

Recommended Tools

1. 2mm hex key or driver
2. Small Phillips-Head screwdriver
3. Precision tweezers
4. Curved tweezers
5. Needle nose pliers

Part Overview

Below is a labeled layout of all the parts included in the Snapdragon Flight™ Drone Kit, as well as the two boards acquired through Intrinsic, the “Snapdragon Flight™,” which contains all of the flight software and sensor interfaces, and the “ESC,” (Electronic Speed Controller), which is responsible for interfacing with the motors, status LED, and battery.

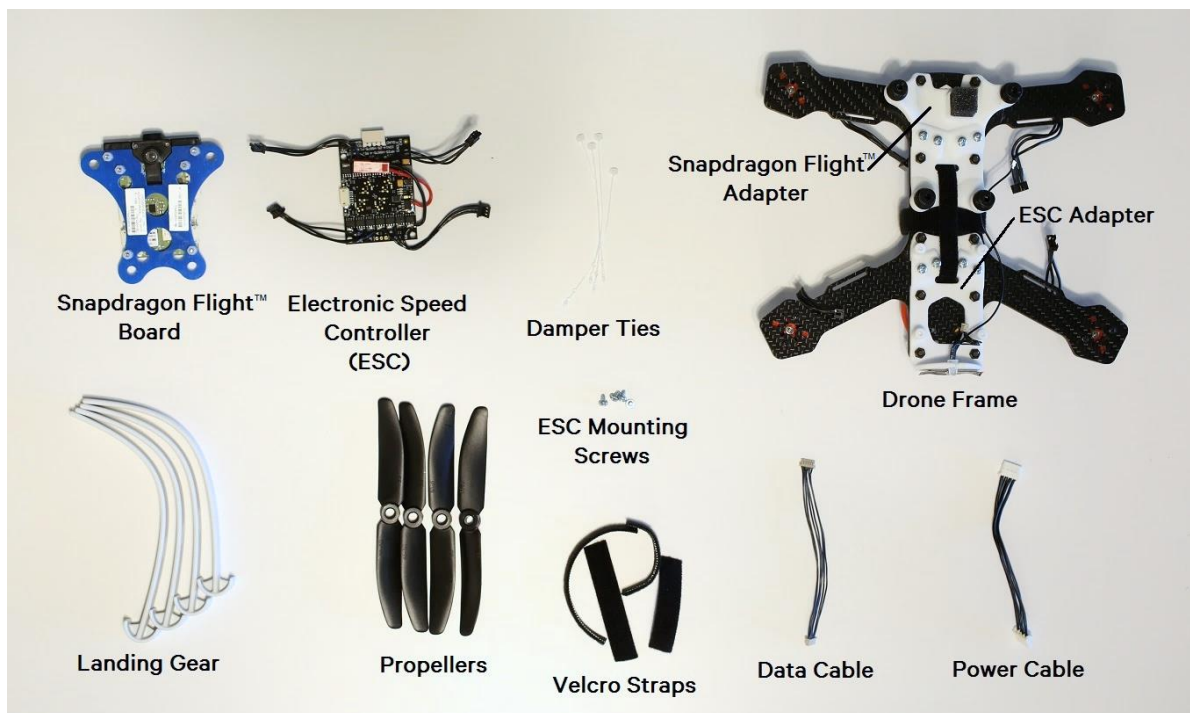


Figure 1.1—Part Overview

There are two supplemental parts included in the kit, pictured below. The Receiver Tape is used to mount the optional Spektrum Receiver, purchased separately. For this process, see the addendum at the end of this document.

The Stereo Adapter is used to mount the Stereo Upgrade Kit, sold separately from the same source as the Snapdragon Flight Board. If using that upgrade kit, consult the Stereo Upgrade Kit Assembly Instructions on how to install the Snapdragon Flight Board, and see the addendum at the end of this document for instructions on how to mount the Stereo Adapter to the upgrade kit and to the drone.

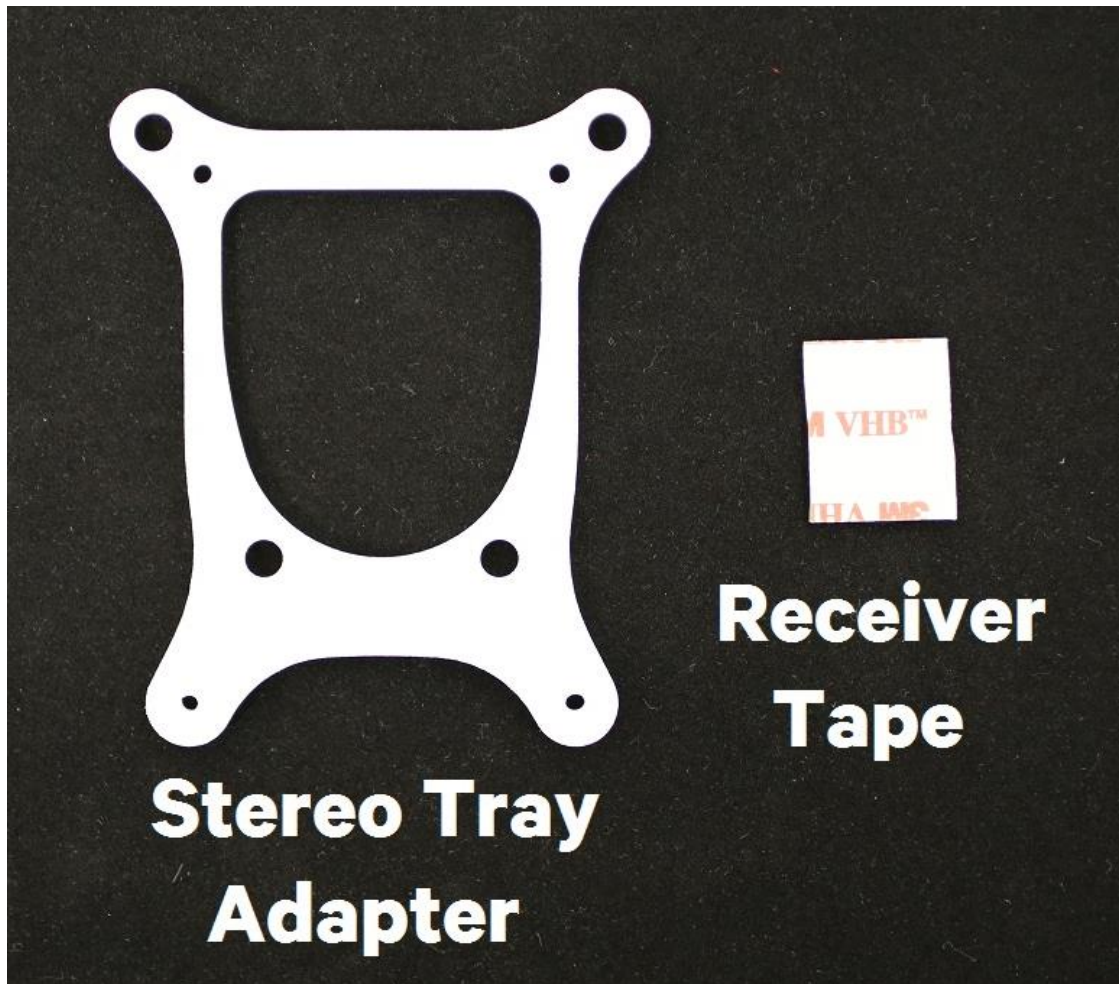


Figure 1.2—Supplemental Part Overview

Assembly Instructions

1. The first step is to attach two landing gear to the Snapdragon Flight™ mount. This is done by inserting the landing gear into the slots and tightening the four set screws until they are hand tight, as pictured below. Try gently to pull each of the landing gear out of their slots to verify that the set screws are firmly holding them in place. Make sure as well to point the landing gear the correct direction, away from the frame.



Figure 2.1—Mounting the front landing gear

2. The next step is to attach the Wi-Fi antenna to the center connector on the bottom of the Snapdragon Flight™ board, as shown below.

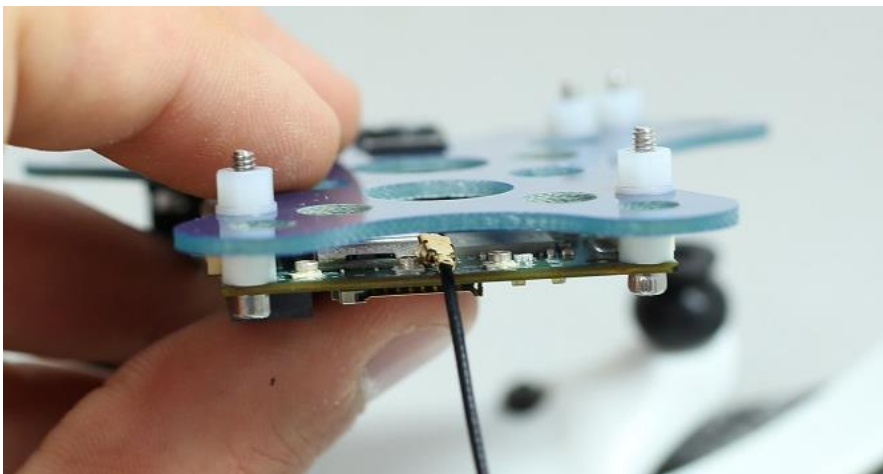


Figure 2.2—Positioning the Wi-Fi cable on the Snapdragon Flight™ board

There are two ways to connect the Wi-Fi antenna to the Snapdragon Flight™ board. Be very careful to not damage the components on the board, and if the first method proves too difficult, follow steps 2d through 2j for removing the Snapdragon Flight™ board from its mounting plate and attaching the antenna.

- a. Align the connector on the end of the Wi-Fi wire with the center connector on the bottom (side closest to the blue mounting plate) of the Snapdragon Flight™ board, and hold it there in preparation to press it into place.
- b. Use a flat tool, such as a flathead screwdriver or the back of a pair of tweezers, to gently press the connector down onto the board until it clicks in place, shown below. The blue mount plate can serve to brace the other end of the tool as the connector is pressed onto the board.

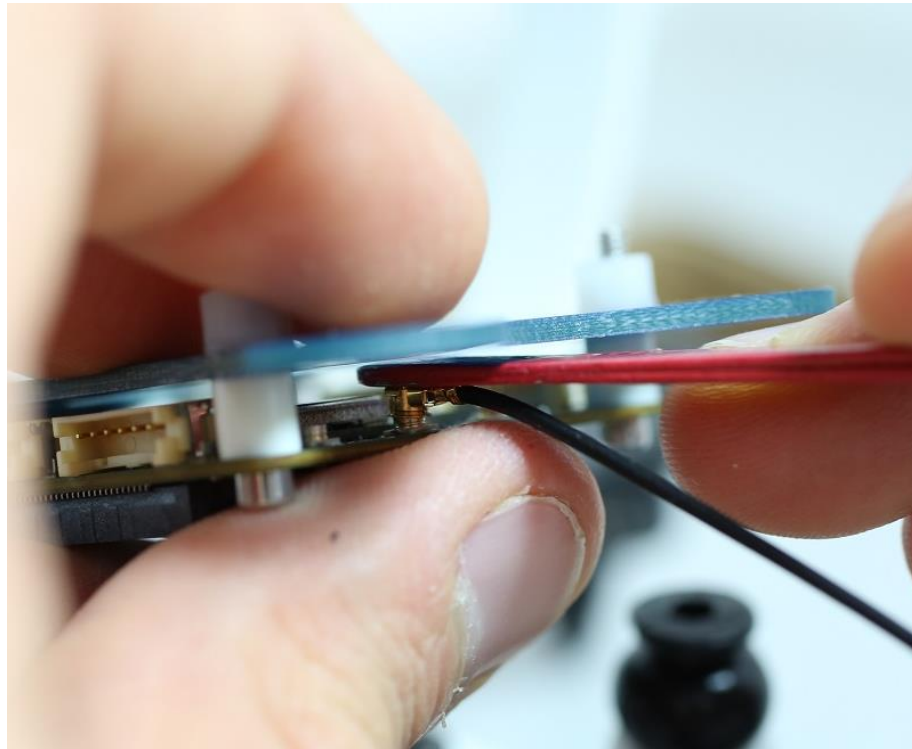


Figure 2.3—Attaching the Wi-Fi cable to the Snapdragon Flight™ board

- c. If holding the wire in place and safely pressing the connector is proving too difficult, begin by removing the screws securing the Snapdragon Flight™ board to its mounting plate, as pictured below. For each of the four screws, hold the nut with a pair of pliers and insert either a 5/64" or a 2mm hex key into the screw size. Remove the screws, and retain all of the mounting hardware, as the board will be secured back to its mounting plate just as it came off.

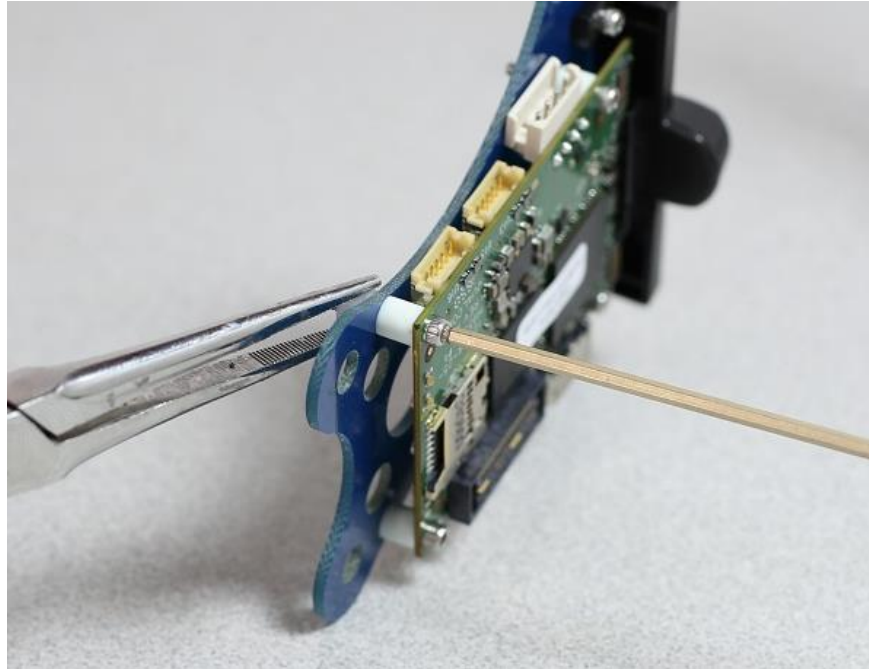


Figure 2.4—Removing the Snapdragon Flight™ board from its mount plate

- d. Remove the back piece holding the 4K camera in place, labeled below, and gently remove the board from the mount plate, taking care not to damage or strain the two cameras.



Figure 2.5—4K camera retainer

- e. Gently press the Wi-Fi wire onto the center connector on the bottom of the Snapdragon Flight™ board until it clicks and is secure.

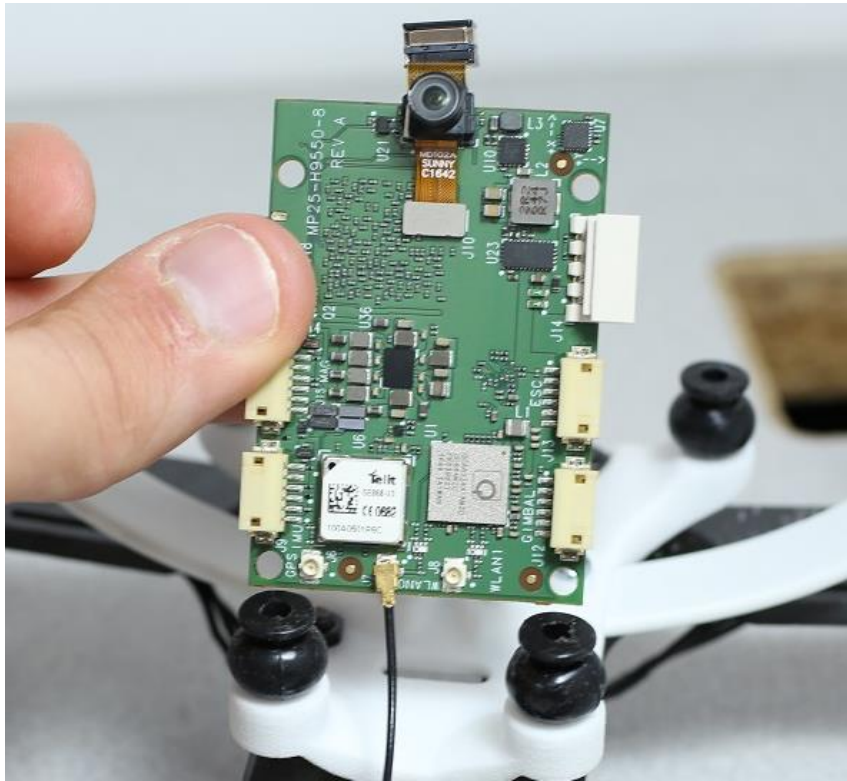


Figure 2.6—Attaching the Wi-Fi cable to the detached Snapdragon Flight™ board

- f. Place the Snapdragon Flight™ board back into position on its blue mount plate, inserting each camera back into its respective mount.
- g. Place two of the white spacers that had previously been used to mount the board underneath the front two mounting holes, closest to the camera. Align them with the holes on board and the blue plate, and insert two of the screws that had been mounting the board through the holes such that the head is on the Snapdragon Flight™ board. Twist two of the nuts onto each of the screws so that they don't come off. These will be secured later.
- h. The same process will be used for the rear two mounting holes, again leaving the nuts loose for positioning of the spacers. Care needs to be taken to ensure that the spacers press flat against the Snapdragon Flight™ board. As highlighted in the two pictures below, it is easy to catch the spacers on the thin metal tabs on the sides of the two connectors next to the hole. Make sure not to do this.

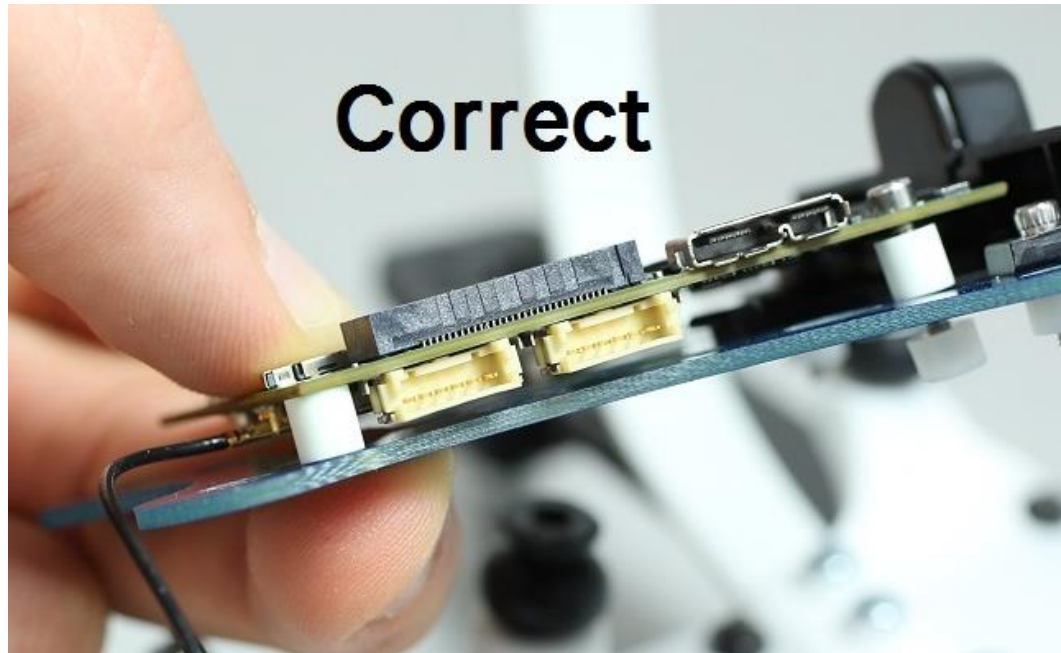


Figure 2.7—Correct positioning of the rear spacer

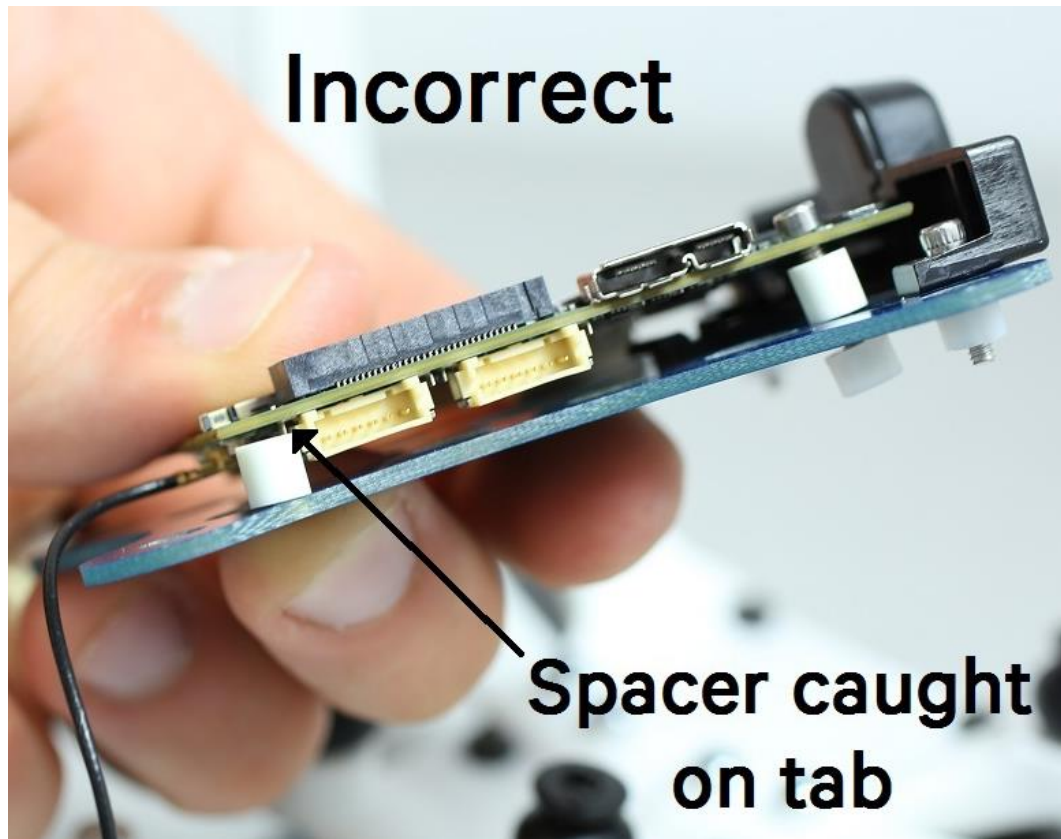


Figure 2.8—Incorrect positioning of the rear spacer

- i. Keeping the spacers free from the tabs, continue tightening all four nuts so that the Snapdragon Flight™ board is secure.

3. Now that the Wi-Fi cable is connected, the next step is to mount the Snapdragon Flight™ blue mount plate to the vibration dampers protruding from the Snapdragon Flight™ adapter. The most effective way to do this is to pinch the neck of one of the dampers curved tweezers such that the end of the tweezers lines up with the end of the damper, as shown below.



Figure 2.9—Squeezing the neck of the damper

4. Then, poke the squeezed end of the damper through the large hole in the corner of the blue mount plate such that the Snapdragon Flight™ board is down, toward the adapter and frame, as illustrated below.

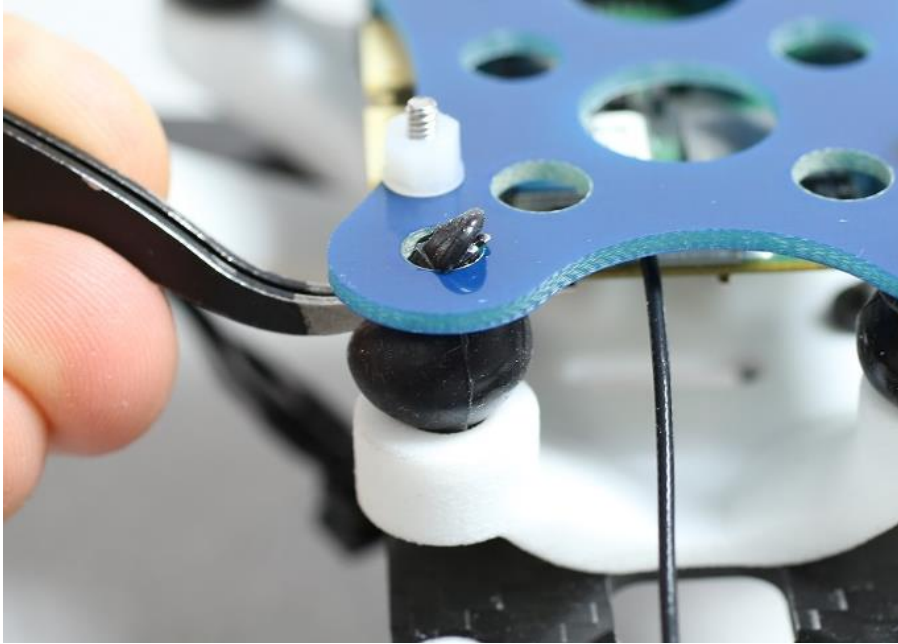


Figure 2.10—Inserting the damper into the Snapdragon Flight™ board

5. Once the damper is poking through, grab the other end with fingers and begin to pull it through the hole, as shown in the example below. This may take a couple of pulls and repositions, but eventually the top flange should pull through and rest flat on the other side of the blue mount plate.

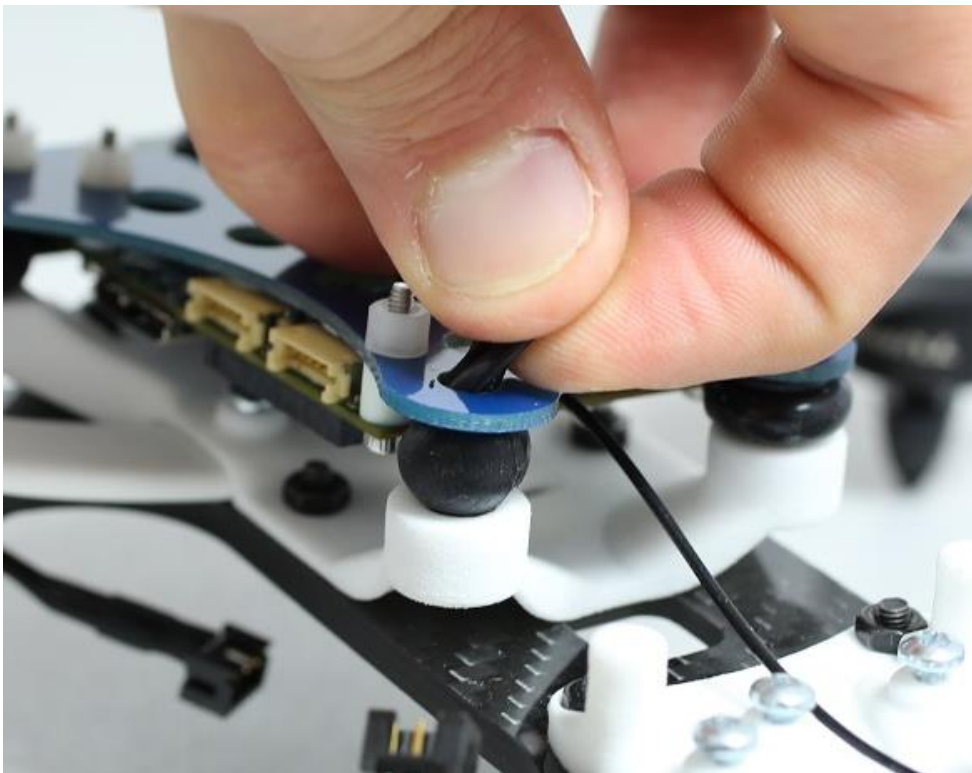


Figure 2.11—Pulling the damper through

- Repeat this process for the other three dampers until they are each fully inserted into the blue mount plate, as visible below. Note the gray foam protruding from the Snapdragon Flight™ Adapter, and make sure that it fits straight down onto the circuit board, not swept to one side. This covers the barometer to ensure that it is protected from light interference.



Figure 2.12—Fully mounted Snapdragon Flight™

- Insert two landing gear into the ESC Adapter in the same manner that the front two landing gear were inserted into the Snapdragon Flight™ Adapter. Turn the four set screws until they are tight and the landing gear resist being pulled out.

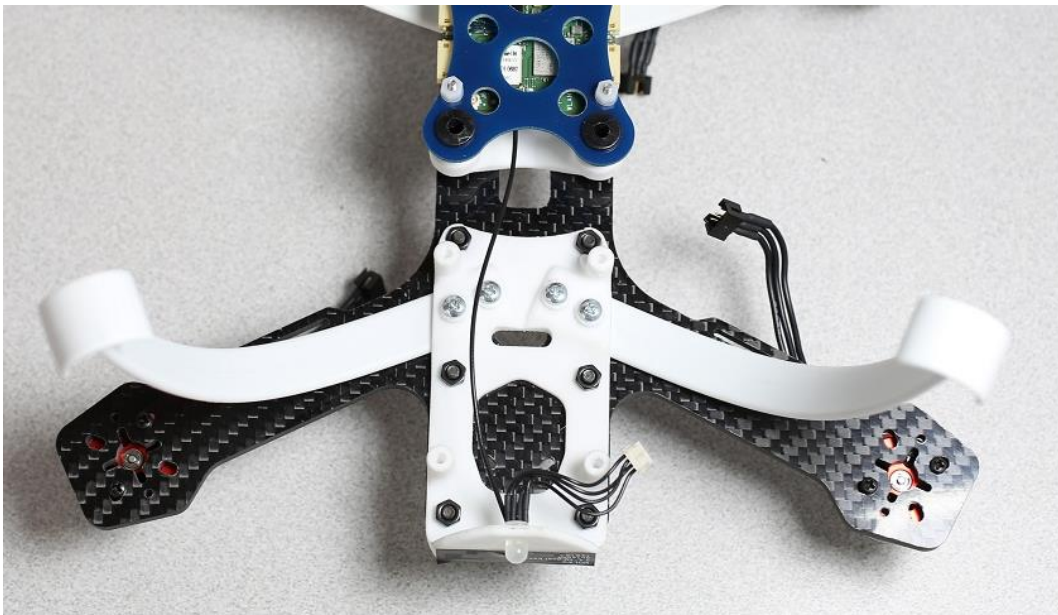


Figure 2.13—Mounting the rear landing gear

8. Now, place the ESC onto the four columns of the ESC Adapter as shown below. The red and black power cables should be on the left, the four sets of motor wires should come out toward the frame, and the power connector in the top middle of the board should also come out toward the frame. Be sure to slide it cleanly under the Wi-Fi cable. Route the four motor cable connectors out as in the picture so that they are free to connect to the motors.

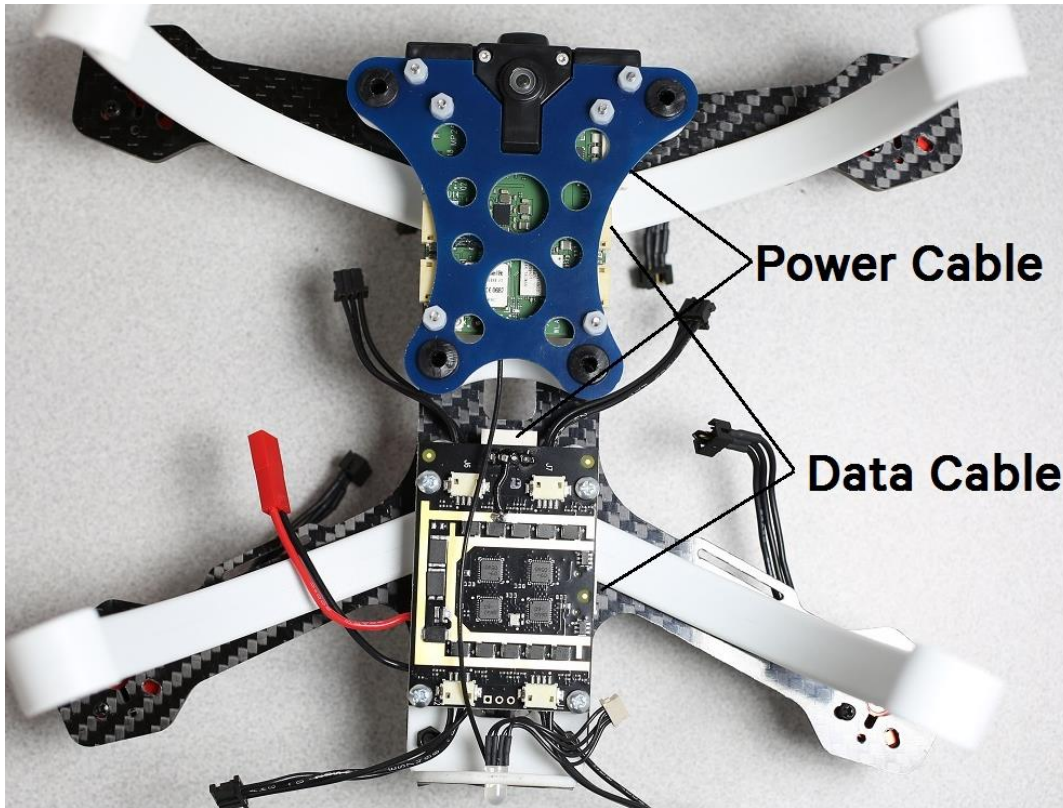


Figure 2.14—Mounting the ESC

9. Secure the ESC by inserting the four ESC mounting screws through the four holes in the ESC and screwing them into the holes in the columns, threading the plastic in the process. Screw them down until they are hand-tight.
10. Plug the power cable into the corresponding connectors on the ESC and the Snapdragon Flight™ board, as shown in the picture below.

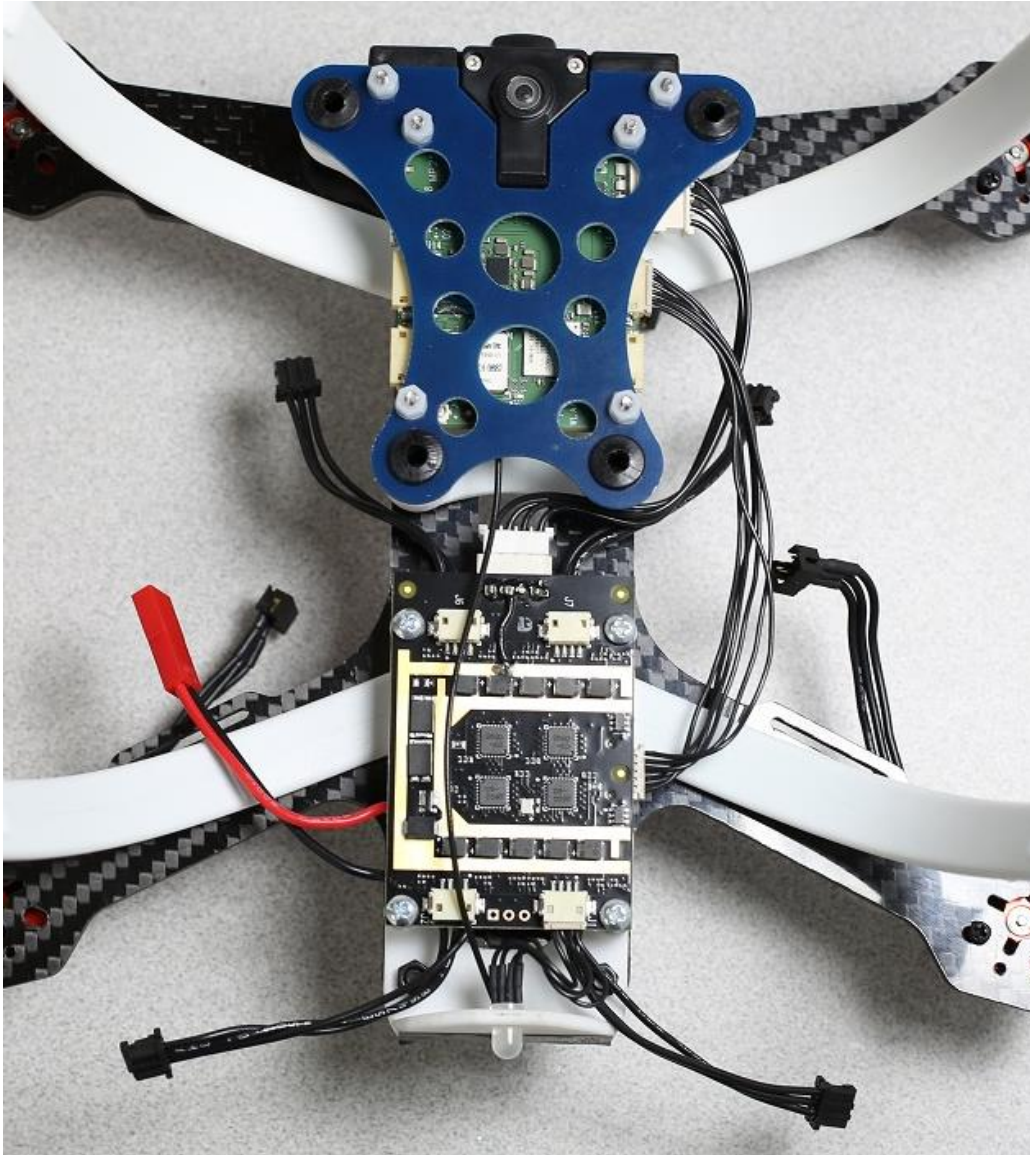


Figure 2.15—Connecting the power and data cables

11. Plug the Data Cable into the corresponding connectors on the ESC and the Snapdragon Flight™, as shown in the previous picture. This may require some force, but be careful not to apply too much, which can torque and snap the front of the connector off of the board.
12. Then, plug the LED into the right corresponding connector at the near end of the board next to the LED, also shown in the picture.
13. Route the rear two motor wires toward the middle of the frame and under the arms, and connect them to the two rear connector wires coming off the ESC. Refer to the picture below for reference.

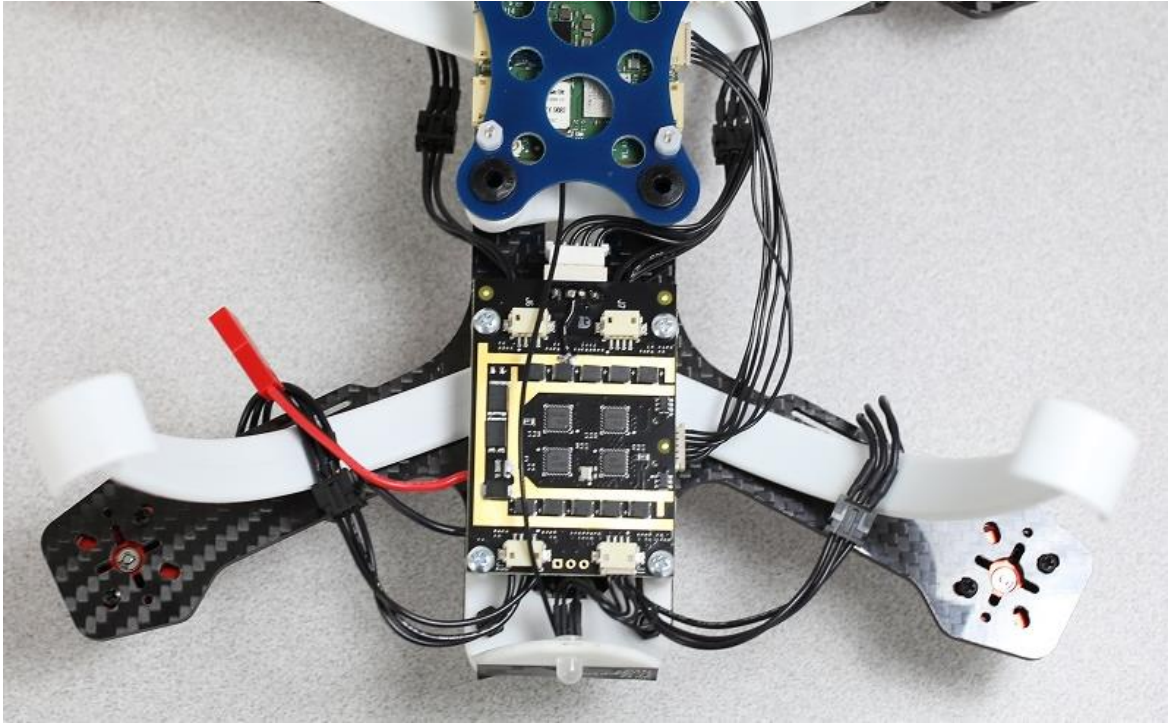


Figure 2.16—Connecting the power and data cables

14. Route the other two connector wires on the outside of the Snapdragon Flight™ Adapter and connect them to the two motor wires, as shown below.



Figure 2.17—Connecting the motor cables

15. Using the following steps, make sure to attach the correct propellers to the correct motors, as mounting propellers in the wrong position can be very dangerous and cause the drone to flip on takeoff. Refer to the picture below for reference.



Figure 2.18—Mounting the propellers

- a. Remove the two silver conical nuts from the tops of the top-right and bottom-left motors respectively. Place a counterclockwise propeller on each such that the non-shiny side with the writing on it is face up. These propellers have “5040R” embossed on one of the blades, rather than “5040,” which is embossed on the clockwise propellers. Reattach the conical nuts and twist until they are hand-tight.
 - b. Remove the two black conical nuts from the top-left and bottom-right motors by twisting them the opposite direction, as they are counter-threaded. Place a clockwise propeller, embossed with “5040,” on each motor such that the non-shiny side is up. Reattach the two black conical nuts and twist until hand-tight
16. Take one of the 2.5-inch Velcro straps and fit it through the slot in the front-left arm. Wrap it over the motor wires and secure it to itself tightly so that the motor wire is constrained against the carbon fiber. This is to keep it from impacting the propellers as they spin. Repeat on the front-right arm. Refer to the previous picture for a visualization.

17. Repeat this process using two more 3.5-inch Velcro straps on the rear two motor wires, as shown below. Be sure to secure the motors wires such that any extra length is on the bottom and not the top, where it can get in the way of the propellers.



Figure 2.19—Securing the motor cables

18. To protect the Snapdragon Flight™ board from coming loose in an extreme crash, insert one end of a damper tie into the hole in the middle of the damper, and route it around the two mount parts, as shown below. Attach the tie to itself and leave it loose.

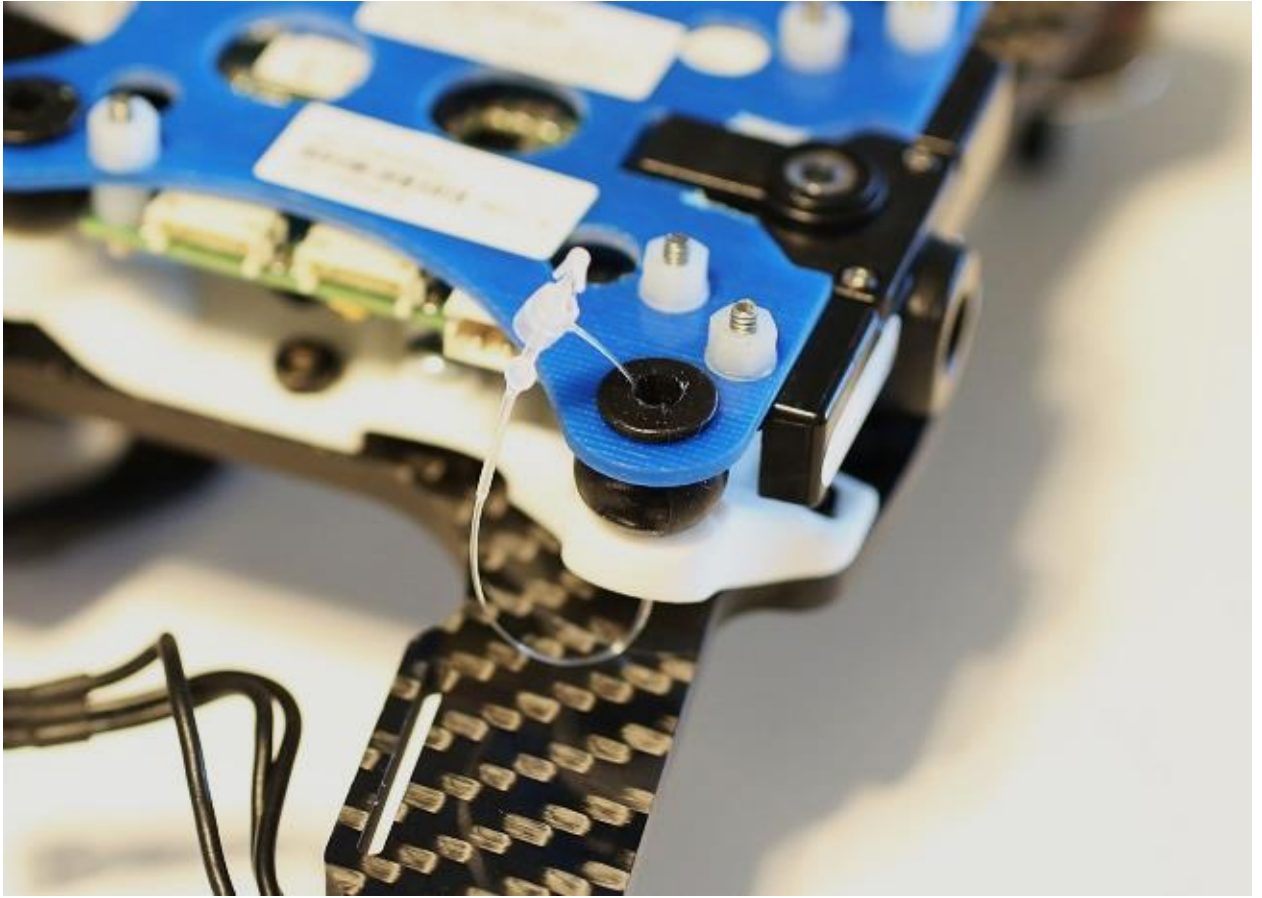


Figure 2.20—Reinforcing the dampers

19. Repeat this process with the other three dampers.

RC Addendum

In order to interface with the drone using a Spektrum Controller, the Snapdragon Flight™ needs to connect to a Spektrum receiver, which is purchasable through a link on the drone website. Mounting materials are included in the standard parts along with the rest of the drone.

1. To mount the receiver, remove one side of the paper from the double-sided tape and press it against the back of the receiver, which does not have the raised connector protruding out of it.
2. Then, remove the other from the opposite side and press the receiver against the bottom of the blue Snapdragon Flight™ mount plate such that the receiver is flush against the plate and no part of it, including the antennas, would be in view of the downward-facing camera. An illustration of the setup is shown below.

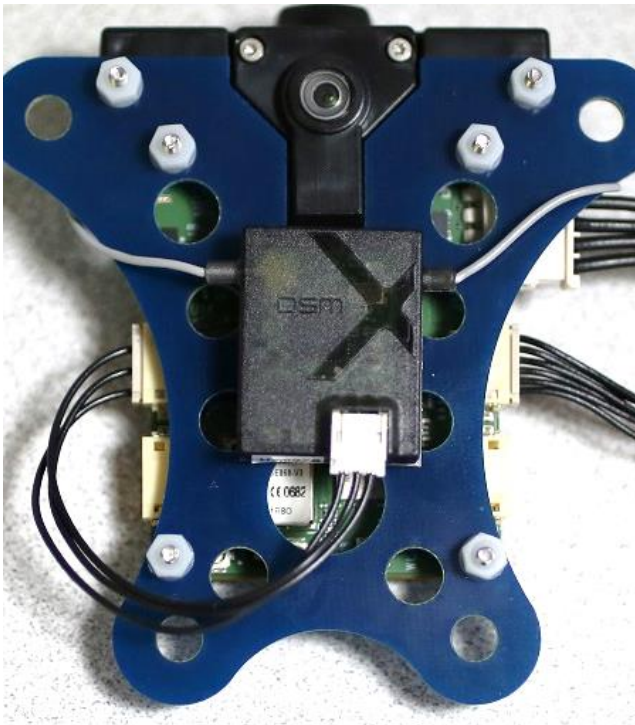


Figure 3.1—Mounting the receiver

3. Insert the larger connector of the receiver cable into the connector next to the USB port on the Snapdragon Flight™. Then, route the other end of the cable around and insert it into the connector on the back of the receiver, as illustrated in the previous picture.

Stereo Upgrade Kit

Alongside the Snapdragon Flight™ Board and ESC, you can also purchase the Stereo Upgrade Kit, which enables your drone to use stereo cameras for depth sensing. Using the stereo adapter, the kit connects to the same dampers that the mount plate was connected to previously.

1. Before mounting anything, make sure to connect the Wi-Fi antenna to the Snapdragon Flight™ Board in the same way as previously described in this document.
2. After the Snapdragon Flight™ Board has been removed from the drone and placed into the Stereo Upgrade Kit, insert the free end of the four dampers into the corresponding holes on the stereo adapter using the same insertion method described previously in this document. Make sure that the protruding part of the other four holes points away from the drone, as shown in the picture below.



Figure 4.1—Inserting the dampers into the stereo adapter

3. Align the stereo upgrade kit with the Snapdragon Flight™ inside with the aforementioned protruding holes, which should leave a gap between the stereo kit and the adapter. Make sure the camera is pointing forward. Insert the mounting screws into the four holes and align a locknut with each using tweezers, as pictured below. Tighten all four screws down.



Figure 4.2—Mounting the stereo upgrade kit

4. Reconnect the data cable and the power cable to the ports to which they were previously connected.
5. Insert the additional damper ties into the dampers in the same fashion as before to secure them in the event of an extreme crash.