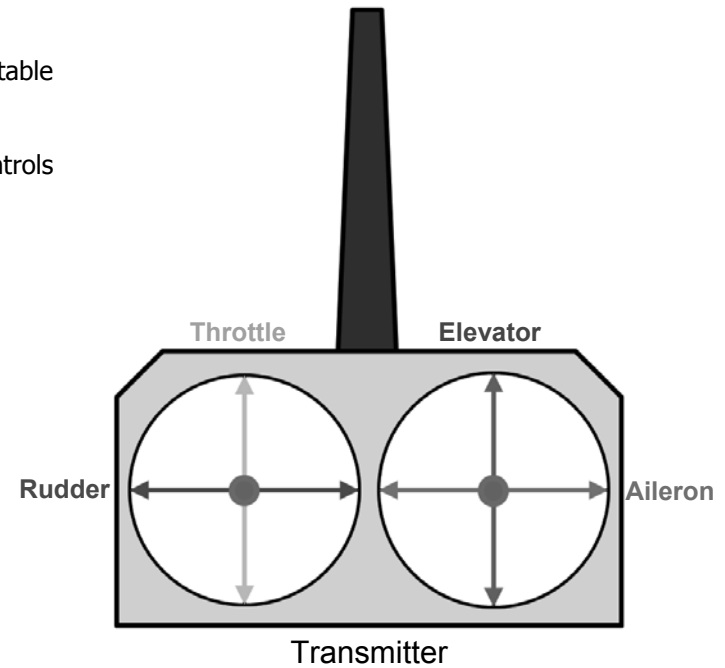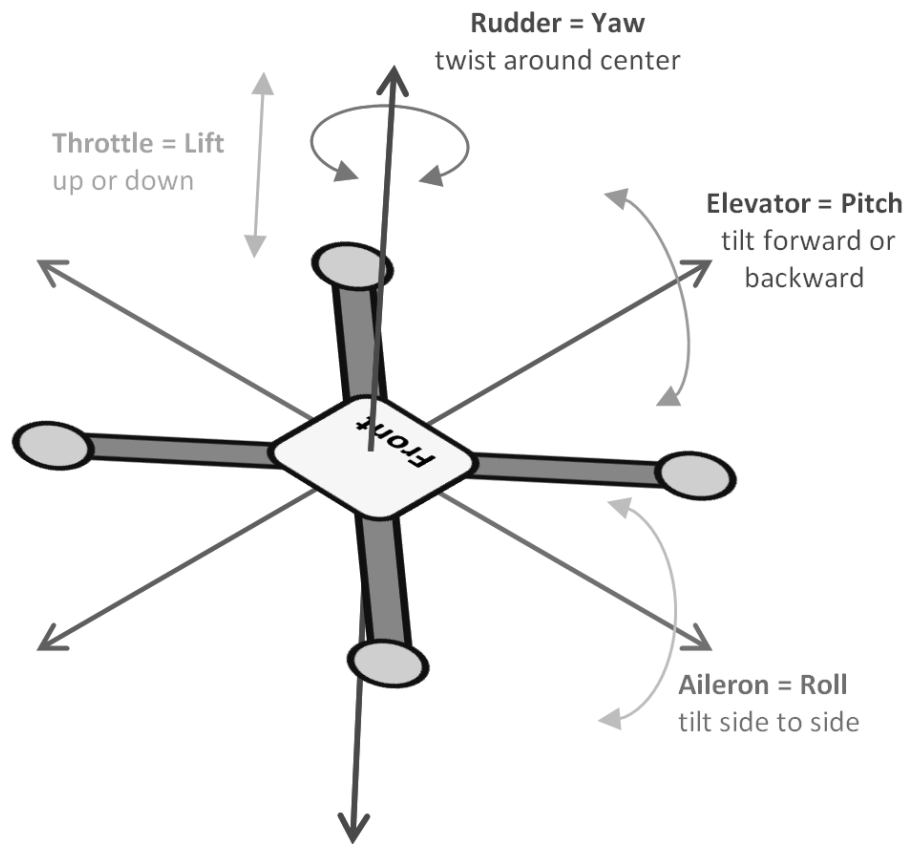## Step 8: Configure your Transmitter

1. For best results, follow the Transmitter Setting Recommendations in the table below to configure your Transmitter.

2. Refer to the diagram below to see how your Transmitter's 2-axis joystick controls will translate into ELEV-8 quadcopter motion with these settings.

Rudder = Yaw
twist around center

Throttle = Lift
up or down

Elevator = Pitch
tilt forward or backward

Front

Aileron = Roll
tilt side to side

Throttle   Elevator

Rudder   Aileron

Transmitter

Transmitter Setting Recommendations	
Box Model Type	ACRO (Plane Mode)
End point adjustment	Set to 50% initially. (If the ELEV-8 still seems too reactive, reduce to 30% until you get used to flying it.)
Dual-Rates (D/R)	100%
Channel Reverse	Normal: Hi Tech Spektrum, JR brands Reversed: Futaba brand
Trims	Centered
Sub-trims	Centered
Gain Adjust	Set Gain on 5th channel. Start with 25%, add or subtract based on flight stability
Exponential	After gaining experience, add up to 30% into aileron and elevator

Step 9: Programming the ESC Speed Controllers

In this step, you will program the motor's electronic speed controllers (ESCs) with an ESC Programming Card. The ESCs should not be plugged into the motors yet. IF THE ESCs ARE PLUGGED INTO THE MOTORS, DISCONNECT THEM NOW.

Note: The ESC Programming Card was added to kits in April 2013. They are also available separately from www.parallax.com; search "85000".

1. Connect your charged LiPo battery to the power harness.

2. Connect an ESC to the ESC programming card's BEC port. Be sure to line up the black wire with (-), the red wire with (+), and the white wire with (Signal).

   WARNING: Do not connect to the Programming Card's BEC port and Batt port at the same time; this would damage the card.

3. Set the ESC card to the configuration shown in the picture and the table, then push OK to program the ESC. Repeat with each ESC, using the same settings. Be sure to cycle power between each programming cycle.

1	Brake	Off
2	Battery Type	Li-xx
3	Cut Off Type	Soft-cut*
4	Cut Off Voltage	Middle
5	Start Mode	Normal
6	Timing Mode	Middle
7	Music/Li-Po Cells	(none)
8	Governor Mode	Off

* Soft-cut (also called Reduce Power) lets you know when the quadcopter's batteries are running low. If you set this to Cut-off/Shut Down, your quadcopter will simply fall out of the sky when it reaches a certain battery level.
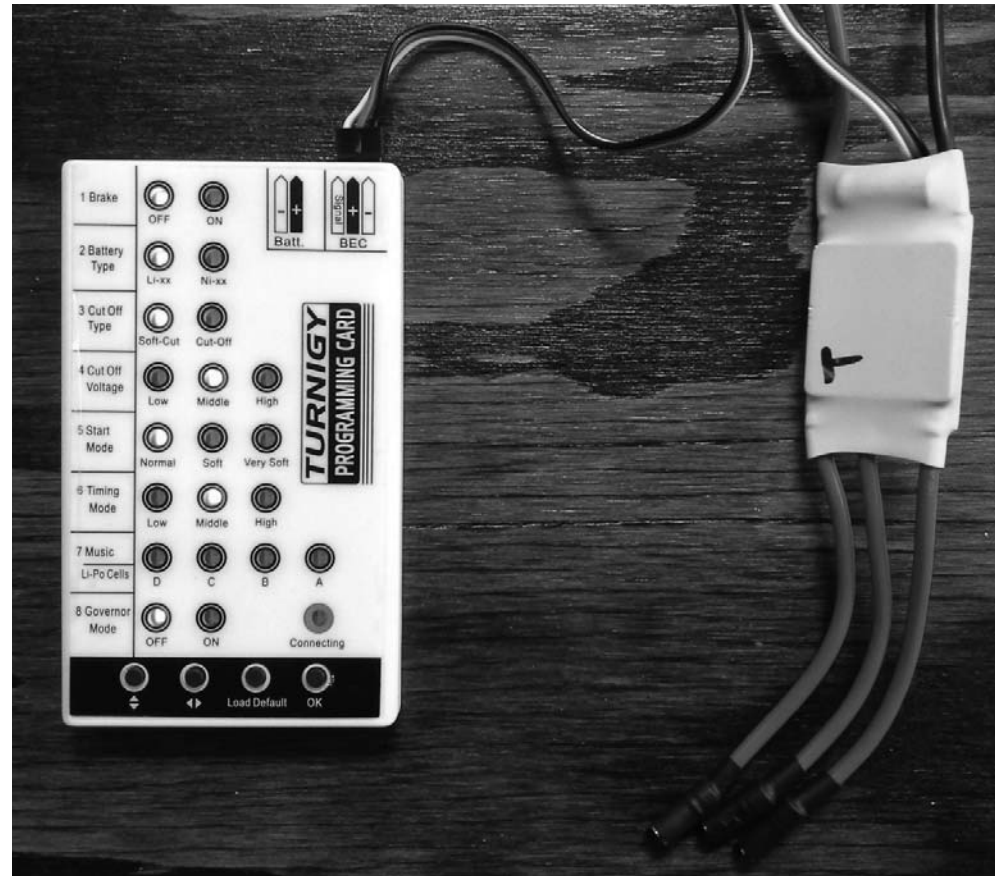
Step 10: Connect the Motors and Synchronize the ESCs

After programming the electronic speed controllers, it is time to connect each one to its motor and test it to make sure it is turning in the proper direction. For this step, your Receiver will temporarily connect directly to (and receive power through) each ESC.

WARNING: Do not connect a battery or other power source and an ESC to your receiver at the same time. If you do, you will permanently and catastrophically damage both the ESC and Receiver.

STOP: YOU SHOULD NOT HAVE PROPELLER BLADES ON YOUR MOTORS YET! IF YOU DO, REMOVE THEM NOW.

1. If you have not done so already, bind your Transmitter to your Receiver as per your RC controller's instruction manual.

2. Identify which edge of the chassis will be the front of your ELEV-8 quadcopter.   If you have used the checkered stickers and/or the LED tapes, the front edge would be between the two black-checkered, white-LED Booms.

3. Put a piece of tape on the output shaft of each motor, so you can easily tell the direction of rotation.

4. Connect an ESC's 3-pin socket to the Throttle port on your Receiver.

5. Gently apply the throttle to see which direction the motor turns. Refer to the diagram to see which direction each motor needs to turn.

6. If the motor is not turning the proper direction, disconnect any two of its leads, reverse them, and reconnect.

7. Label the ESC with its motor position number, both on its case and on its 3-pin socket.

8. Repeat with each ESC until all motors are turning in the correct direction and each ESC case and lead are numbered.

9. When you are sure your motor connections are all correct, apply heat to finish shrinking the tubing over the motor/ESC connector joints.

10. To synchronize your ESCs, power on the ELEV-8 quadcopter. Turn on your transmitter, then set Throttle to max position. After the standard startup sequence, two separate beeps will indicate the max throttle position has been set and stored. Lower throttle to min position. You will hear three beeps, which indicate that min throttle position has been set and stored.
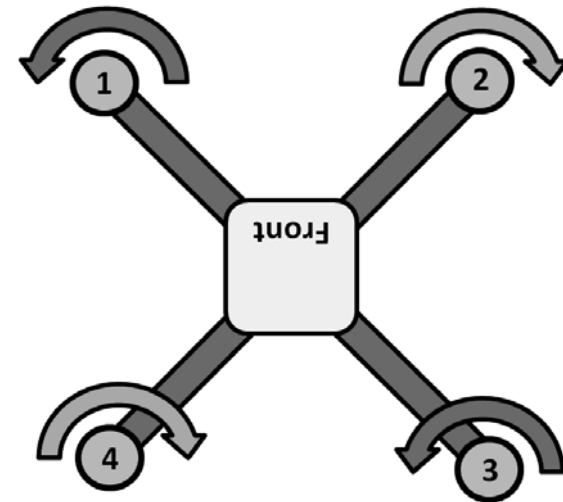
Step 11: Chassis Top Plate and Control Board Assemblies

In this step, you will prepare and attach the Chassis Top Plate. Then, you prepare and attach the Control Board to its Mount plate.

Gather the items shown in the diagrams on the next two pages. Note: the Control Board Mount Plate has slots around all four edges.

1. Pull all the ESCs' 3-pin leads together towards the front of the chassis.

2. Referring to the diagram on the next page, locate the correct holes in the Top Chassis Plate (item 2) to attach the four 1-1/4" Nylon Standoffs (item 1).

3. Attach each Nylon Standoff (item 1) to the top of the Top Chassis Plate (item 2) with a 3/8" Panhead Screw (item 3).

4. Attach the Top Chassis Plate to the standoffs on top the Booms using 1/4" Black Panhead Screws. There will be two screws required for each Boom.

5. Refer to the diagram on page 21. Rubber grommets are included with the Control Board. Insert a Rubber Grommet (item 3) into the large mounting hole on each corner of the Control Board (item 4). These grommets reduce vibrations transferred to the Control Board during flight.

6. Insert each 3/8" Panhead Screw (item 1) through a Washer (item 2), then through an installed Grommet, and into the Control Board Mount Plate (item 5). The screws are self-tapping into the Mount Plate, so only gently hand-tighten to avoid stripping the hole.
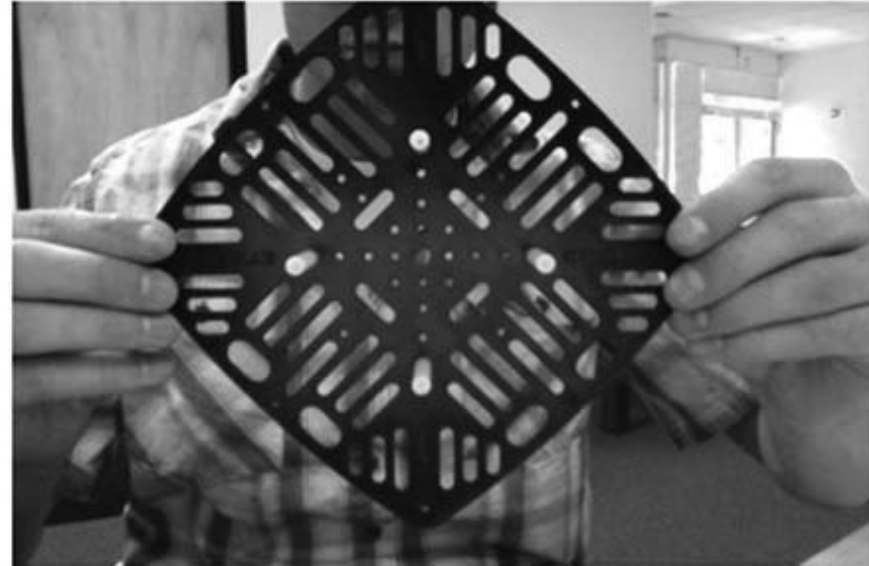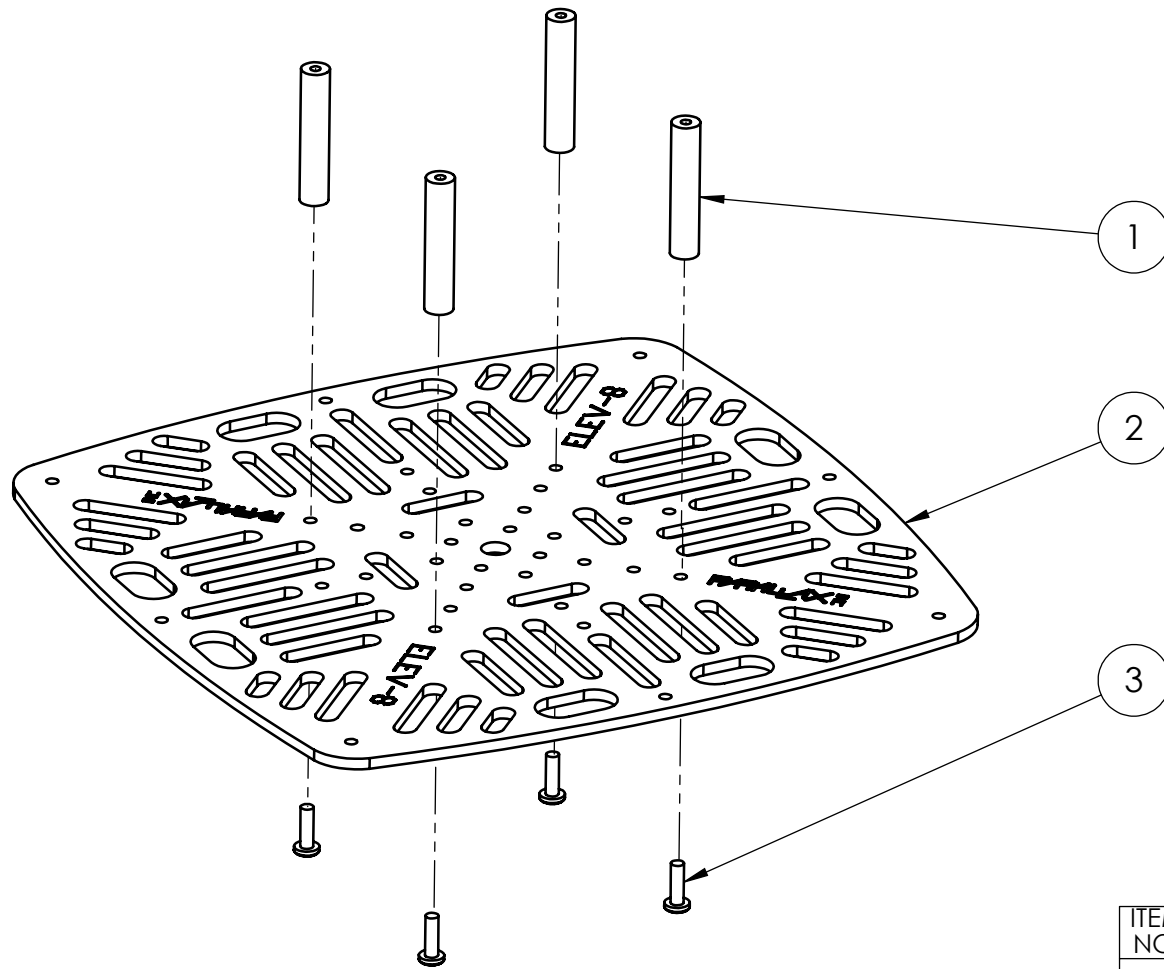
ITEM NO.	Description	QTY.
1	Stand off nylon, 1-1/4", Thread	4
2	Quad Chassis	1
3	Screw 4-40 3/8 Pandhead stainless steel	4
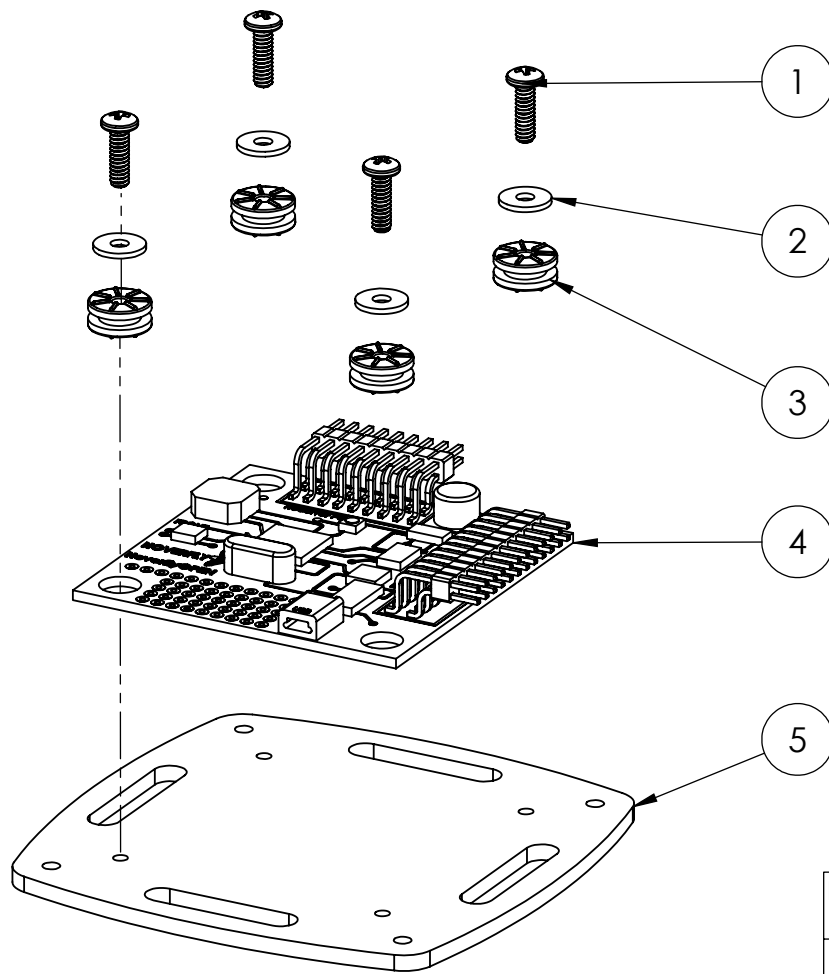
ITEM NO.	Description	Part Number	QTY.
1	Screw, 4-40, 3/8", panhead, stainless steel	710-00036	4
2	# 4 SS Steel Washer		4
3	Rubber Grommet		4
4	HoverFly Open PC Board		1
5	ELEV-8 Control Board Mount Plate Assy	721-80002	1

Step 12: Mount the Control Board Assembly onto the Chassis

In this step, you will enclose the Control Board within its protective Top Plate, and then mount the Control Board Assembly onto the completed ELEV-8 quadcopter chassis.

1. Gather the items listed in the diagram on the next page.

2. Find the arrow on the Control Board silkscreen, as shown in the picture. This arrow points to the front of the Control Board, which must be facing the same direction as the front of the ELEV-8 chassis.

3. Set the Control Board Assembly over the standoffs in the Top Chassis Plate. Make sure the front of the Control Board is aligned with the front of the Chassis.

4. Align the Control Board Top Plate over the Control Board. The small hole near the center of the Control Board Top Plate is for a light pipe. Make sure this hole is directly above the LED on the Control Board. This will make light from the LED visible when the Top Plate is in place.

5. Thread each 1" Panhead Screw (item 2) through a corner hole in the Control Board Top Plate (item 3), then through a 1/2" Nylon Spacer (item 4), through a corner hole in the Control Board Assembly (item 5), and finally into a standoff on top of the Chassis (item 6). Gently tighten.

6. Insert the Light Pipe (item 1) into its hole in the Control Board Top Plate (item 3), until it touches the LED underneath. Trim the Light Pipe to length.

7. Slip your battery between the Control Board Mount Plate and the Chassis Top Plate, and secure it in place with the Nylon Straps.

8. Mount your Receiver to the chassis with zip-ties, referring to its documentation for best placement recommendations.
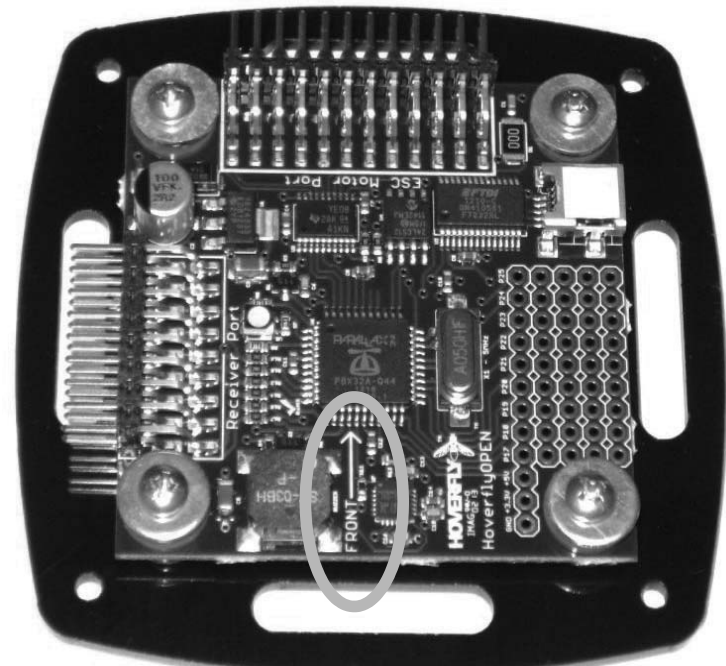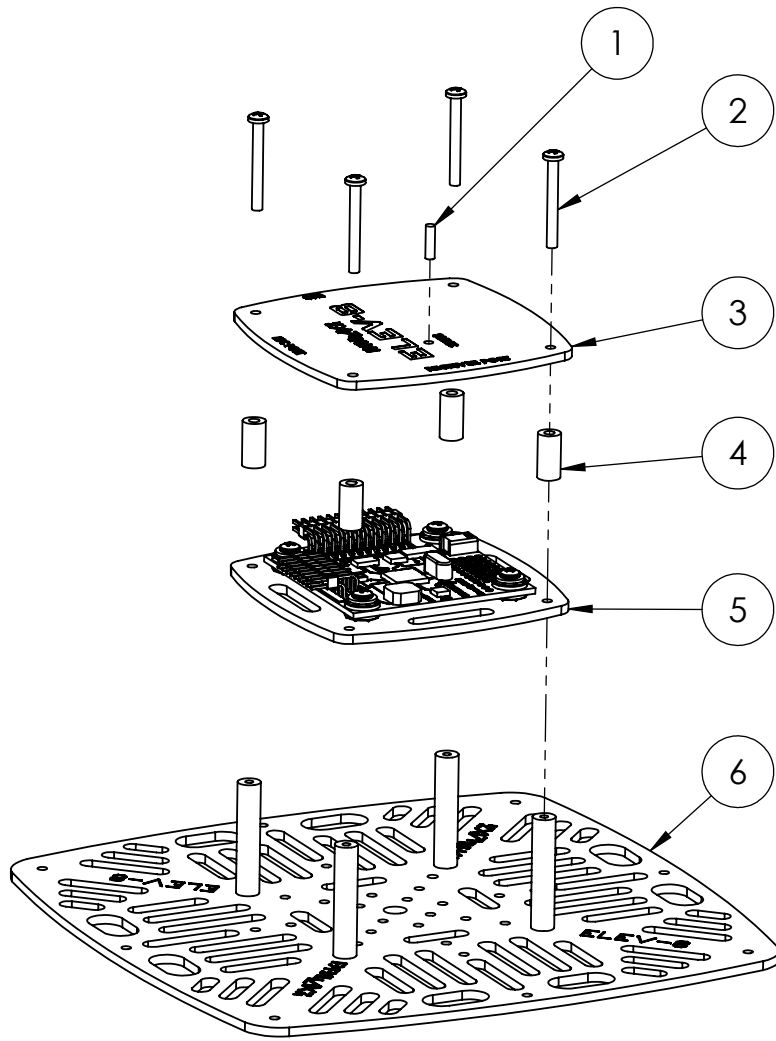
Note: #5, Light Tube comes 5/8" long.
Cut to length needed

ITEM NO.	PART NUMBER	QTY.
1	light tube	1
2	Screw, 4-40 x 1" Pandhead SS Steel	4
3	ELEV-8 Control Board Top Plate	1
4	Spacer, Nylon, 1/2", 4-40 screw size	4
5	Assy PC Board HoverFly Open	1
6	Quad Chassis	1

Step 13: Control Board Connections

In this step, you will connect your ESCs and Receiver to your Control Board. The Receiver connects to the Receiver Port's 2x9 male header on the left edge of the Control Board. The electronic speed controllers connect to the ESC Port's 2x12 male header on the front edge of the Control Board.

1. Connect the Receiver to the Receiver Port, with the five signal connections listed below. Use the 3-wire extension cables included in the ELEV-8 Electronics Kit.

    A = Aileron
    T = Throttle
    R = Rudder
    E = Elevator
    G = Gear (ON: EPA value is Primary Gain, Altitude Hold is off.)
    　　　　(OFF: EPA value is Altitude Hold Gain, Altitude Hold is on.)

5 VDC
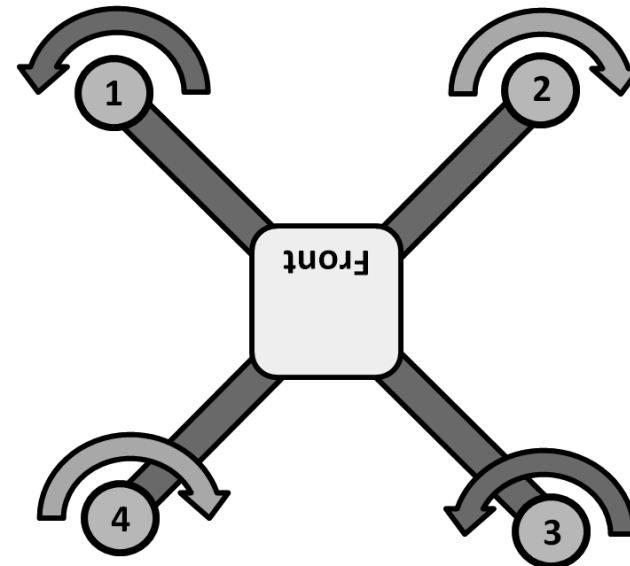
Signal

Ground
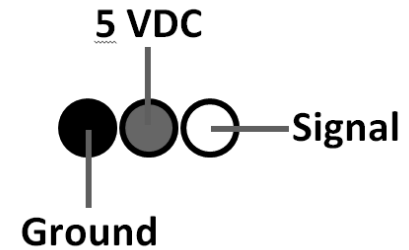
Receiver Port: Control Board Left Edge

2. Connect each motor's ESC controller to the corresponding pins on the ESC port. Match the motor numbers at left to the port numbers below.

3. Double-check your connections – it's easy to make a mistake here.

ESC Port: Control Board Front Edge

**Front**

Step 14: Mounting the Propeller Blades

Only mount the propeller blades when you are ready to fly.

There are two different types of slow flyer propeller blades in the ELEV-8 Electronics Kit: Counterclockwise, (CCW, marked 1045) and Clockwise (CW, marked 1045R). The correct type of blade must be used on each motor for the ELEV-8 to fly. See the drawing below for label location; the blades are rounded-side-up.

1. Disconnect the battery from the Power Harness.

2. Refer to the diagram on this page for the correct placement of each blade.

3. Connect each blade to its motor, referring to the diagram on the next page. The Blade (item 2) should be mounted rounded-side-up, seated on a Cone Lock (item 3) over a Collet (item 4).

4. Finger-tighten the Propeller Nut (item 1), then use an Allen wrench to tighten ¼ turn more.
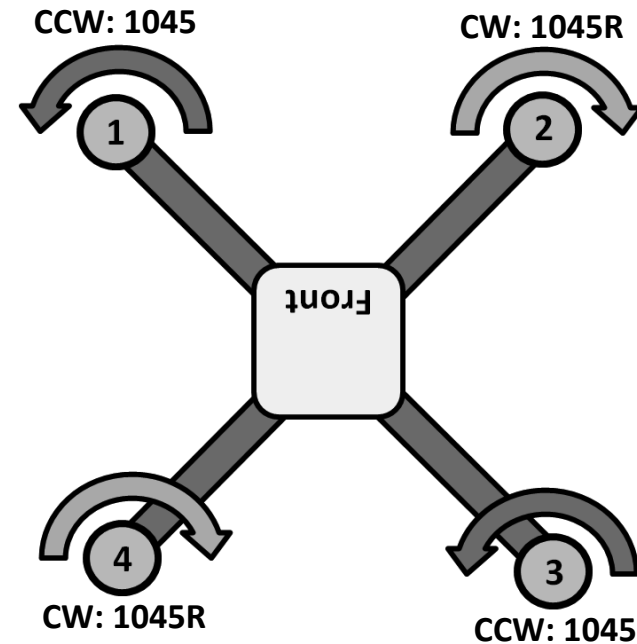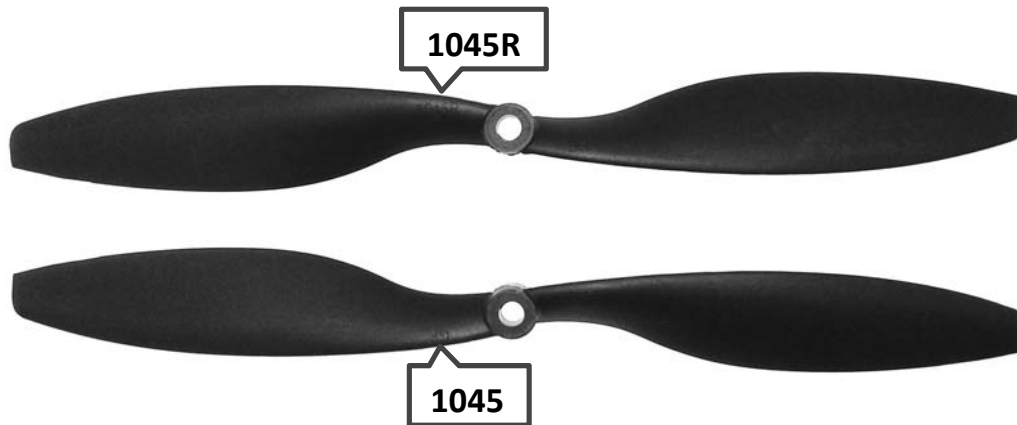
Congratulations! Your assembled ELEV-8 Quadcopter is ready to fly. For a "First Flight" video and troubleshooting tips, see the ELEV-8 Quadcopter product page; go to www.parallax.com and search "80000".

Use Blue Loctite
Before installing.
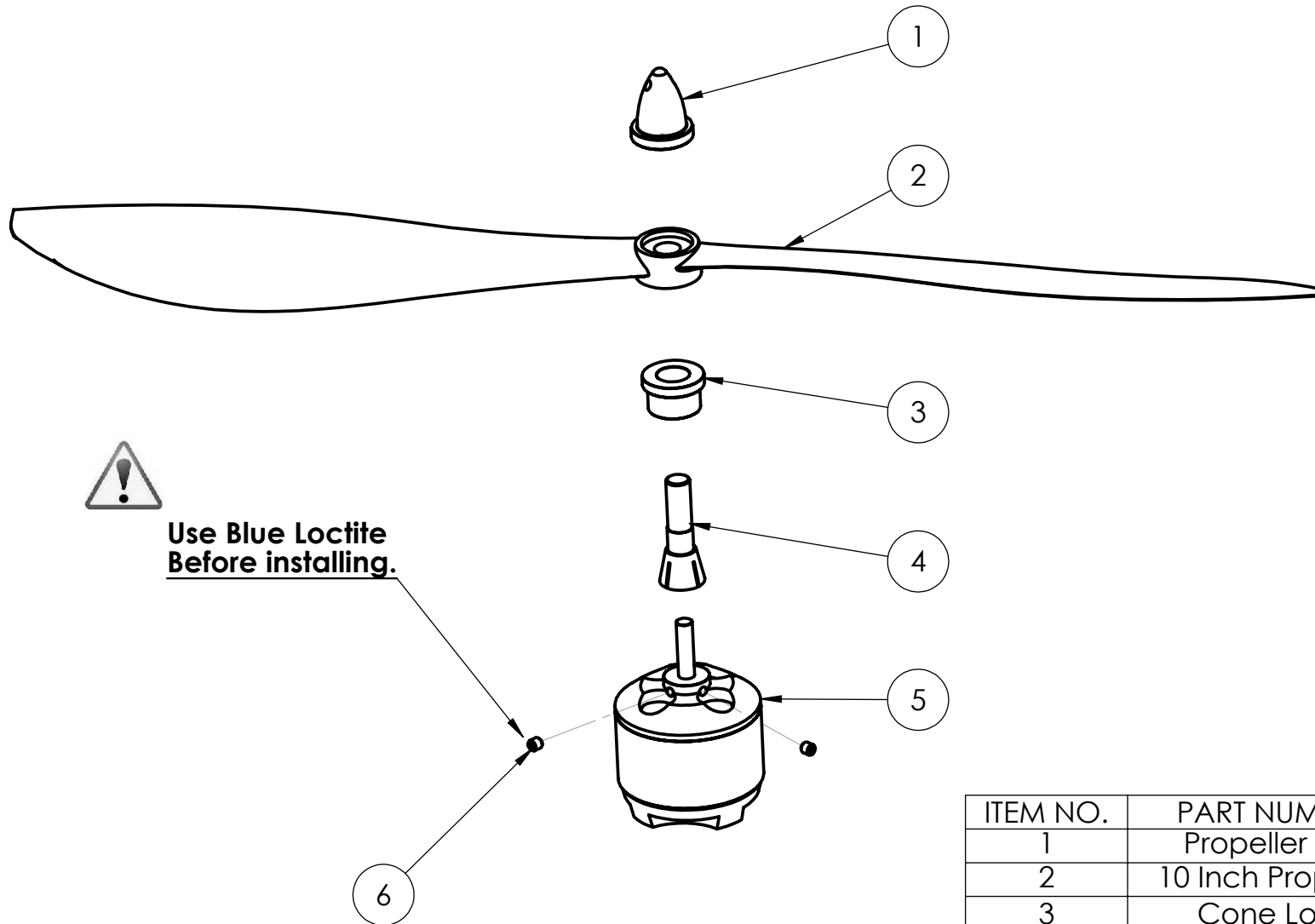
ITEM NO.	PART NUMBER	QTY.
1	Propeller Nut	1
2	10 Inch Propeller	1
3	Cone Lock	1
4	Collet	1
5	Motor 2	1
6	Set Screw	2