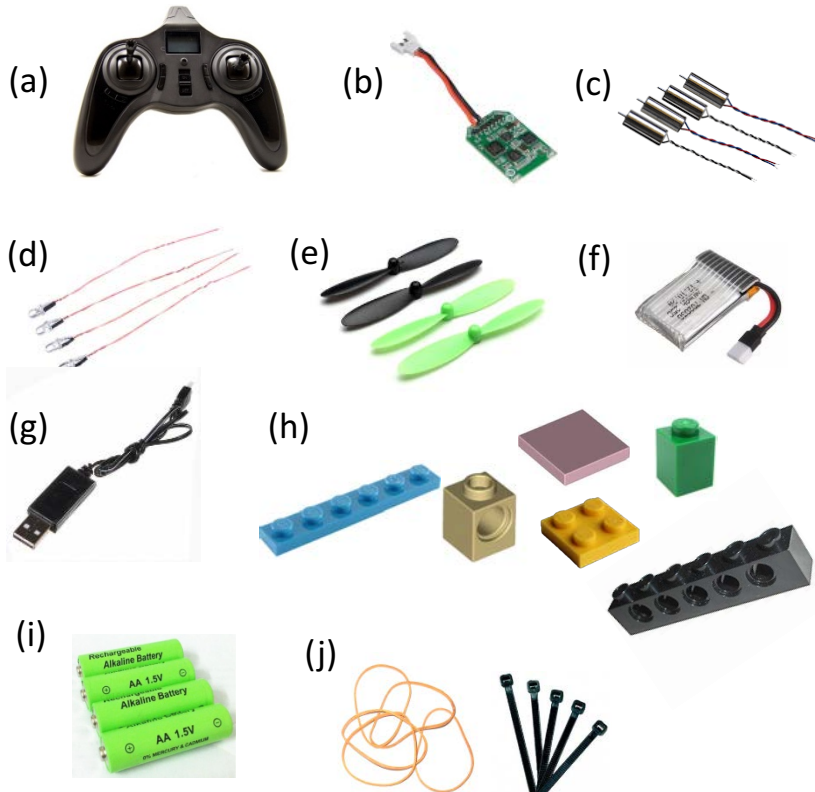


Lego Drone Kit Instructions



Kit Includes:

- | | |
|-------------------------------|-----------------------------|
| (a) Transmitter | (f) Lipo battery |
| (b) Receiver board | (g) USB Charging Cable |
| (c) Motor Set | (h) Lego Pack – colors vary |
| (d) LED Set (2x 2 colors) | (i) 4xAAA Batteries |
| (e) Prop Set (2x "A", 2x "B") | (j) Zipties + Rubber bands |



Getting Started

- 1) Check your parts list.
- 2) Read through the instructions.
- 3) Gather your tools.
- 4) Start charging your LiPo battery.
- 5) Build one version of the Lego frame.
- 6) Solder motors and LEDs to receiver.
- 7) Attach electronics to frame.
- 8) Attach charged battery.
- 9) Plug in, turn on and FLY!

Tools Needed:



Soldering iron and accessories



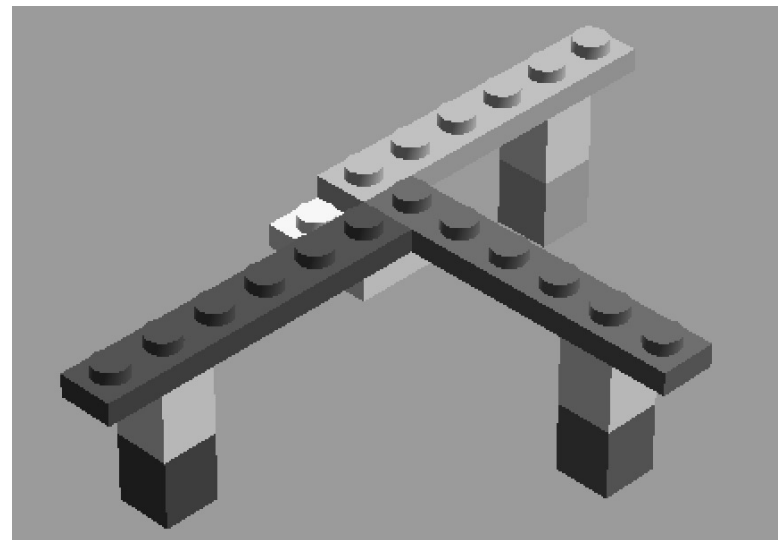
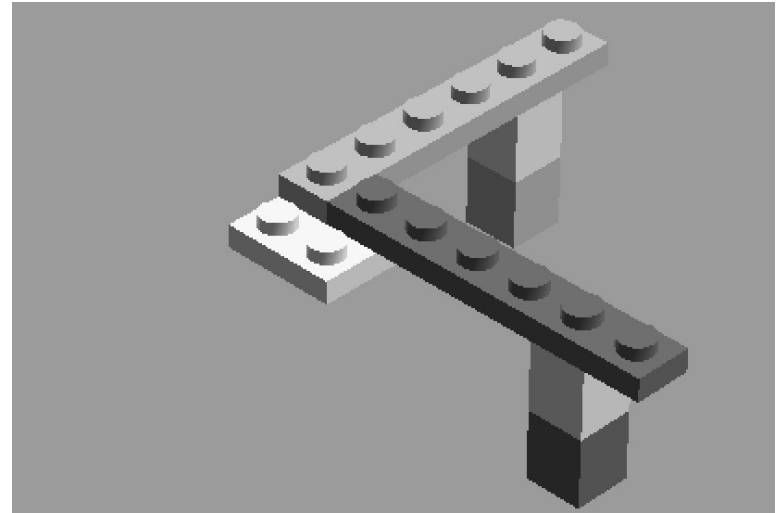
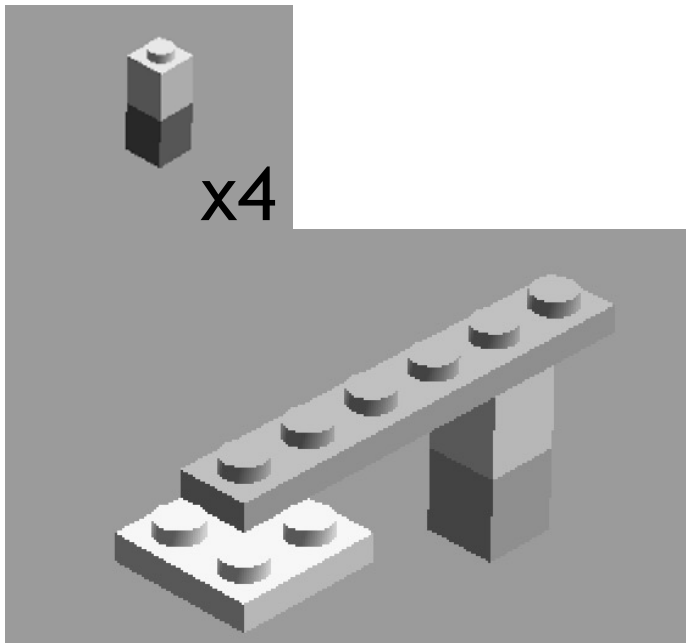
Scissors

Lego Drone Kit Instructions

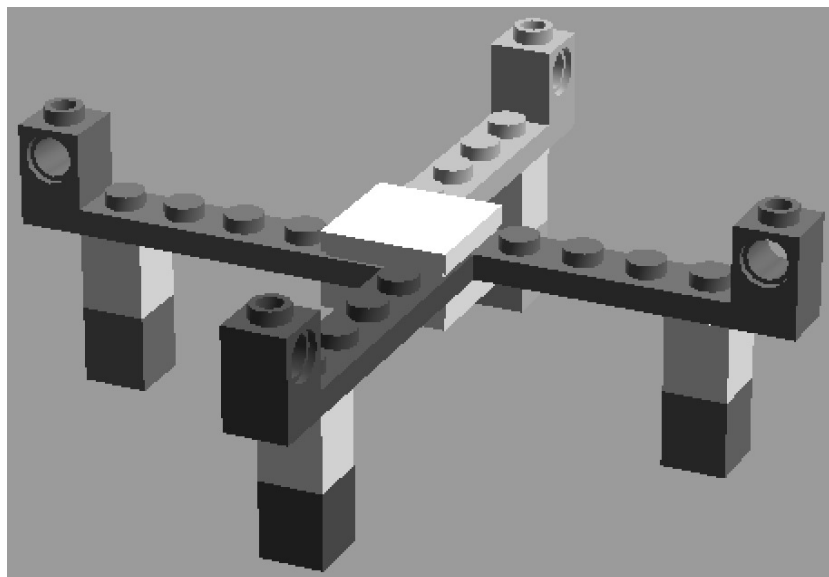
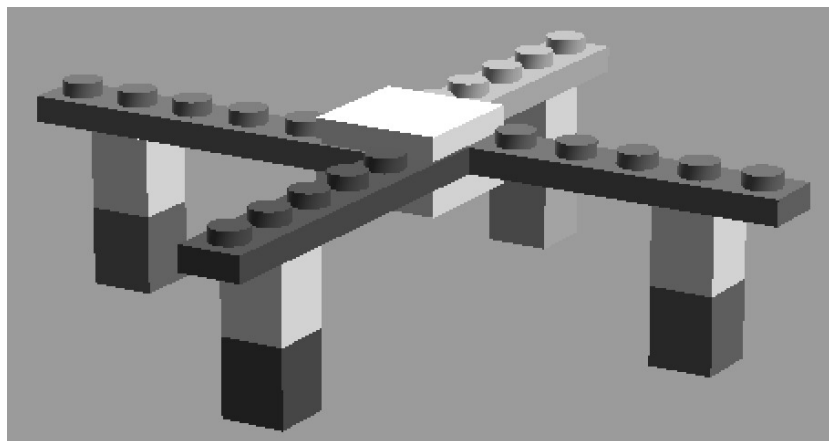


Start by building the Lego frame. We've provided Legos for multiple frame options. Try out your own configurations! Just note, the lighter the frame, the longer the flight time!

Lego Frame Type #1
Approximate weight = 10.4g



Lego Drone Kit Instructions

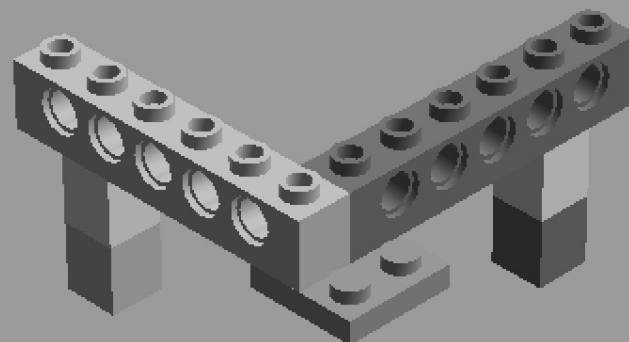
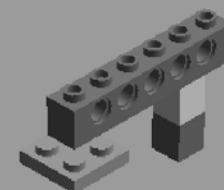


Lego Frame Type #2

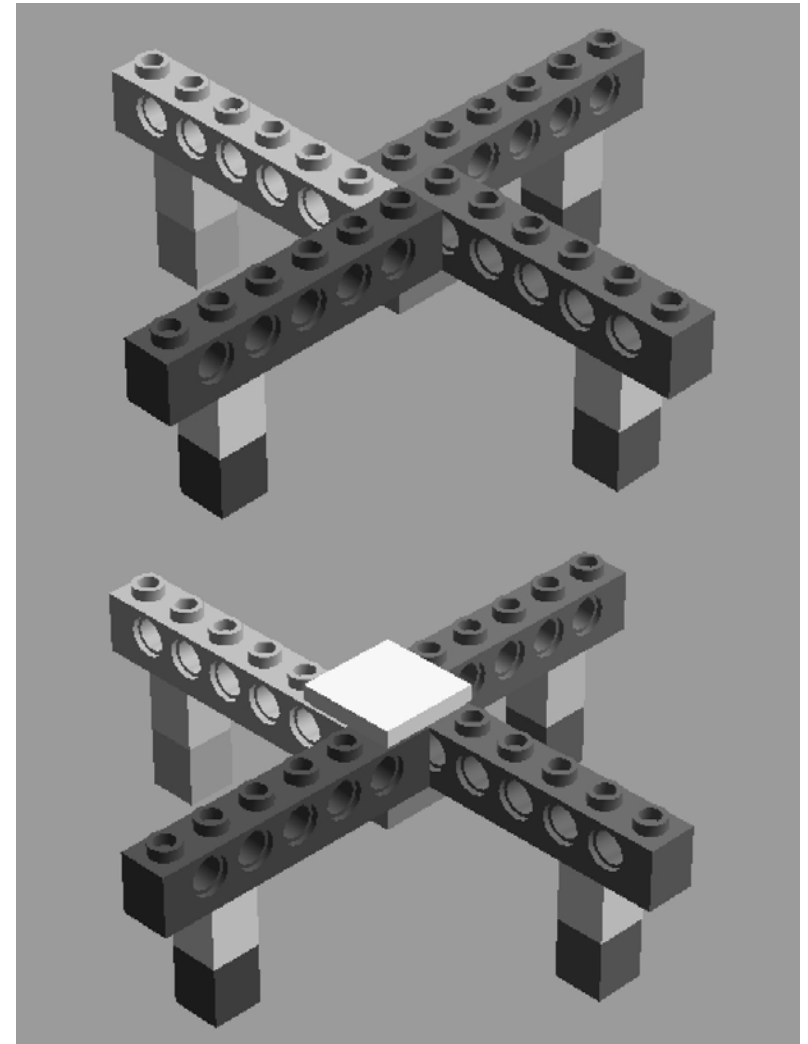
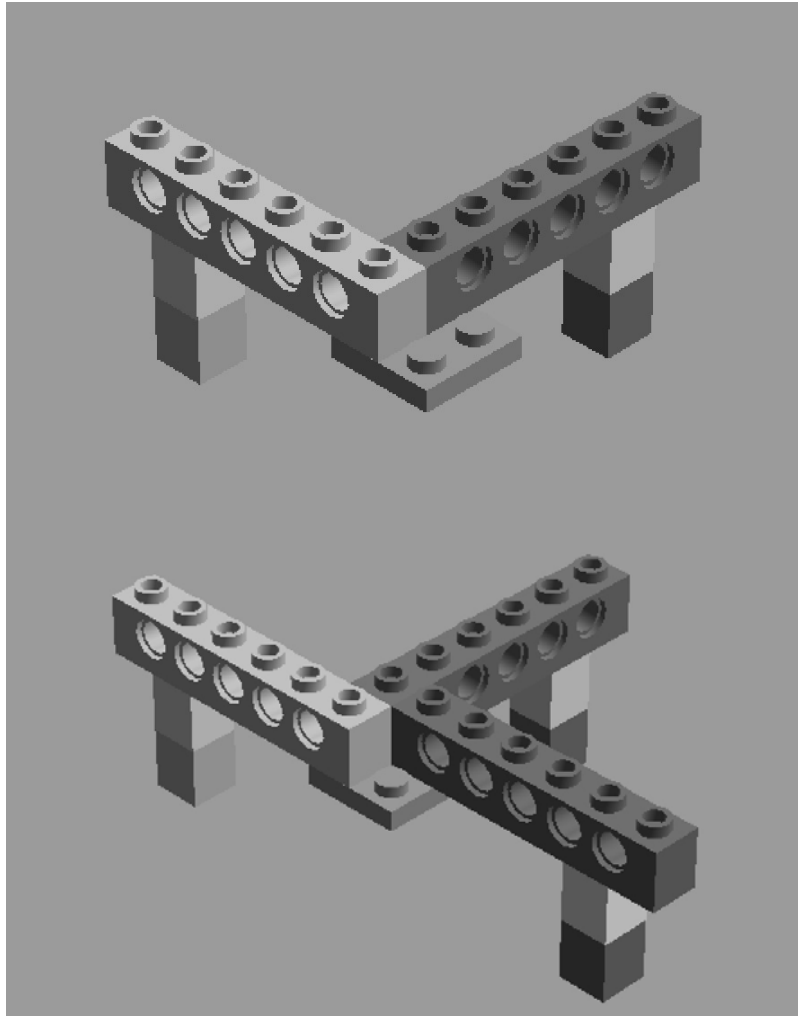
Approximate weight = 13.5g



x4



Lego Drone Kit Instructions

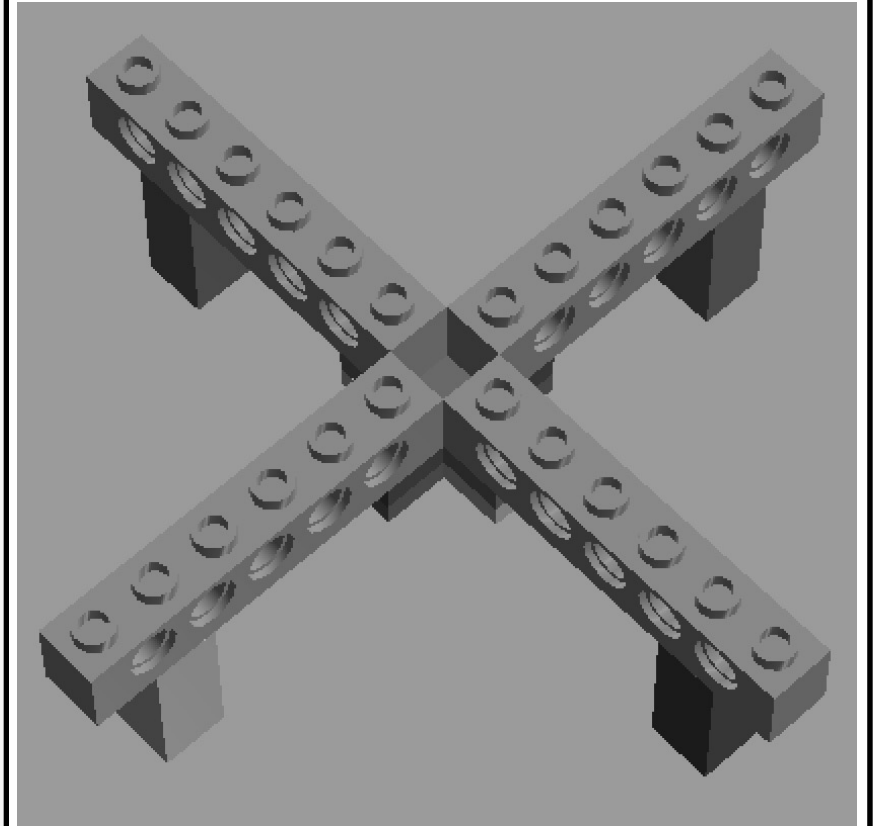
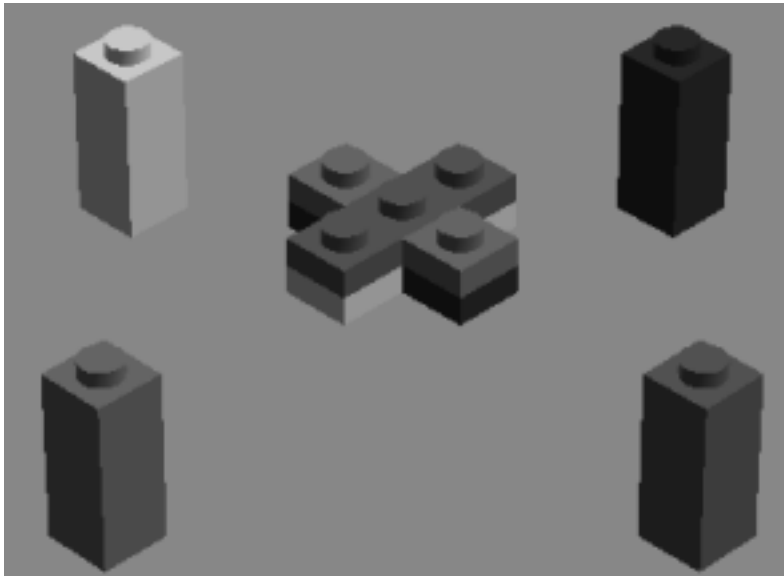
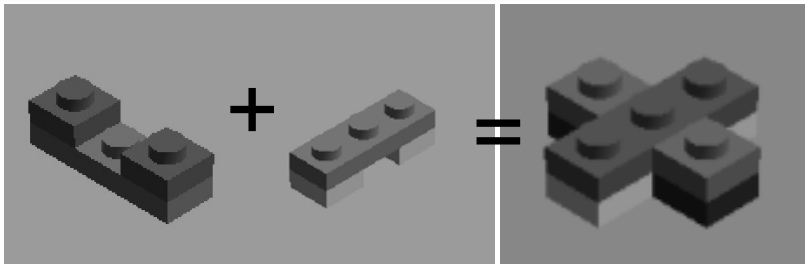


Lego Drone Kit Instructions

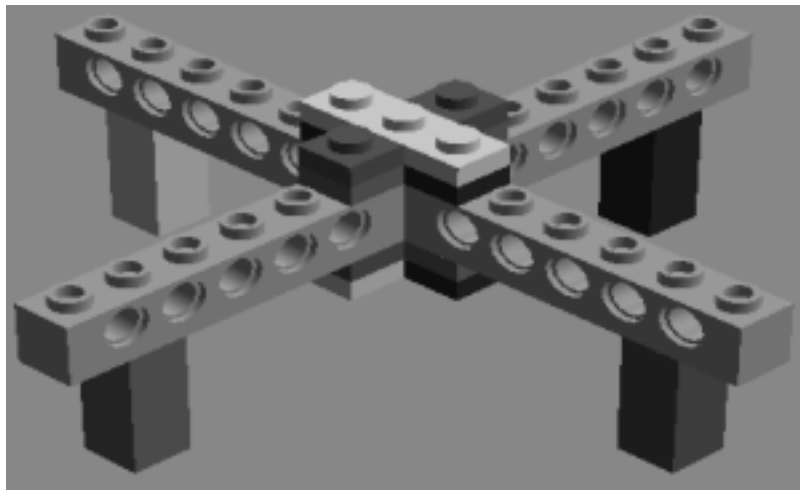
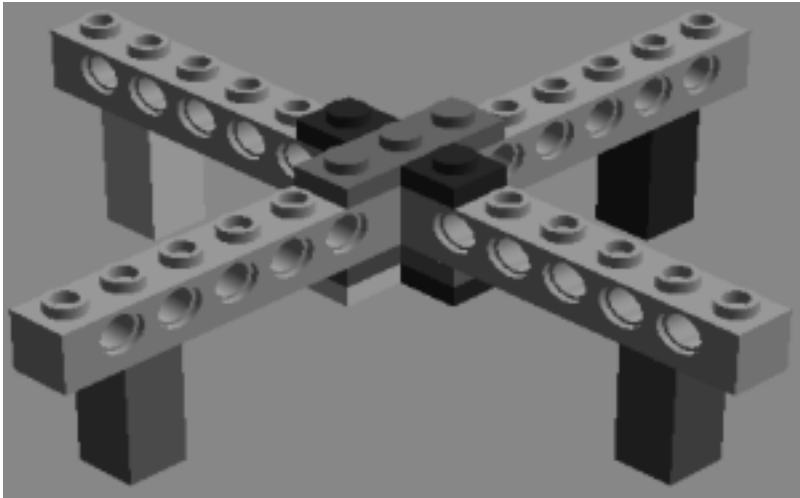


Lego Frame Type #3

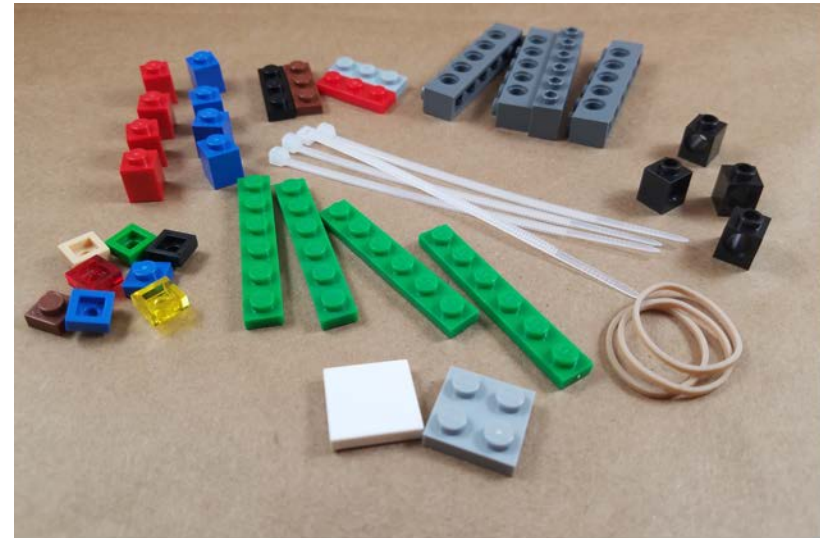
Approximate weight = 16.5g



Lego Drone Kit Instructions



You'll find a variety of Lego types and colors in your pack. Your goal is to make a frame that can hold 4 motors without being too heavy! We recommend gluing the bricks of your final design so it doesn't break during landing.

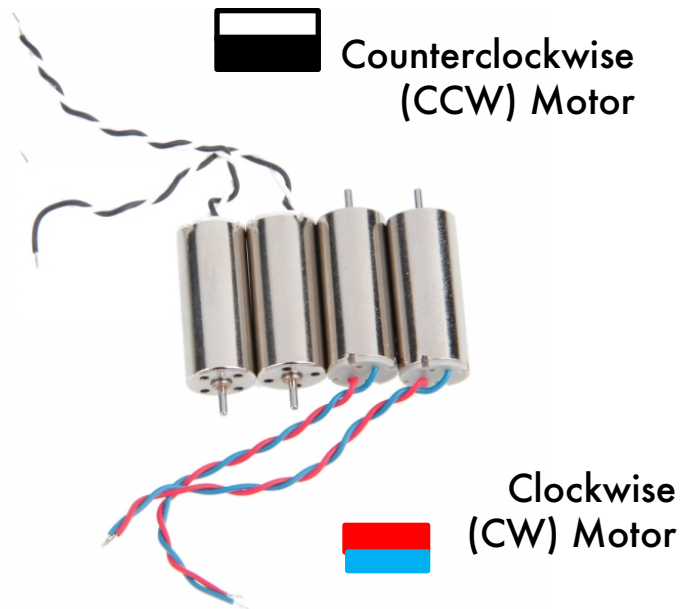


Lego Drone Kit Instructions



Get Ready to Solder!

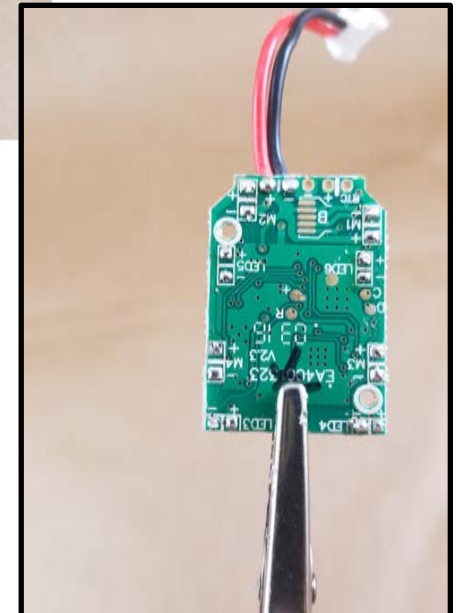
You will need to solder each of the 4 motors (c) and each of the 4 LEDs (d) to the receiver board (b). Motor location on the board matters because 1 set of motors spin in the clockwise (CW) direction and 1 set of motors spin in the counterclockwise (CCW) direction.



Use a helping hand to hold the receiver board while you solder. Start with the wire on the board facing away from you and the solder joints facing "up". You can tell the solder joints for the motors as they read "M1" "M2" "M3" "M4" and for the LEDs as they read "LED3" "LED4" "LED5" "LED6"



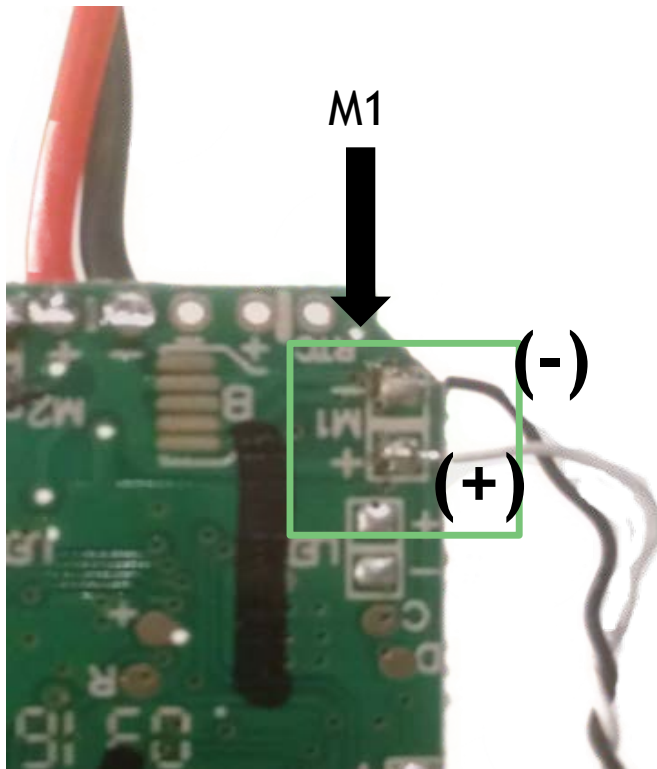
Helping Hand



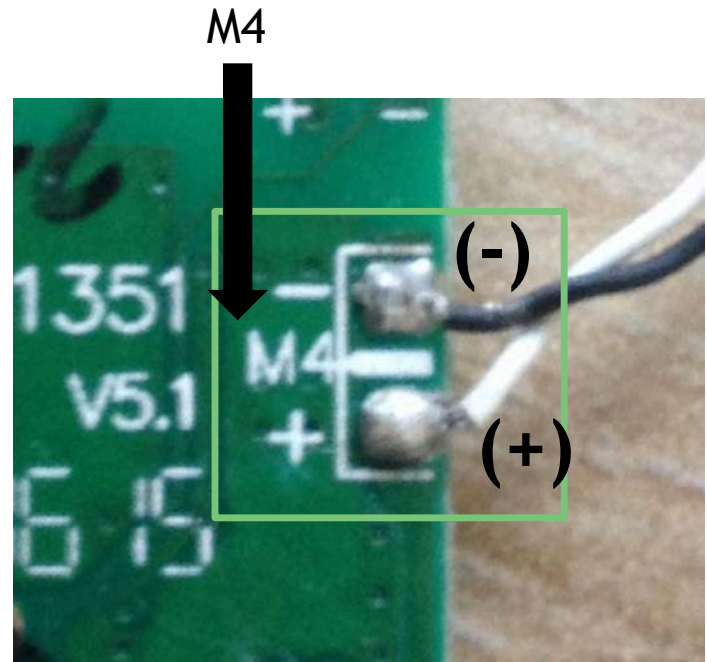
Lego Drone Kit Instructions



Solder a CCW motor (black and white wires) to the **M1** location on the board. You will see a positive (+) and negative (-) terminal. Solder the **BLACK** wire to the (-) terminal and the **WHITE** wire to the (+) terminal as shown.



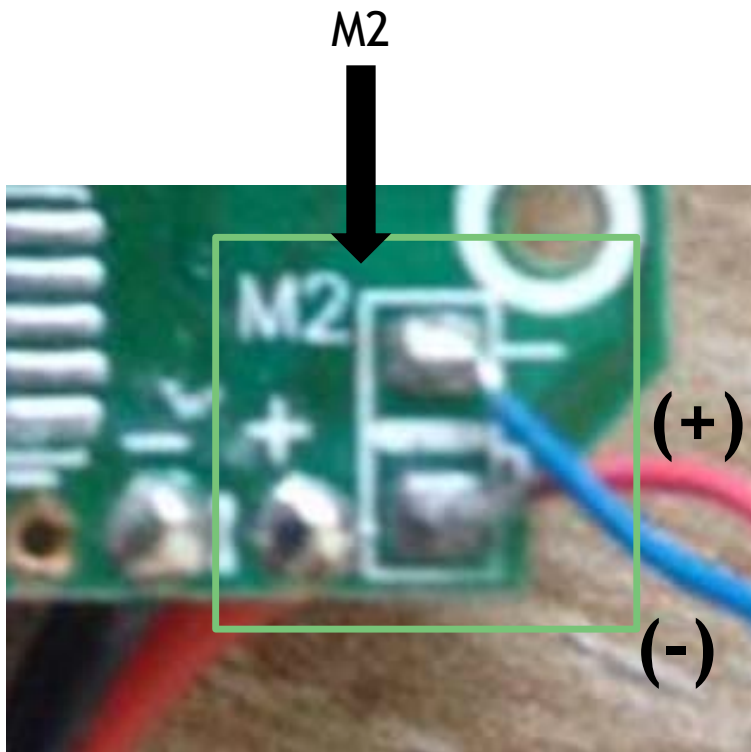
Solder a CCW motor (black and white wires) to the **M4** location on the board. You will see a positive (+) and negative (-) terminal. Solder the **BLACK** wire to the (-) terminal and the **WHITE** wire to the (+) terminal as shown.



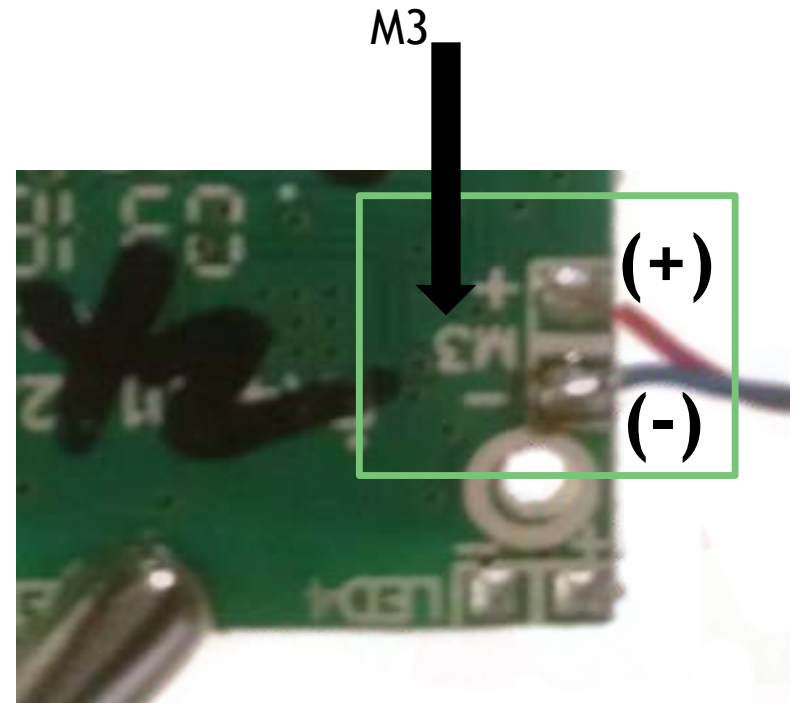
Lego Drone Kit Instructions



Solder a CW motor (blue and red wires) to the **M2** location on the board. You will see a positive (+) and negative (-) terminal. Solder the **BLUE** wire to the (-) terminal and the **RED** wire to the (+) terminal as shown.



Solder a CW motor (blue and red wires) to the **M3** location on the board. You will see a positive (+) and negative (-) terminal. Solder the **BLUE** wire to the (-) terminal and the **RED** wire to the (+) terminal as shown.



Lego Drone Kit Instructions

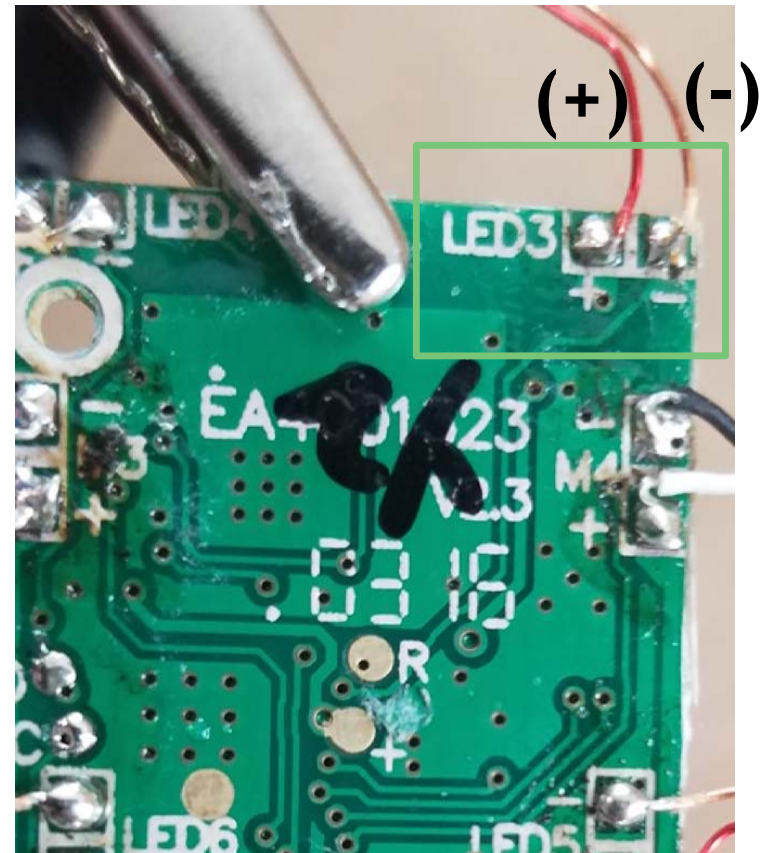


Continue to Solder!

You will have a total of 4 LEDs. You have 2 of each color LED. You might have a combination of 2 Blue LEDs and 2 Red LEDs or 2 Blue LEDs and 2 White LEDs.



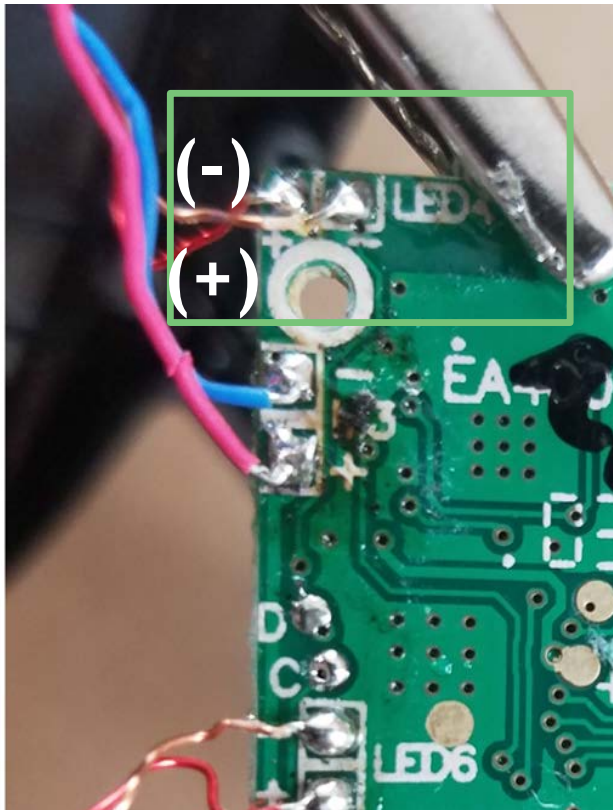
Solder a **BLUE** LED to the LED3 location on the board. You will see a positive (+) and negative (-) terminal. Solder the red wire to the (+) terminal and the copper wire to the (-) terminal as shown.



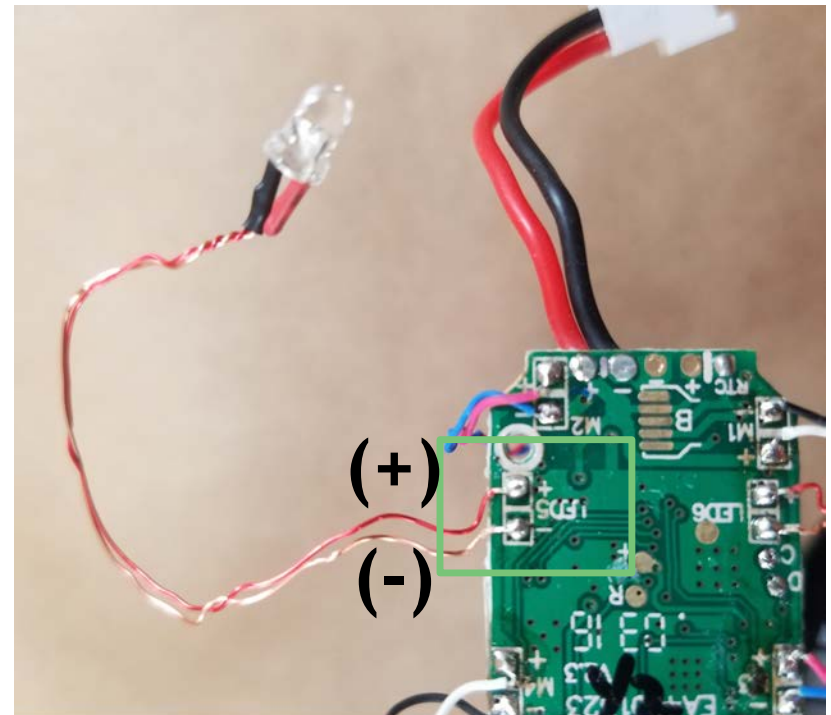
Lego Drone Kit Instructions



Solder a **BLUE** LED to the LED4 location on the board. You will see a positive (+) and negative (-) terminal. Solder the red wire to the (+) terminal and the copper wire to the (-) terminal as shown.



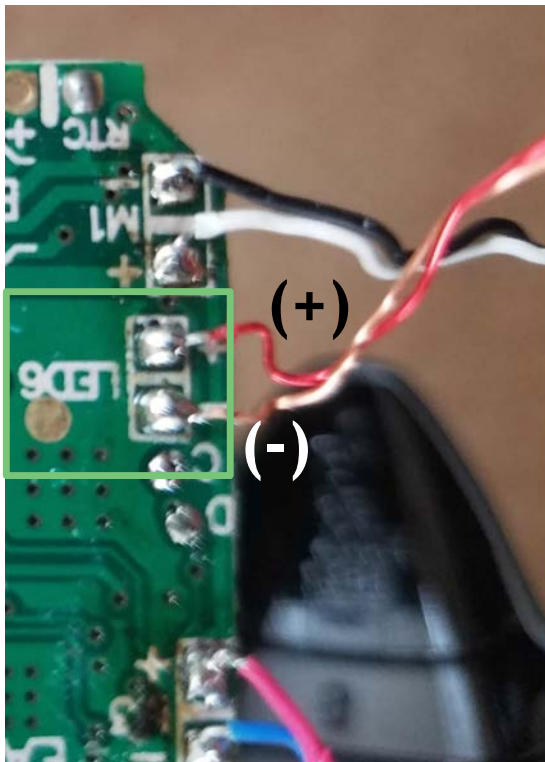
Solder a **RED or WHITE** LED to the LED5 location on the board. You will see a positive (+) and negative (-) terminal. Solder the red wire to the (+) terminal and the copper wire to the (-) terminal as shown.



Lego Drone Kit Instructions

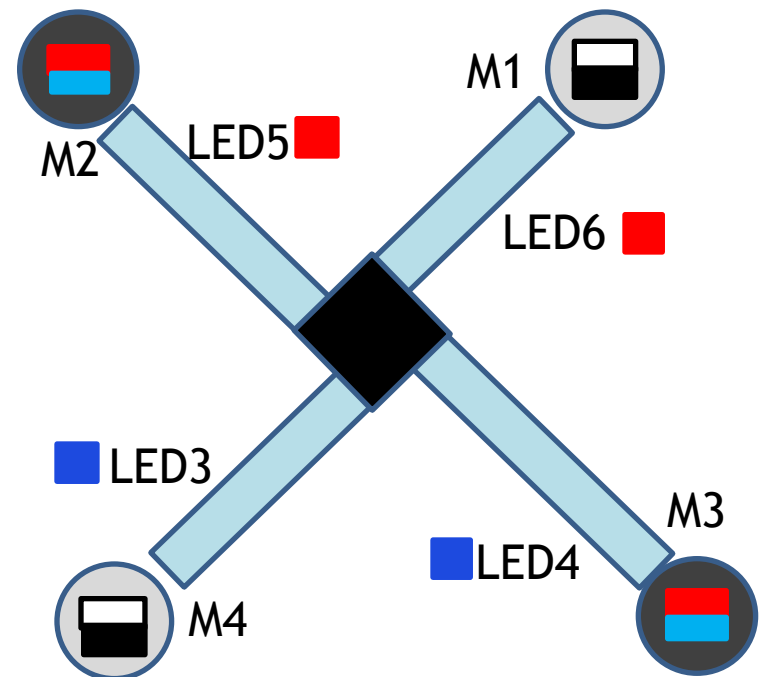


Solder a **RED or WHITE** LED to the LED6 location on the board. You will see a positive (+) and negative (-) terminal. Solder the red wire to the (+) terminal and the copper wire to the (-) terminal as shown.



Final Wiring Diagram

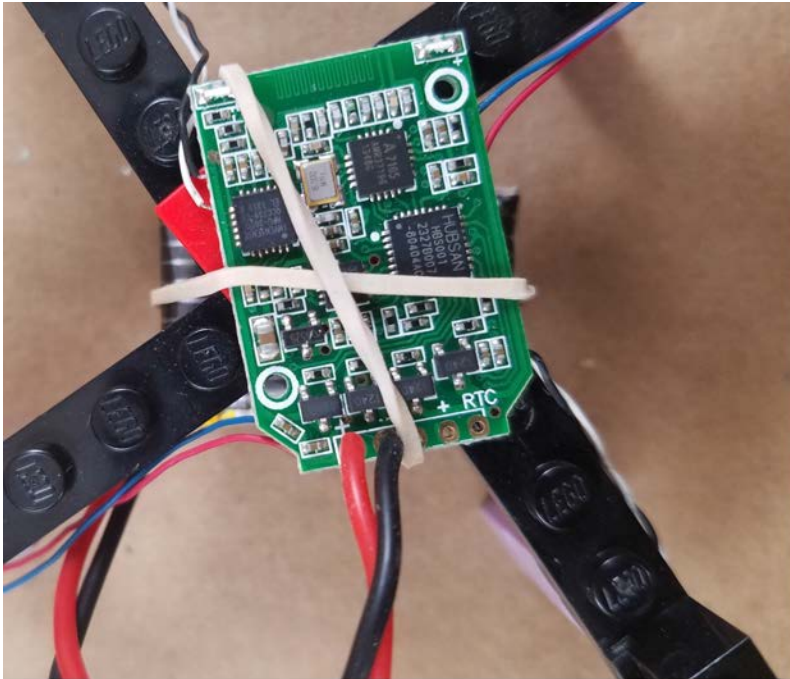
This diagram just shows the relative location of each motor and LED on an example Lego frame.



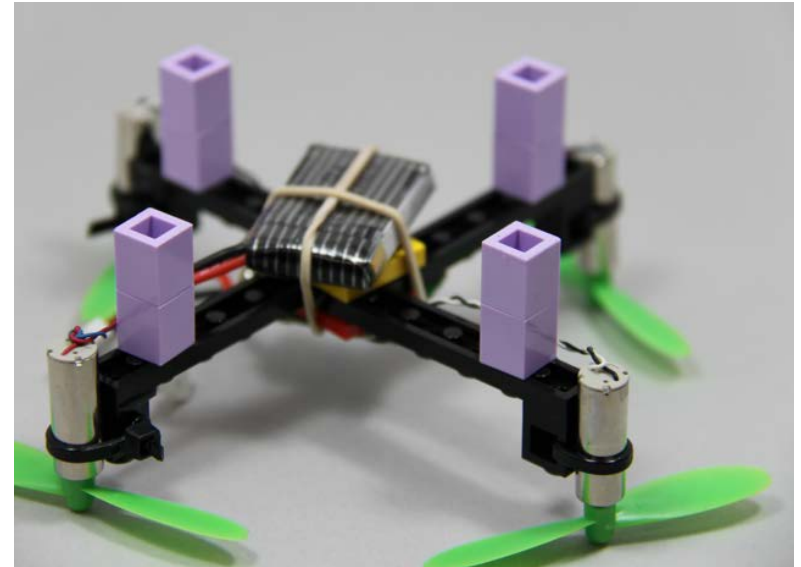
Lego Drone Kit Instructions



Secure receiver board (b) to top of Lego frame with 2 rubber bands. Angle it so motors point along each arm. The board components should be on "top" as shown.



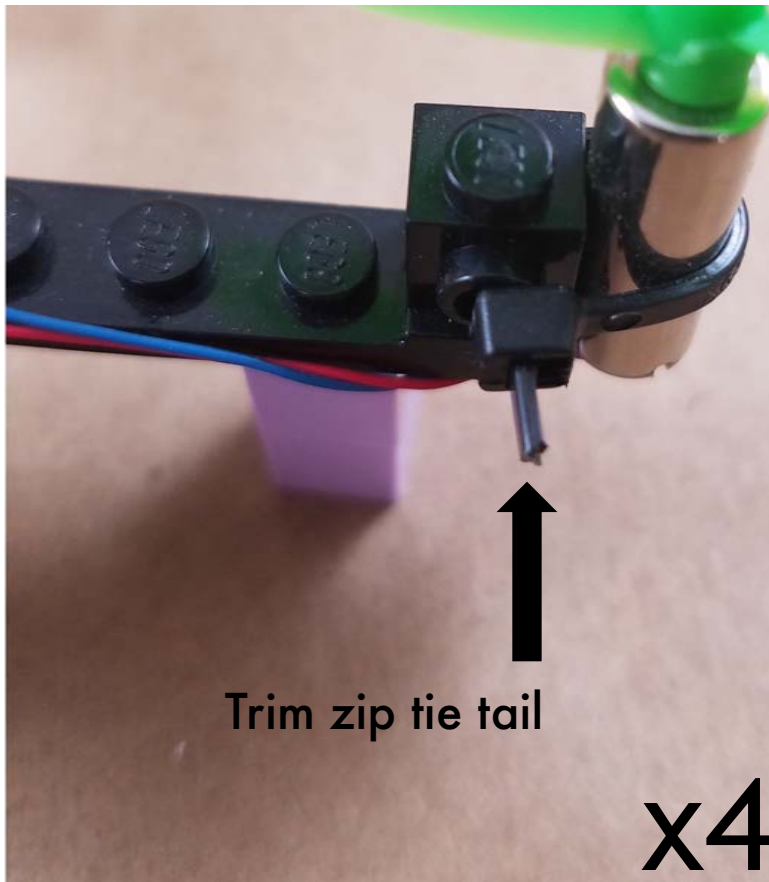
Secure battery to bottom of Lego frame with the rubber bands used to secure receiver board.



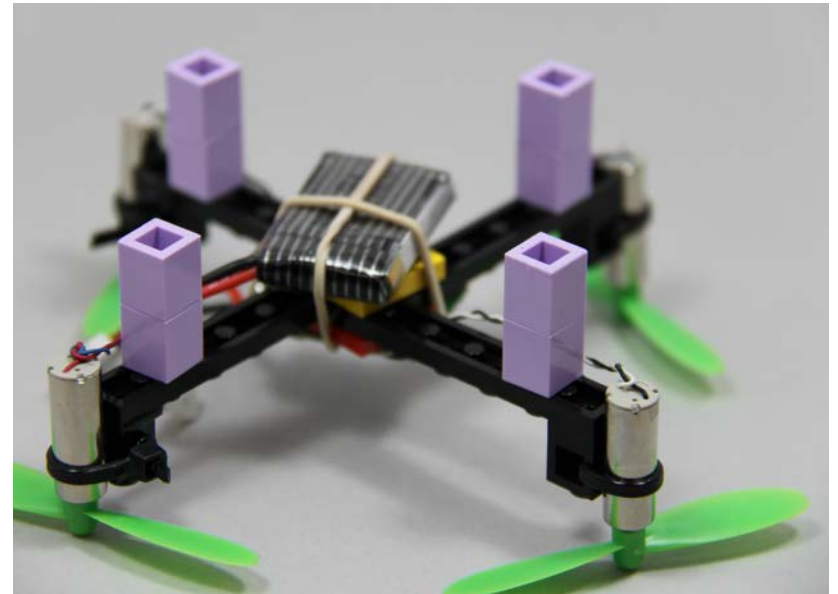
Lego Drone Kit Instructions



Secure each motor to the Lego frame arm with a zip tie as shown. Do this 4 times for each motor on each arm.



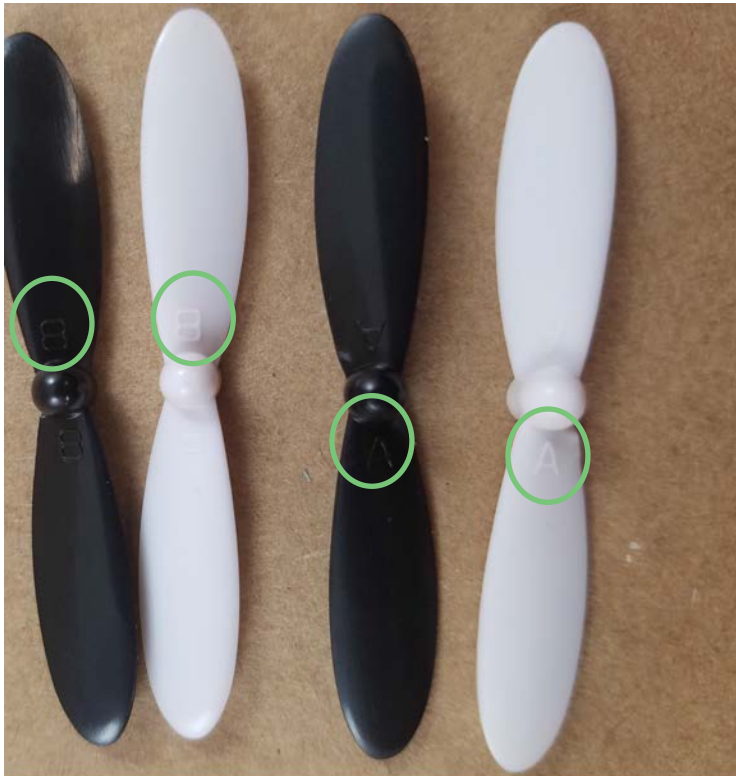
Secure battery to bottom of Lego frame with the rubber bands used to secure the receiver board.



Lego Drone Kit Instructions



Attach propellers to motors. Each color* has an "A" and "B" label on top of the propeller. "A" propellers attach to **Red/Blue** (CW) motor, "B" propellers to **Black/White** (CCW) motor.



*Colors will vary.

Firmly press propeller down on to motor spike. It should sit snugly against the motor.



Lego Drone Kit Instructions



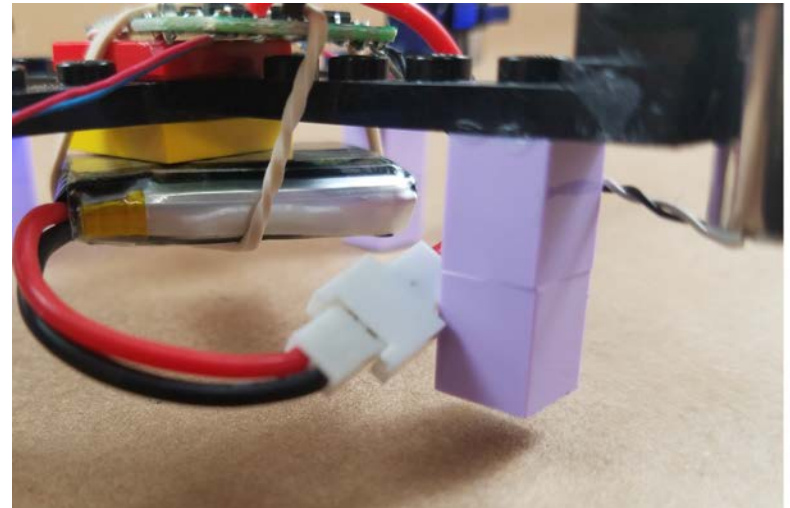
Charging Battery

Charge battery by plugging JST connector from Lipo battery to JST/USB cable. We recommend charging the battery prior to your first flight. You can charge the battery while it's attached to the drone as well.



****Do not overcharge the battery. Charge for a couple hours at most and then remove. If you notice the battery "puffing" up or "swelling" do not use it and contact us for a replacement. ****

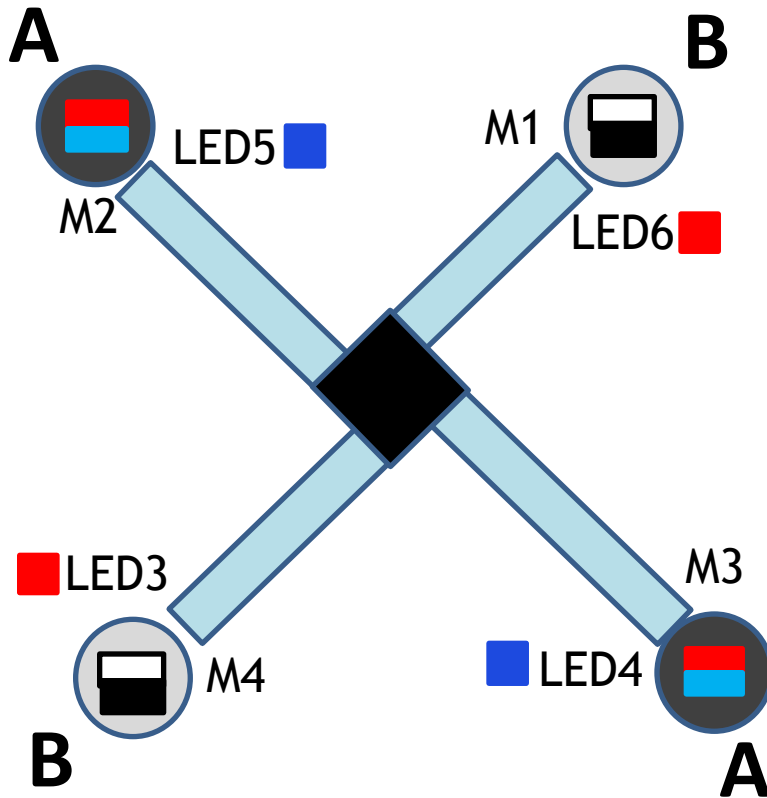
The end of the battery has a male JST type connector that fits with the female JST type connector on the receiver board. They fit together as shown. When you plug the battery into the receiver board, 2 LEDs located on the board will light up.



Lego Drone Kit Instructions



Final Drone Layout!



Turning On

1. Plug in your battery (c) to your receiver board (b).
2. Set on a level surface to ensure internal accelerometer is level.
3. Turn on controller. You will hear a "beep" when the controller and receiver are paired.
4. Test joysticks to make each propeller rotate.
5. Slowly engage all 4 motors and work on controlling movement and lift.
6. FLY!
7. Watch out for fast spinning propeller blades, they're sharp!



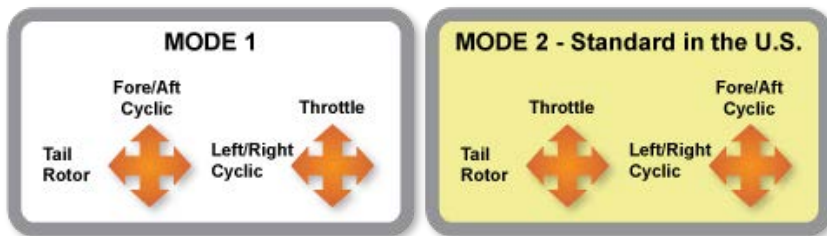
Lego Drone Kit Instructions



IF YOU NEED TO CALIBRATE

Joysticks

First and foremost is calibrating your joysticks. Calibrating the joysticks does two things for you. One, it allows you to properly align the joysticks for maximum range of control and sensitivity. Two, it allows you to decide if you want to fly in Mode 1 or Mode 2. Remember: Which mode you pick determines what direction you need to hold the joysticks during the calibration.



To Change to Mode 2 and Calibrate Sticks



(MODE 2)

1. Disconnected board from battery
2. Turn off Controller
3. Place both joysticks in upper-most left position
4. While holding joysticks in position, turn on controller. The light on the controller should start flashing
5. Roll each joystick around in the clockwise fashion for calibration.
6. Press down on the right aileron trim button (farthest right trim button on the controller) until the controller light starts blinking red.
7. Turn off the controller.

Lego Drone Kit Instructions



To Change to Mode 1 and Calibrate Sticks



(MODE 1)

1. Disconnect board from battery
2. Turn off Controller
3. Place the LEFT joystick in upper-most left position
4. Place the RIGHT joystick in the upper-most right position.
5. While holding joysticks in position, turn on controller. The light on the controller should start flashing
6. Roll each joystick around in the clockwise fashion for calibration.
7. Press down on the right aileron trim button (farthest right trim button on the controller) until the controller light starts blinking red.
8. Turn off the controller.

Calibrating the Accelerometer

Calibration of the accelerometer will help to keep your drone stable while in flight and minimize any drift due to sensor misalignment. The most important step in calibrating the accelerometer is that you want to set your drone on to a stable and flat surface. Once you've done that you can get started with the below instructions.

1. Turn on Controller
2. Connect battery to board. The drone and controller should pair immediately, you will hear a beep and the light on the controller will turn solid red.
3. Place the LEFT joystick in lower-most right position (think 4-o-clock on watch).
4. While holding the left joystick in position, push the right joystick side to side over and over again.
5. Continue pushing the right joystick back and forth until the blue LEDs flash twice.
6. If in Mode 1, keep the right joystick aimed down (toward you) when pushing side to side so your drone doesn't start flying!

Lego Drone Kit Instructions



FIRST FLIGHT

It's the time you've been waiting patiently for. Your battery is charged, your drone is assembled, and everything has been calibrated. Time to get started.

When flying your new drone, always remember to turn your controller on first prior to connecting the battery in the drone. While it can work the other way around, turning your drone on will cause it to immediately search for a controller to sync to. If another 2.4 GHz controller is turned on nearby, it may pair with the drone, causing you to lose control of your drone.

Once the controller is on and the drone's battery is connected, the drone and controller will pair instantly. Don't worry if the blue LEDs of the drone continue to blink, they will go solid once you set the drone back down onto a flat surface. When finally settled, start pushing the appropriate joystick for throttle upward (away from you) until the drone takes off. For ease of control, try to keep the drone about two feet above the ground, so the downward thrust of the quadcopter doesn't cause any turbulence. Practice tilting the drone left/right and front/back some while adjusting the throttle to keep the drone at the same altitude. This will give you a good idea of how the drone reacts to the controller settings.

Setting Trim

It's important to use this time to also check your drone for any minor drifting that may occur when hovering in place. Land your drone squarely on a flat surface and take off again, keeping an eye out on which way the drone flies without you touching the joysticks that control pitch or roll. If the drone drifts significantly in one direction, consider troubleshooting the issue by recalibrating the accelerometer with pieces of folded paper stacked under the feet of the drone on the side opposite of the drift (ie: drifts right, place paper under left two feet, then recalibrate). If the drone is able to be controlled easily and only has a minor drift in one or two directions, use the following buttons to adjust your trim accordingly.

Lego Drone Kit Instructions



If it drifts forward

For Mode 1: Press DOWN on the trim button that sits to the side of the LEFT joystick

For MODE 2: Press DOWN on the trim button that sits to the side of the RIGHT joystick.

If it drifts backward

For Mode 1: Press UP on the trim button that sits to the side of the LEFT joystick

For MODE 2: Press UP on the trim button that sits to the side of the RIGHT joystick.

If it drifts left

For Either Mode: Press RIGHT on the trim button that sits to the side of the RIGHT joystick

If it drifts right

For Either Mode: Press LEFT on the trim button that sits to the side of the RIGHT joystick

For MODE 2: Press UP on the trim button that sits to the side of the RIGHT joystick.

Lego Drone Kit Instructions



You have now completed a Kitables Kit! If you have questions, check out our FAQ at Kitables.co or email us at info@kitables.co

We're working to make replacement parts available on our website. If you think you are missing a part, just email us with any questions.

