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# Add a Gimbal Mount to Your ELEV-8 V2

**Level:** Intermediate
**Skills required:** Soldering, Mechanical Assembly, Multirotor Piloting

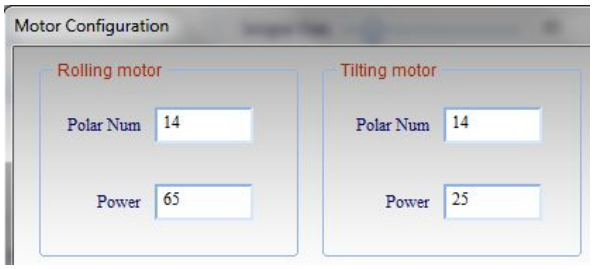
One of the most common uses of multirotors is aerial photography and videography. In order to capture quality media, a Brushless Gimbal must be used to correct for the constant movements of multirotors which would otherwise cause extremely shaky footage. In this project, a very simple mount was made to attach a Tarot T-2D Gimbal with a GoPro Hero 3 camera to the front of an ELEV-8 V2. By moving the battery to the rear of the ELEV-8, balance can be maintained.

The tilt of the gimbal will be set up so that it can be controlled by the 6th channel of the RC receiver. Properly done, this setup will give you very smooth footage; it's been used to capture most of the promotional images and videos distributed by Parallax.

## What's Needed:

### Parts

- 1 - ELEV-8 v2 Quadcopter (Assembled, Tested, Tuned) - 80200
- 1 - Tarot T-2D Brushless Gimbal (Assembled, Tested, Tuned)
  - Assembly Manual v1.1 - Revised by John C. Lin (3rd Party)
  - Software v1.5
  - Recommended starting PID values for Gimbal Controller and Motor Driver (following two images, respectively)


- Properly Assembled for this project, it should appear as in the following image:

- 1 - GoPro Hero 3 or 3+ Camera
- 10” - U-Channel Aluminum Extrusion, appx 0.65” wide by 0.5” tall (sold in some hardware stores as "plywood edge trim")
- 2 - 3.5mm Bullet Connector, Male
- 2 - 3/16” Heat-Shrink Tubing, ½” (1 cm) long
- 6 - Machine Screw, #4-40 x ⅜”, Pan Head
- 2 - Internal Lock Washer, #4 OR Locktite Threadlocker
- 1 - Locknut, #4
- 2 - Standoff, #4-40 x ⅞”
- 1 - Servo Extension (3-wire) Cable, Male to Female, 4 to 8” (optional)

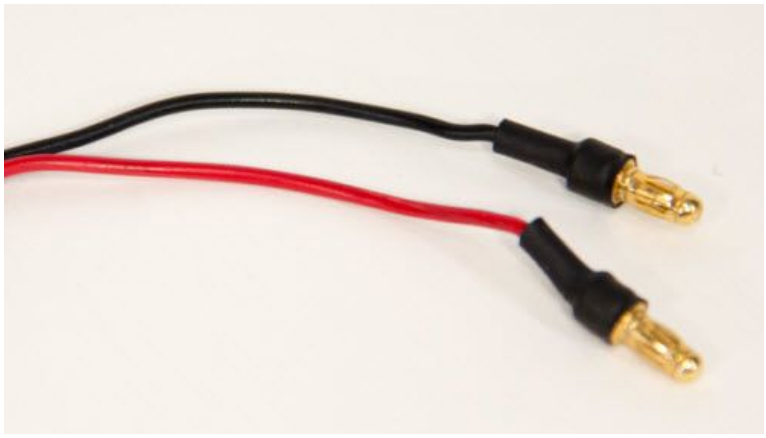
# Tools

- PC running Windows 7 with Internet Access
- Pencil or Metal Scribe
- Measuring Tape or Calipers
- Hacksaw
- Metal File
- Power Drill
- #30 or 4/32” Drill Bit
- Vice or Clamps
- #1 Philips Head Screwdriver
- Soldering Iron (We recommend the Parallax Basic Soldering Kit, #700-10011)
- Rosin-Core Solder (Also in the Parallax Basic Soldering Kit)
- Work-Holding Vise (Also in the Parallax Basic Soldering Kit)
- Metal or Wood Block with 5/32” (4 mm) hole (optional)
- Heat Gun, Hair Dryer, or Soldering Iron
- 1/4” Wrench or Adjustable Wrench
- Flat-Nose Pliers

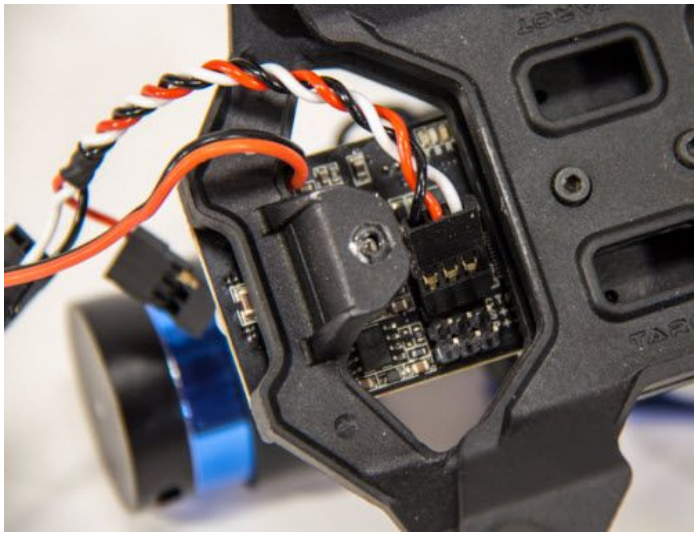
# Attach the Mount to the ELEV-8 V2 Frame

## Setup Instructions

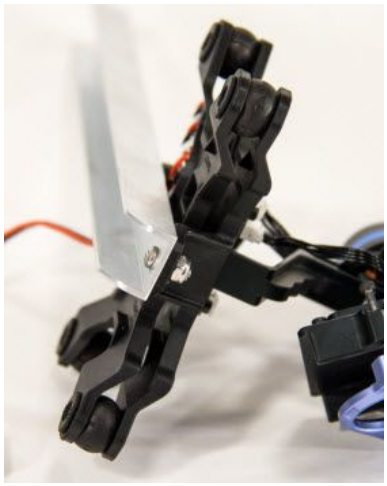
1. Use the Hacksaw to cut the Aluminum Channel to length per the technical drawing included with this download: Aluminum Channel Technical Drawing.
2. Use the Metal File to round all sharp edges and chamfer the ends of the Aluminum Channel.
3. Measure out and mark the locations of the four holes in the Aluminum Channel.
4. Drill out the four holes in the Aluminum Channel, then remove and burrs.
5. Solder Male Bullet Connectors onto the ends of the red/black power cable connected to the Gimbal Control Board. See the ELEV-8 V2 Assembly Guide for Soldering Instructions.
6. Apply Heat-shrink tubing to the two bullet connectors, as detailed in the ELEV-8 V2 Assembly Guide and shown in the image below.



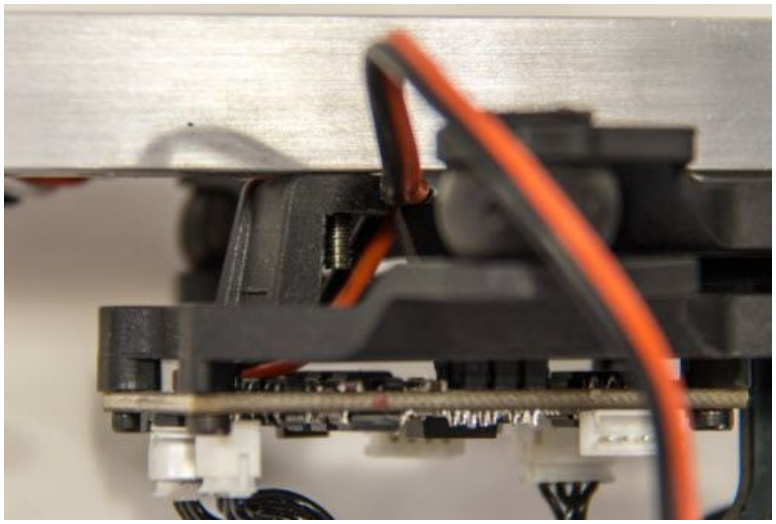
7. Remove the bottom plate from the ELEV-8 to access the power distribution cable outputs. Plug the Bullet Connectors you just soldered into the available auxiliary outputs and route the cables towards the front of the ELEV-8. Replace the bottom plate.
8. Plug the Signal Cable Splitter that came with the Gimbal into the CTR port on the Gimbal Control Board, in the orientation shown below. Slowly and gently bend the plug towards the center of the board, as shown below.

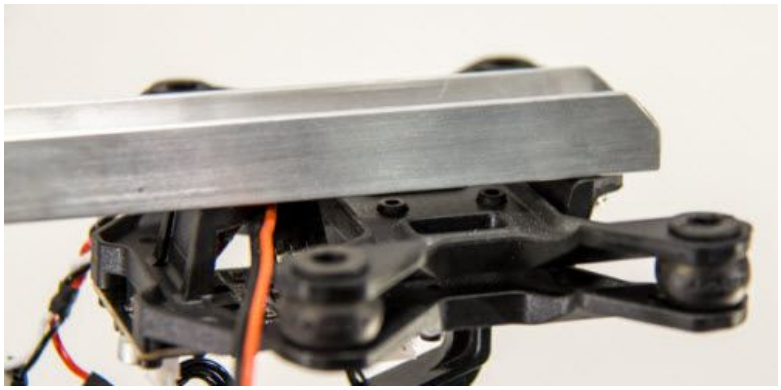


9. Bolt the Aluminum Channel to the front support of the Gimbal using a Machine Screw and Locknut. You may need need to use a drill to enlarge the mounting hole on the Gimbal.

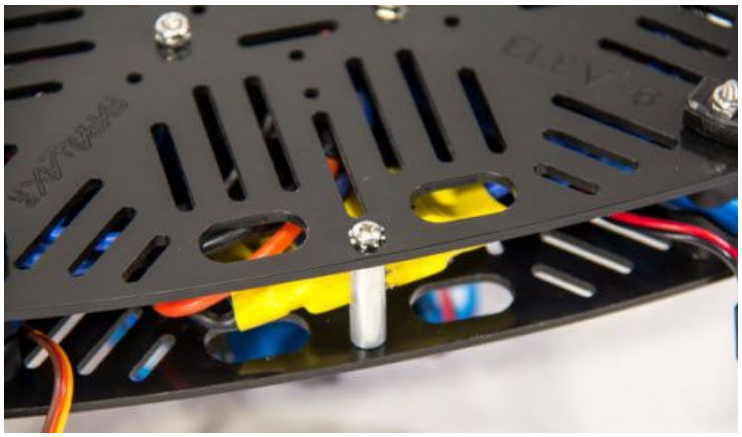


10. Screw the Aluminum Channel to the back support of the Gimbal. Since it is extremely difficult to access the other side of the hole, we won't use a nut here, but rather just thread into the plastic of the Gimbal mount, so don't drill out or enlarge the hole! Tighten the machine screw until the resistance suddenly increases (don't over tighten!).

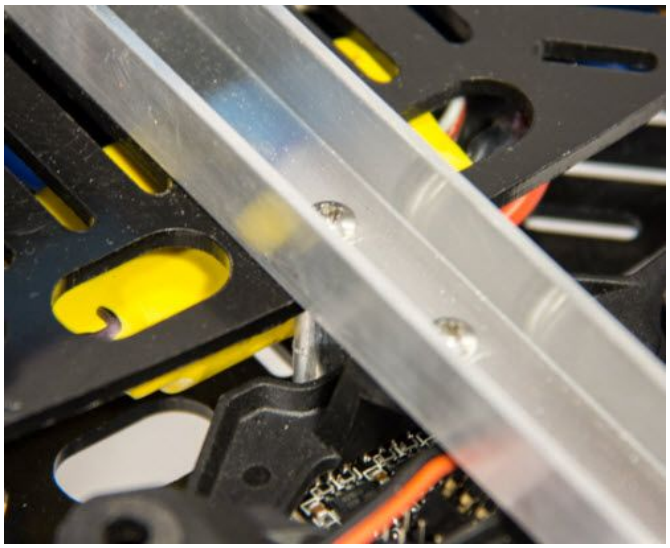


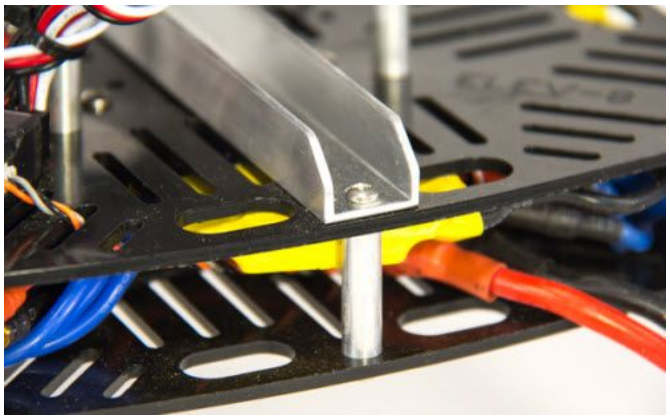


11. Bolt a standoff to the center hold on the very front and back of the *bottom* chassis plate, using either an internal lock washer or Locktite. Use the Flat-Nose pliers to tighten them.

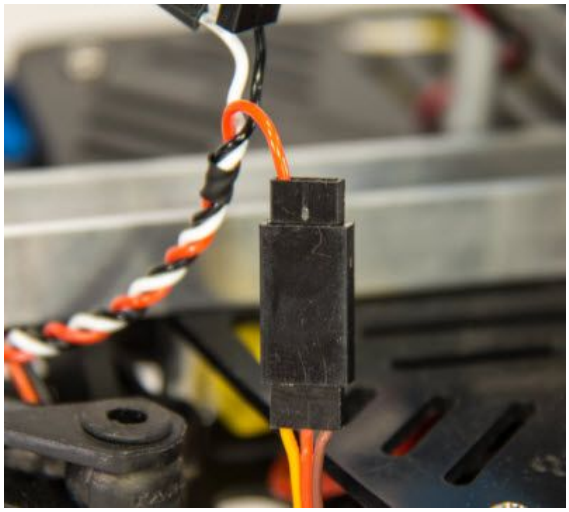


12. Bolt the Gimbal and mount assembly to the top of the ELEV-8 into the standoffs using the machine screws.





13. Connect the Red wire of the signal cable from the gimbal control board to the signal pin on the 6th channel of your RC receiver. You may need to use an extension cable, as shown below.



14. Install the battery straps on the back of the ELEV-8 and mount the battery as shown. This will help to balance out the weight of the camera and gimbal.