Way To Fix Drones project

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INTRODUCTION:

This is a compilation of MEMBER GENERATED INFORMATION. The accuracy of all information is limited to the observations and interpretations of the contributing member(s). Errors may be present. It is the responsibility of the user to evaluate the information prior to use

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Attachment 1
CG03 Removing the Three Black Wires

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INTRODUCTION:

The infamous "three black wires" have possibly been responsible for the damage of more CGo3 cameras than all other causes combined. One common problem is that when the wires are damaged, people have installed and powered up through the pigtail without properly securing, insulating or removing the damaged wires. The result can be a damaged gimbal board or damaged mainboard in the drone itself.

If the wires are pulled out by a crash, there is often damage to the board, and sometimes remnants of the wire strands remain attached. Both can cause issues if not found and corrected. The process of removing the wires also allows an opportunity to find these issues. Removing the wires removes any possibility they can cause mechanical or electrical problems in the future.

PROCEDURE:

1). Remove damper retainers if installed

2). Dismount the rubber dampers:

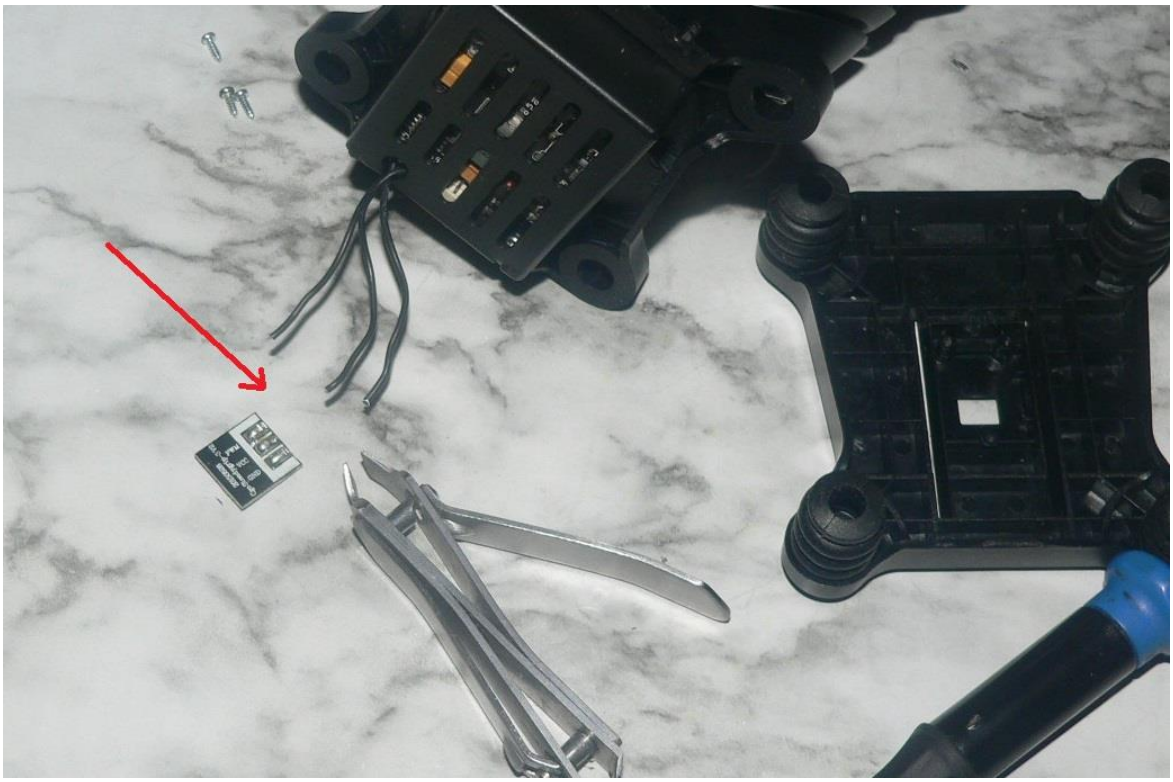
Attachment 1
CG03 Removing the Three Black Wires

3). Remove the three screws on the Contact Cover Plate:

4). Lift Contact Plate out of Upper Camera Mount:

Attachment 1
CG03 Removing the Three Black Wires

5). De-solder or clip wires away from Contact Plate:



:

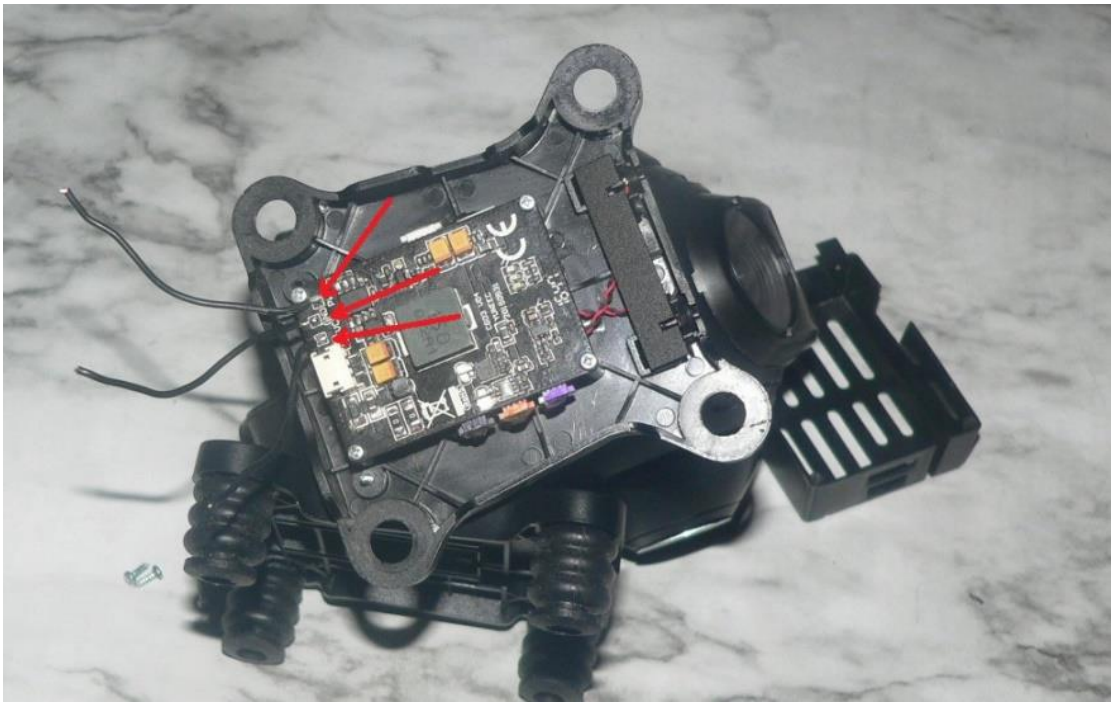
6). Remove both Gimbal Board Enclosure mounting screws:

Attachment 1
CG03 Removing the Three Black Wires

7). Remove Gimbal Board Enclosure:

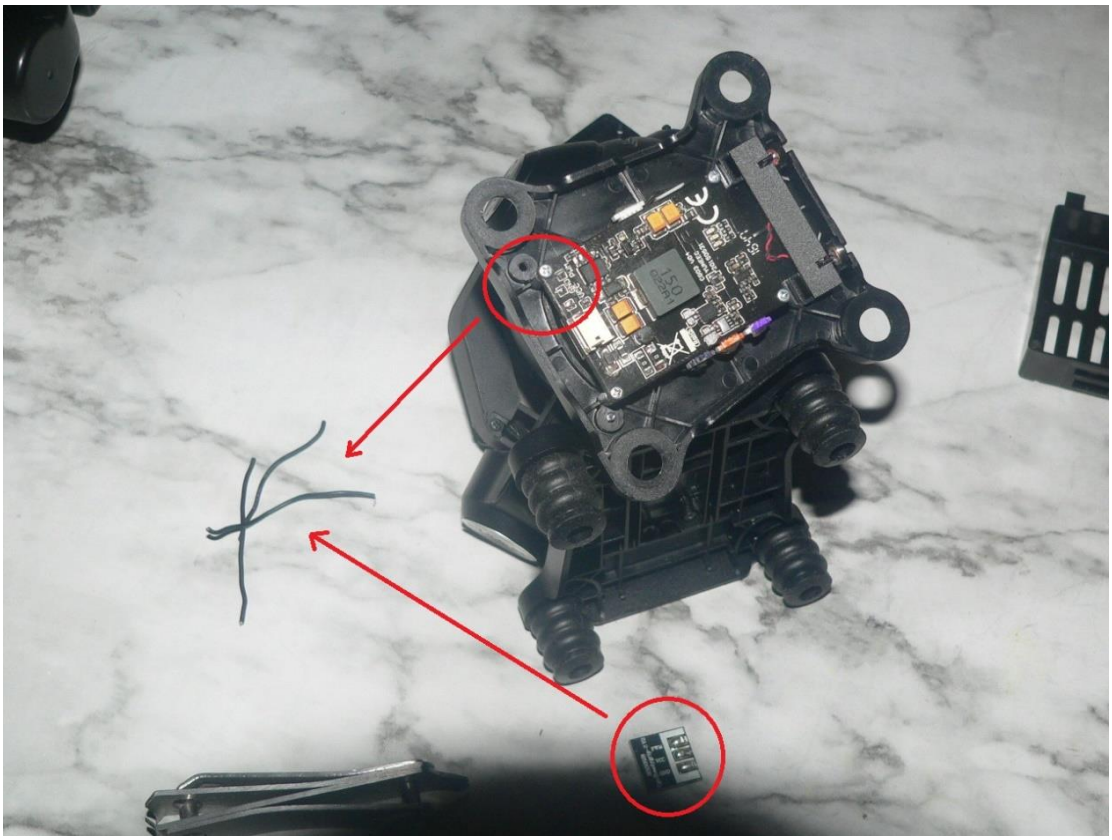
:

8). De-solder or clip wires away from Gimbal Board:

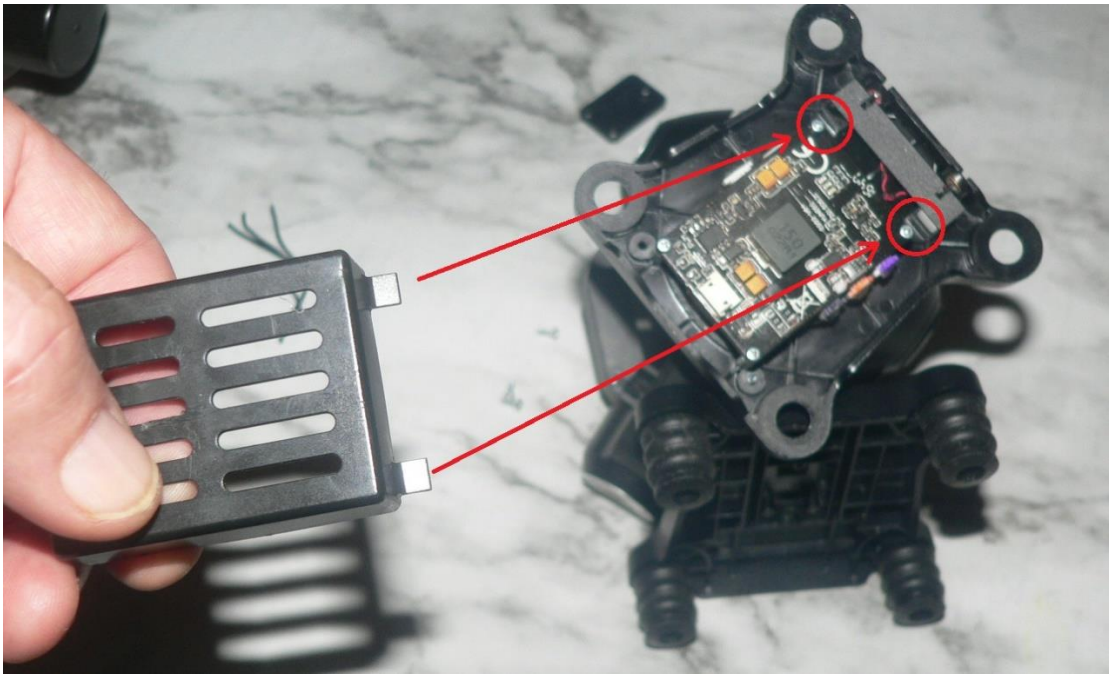


Attachment 1
CG03 Removing the Three Black Wires

9). Discard wires or save for later use:



10). Insert the gimbal board enclosure tabs into the mounting slots:



Attachment 1
CG03 Removing the Three Black Wires

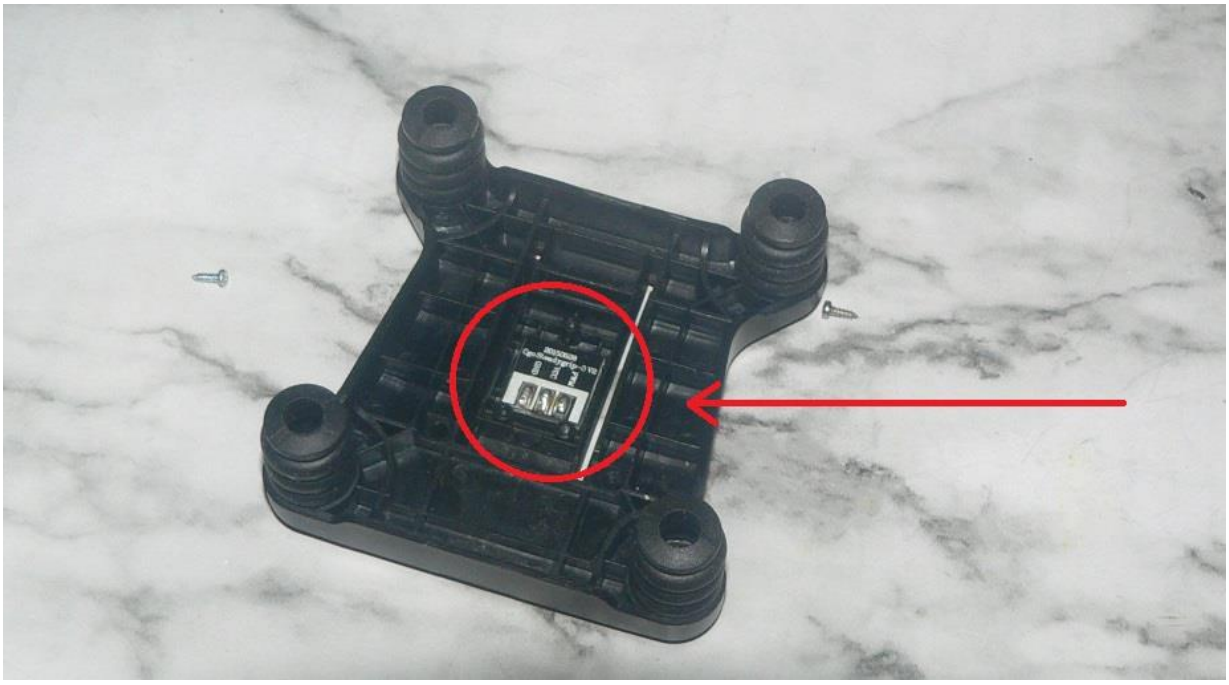
11). Reinstall both Gimbal Board Enclosure mounting screws:

12). Plug in the Pigtail:

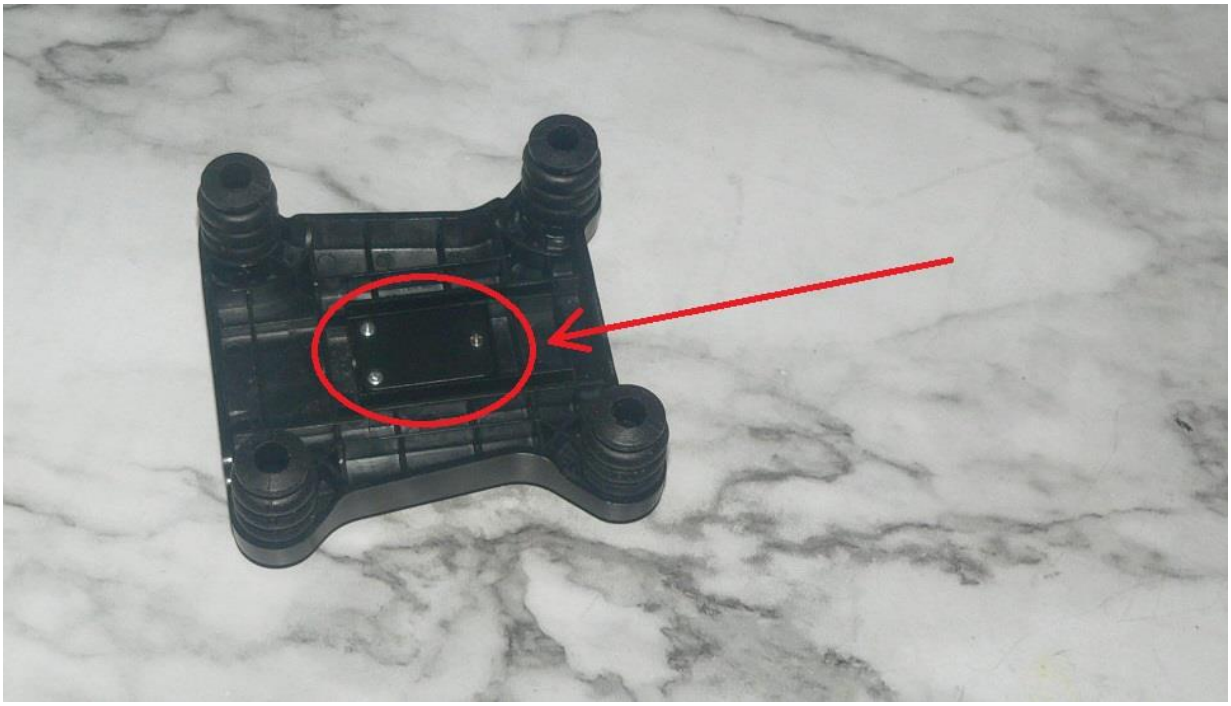
Attachment 1
CG03 Removing the Three Black Wires

NOTE: Contact plate and cover are installed to maintain structural integrity of the upper mount plate. They no longer perform any electrical function.

13). Install Contact Plate:



14). Install Contact Plate Cover:



Attachment 1
CG03 Removing the Three Black Wires

15). Install rubber Dampers.

16). Install Damper Retainers.

Attachment 2
CGo3 Wi-Fi Board Replacement

Use of this information is at your own risk.

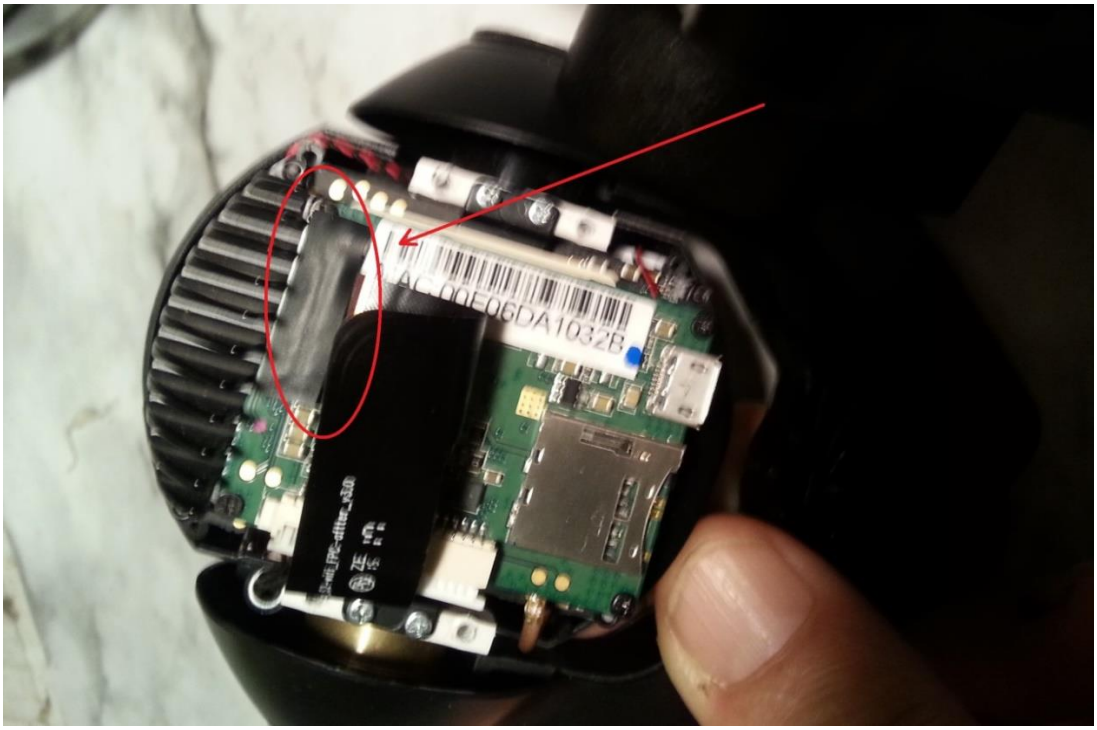
1). Remove all eight screws from the rear of the camera (Four on each side):

2). Work rear cover slightly forward to clear the USB and SD Card connectors:

Attachment 2
CGo3 Wi-Fi Board Replacement

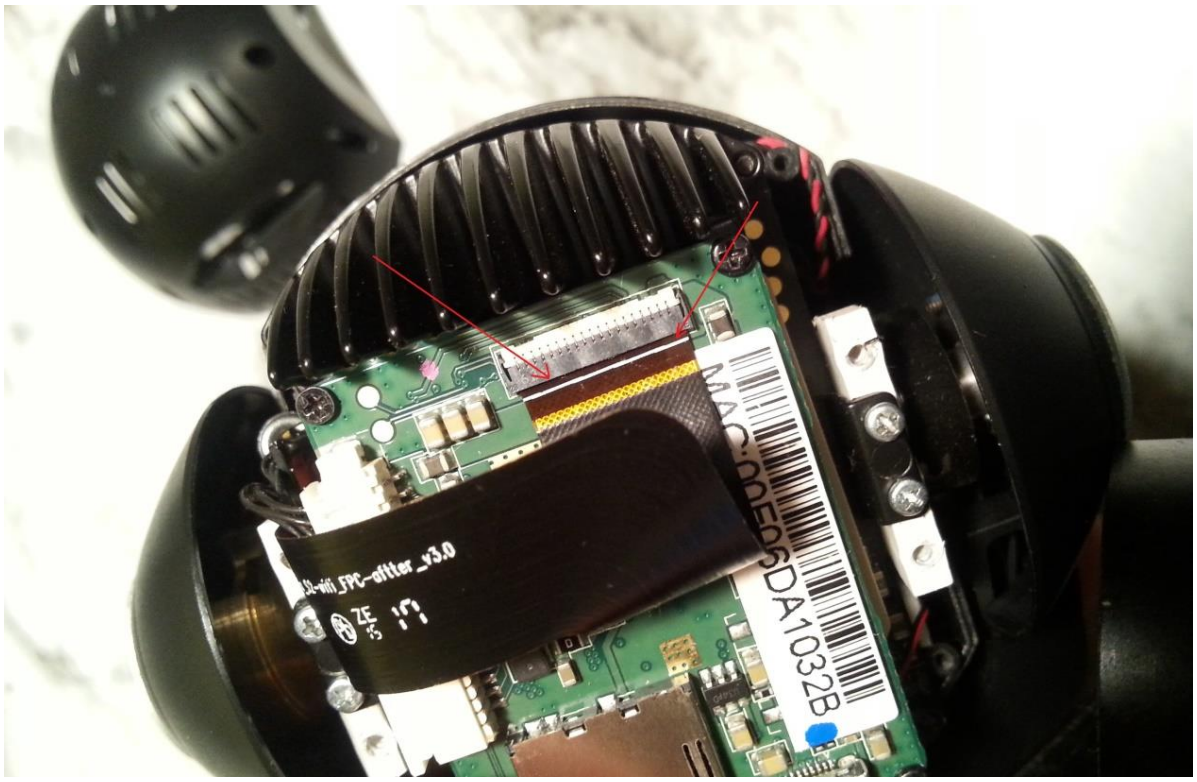
3). Remove cover:

4). Carefully remove tape from ribbon connector (tape color may vary):

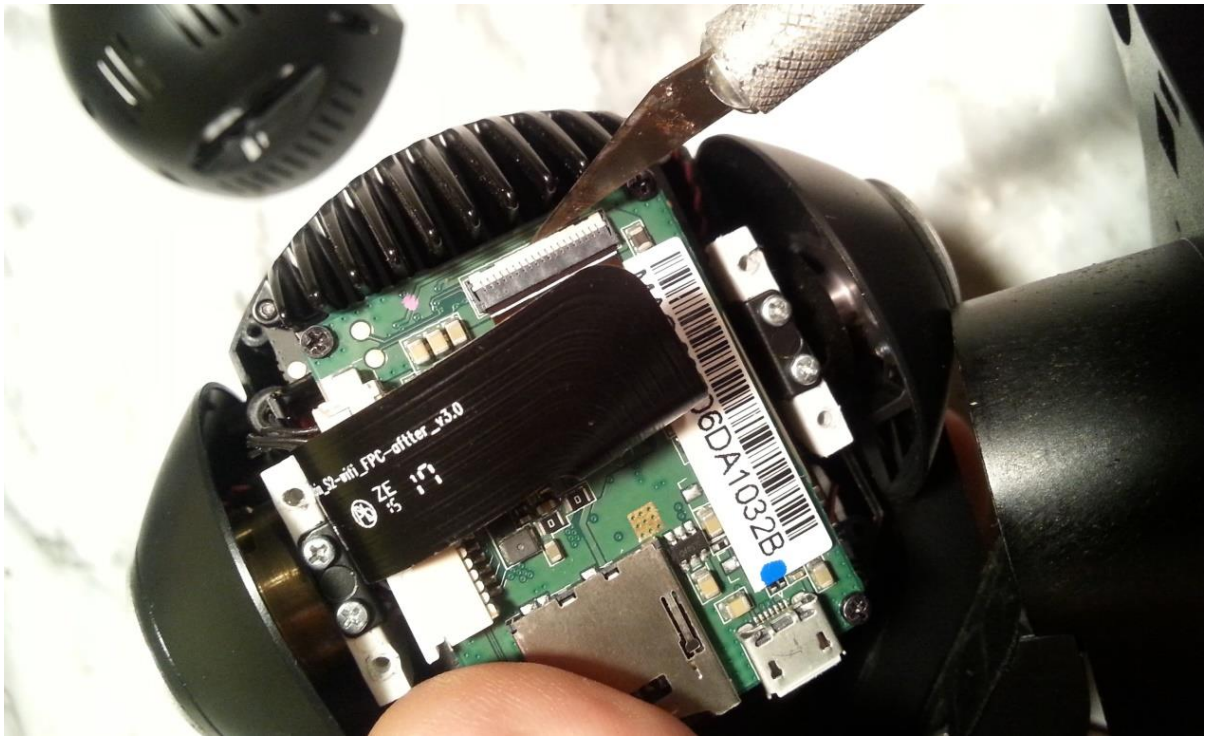


Attachment 2
CGo3 Wi-Fi Board Replacement

5). Note the position of the white alignment mark on the ribbon for future reference:



6). Using fingernails or a small tool, lift the back edge of the ribbon lock to release the ribbon:



Attachment 2
CGo3 Wi-Fi Board Replacement

7). Slide the ribbon out of the connector:

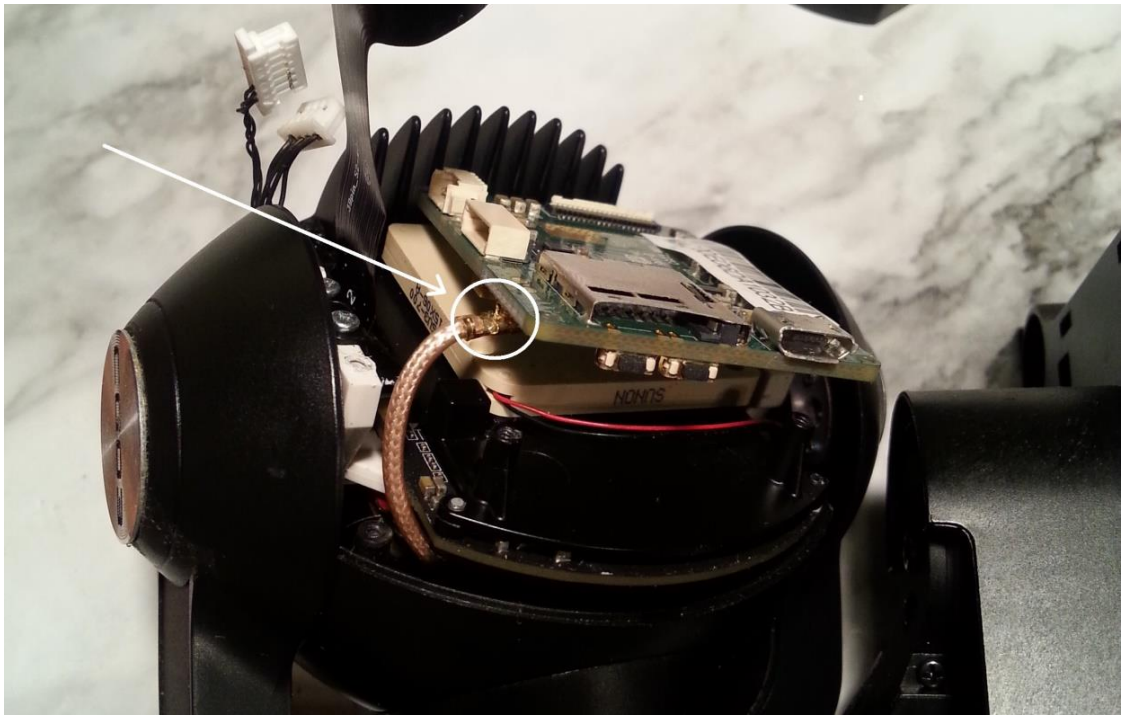
8). Unplug both wiring connectors:

Cc

Attachment 2
CGo3 Wi-Fi Board Replacement

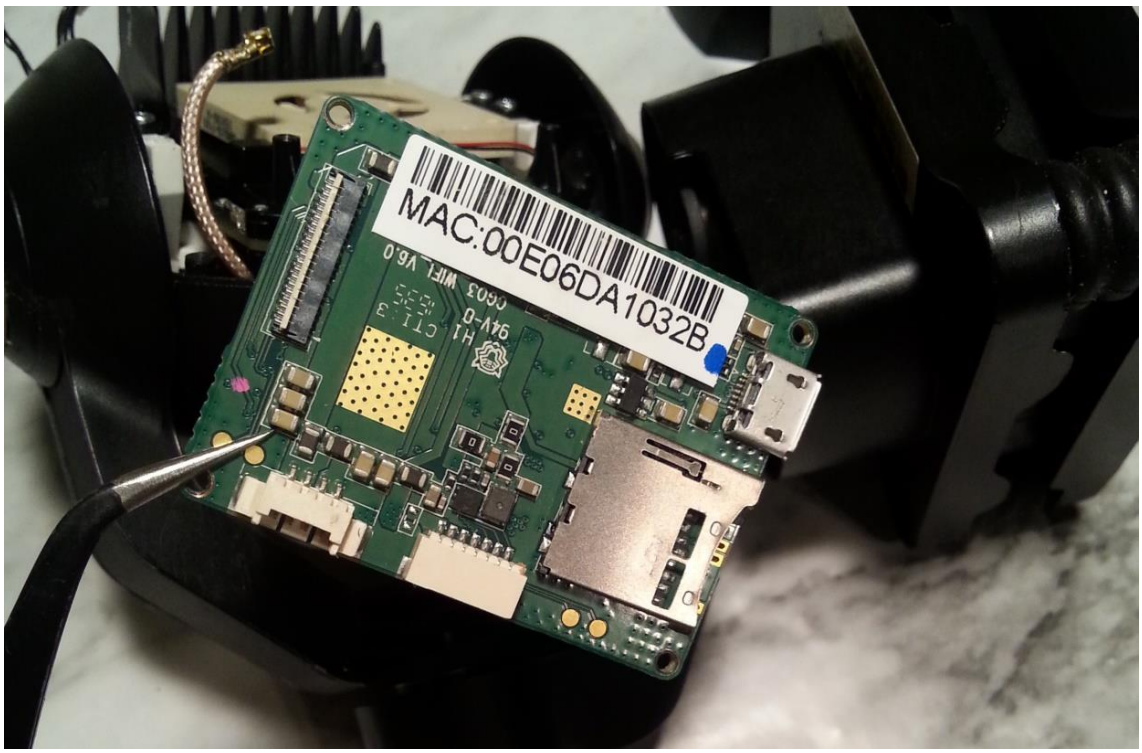
9). Remove the four mounting screws:

10). Carefully unplug the WIFI antenna.

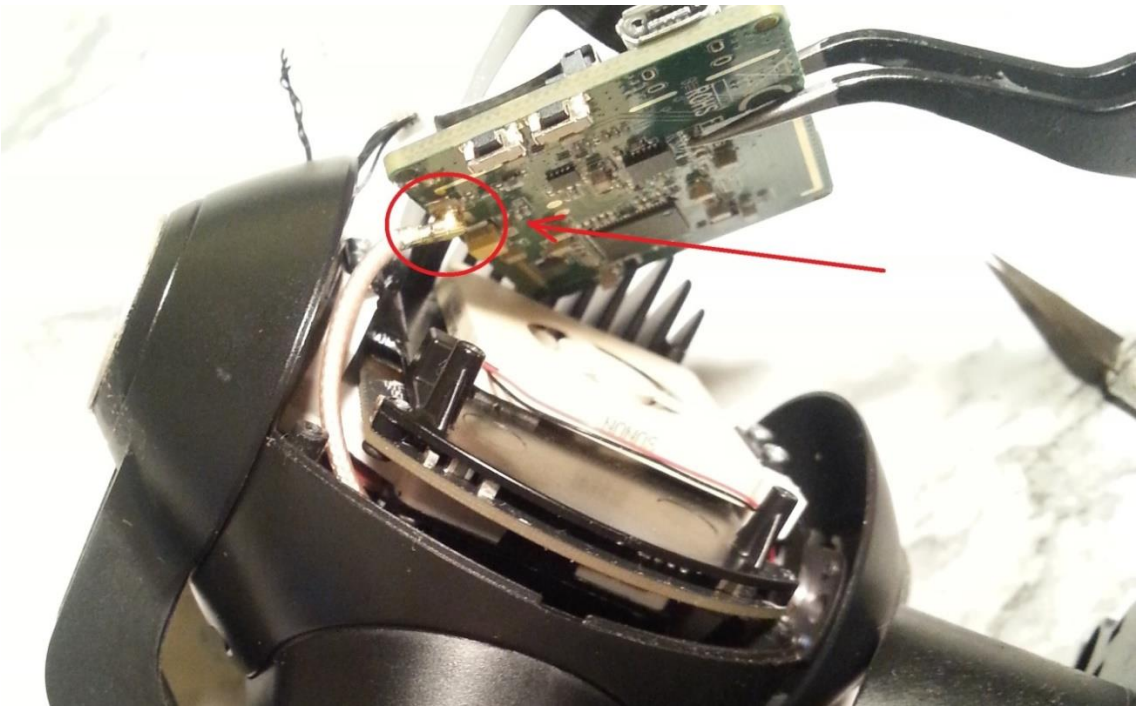


Attachment 2
CGo3 Wi-Fi Board Replacement

11). Remove the old WIFI board:

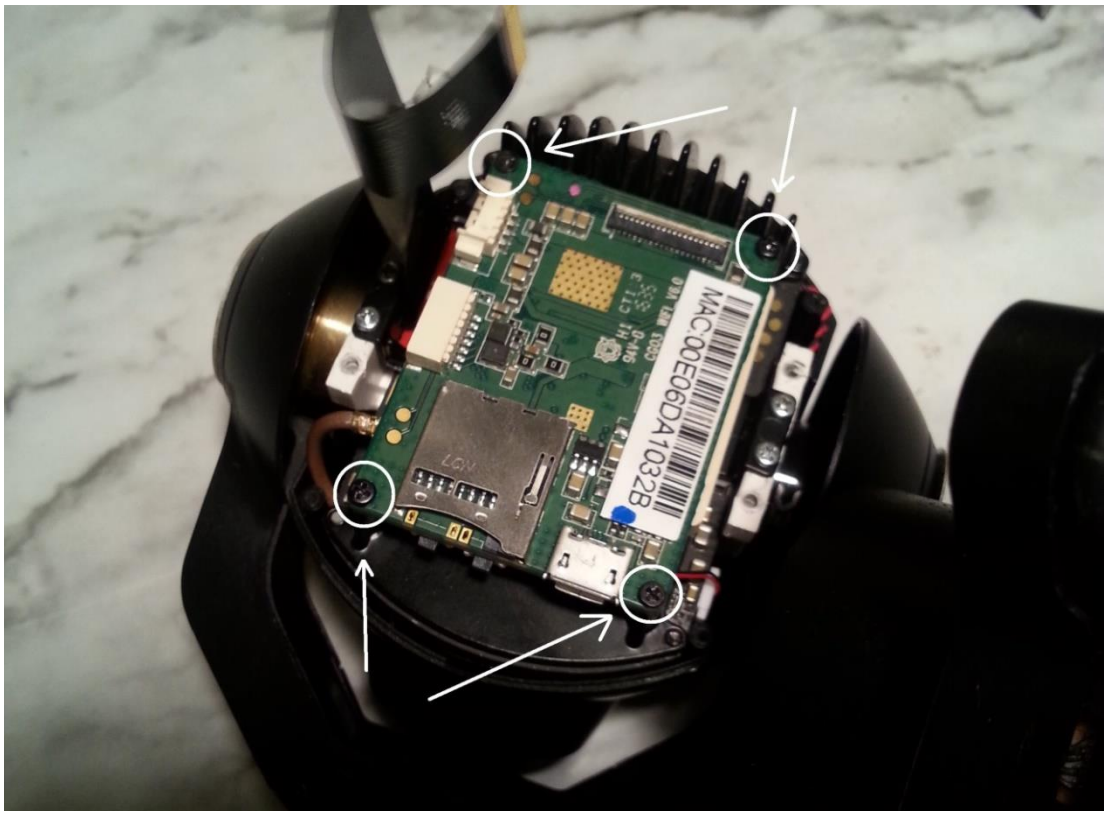


12). **Carefully** align the WIFI antenna to the socket on the new board, and plug it in:

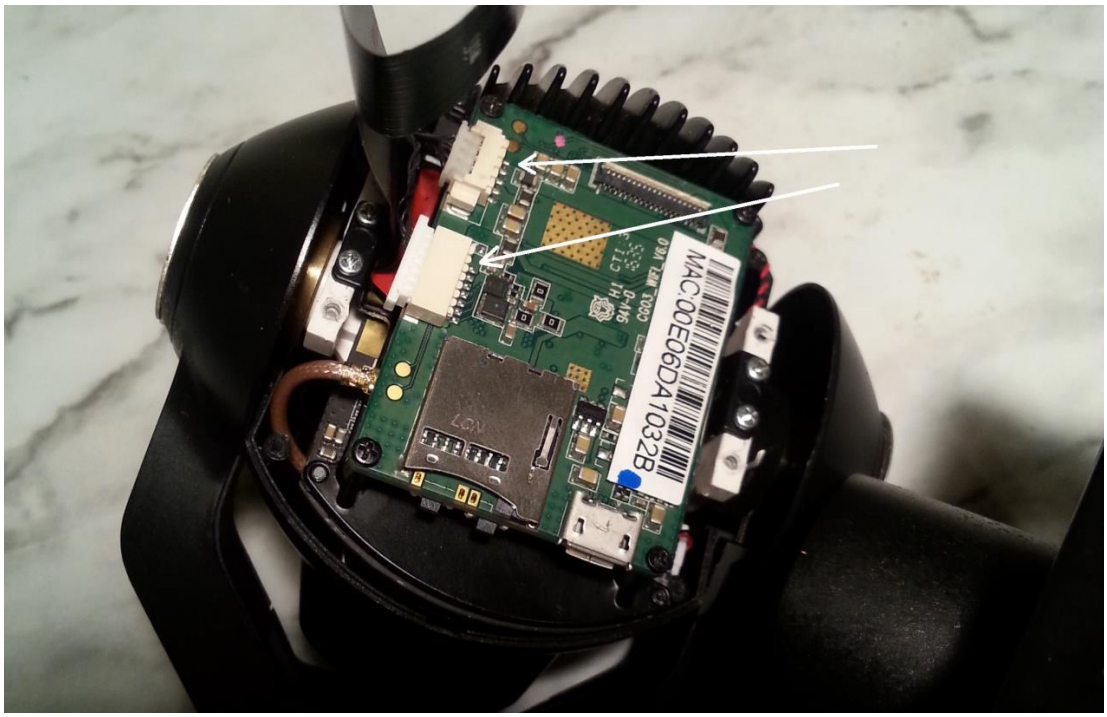


Attachment 2
CGo3 Wi-Fi Board Replacement

13). Line the new board up with the mounting posts, and install the four mounting screws:

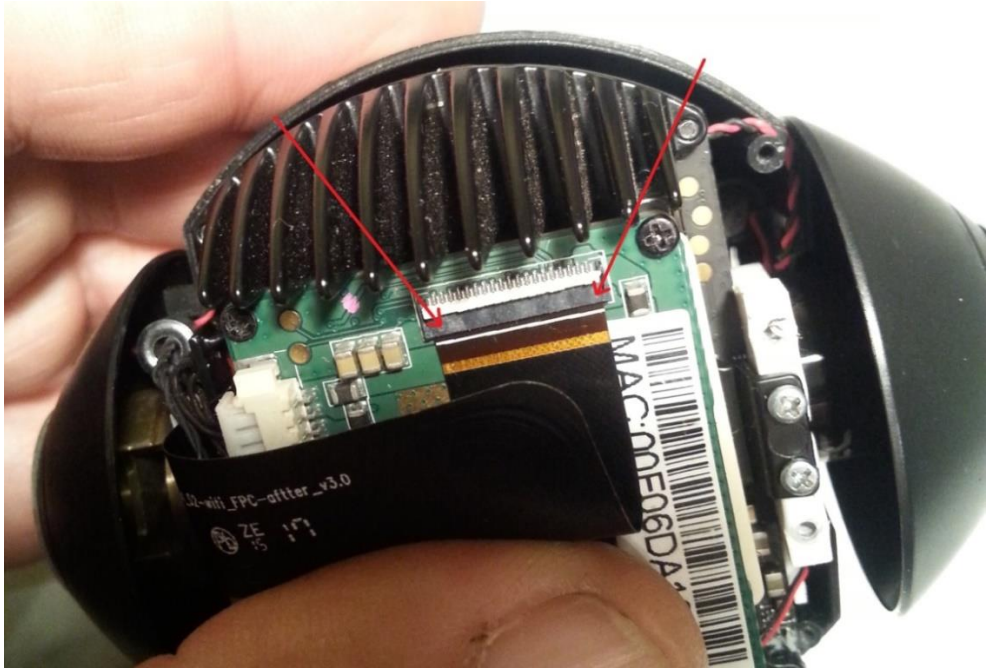


14). Plug in BOTH wiring connectors, ensuring both go UNDER the ribbon:

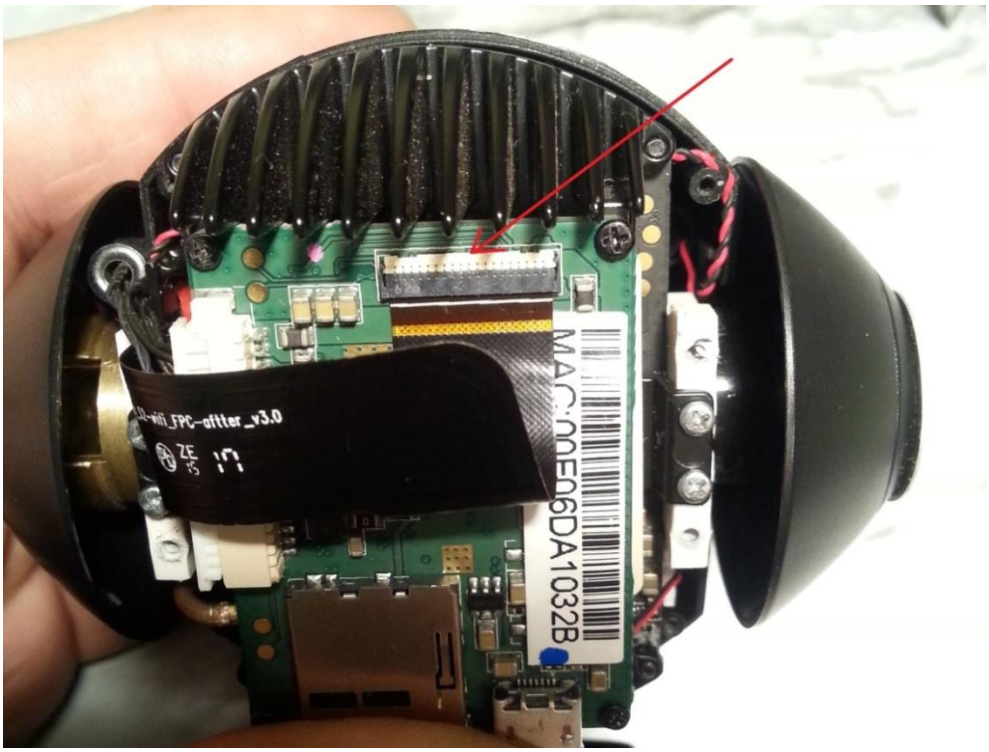


Attachment 2
CGo3 Wi-Fi Board Replacement

15). Slide the ribbon back into the ribbon connector. **ENSURE** the white alignment mark is even all the way across:



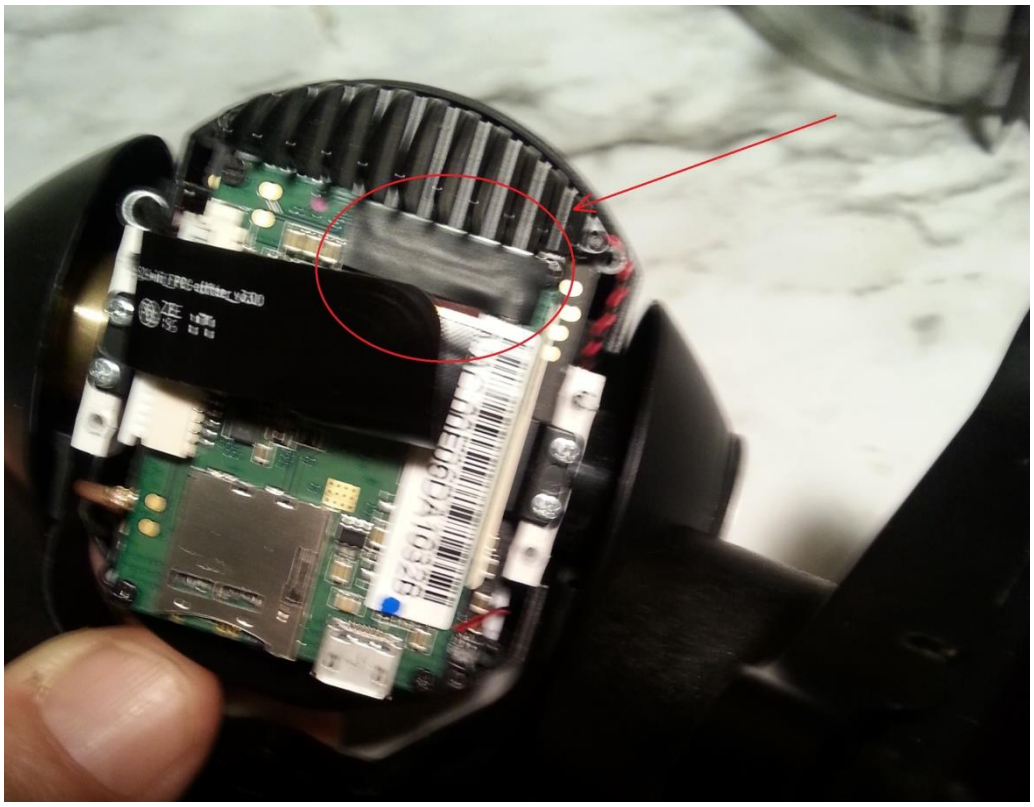
16). Close the tab to lock the ribbon in place:



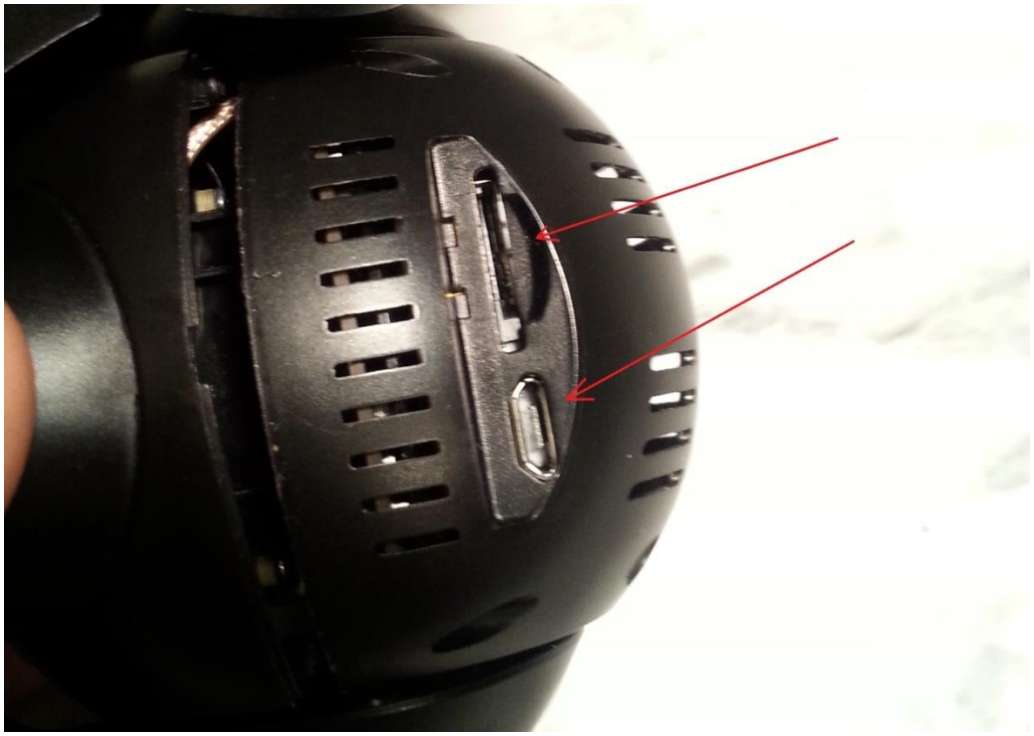
17). **OPTIONAL STEP**: Power camera up to check WIFI functionality prior to completing assembly.

Attachment 2
CGo3 Wi-Fi Board Replacement

18). Install the tape over the ribbon connector:

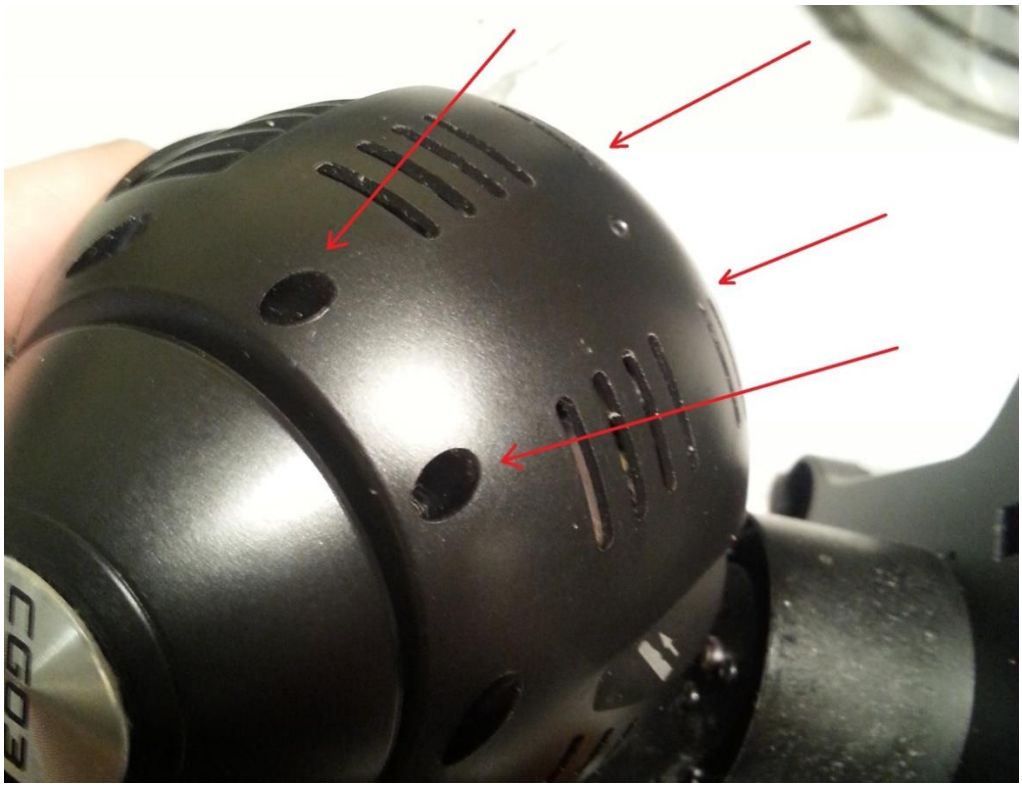


19). Align the rear cover over the USB and SD card connectors, and work the cover slightly back over the connectors:



Attachment 2
CGo3 Wi-Fi Board Replacement

20). Install the four silver colored rear cover mounting screws. Two on each side:



21). Align the front cover, ensuring no wires are trapped between the surfaces or screw mounting holes:

Attachment 2
CGo3 Wi-Fi Board Replacement

22). Install the four black front cover mounting screws, two on each side

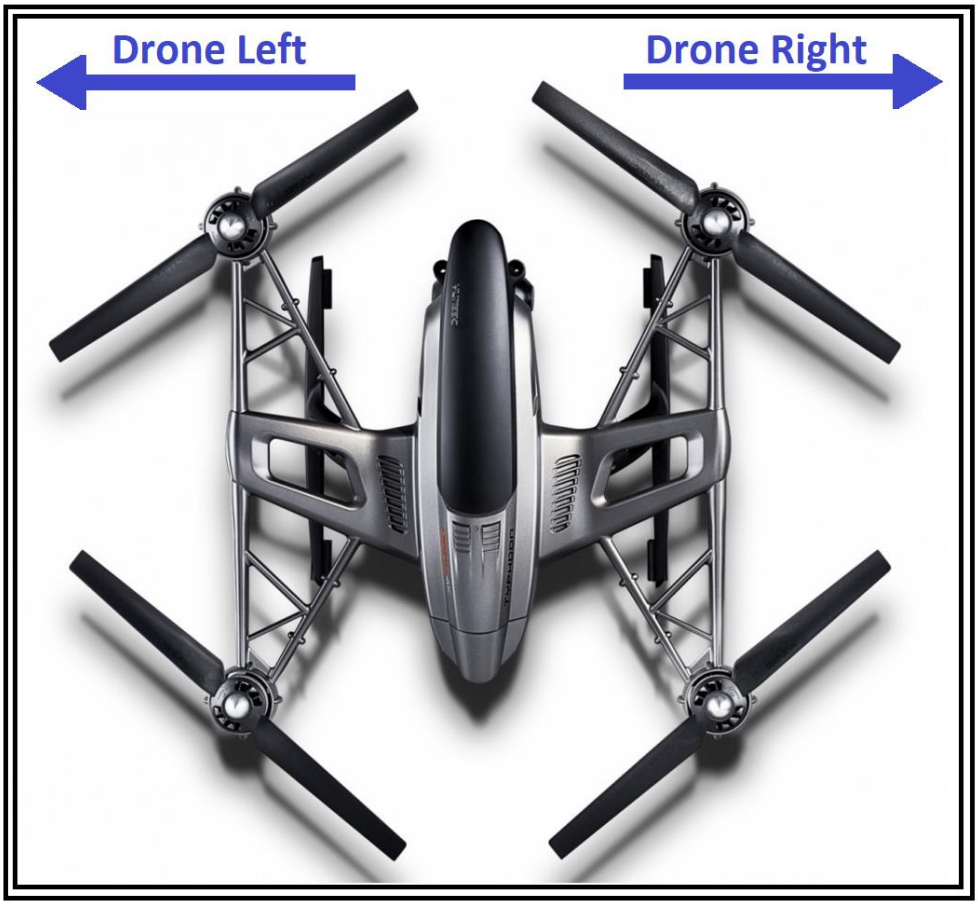
23). You are finished.

Attachment 3
CGo3 Rear Arm Alignment

Use of this information is at your own risk.

Introduction:
This project is to realign the CGo3 rear arm if the camera is pointing “Hard Left” or “Hard Right” due to improper rear arm mounting screw alignment during previous work.

NOTE:
The terms “left” and “right” can become confusing while working on a component that is upside down and is being viewed from the front instead of the rear. The terms “left” and “right” throughout this document will refer to standard “Drone Left” and “Drone Right” as shown here.



Preamble:
You are going to be working with some thin plastic, small screws and flimsy wire. The words "patience", "careful" and "gently" should govern your work for this project. You will also be touching some electronic components. You need to be mindful of static electricity. An antistatic wrist band, or some sort of grounding are advised. At the very least, ensure you touch something else on the camera BEFORE you touch any of the sensitive components. READ THROUGH THIS FIRST. If you don't feel confident, then don't do it. You can mess your camera up pretty easily with this

Attachment 3
CGo3 Rear Arm Alignment

With the nagging aside, here is how to align a CGo3 rear arm if it has been installed incorrectly:

1). Use your fingernails, or some thin plastic to pry the label off the rear motor cover. It is held on by contact cement, and if you keep both sides clean, it will go right back on

2). Remove THESE TWO screws from the rear motor cover. (leave the other two alone for now)

Attachment 3
CGo3 Rear Arm Alignment

3). Remove this one from the side of the rear motor cover

4). And this one from the other side:

Attachment 3
CGo3 Rear Arm Alignment

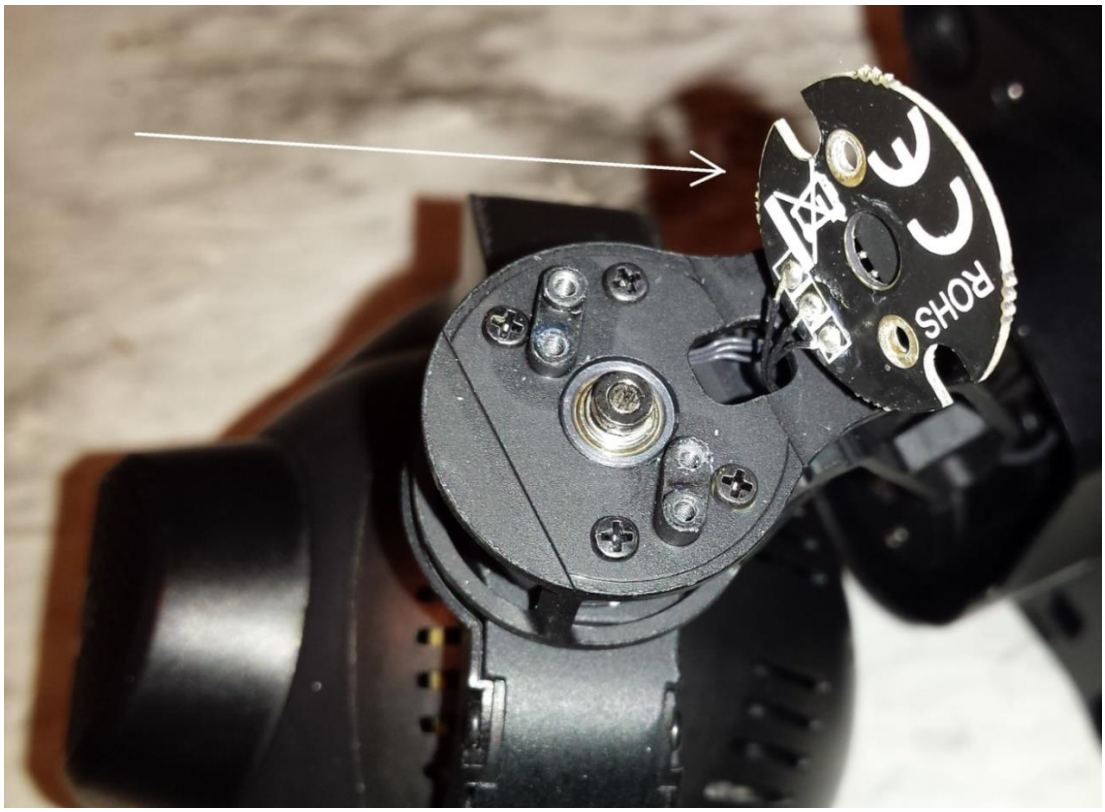
5). Pry the "wings" of the rear motor cover out ONLY enough to clear the interferences: (Remember the "Thin Plastic" nag at the start of this note

6). Slide the rear motor cover off and set it aside:

Attachment 3
CGo3 Rear Arm Alignment

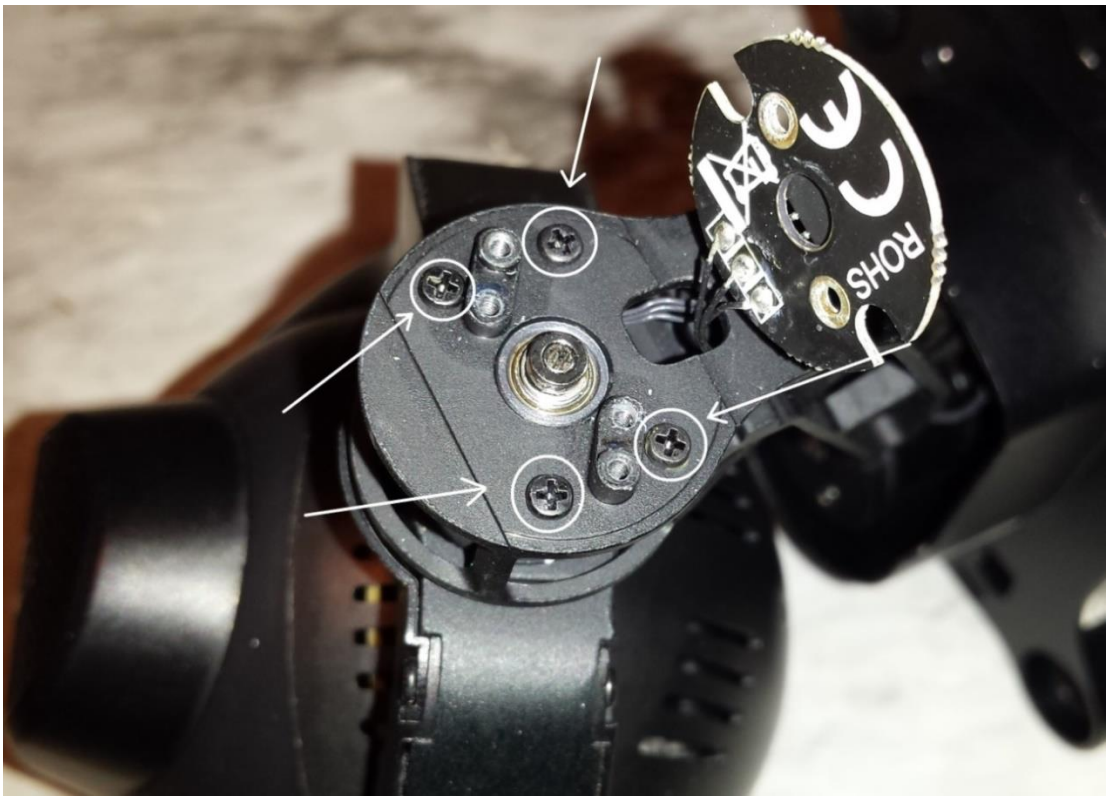
7). NOW remove these two screws from the rear motor position sensor: (Remember the "static electricity" nag.)

8). GENTLY tilt the rear motor position sensor out of the way, (The "flimsy wire" nag):



Attachment 3
CGo3 Rear Arm Alignment

9). Remove the four motor mount screws:

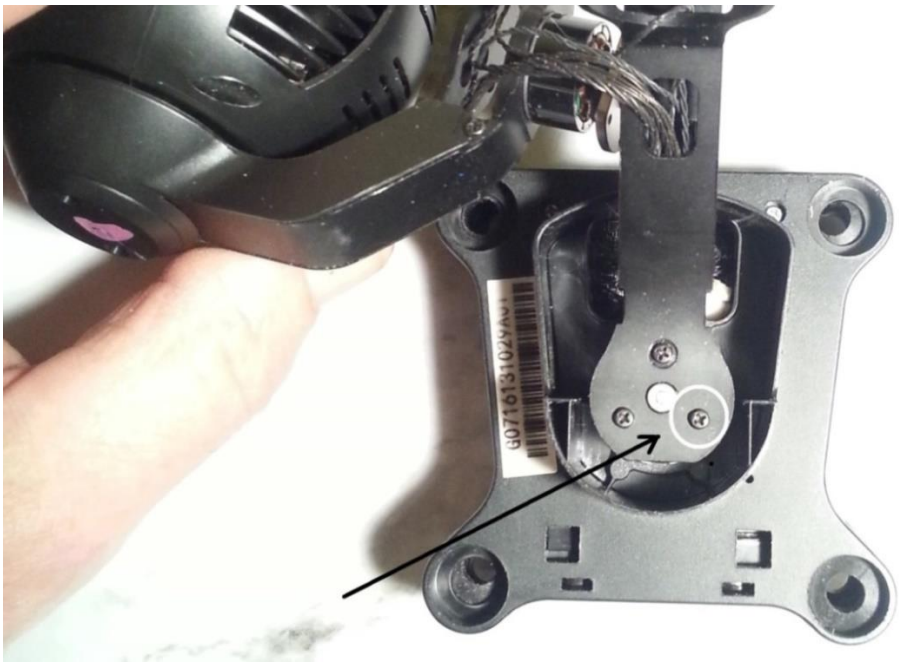


10). Gently slide the motor forward out of the support arm cage, and set it aside.

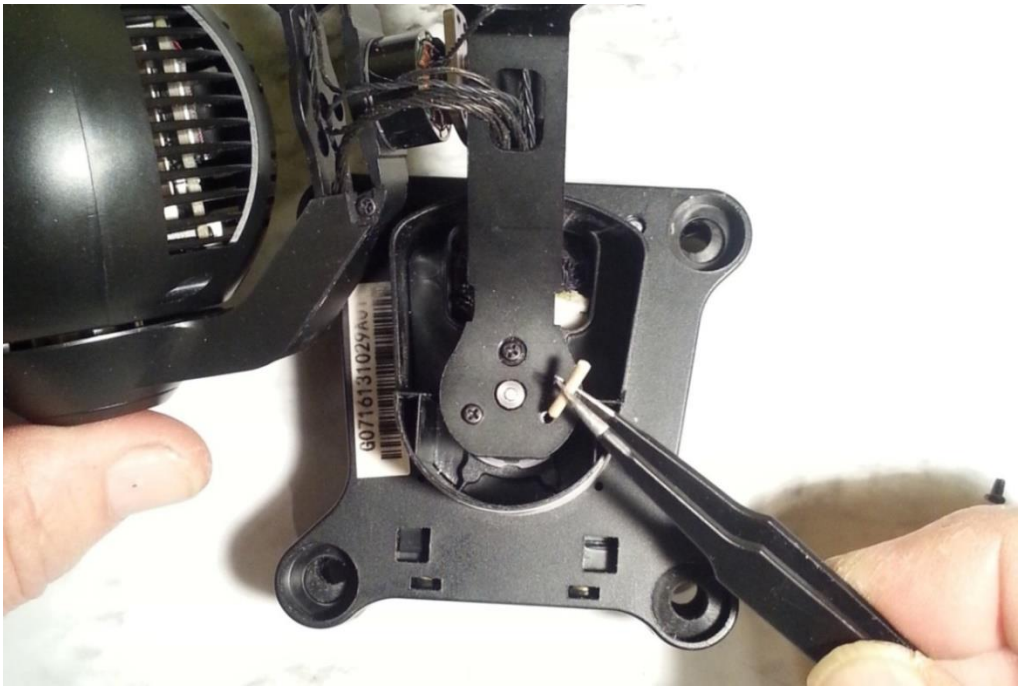
Attachment 3
CGo3 Rear Arm Alignment

11). Steps 12) through 16) are related to cameras that were pointing “DRONE RIGHT”. IF camera was pointing “DRONE LEFT”, THEN skip to Step 17)

12). IF camera was pointing “DRONE RIGHT”, THEN remove this screw.

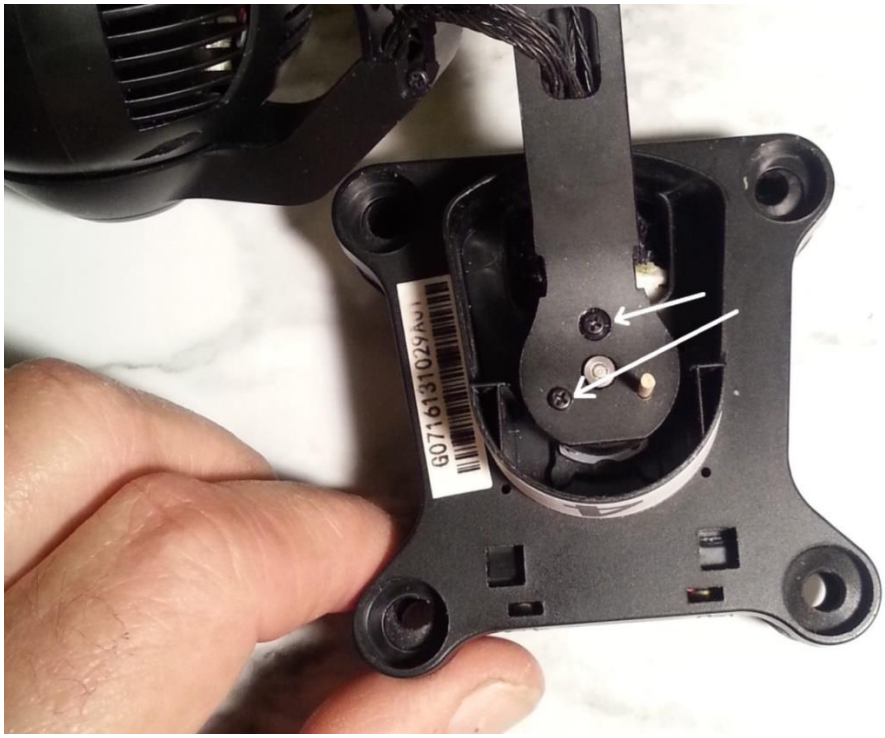


13). Insert a SHORT piece of toothpick, (or similar) into the hole for the removed screw to serve as an alignment pin.

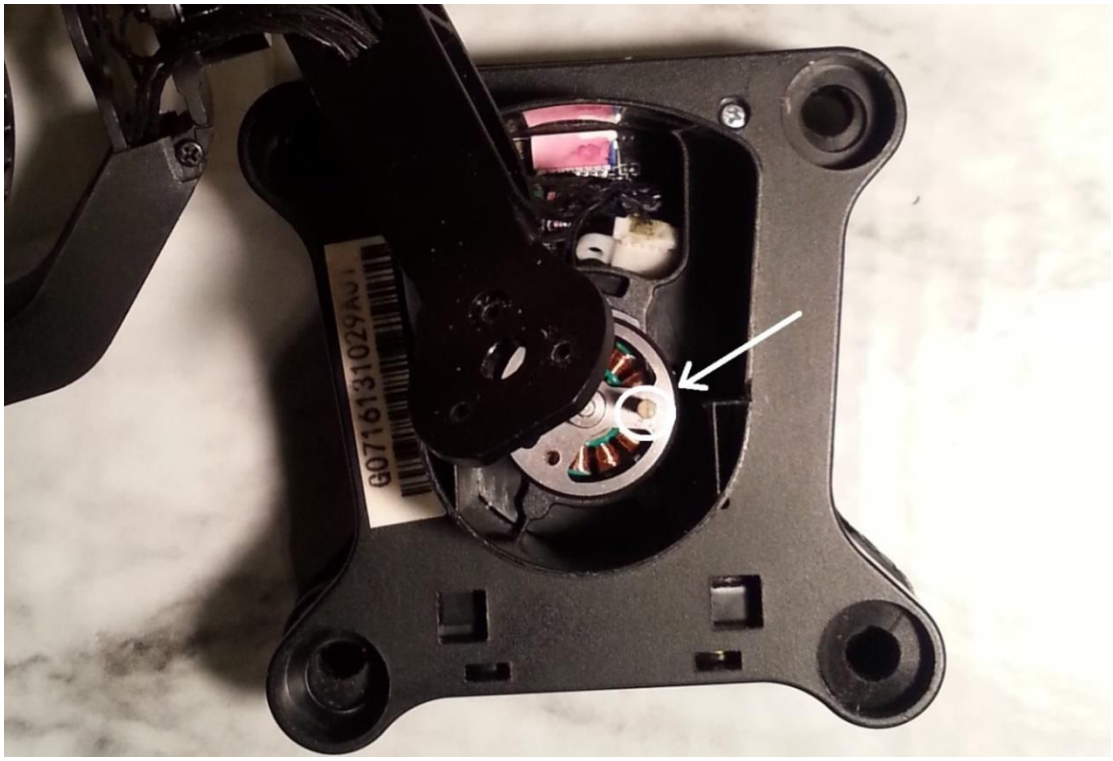


Attachment 3
CGo3 Rear Arm Alignment

14). Remove the two remaining screws.



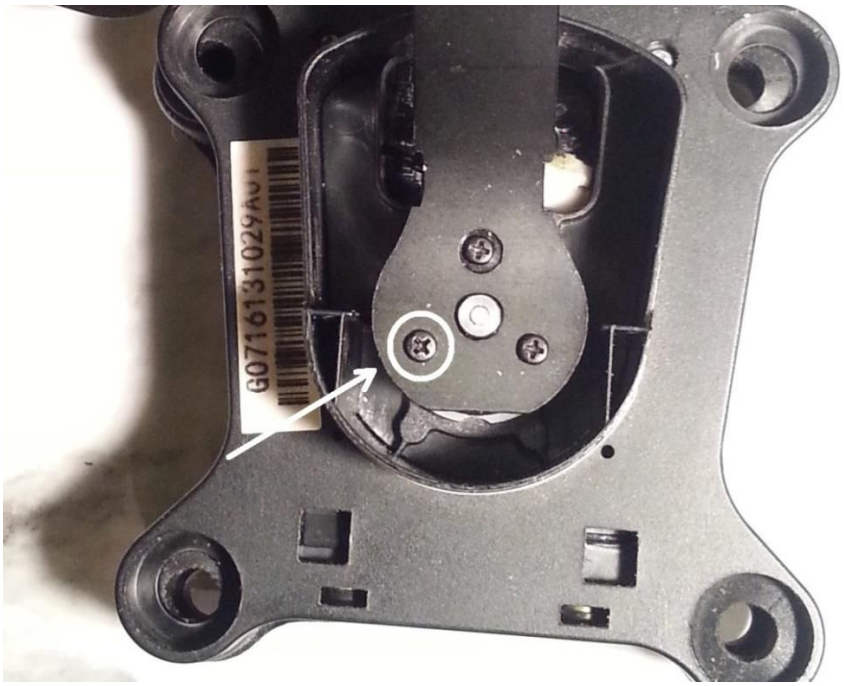
15). Carefully remove the arm while ensuring the alignment pin remains in the motor face.



Attachment 3
CGo3 Rear Arm Alignment

16). Steps 17) through 20) are related to cameras that were pointing “DRONE LEFT”. IF you have completed Steps 12) through 15), skip to Step 21).

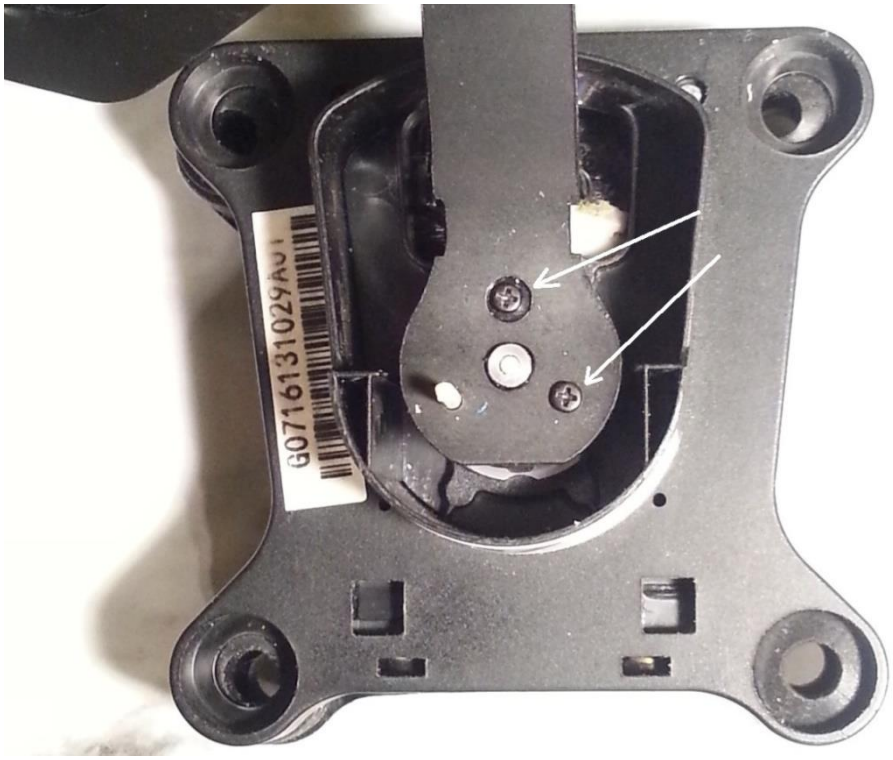
17). IF camera was pointing “DRONE LEFT”, THEN remove this screw.



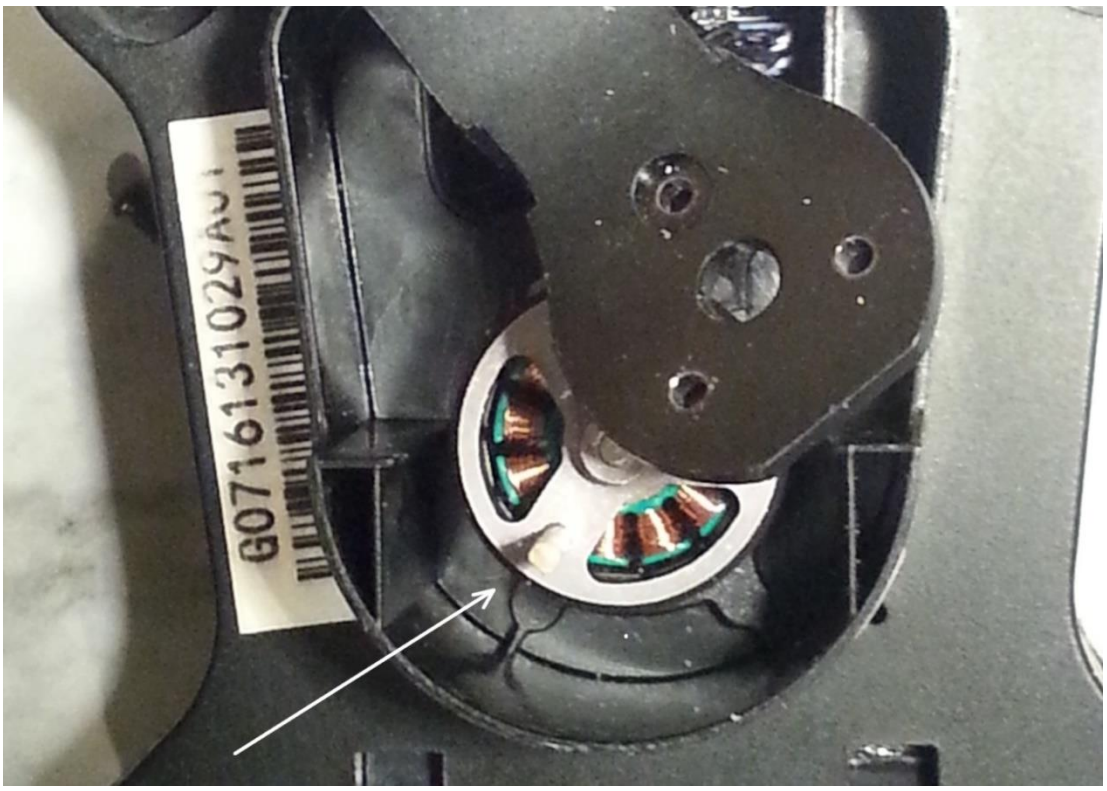
18). Insert a SHORT piece of toothpick, (or similar) into the hole for the removed screw to serve as an alignment pin.

Attachment 3
CGo3 Rear Arm Alignment

19). Remove the two remaining screws.

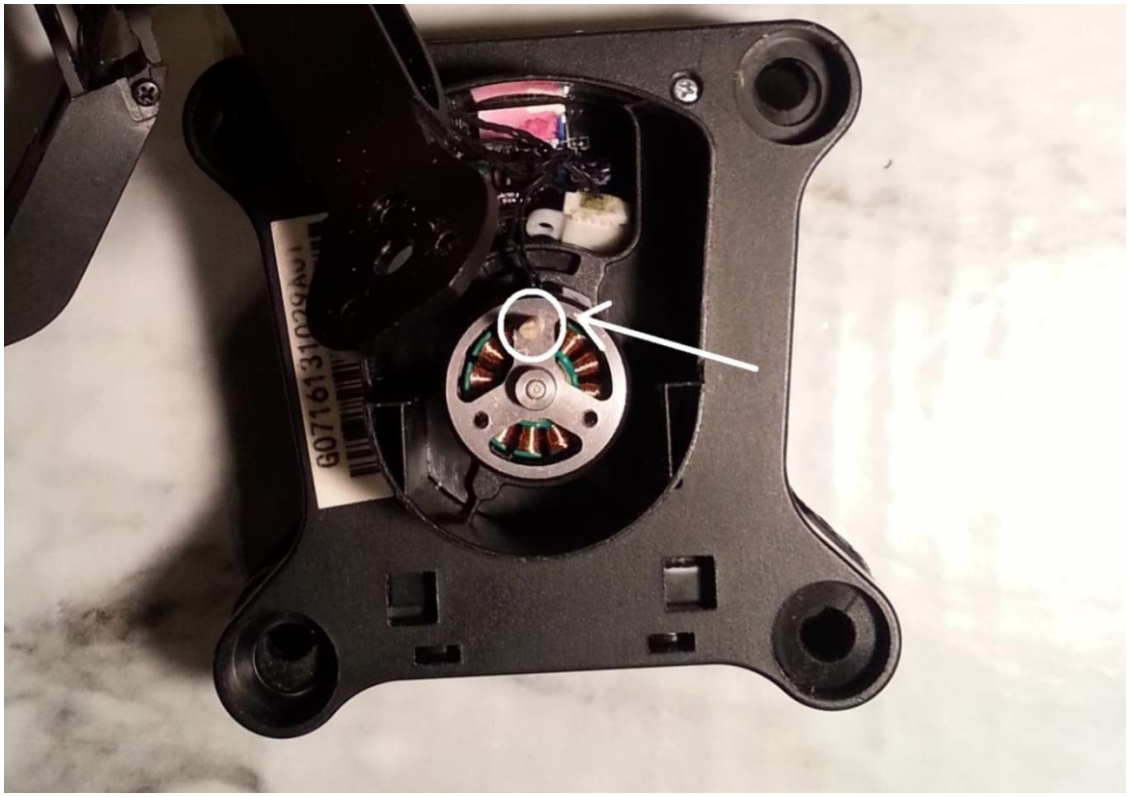


20). Carefully remove the arm while ensuring the alignment pin remains in the motor face

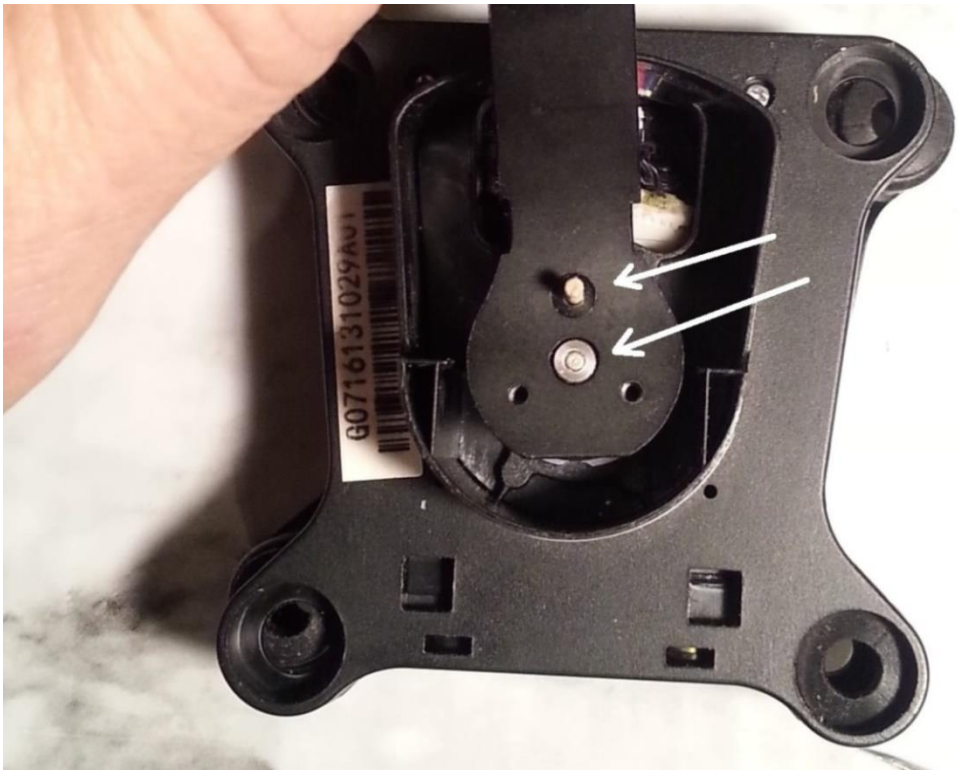


Attachment 3
CGo3 Rear Arm Alignment

21). Rotate motor to move alignment pin to rear of camera.

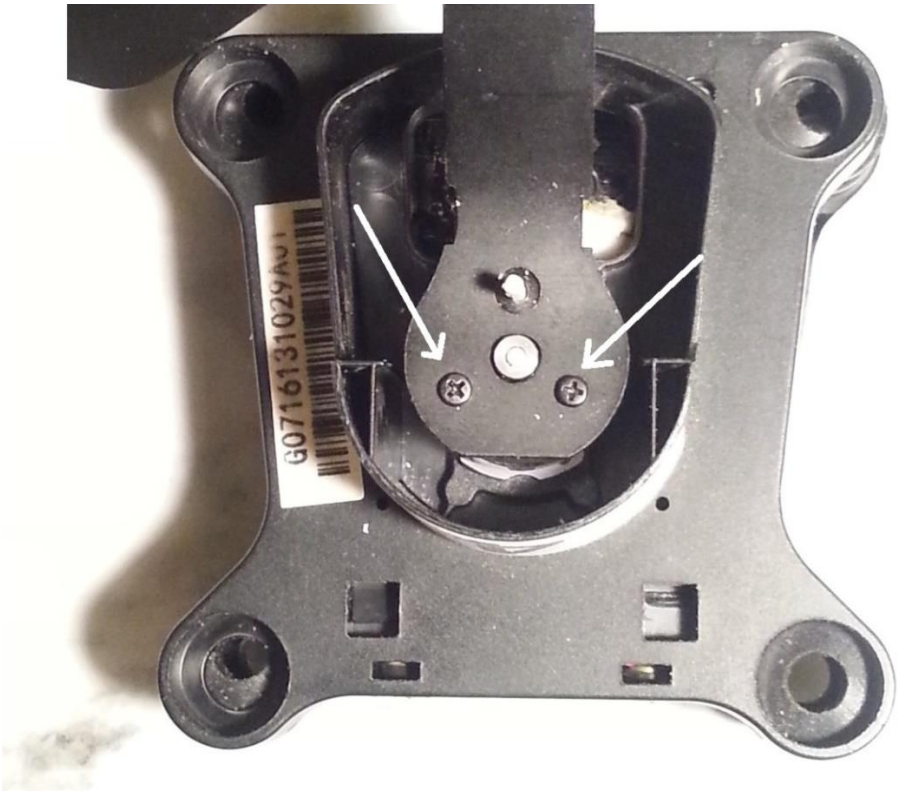


22). Place the rear arm over the alignment pin and motor face.

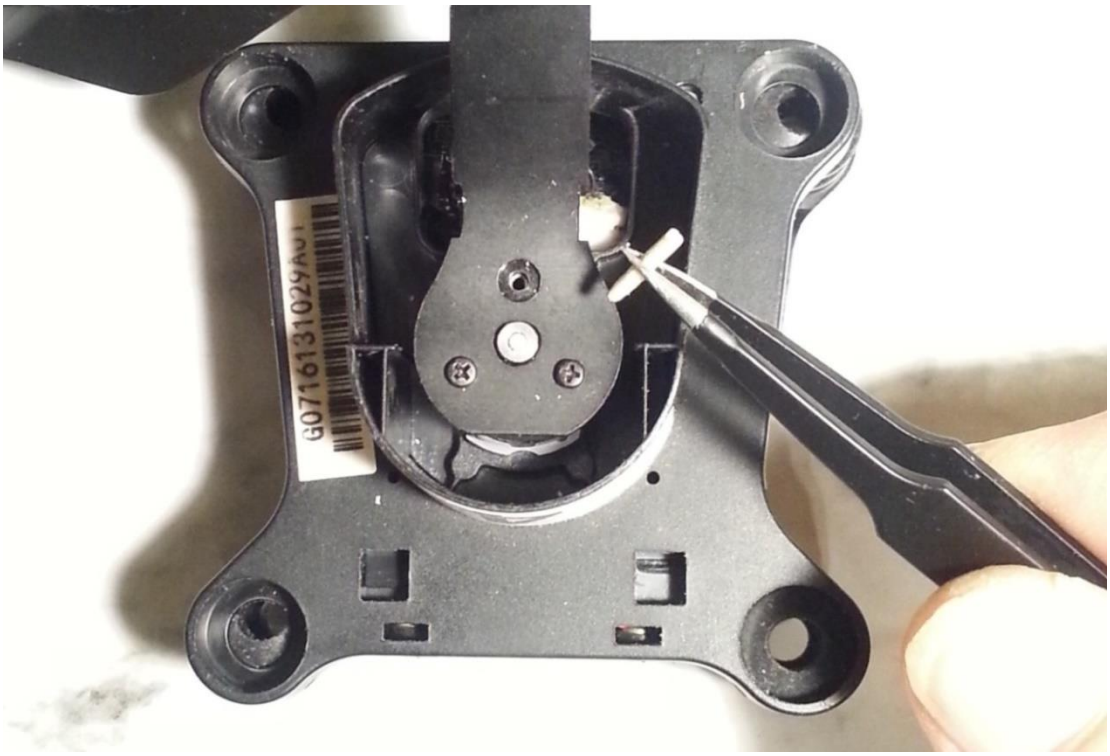


Attachment 3
CGo3 Rear Arm Alignment

23). Install the front two screws.

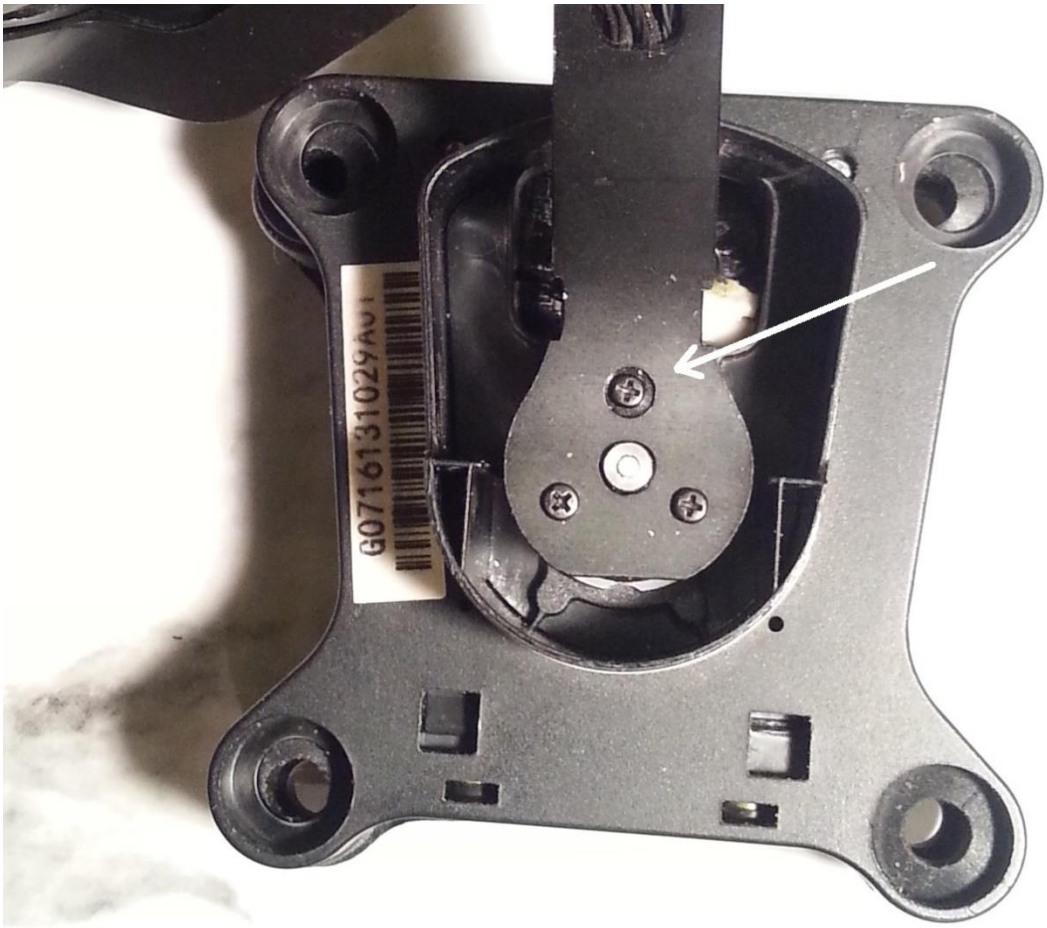


24). Remove the alignment pin.



Attachment 3
CGo3 Rear Arm Alignment

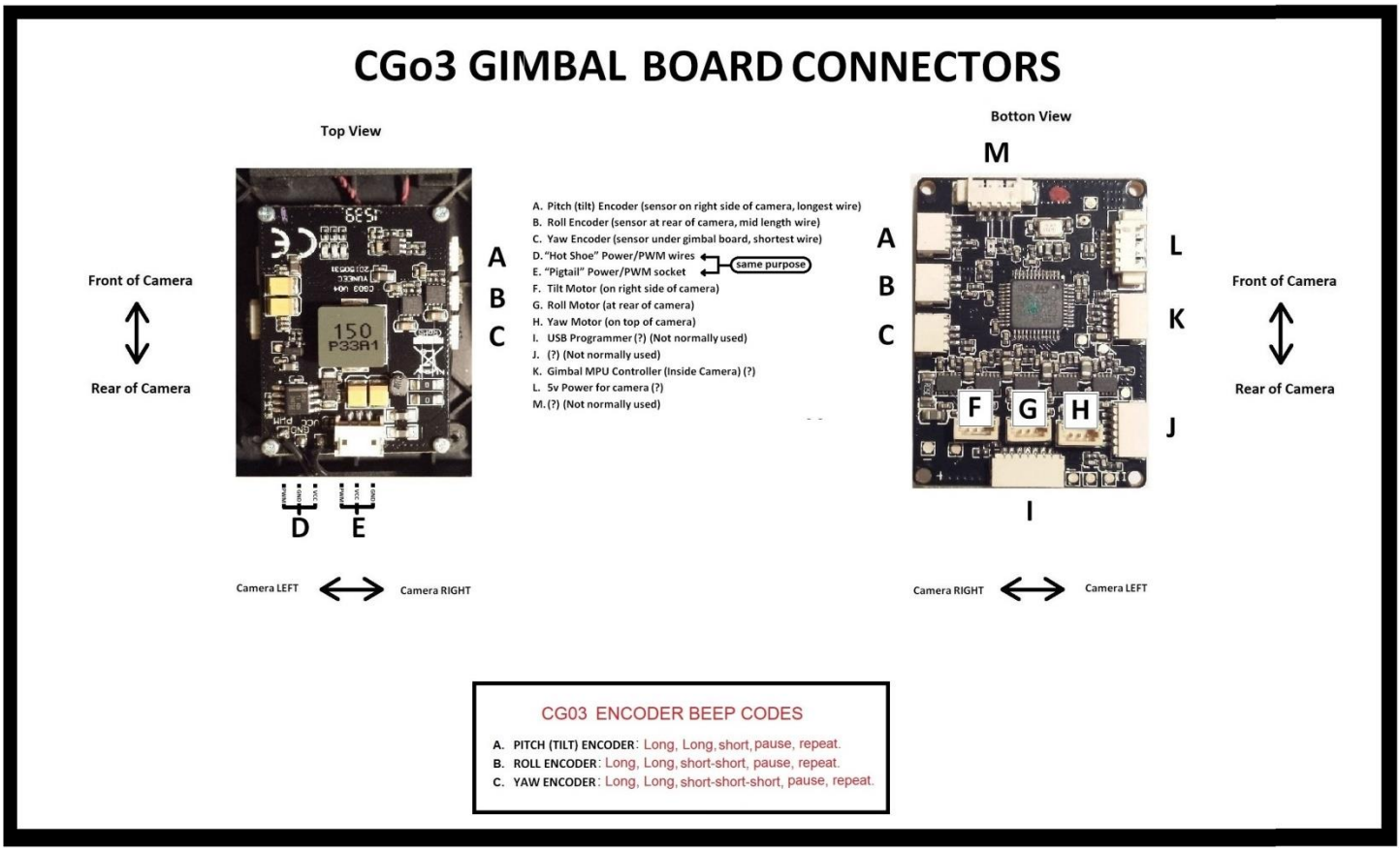
25). Install the last screw.



Reassembly is pretty much “reverse the process” from Step 10). Don't forget the static, and ensure the right size screw goes in each hole.

Attachment 4
CGo3 Gimbal Board Connectors

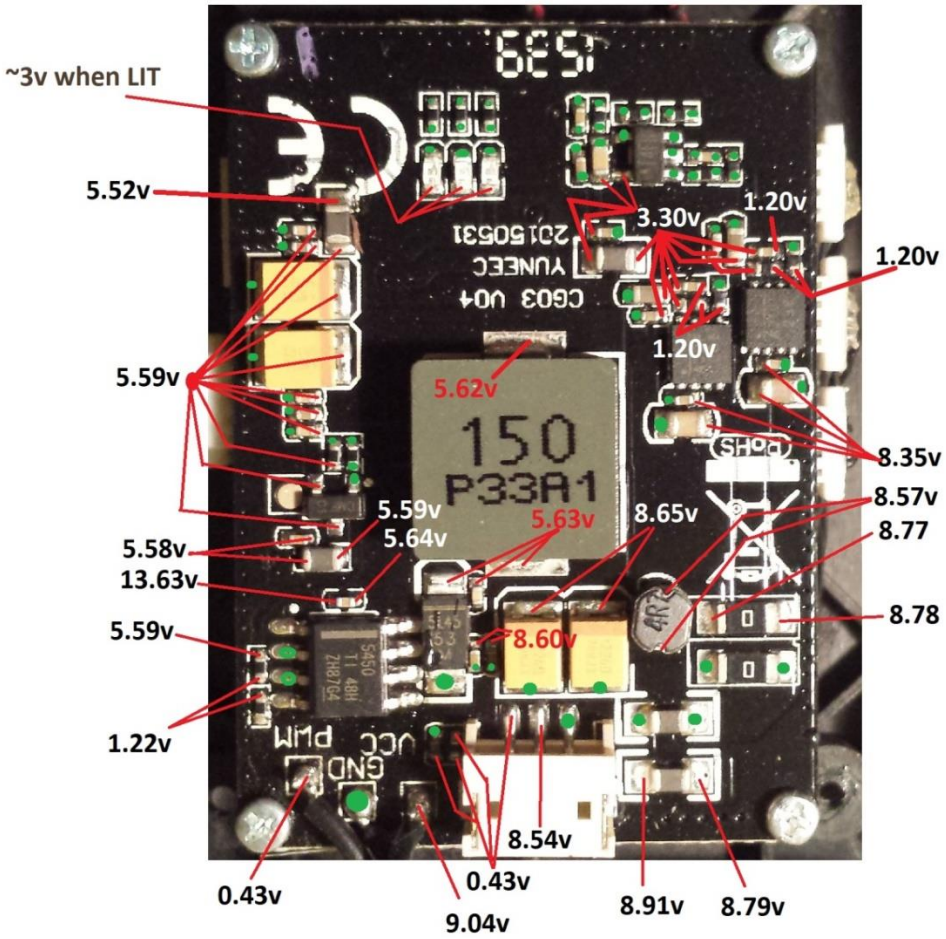
Use of this information is at your own risk.



Attachment 5
CGo3 Gimbal Board Voltages (TOP)

Use of this information is at your own risk.

CGo3 Gimble Board Sample Voltages (TOP)



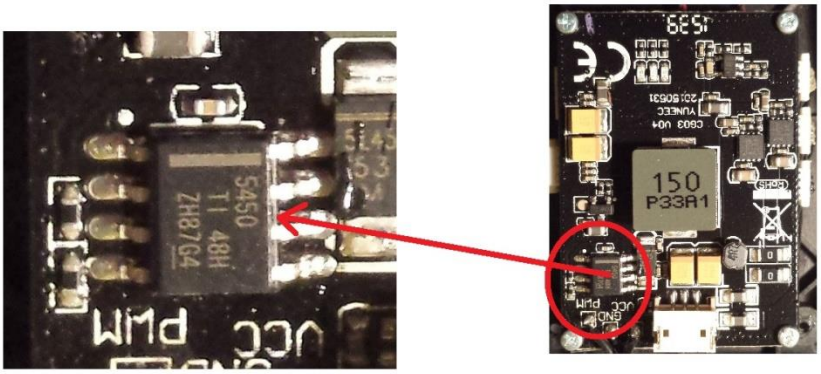
NOTE: Green may indicate Ground OR zero (low side) normal voltage.

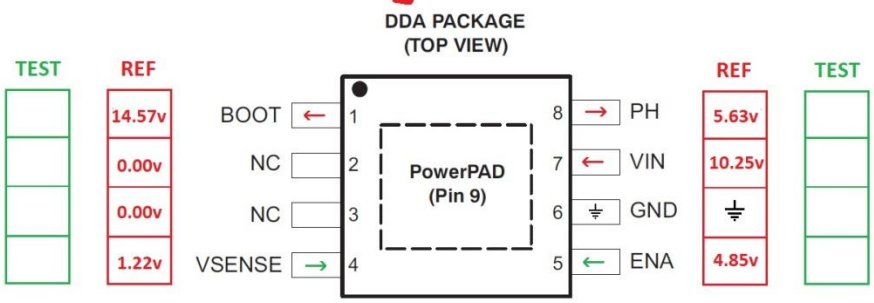
Revision 2 | 2019-04-26

Attachment 6
CGo3 Gimbal Board Mosfet Information

Use of this information is at your own risk.

CGo3 Gimbal Board Mosfet Sample Voltages





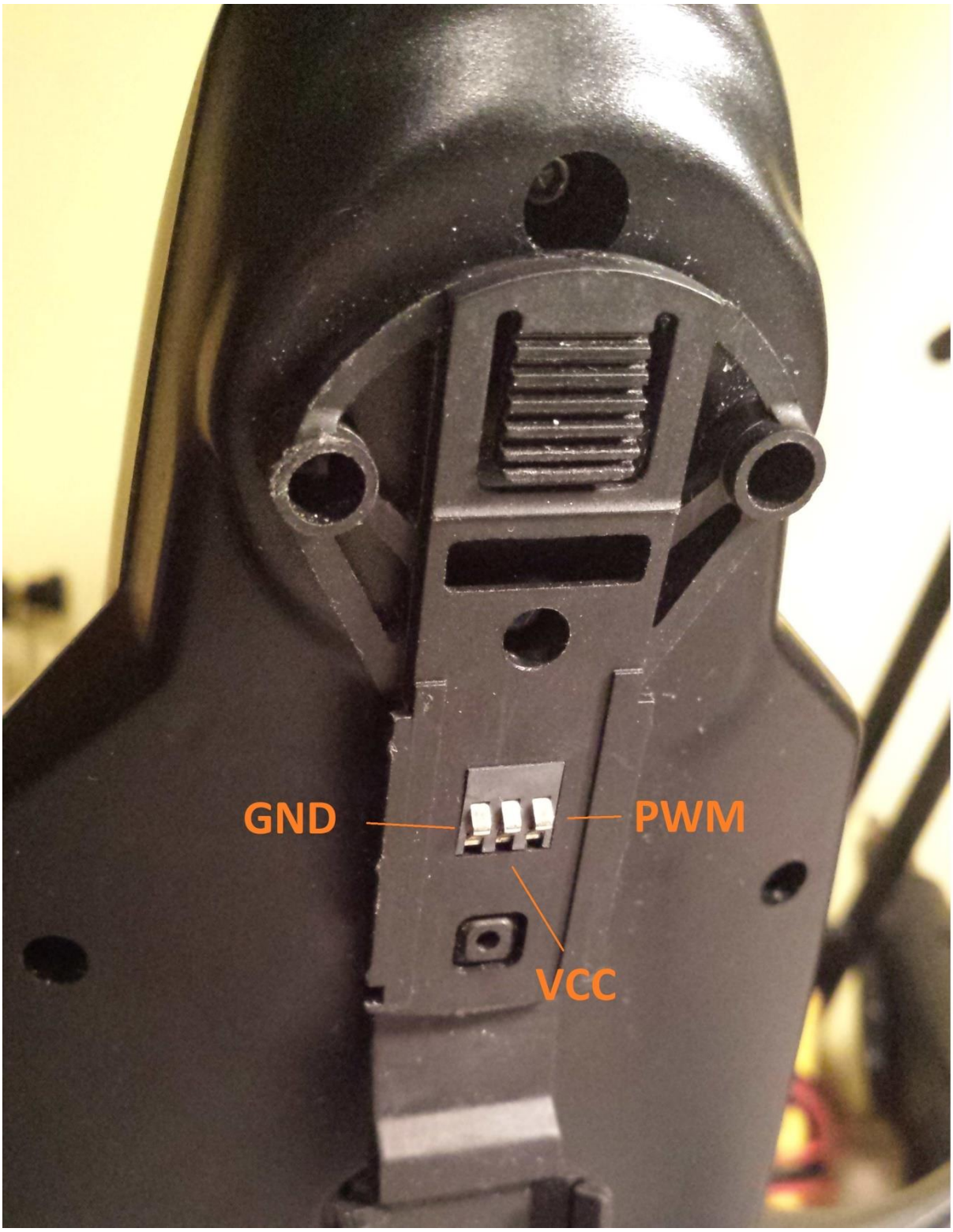
Pin Functions

PIN		I/O	DESCRIPTION
NAME	NO.		
BOOT	1	O	Boost capacitor for the high-side FET gate driver. Connect 0.01-µF, low-ESR capacitor from BOOT pin to PH pin.
NC	2, 3	–	Not connected internally.
VSENSE	4	I	Feedback voltage for the regulator. Connect to output voltage divider.
ENA	5	I	On and off control. Below 0.5 V, the device stops switching. Float the pin to enable.
GND	6	–	Ground. Connect to PowerPAD.
VIN	7	I	Input supply voltage. Bypass VIN pin to GND pin close to device package with a high-quality, low-ESR ceramic capacitor.
PH	8	O	Source of the high-side power MOSFET. Connected to external inductor and diode.
PowerPAD	9	–	GND pin must be connected to the exposed pad for proper operation.

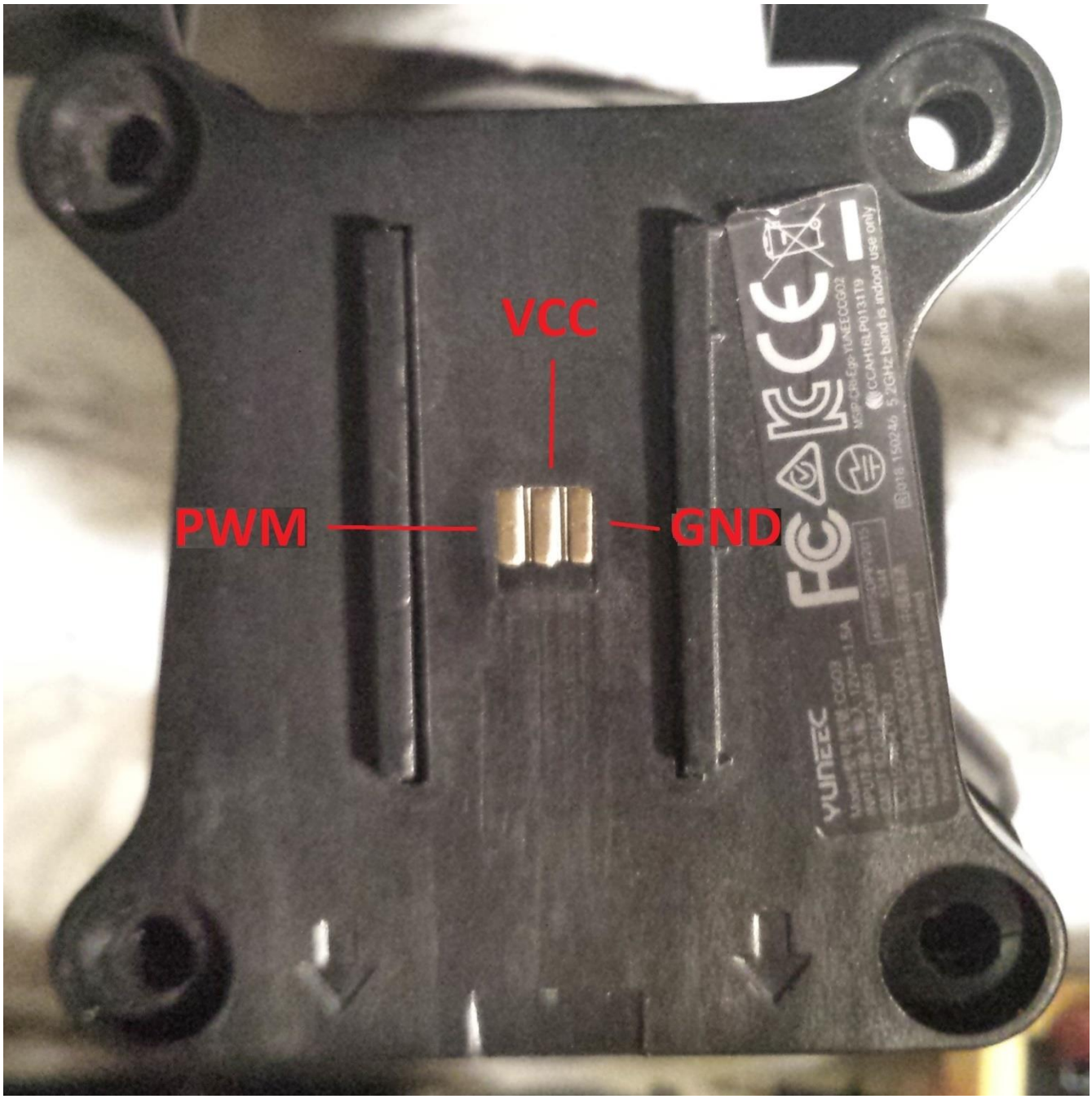
Revision 1 | 2019-04-26

Attachment 7
CGo3 Hot Shoe Contacts

Use of this information is at your own risk.



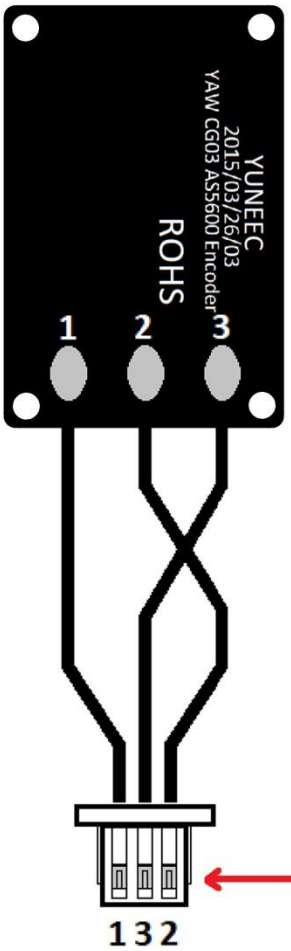
Attachment 7
CGo3 Hot Shoe Contacts



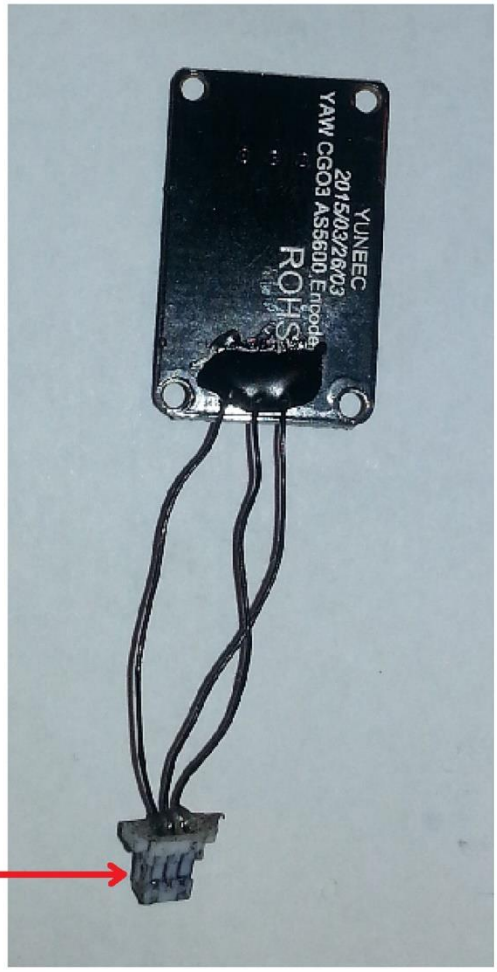
Attachment 8
CGo3 Yaw Encoder Pinout

Use of this information is at your own risk.

CGo3
Yaw Encoder Wires



Note Pin Latches are facing you



Revision 2		2019-09-18

Attachment 9
CGo3 Core Assembly Replacement

Use of this information is at your own risk.

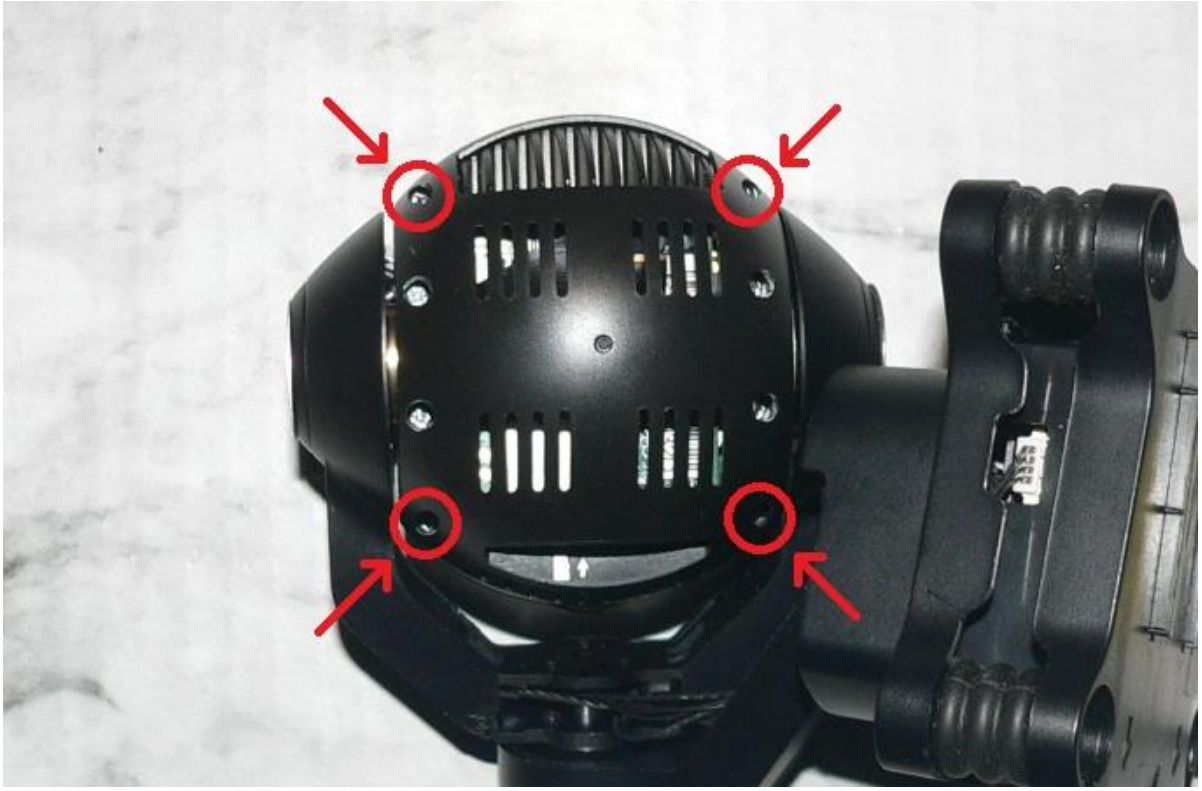
Introduction: The CGo3 and CG03+ core assembly consists of the Main Processor Board, WIFI Board, WIFI Antenna, Cooling Fan and the supporting frame. This Attachment provides instructions for removing these items as a single unit. This Attachment is primarily based on a mid-series CGo3 camera. Additional notes and provisional steps have been added to extend applicability to early/late series CG03 and CGo3+.

1). Remove the lens filter:

2). Remove the camera Nose Piece:

Attachment 9
CGo3 Core Assembly Replacement

3). Remove the four front cover screws:



4). Disconnect antenna clover leaf from notch in support bar:

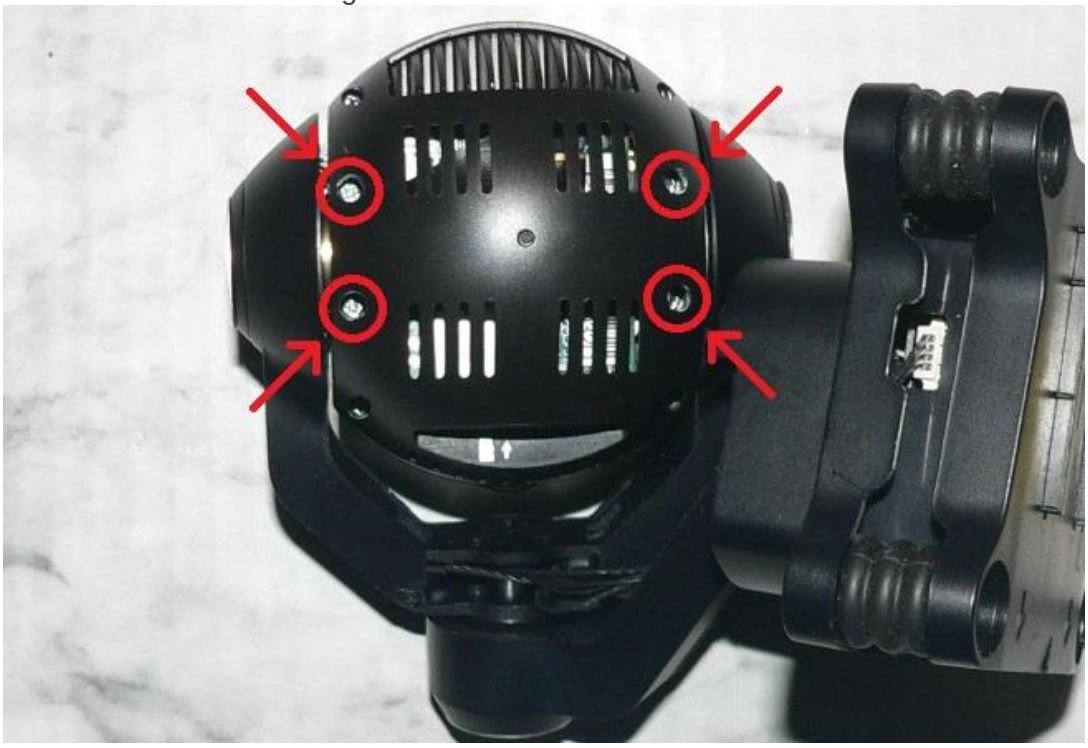
Attachment 9
CGo3 Core Assembly Replacement

NOTE: Some CGo3 and all CGo3+ cameras have the microphones mounted in the front cover.

5). **IF PRESENT,** remove red/black microphone wires and microphones from holders in the front cover.

6). Carefully work front cover off of the antenna clover leaf and remove:

7). Remove the four rear cover mounting screws:



Attachment 9
CGo3 Core Assembly Replacement

8). Work rear cover slightly forward to clear USB and SD card slot, then remove cover:

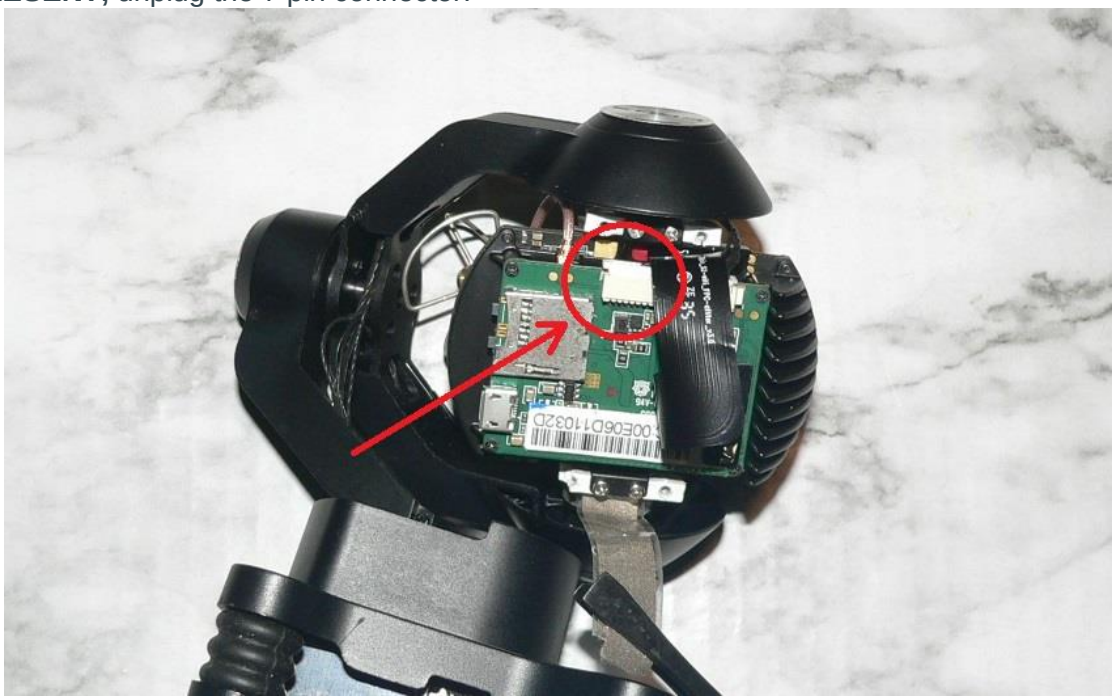
NOTE: The heat sink strap arrangement differs between cameras, and may not exist at all. Refer to Addendum 1 (CGo3 Heat Sink Variations) as required.

9). **IF PRESENT,** disconnect heat sink strap from WIFI board (Leave other end connected to pitch axle):

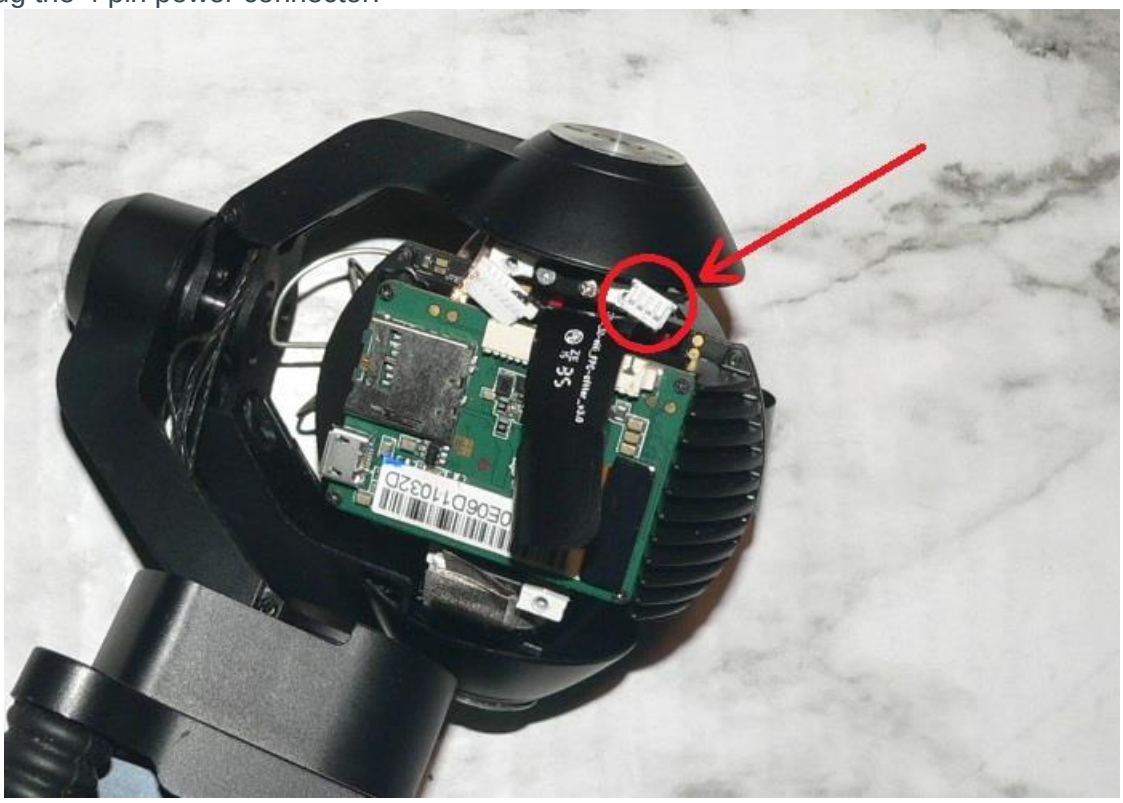
Attachment 9
CGo3 Core Assembly Replacement

NOTE: The pinout of the seven pin connector differs between cameras, and may not exist at all: Refer to Addendum 2 (CGo3 WIFI Board 7 Pin Connector) as required.

10). **IF PRESENT,** unplug the 7 pin connector:

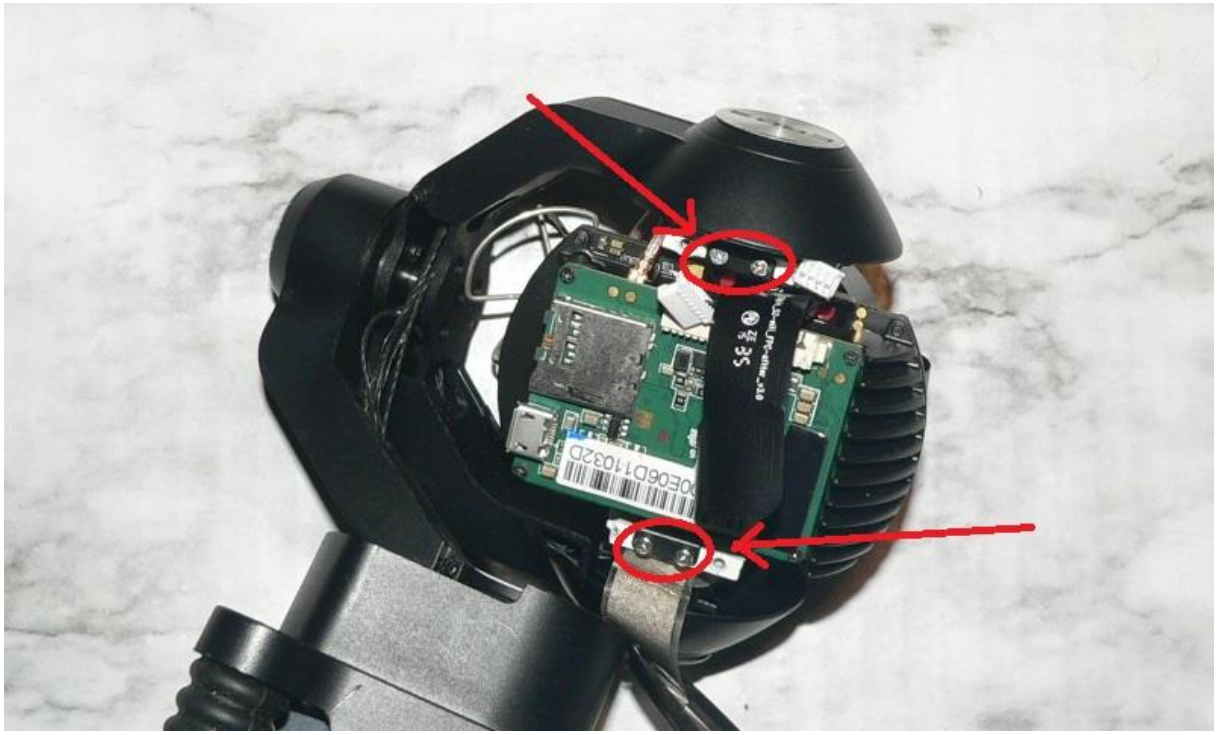


11). Unplug the 4 pin power connector:



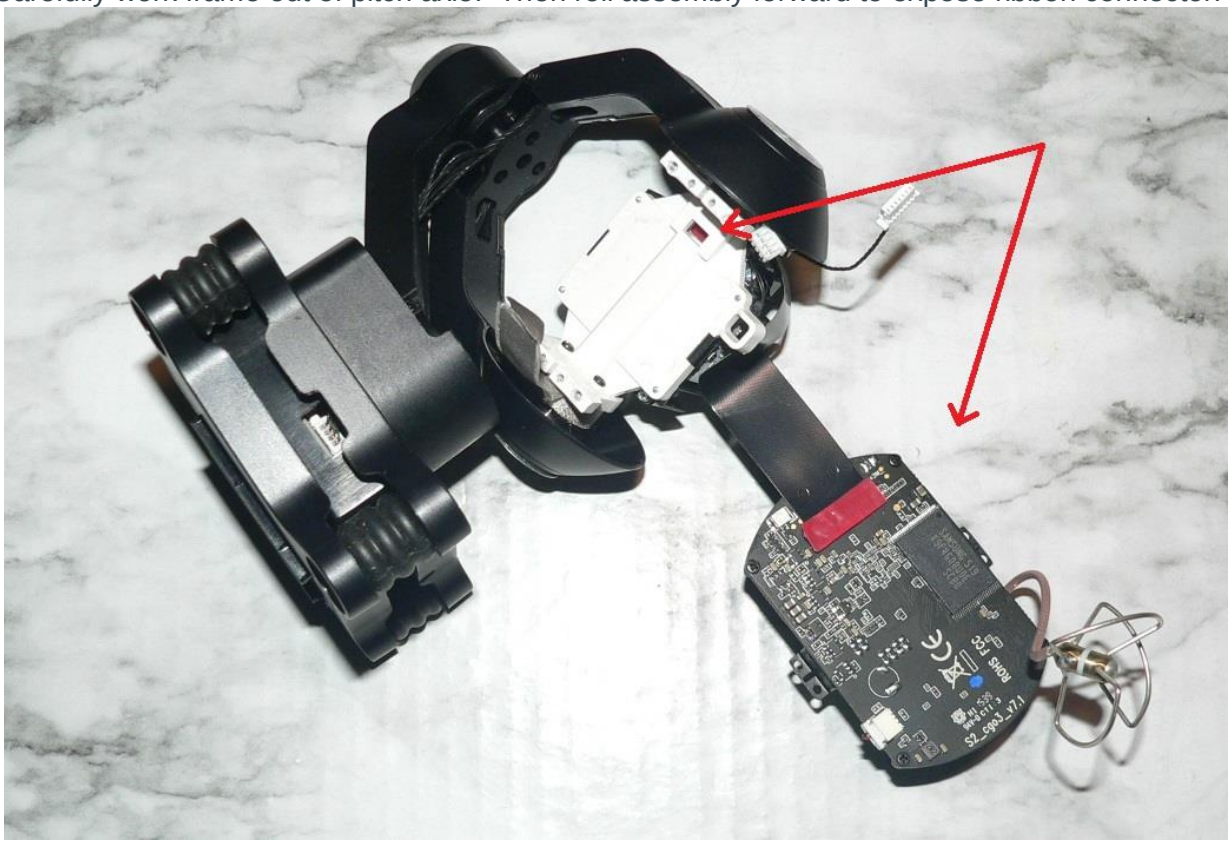
Attachment 9
CGo3 Core Assembly Replacement

12). Remove the 4 frame mount screws:



NOTE: The frame is a tight fit, and includes alignment features. It may not come out freely.

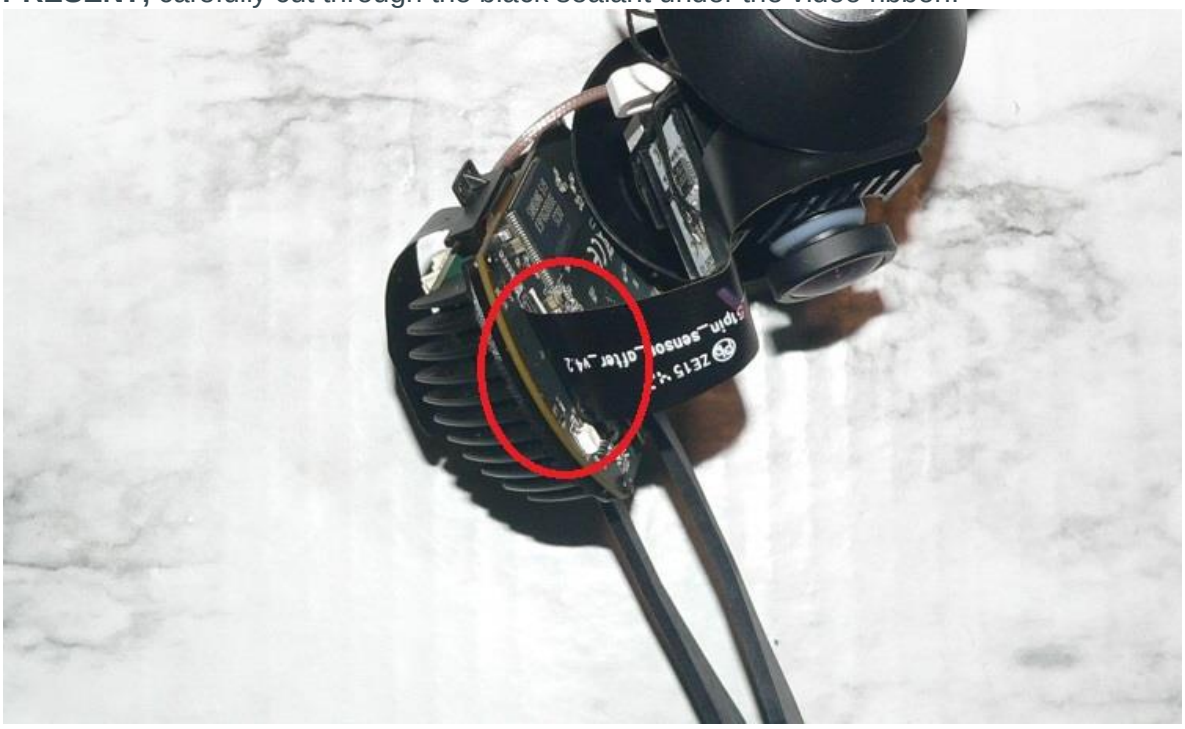
13). Carefully work frame out of pitch axle. Then roll assembly forward to expose ribbon connector:



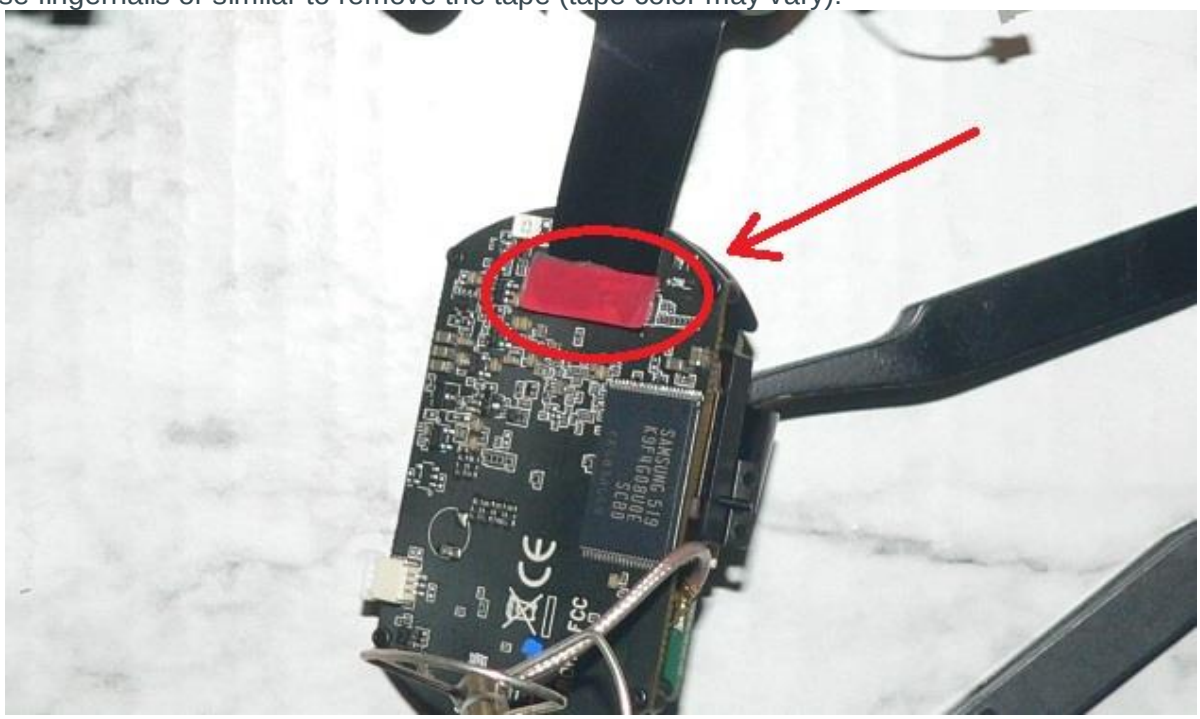
Attachment 9
CGo3 Core Assembly Replacement

CAUTION: Some cameras have black sealant under the video ribbon. Attempts to pull the ribbon out of the sealant will result in permanent damage to the ribbon connector and loss of the board. The sealant must be carefully cut through using a thin blade hobby knife or similar. Keep the blade flat, close to the board, and parallel with the board.

14). **IF PRESENT,** carefully cut through the black sealant under the video ribbon:

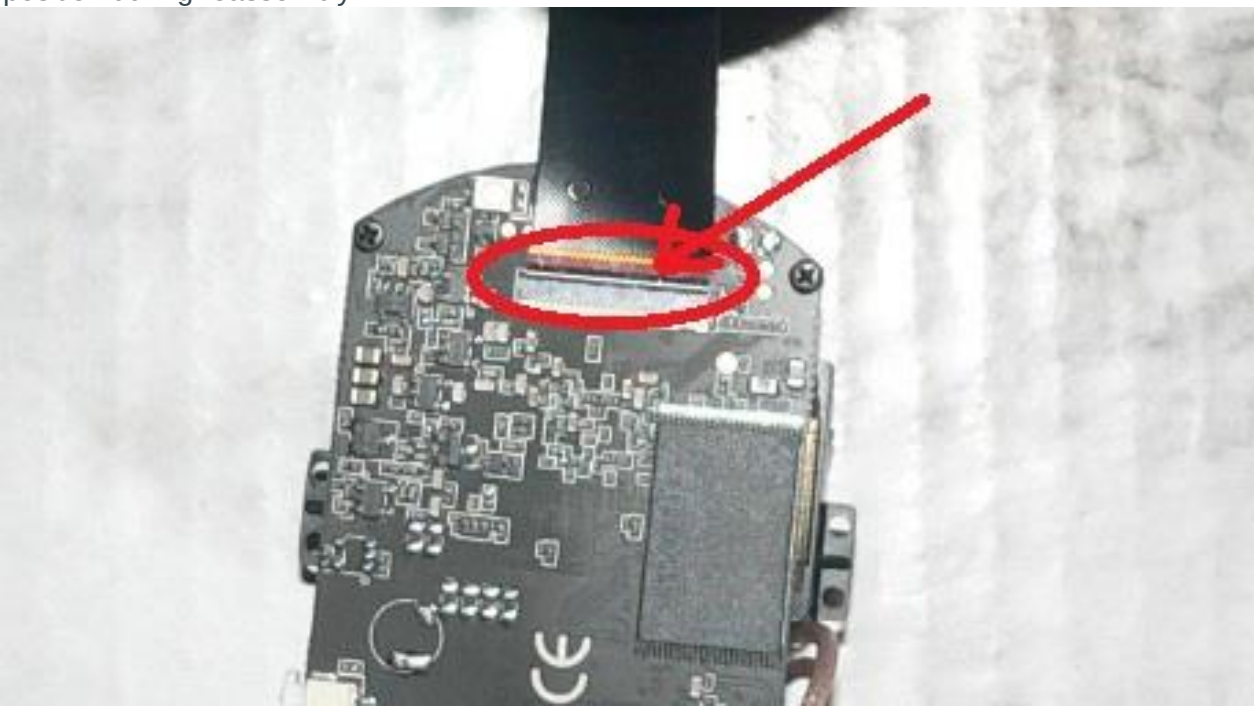


15). Use fingernails or similar to remove the tape (tape color may vary):

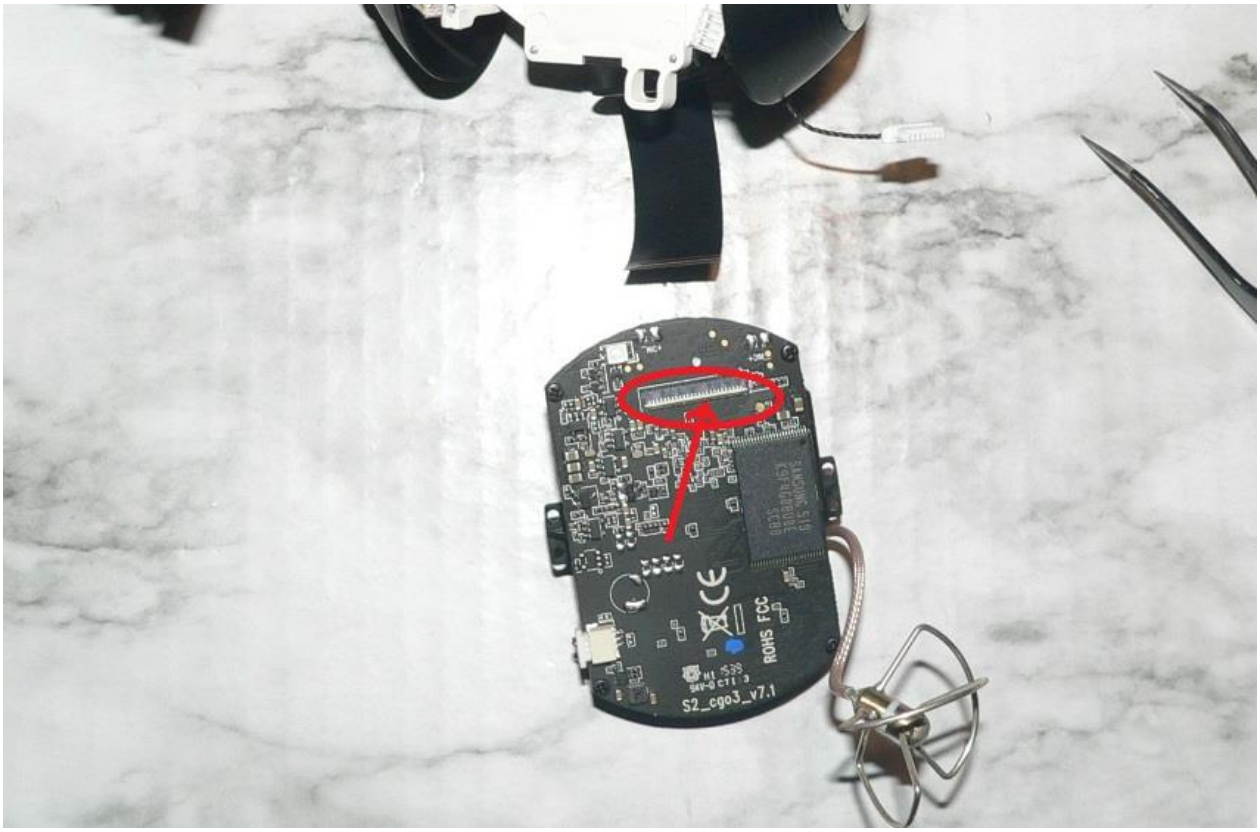


Attachment 9
CGo3 Core Assembly Replacement

16). Carefully note the position and alignment of the white line (ribbon marker). It must be returned to this position during reassembly:



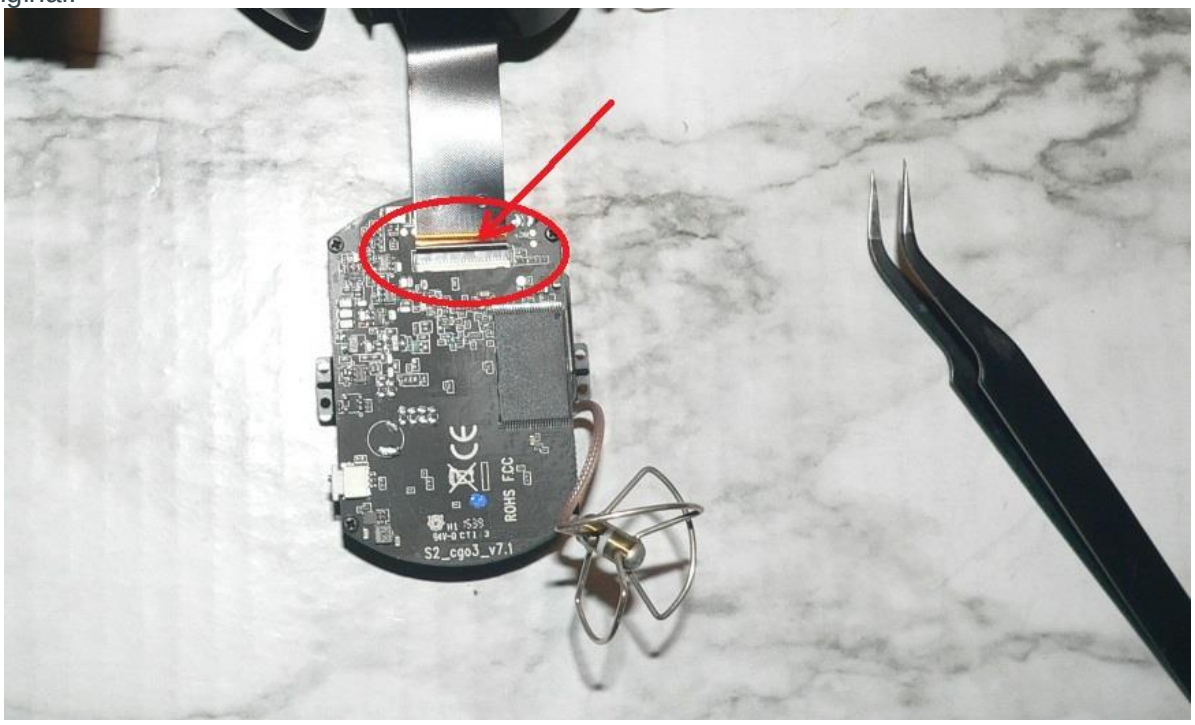
17). Lift the white (color may vary) ribbon lock to release the ribbon, and slide the ribbon out of the connector:



Attachment 9
CGo3 Core Assembly Replacement

18). Remove old assembly from work are to avoid any possibility of confusion.

19). Insert ribbon into new assembly. Ensure alignment mark is straight and in the same position as original:



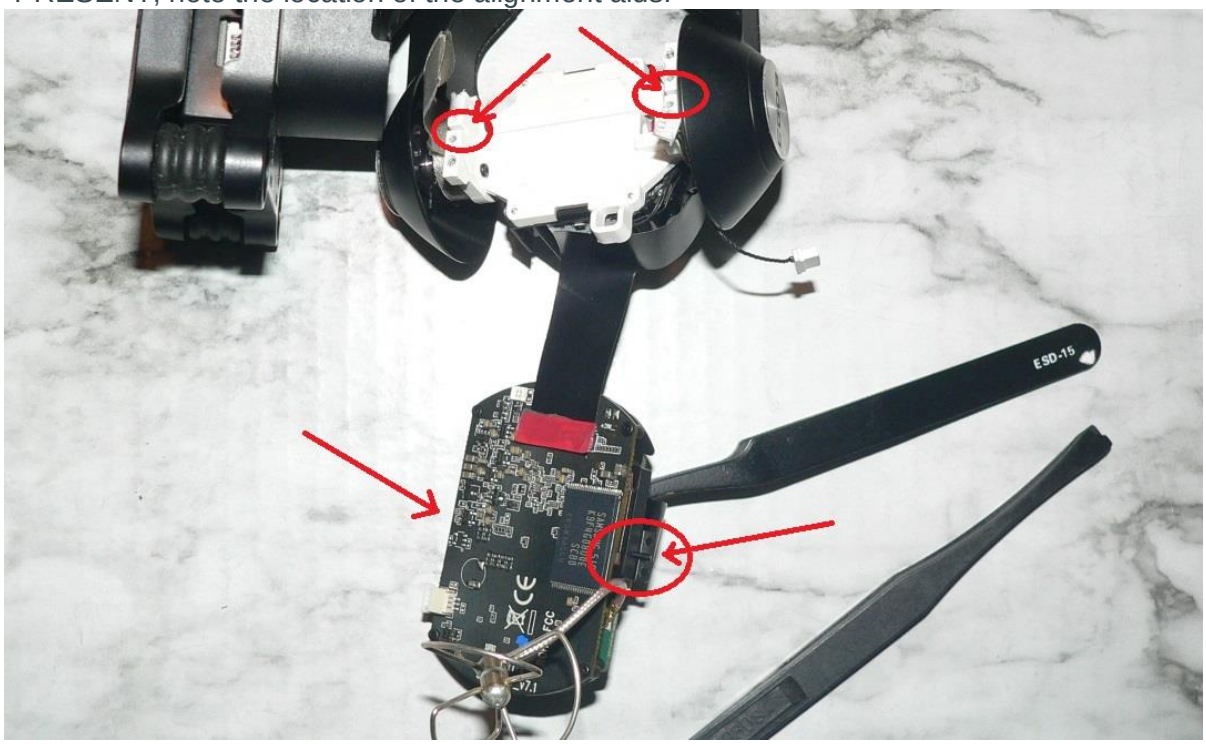
20). Close the ribbon lock to secure ribbon.

21). Install Tape over ribbon connector:

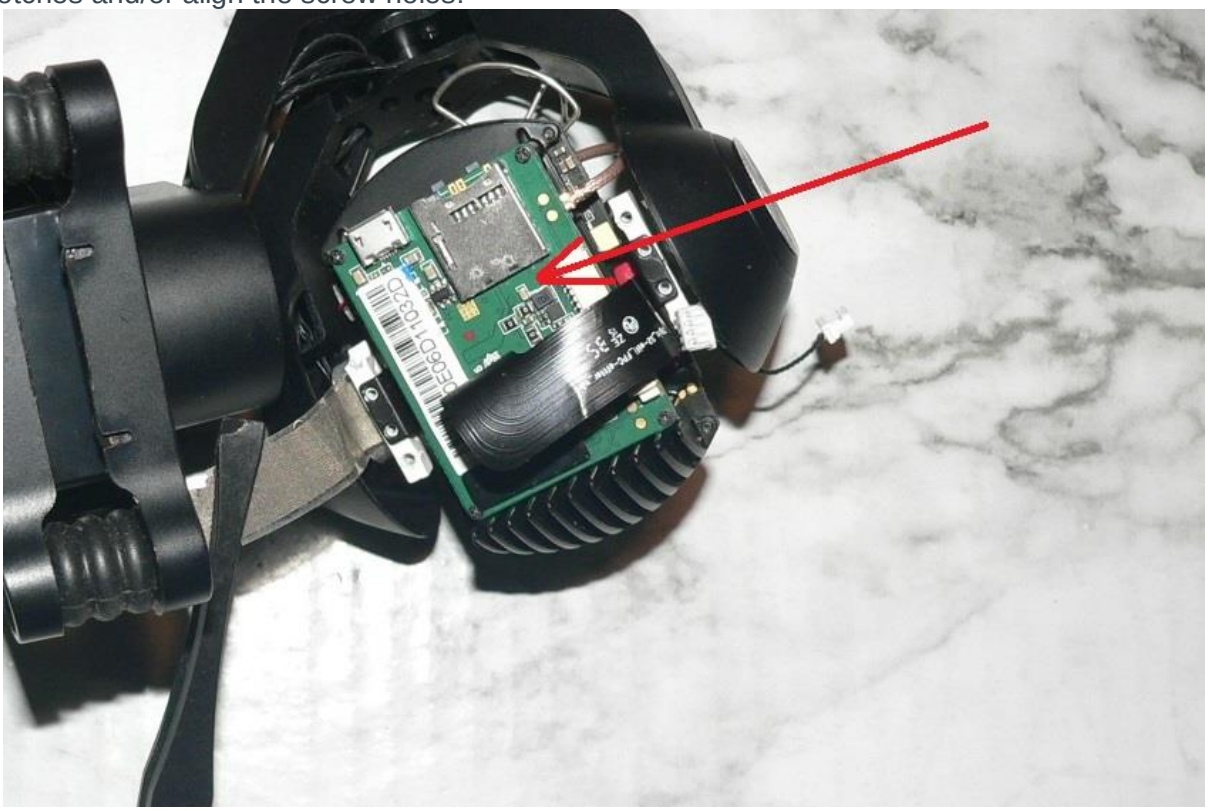
Attachment 9
CGo3 Core Assembly Replacement

NOTE: Not all cameras have the alignment aids.

22). IF PRESENT, note the location of the alignment aids:

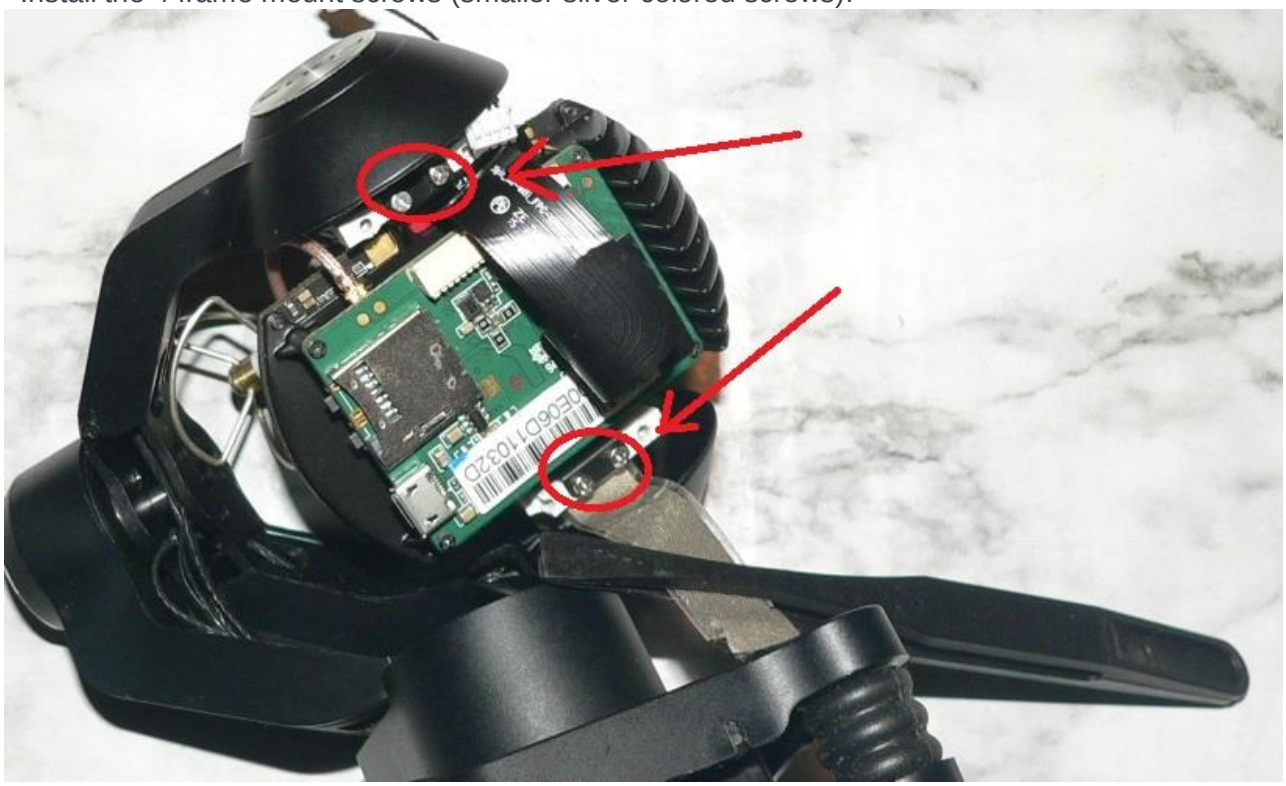


23). Fold the assembly back into the pitch axle. Carefully work the assembly down into the alignment notches and/or align the screw holes:



Attachment 9
CGo3 Core Assembly Replacement

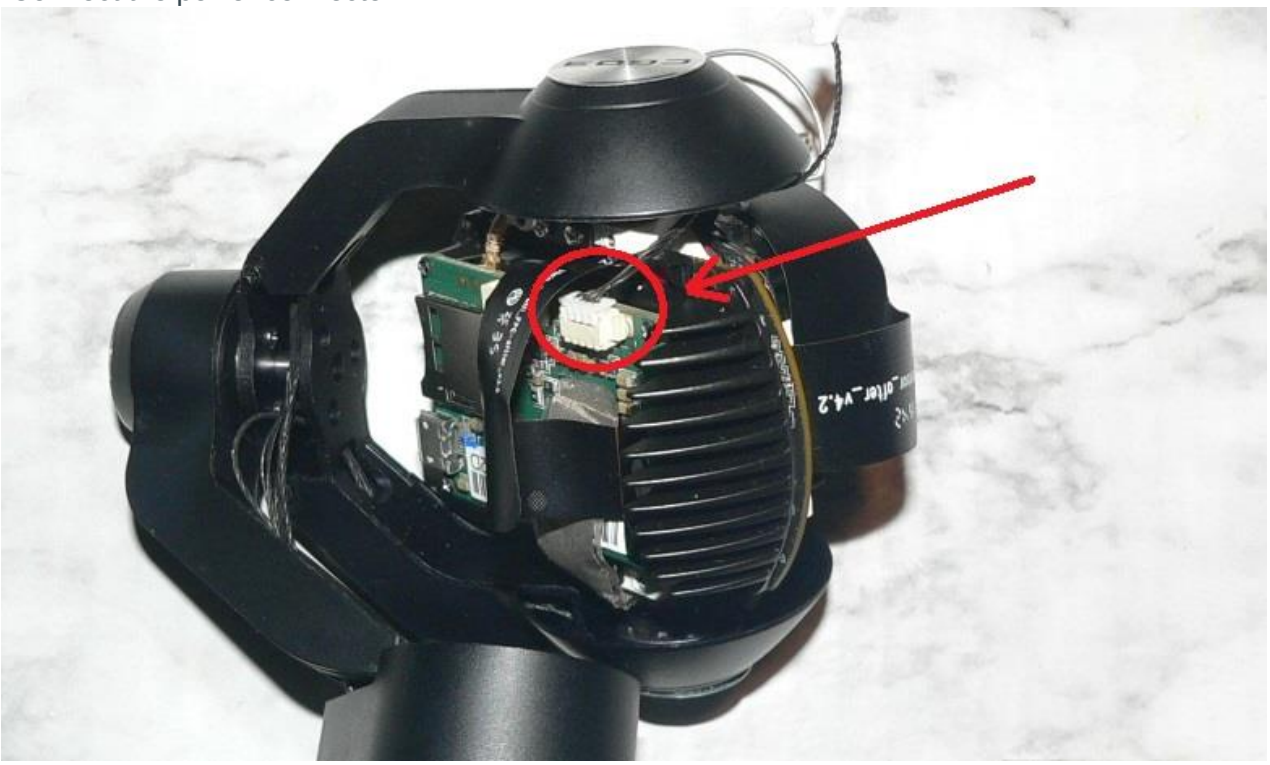
24). Install the 4 frame mount screws (smaller silver colored screws):



25). **IF PRESENT,** install the heat sink strap:

Attachment 9
CGo3 Core Assembly Replacement

26). Connect the power connector:



27). **IF PRESENT,** ensure wire runs under the WIFI ribbon, and connect the 7 pin connector:

Attachment 9
CGo3 Core Assembly Replacement

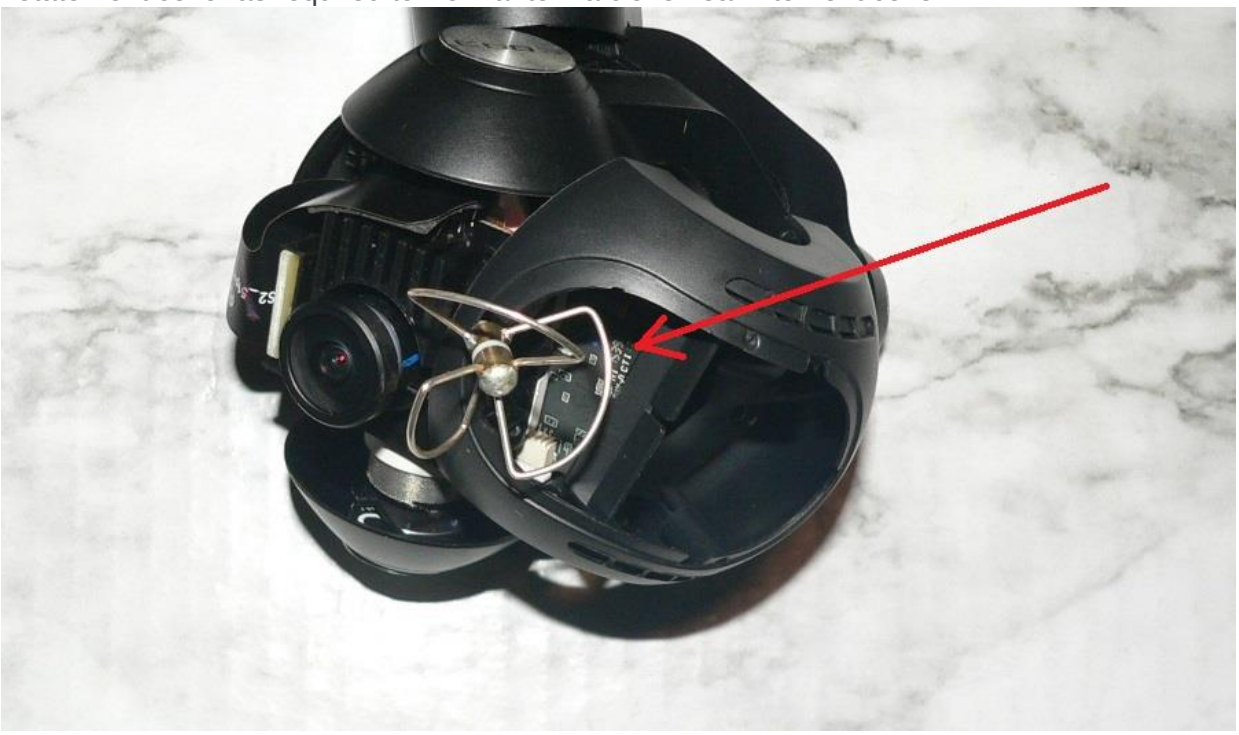
28). OPTIONAL STEP: Power camera up to ensure function prior to completing assembly. (Some gimbal motor whine is normal with covers removed.)

29). Align rear cover over the USB and SD card connectors. Slide cover slightly back to align rear cover with mounting screw holes:

30). Install the four rear cover mounting screws (larger silver colored screws):

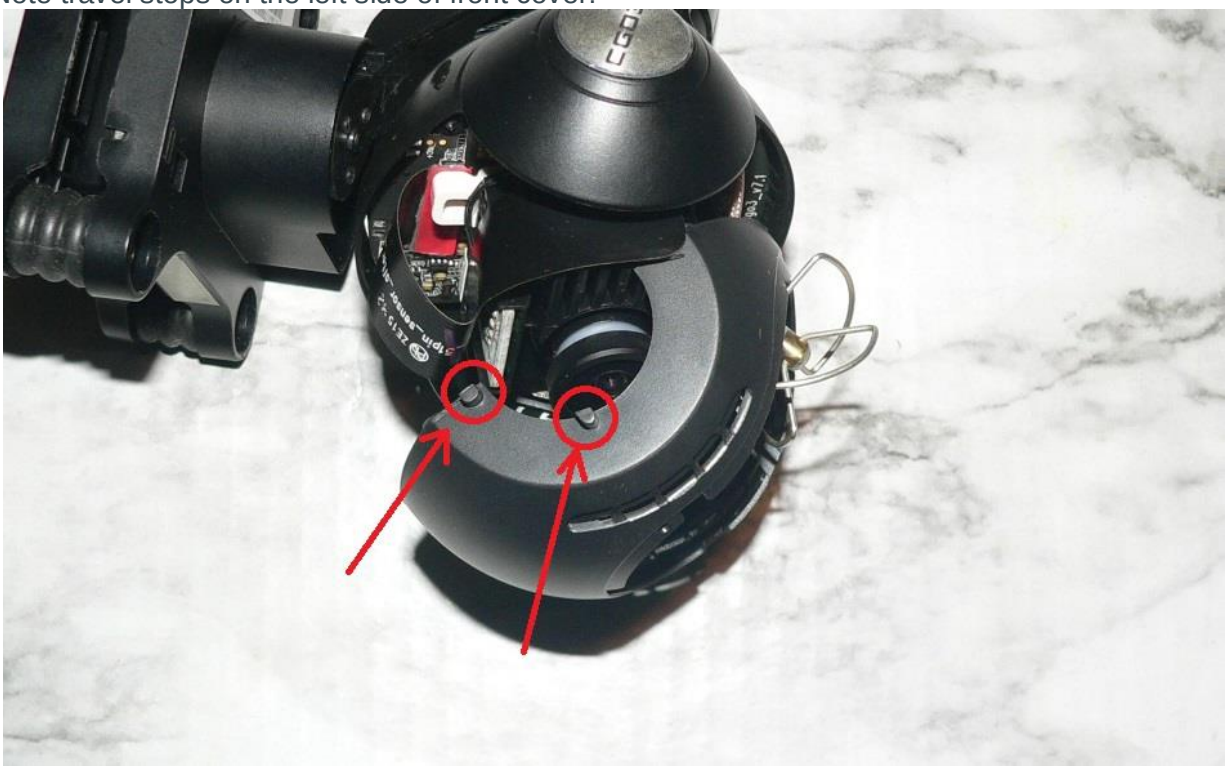
Attachment 9
CGo3 Core Assembly Replacement

31). Rotate front cover as required to work antenna clover leaf into front cover.



32). **IF PRESENT,** install microphones into microphone holders of front cover.

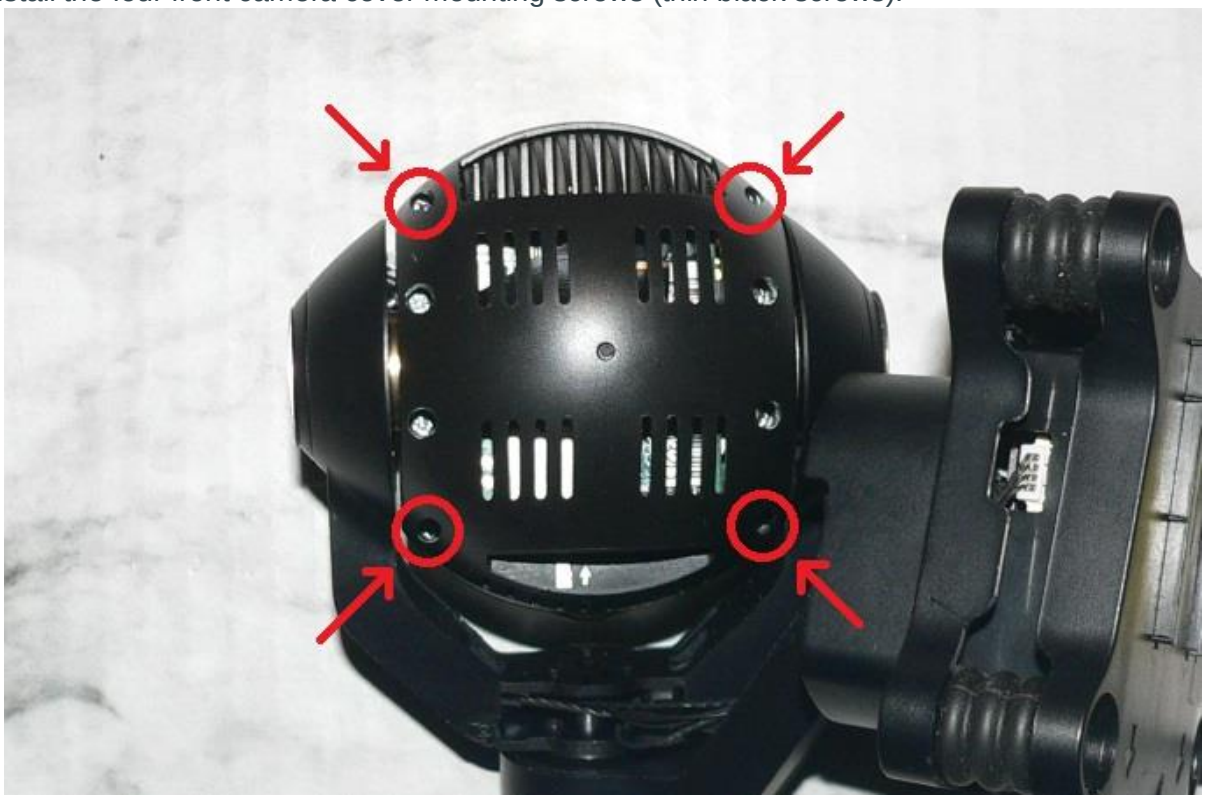
33). Note travel stops on the left side of front cover:



Attachment 9
CGo3 Core Assembly Replacement

34). Work travel stops under left arm cover, then work front camera cover into normal position:

35). Install the four front camera cover mounting screws (thin black screws):



Attachment 9
CGo3 Core Assembly Replacement

36). Secure one arm of antenna clover into notch of support bar: Ensure edge of next leaf is in notch at lower left of opening:

37). Install camera nose piece:

38). Install lens filter:

Attachment 9
Addendum 1
CGo3 Heat Sink Variations

CGo3 Heat Sink Variations

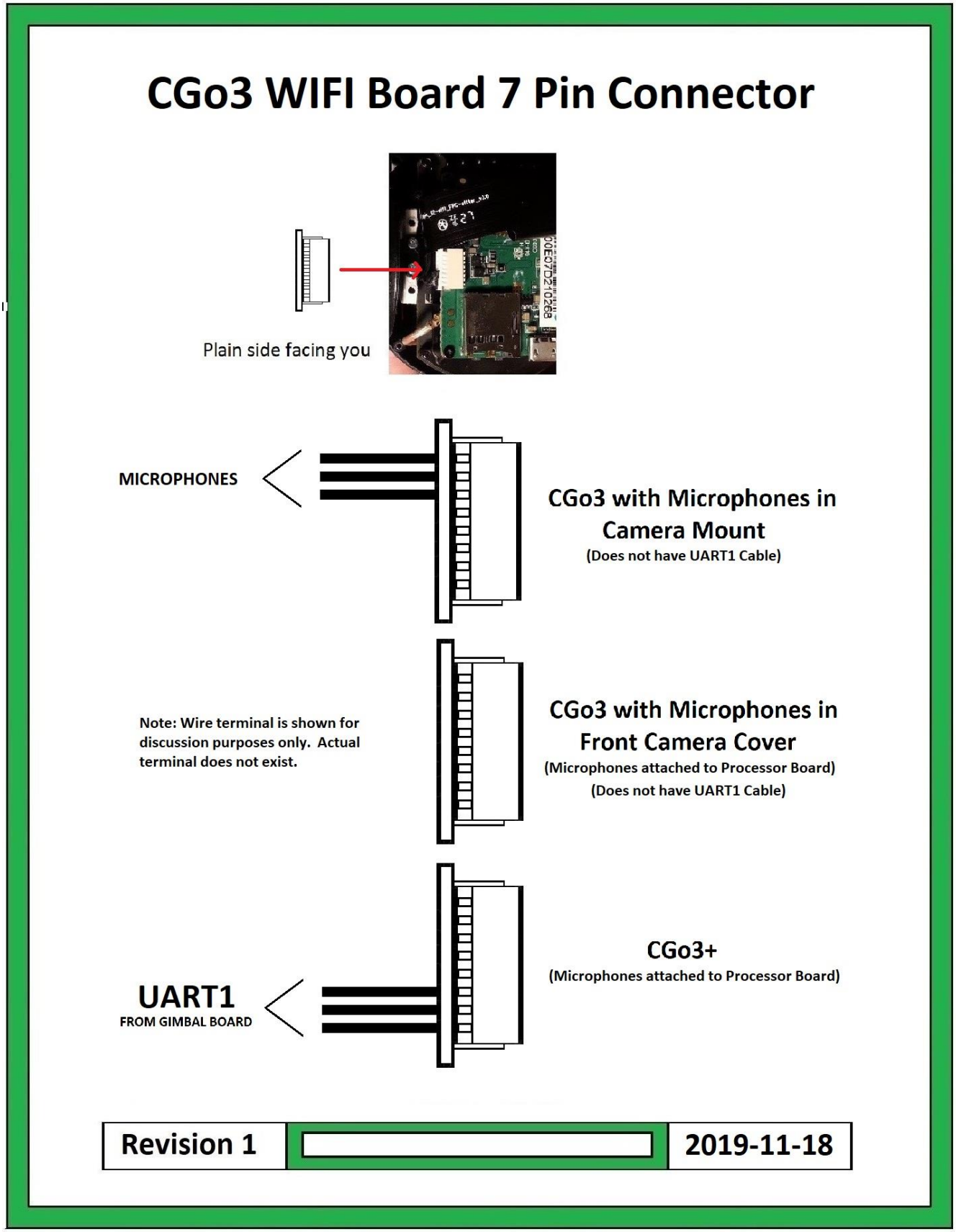
No Strap

Adhesive Strap

Anchor and Thermal Paste

Revision 1		2019-11-19

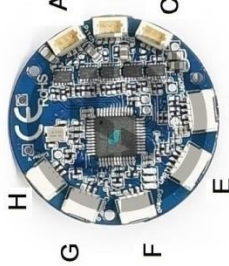
Attachment 9
Addendum 2
CGo3 WIFI Board 7 Pin Connector



Attachment 10
CGo3+ Gimbal Board Connections

CGo3+ Gimbal Board Connections

Front of Camera



Rear of Camera

A. PITCH (TILT) MOTOR (Motor on right side of camera).
B. ROLL MOTOR (Motor on rear of Camera)
C. YAW MOTOR (Motor on top of camera)
D. 4 pin plug with **4** wires attached. (Camera IMU)
E. 4 pin plug with only **3** wires attached. (7 Pin Connector on WiFi Board)
F. YAW POSITION SENSOR (Sensor on top of camera)
G. ROLL POSITION SENSOR (Sensor on rear of camera)
H. PITCH (TILT) POSITION SENSOR (Sensor on right side of camera).

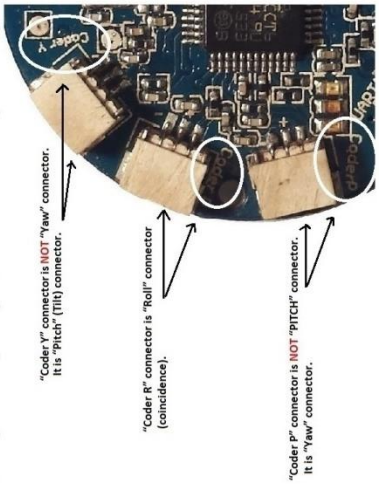
Front of Camera

Rear of Camera

I. SLIP RING CONNECTOR
J. POWER TO CAMERA (4 Pin connector on WiFi board)

SPECIAL CLARIFICATION:

Certain board markings have potential to create confusion. The markings include letters that might appear to correlate to "PITCH" (P), "ROLL" (R) and "YAW" (Y), but are in fact **NOT RELATED**. By coincidence, the connector marked with an "R" actually IS "Roll" (which just adds to the confusion.)



CG03+ ENCODER BEEP CODES

F. **YAW ENCODER**: Long, Long, short-short-short, pause, repeat.
G. **ROLL ENCODER**: Long, Long, short-short, pause, repeat.
H. **PITCH (TILT) ENCODER**: Long, Long, short, pause, repeat.

CG03+ Camera IMU Beep Code

Long, long, long, long, short, short, pause, repeat.

Revision 5 **2019-09-17**

Attachment 11
CGo3+ Yaw Encoder Access

Use of this information is at your own risk.

Purpose: To provide guidance to replace the CGo3+ Yaw encoder

Introduction: You are going to be working with some thin plastic, small screws and flimsy wire. The words "patience", "careful" and "gently" should govern your work for this project. You will also be touching some electronic components. You need to be mindful of static electricity. An antistatic wrist band, or some sort of grounding are advised. At the very least, ensure you touch something else on the camera BEFORE you touch any of the sensitive components. READ THROUGH THIS FIRST. If you don't feel confident, then don't do it. You can mess your camera up pretty easily with this.

With the nagging aside, here is a way to access the CGo3+ Yaw Encoder:

1). Use your fingernails or something thin to pry the label off the rear motor cover. It is held on by contact cement, and if you keep both sides clean, it will go right back on.

2). Remove THESE TWO screws from the rear motor cover. (leave the other two alone for now)

Attachment 11
CGo3+ Yaw Encoder Access

3). Remove these screws from BOTH sides of the rear arm cover:

4). Snap off the gimbal board lower cover, and carefully work it out over the gimbal wire connectors:

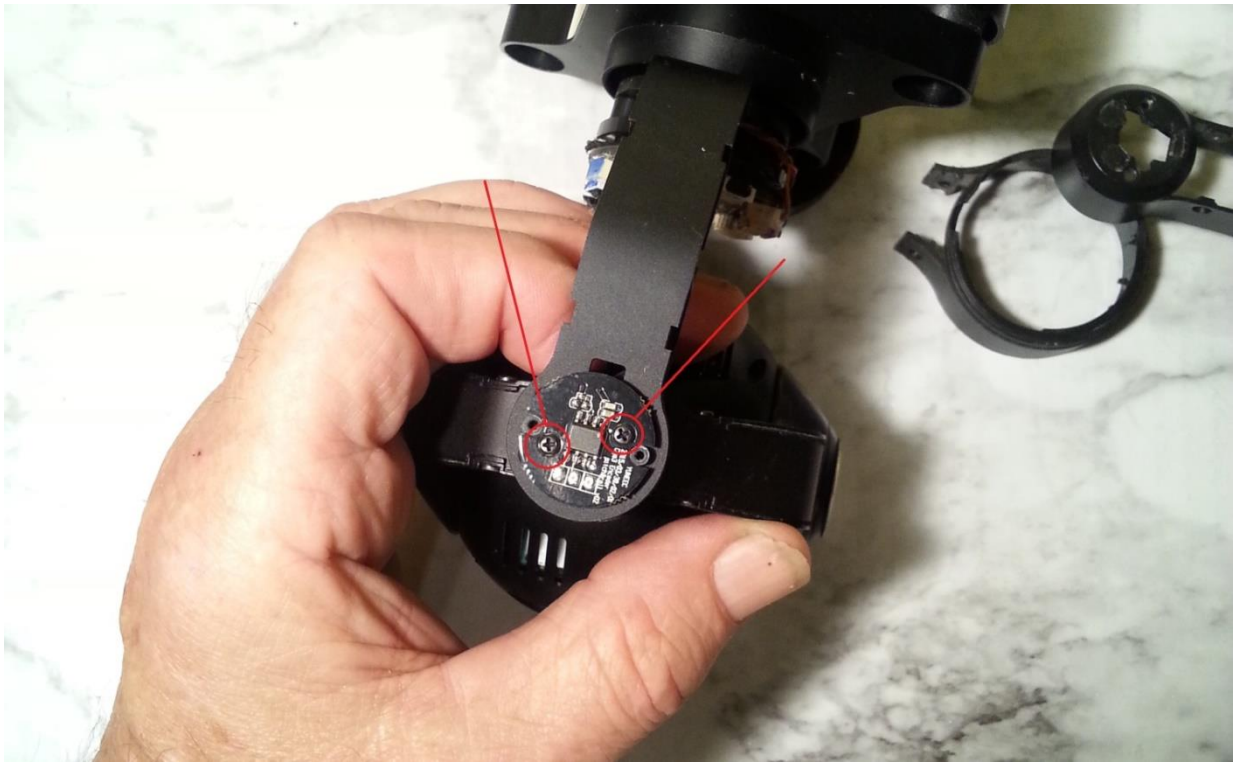
Attachment 11
CGo3+ Yaw Encoder Access

5). Carefully pry the corners out, and remove the gimbal board guard:

6). Remove the rear arm cover:

Attachment 11
CGo3+ Yaw Encoder Access

7). Remove the two screws holding the roll encoder:

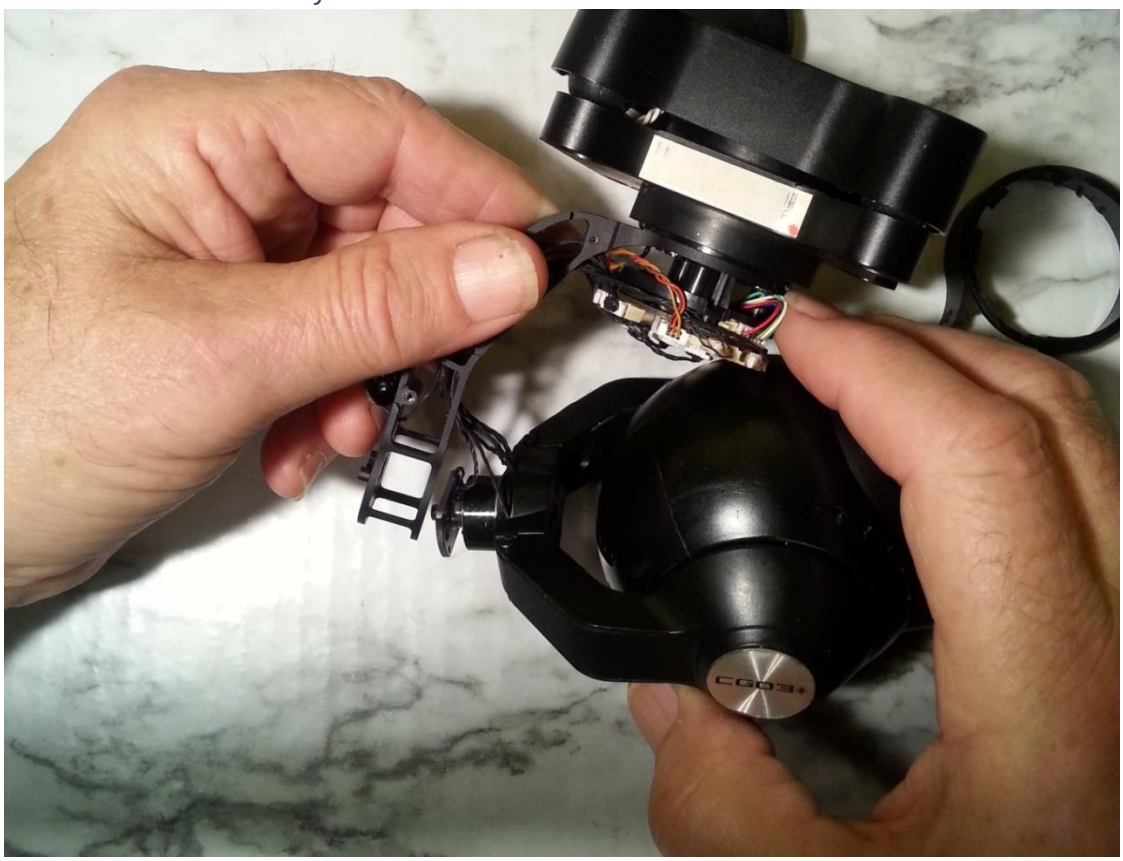


8). Carefully tilt the roll encoder out of the way:

Attachment 11
CGo3+ Yaw Encoder Access

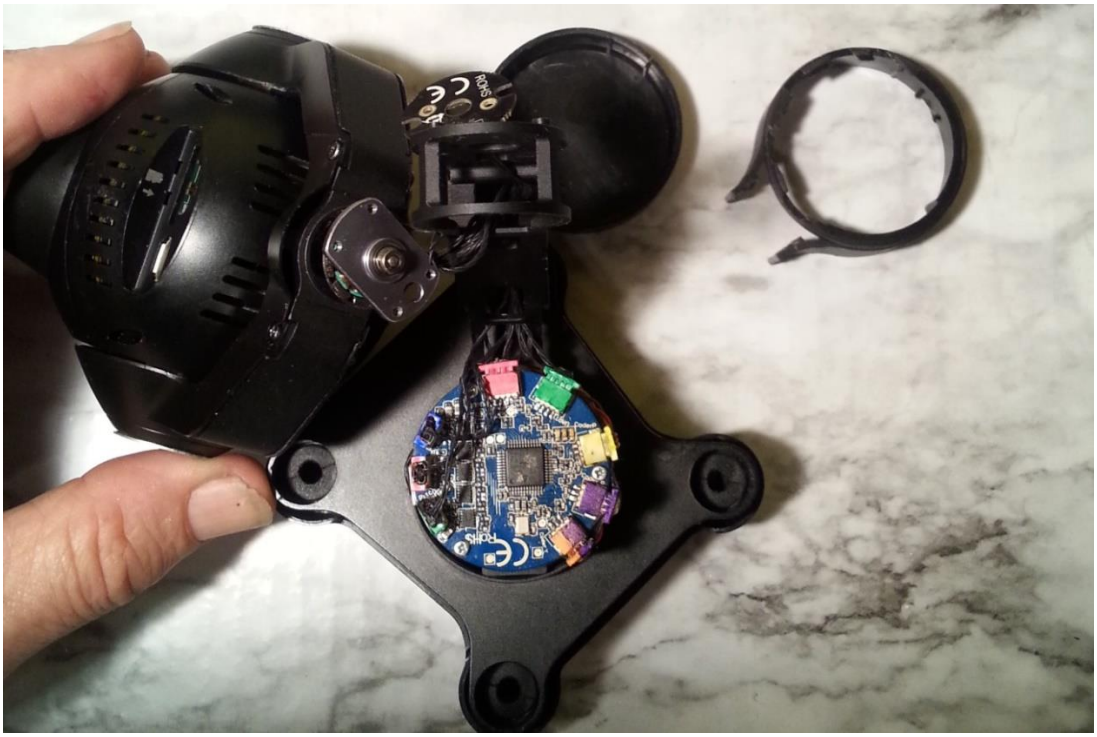
9). Remove the four roll motor screws:

10). Slide the roll motor / camera yoke out of the rear arm:

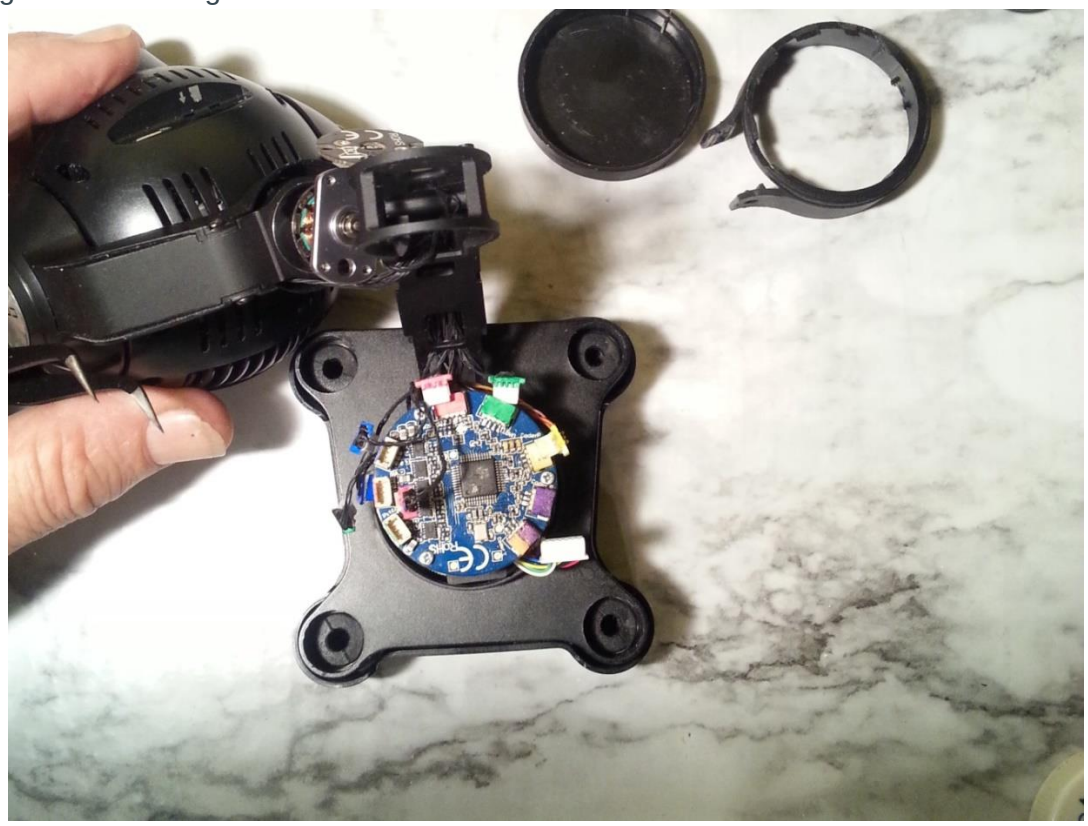


Attachment 11
CGo3+ Yaw Encoder Access

11). Color code ALL accessible gimbal board connectors:

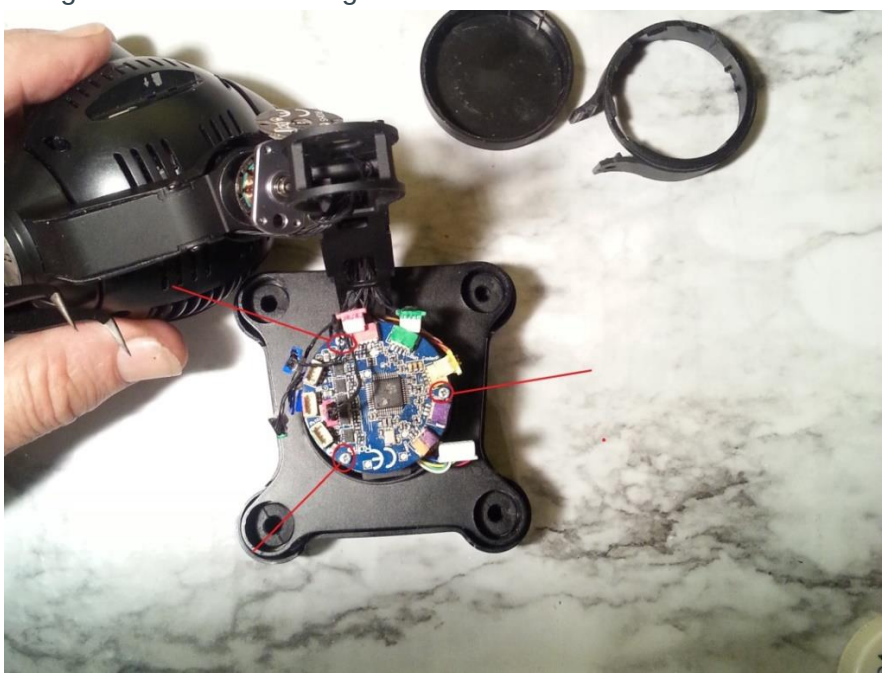


12). Unplug all accessible gimbal board connectors:



Attachment 11
CGo3+ Yaw Encoder Access

13). Remove the three gimbal board mounting screws:

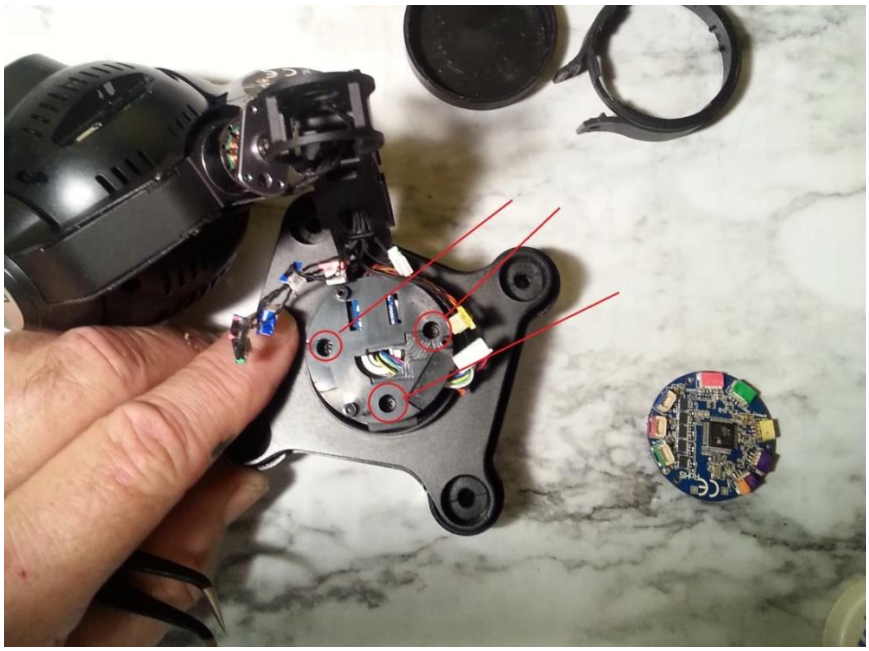


14). Lift out gimbal board.

15). Color code remaining gimbal board connectors,

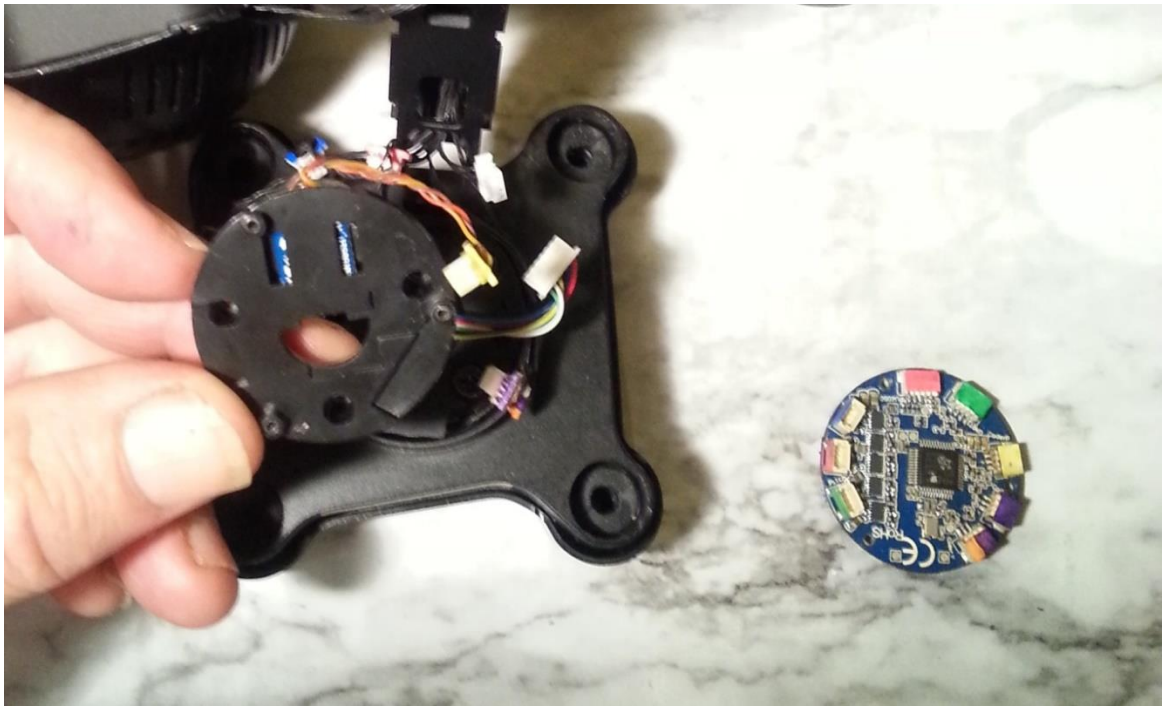
16). Unplug remaining gimbal board connectors,

17). Remove the three gimbal board support mounting screws:



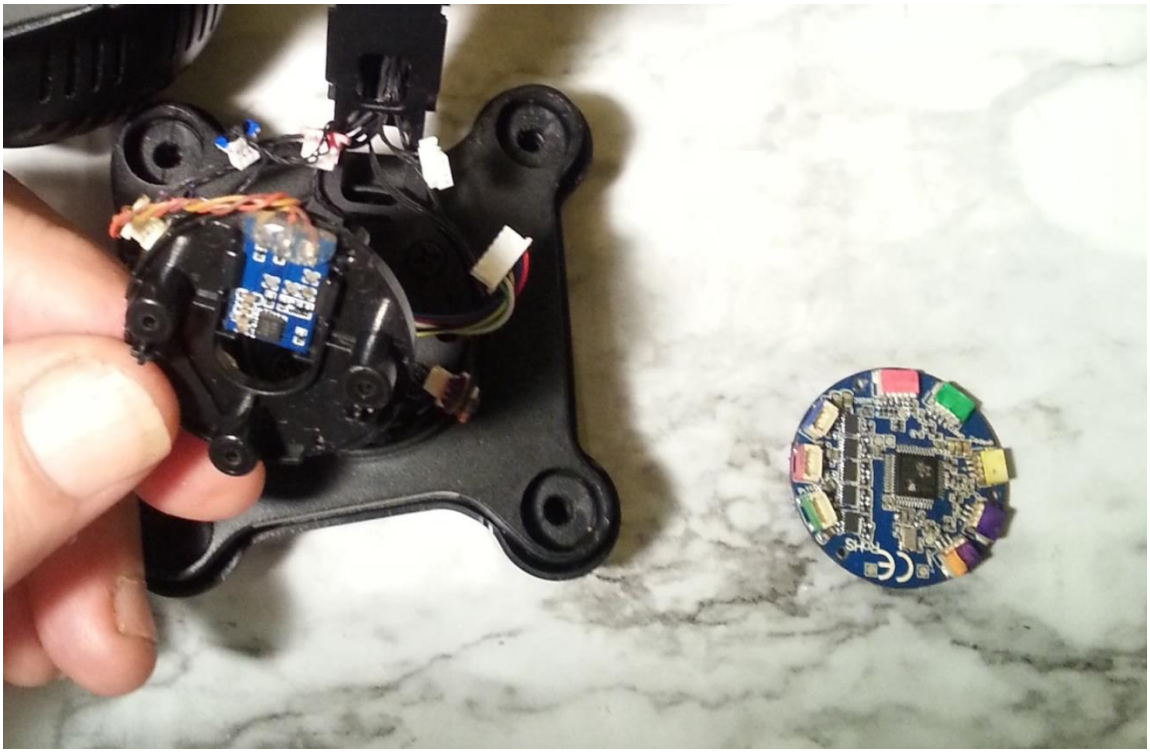
Attachment 11
CGo3+ Yaw Encoder Access

18). Lift the gimbal board support from the frame:



NOTE: This camera has repairs. Wire color, sealant color and general appearance will be different on an OEM assembly.

19). The Yaw Encoder is mounted on the back of the gimbal board support:



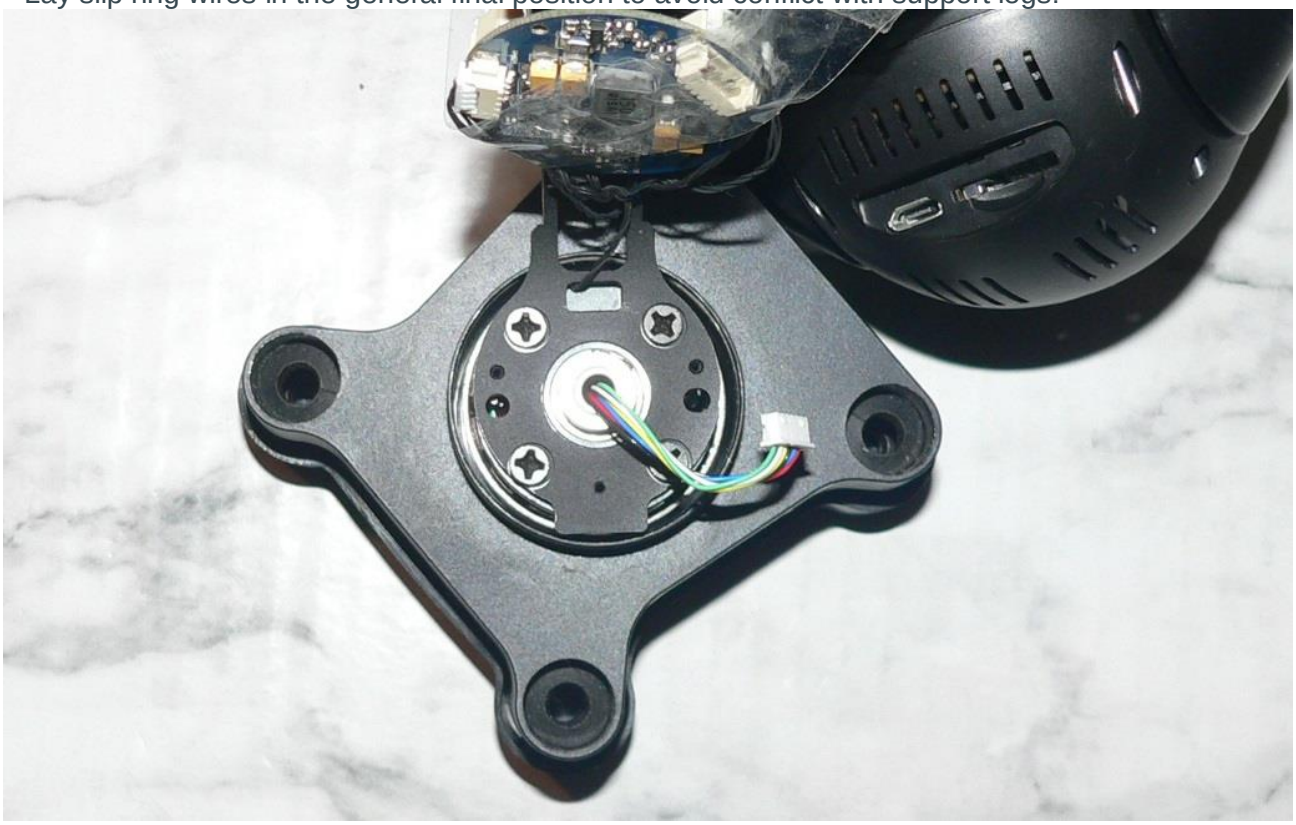
Attachment 11
CGo3+ Yaw Encoder Access

20). Remove old Yaw Encoder:

21). Install new Yaw Encoder:

Attachment 11
CGo3+ Yaw Encoder Access

22). Lay slip ring wires in the general final position to avoid conflict with support legs:

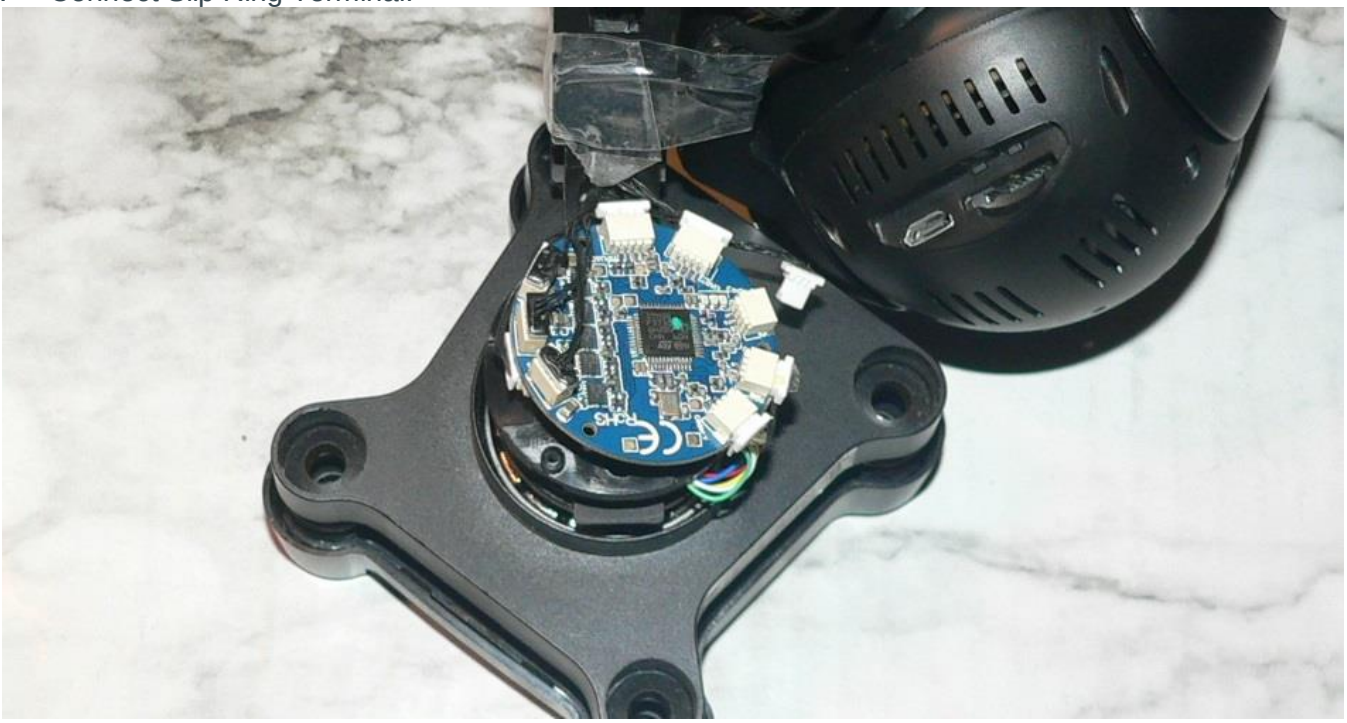


23). Install Gimbal Board / Yaw Encoder Support :

Attachment 11
CGo3+ Yaw Encoder Access

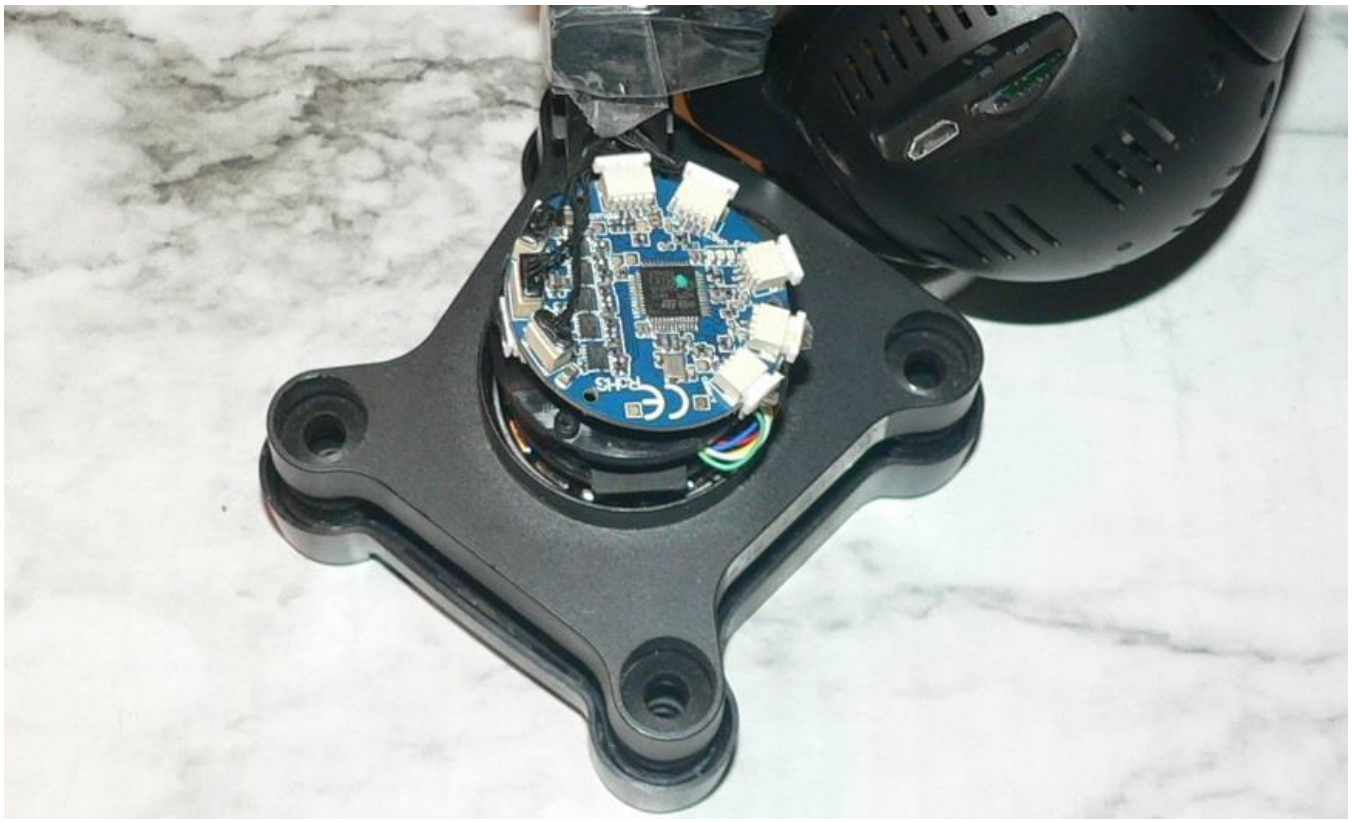
24). Remove temporary strap and lay gimbal board on support:

25). Connect Slip Ring Terminal:



Attachment 11
CGo3+ Yaw Encoder Access

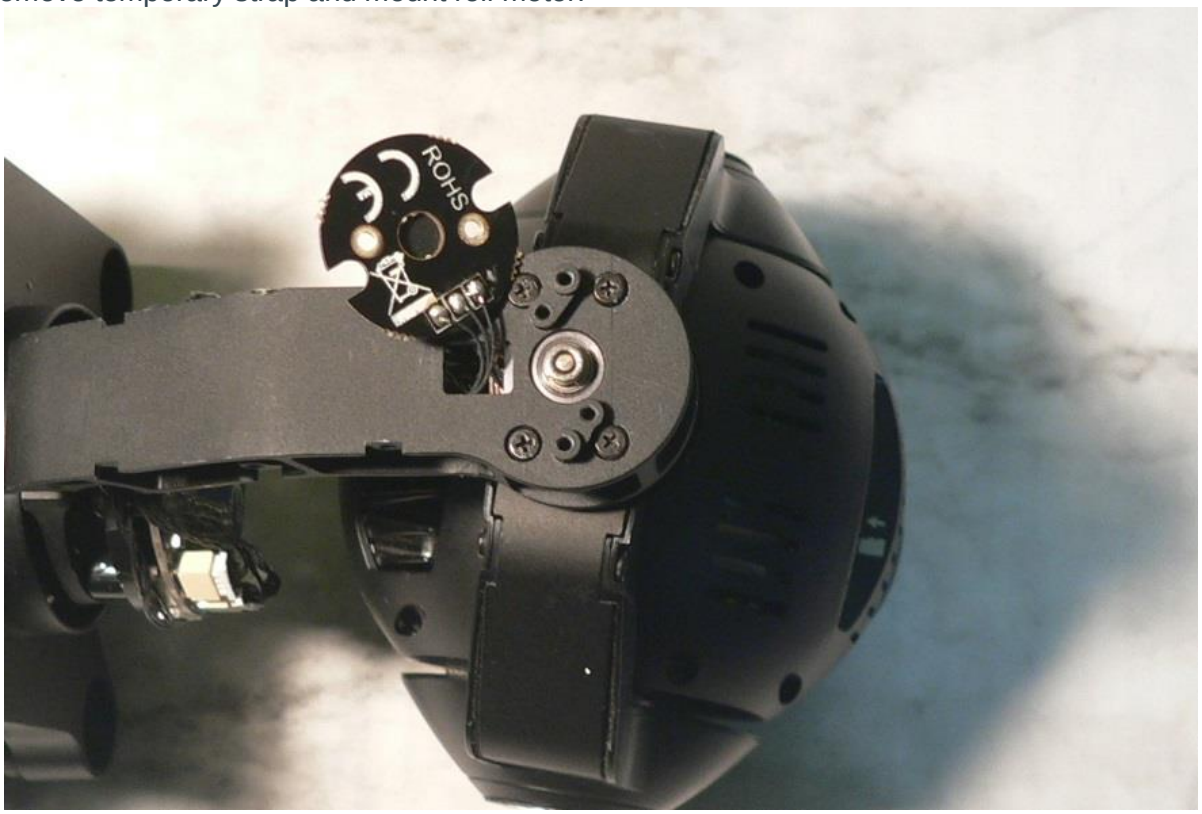
26). Connect Yaw Encoder terminal:



27). Mount Gimbal Board with three screws:

Attachment 11
CGo3+ Yaw Encoder Access

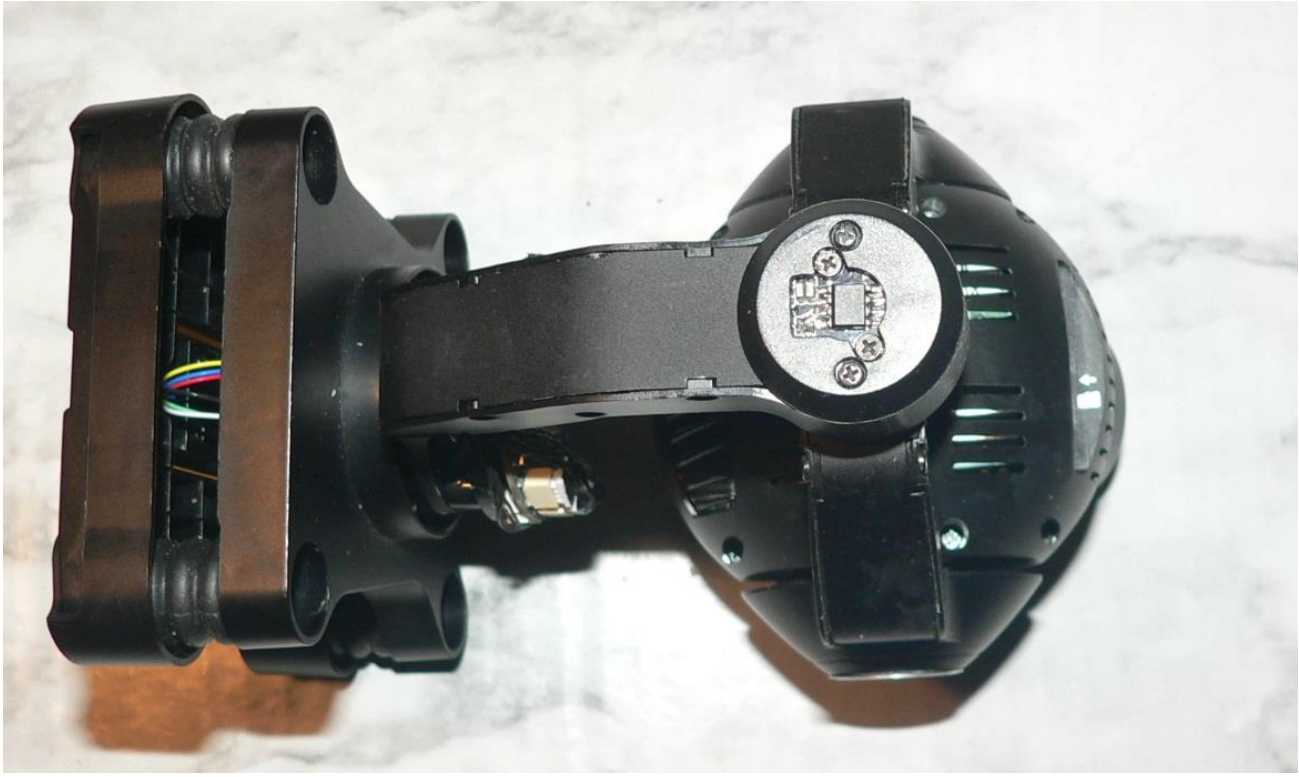
28). Remove temporary strap and mount roll motor:



29). Mount the roll encoder:

Attachment 11
CGo3+ Yaw Encoder Access

30). Install the rear arm cover and :rear screws



31). Install these three rear arm cover side screws on each side::

Attachment 11
CGo3+ Yaw Encoder Access

32). Install the gimbal board protector::

33). Install the gimbal board protector cap::

Attachment 11
CGo3+ Yaw Encoder Access

34). Install rear decoration:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

Use of this information is at your own risk.

1. Snap off the Gimbal Board Cover:

Note: Rotate camera as needed to maximize available clearance. Do not apply significant pressure. Work with the angles until the cover comes free with as little force as possible.

2. Carefully work the Gimbal Board Cover off, and set it aside.

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

3. Remove the two screws (one on each side) holding the Gimbal Board Enclosure to the rear arm:

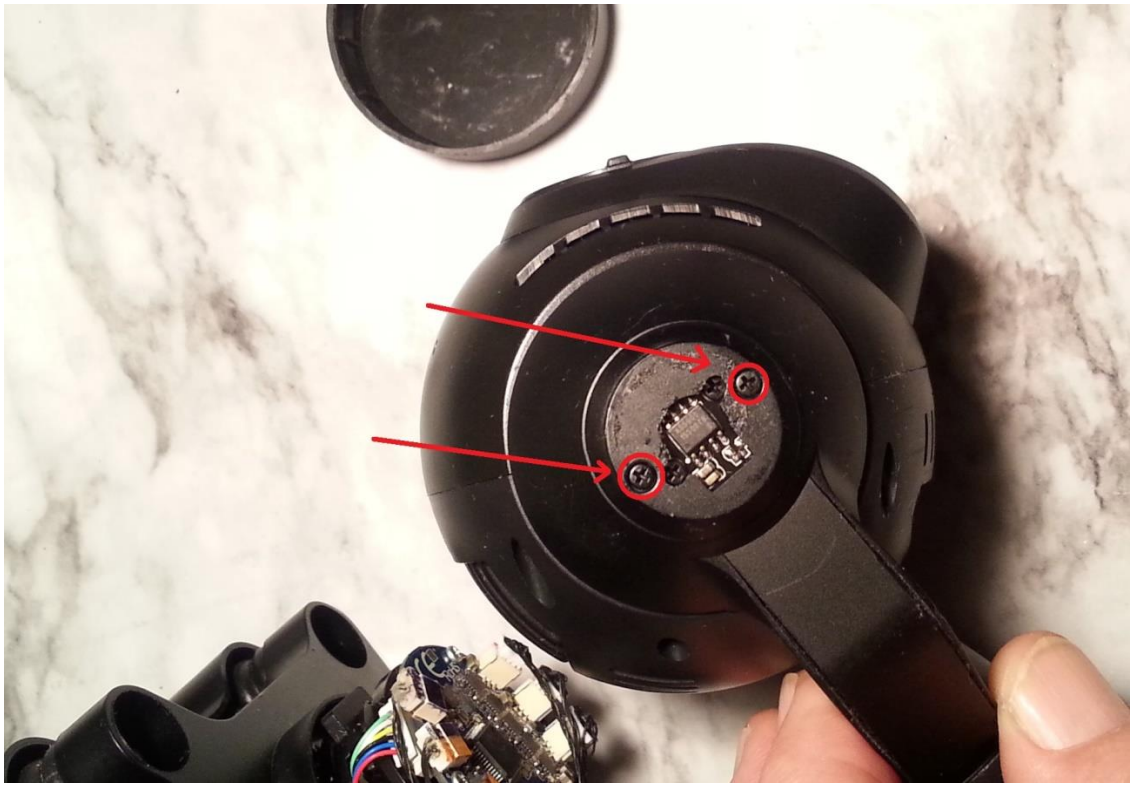
Note: Take full advantage of the gap in the enclosure to clear the connectors. Again, rotate camera as needed to maximize available clearance. Do not apply significant pressure. Work with the angles until the enclosure comes free with as little force as possible.

4. Remove cover:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

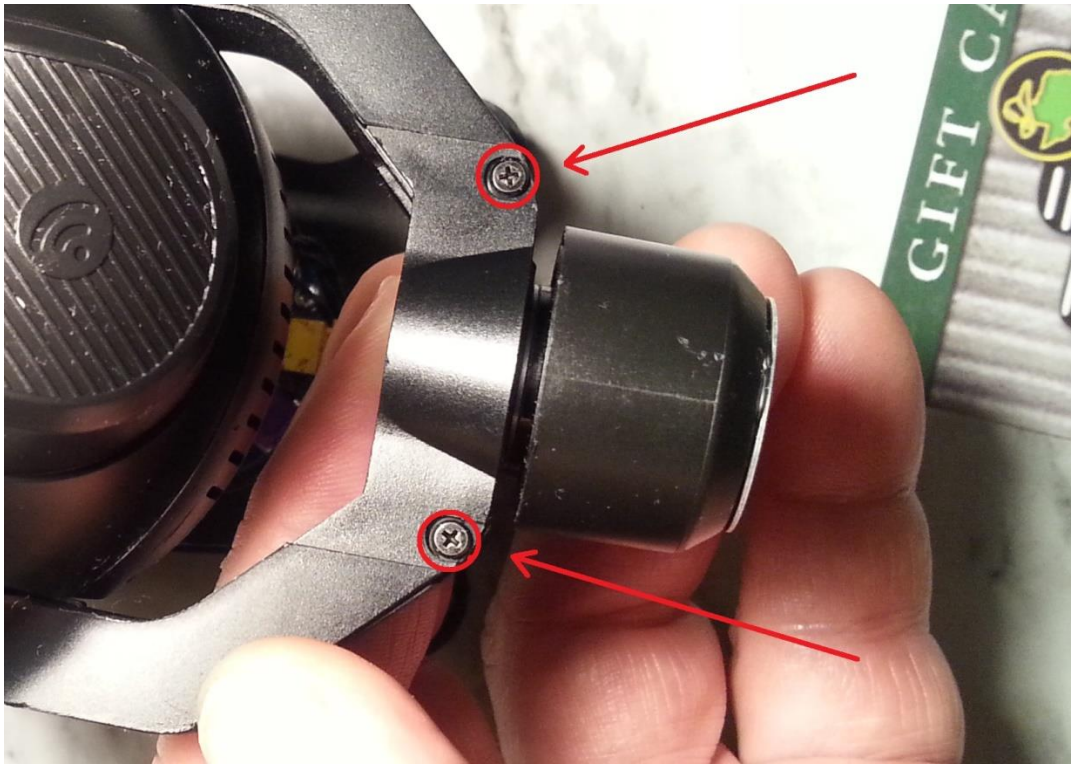
5. Use fingernails or thin plastic to remove the label over the Pitch (tilt) motor:

6. Remove these two screws. Leave the other two for now:



Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

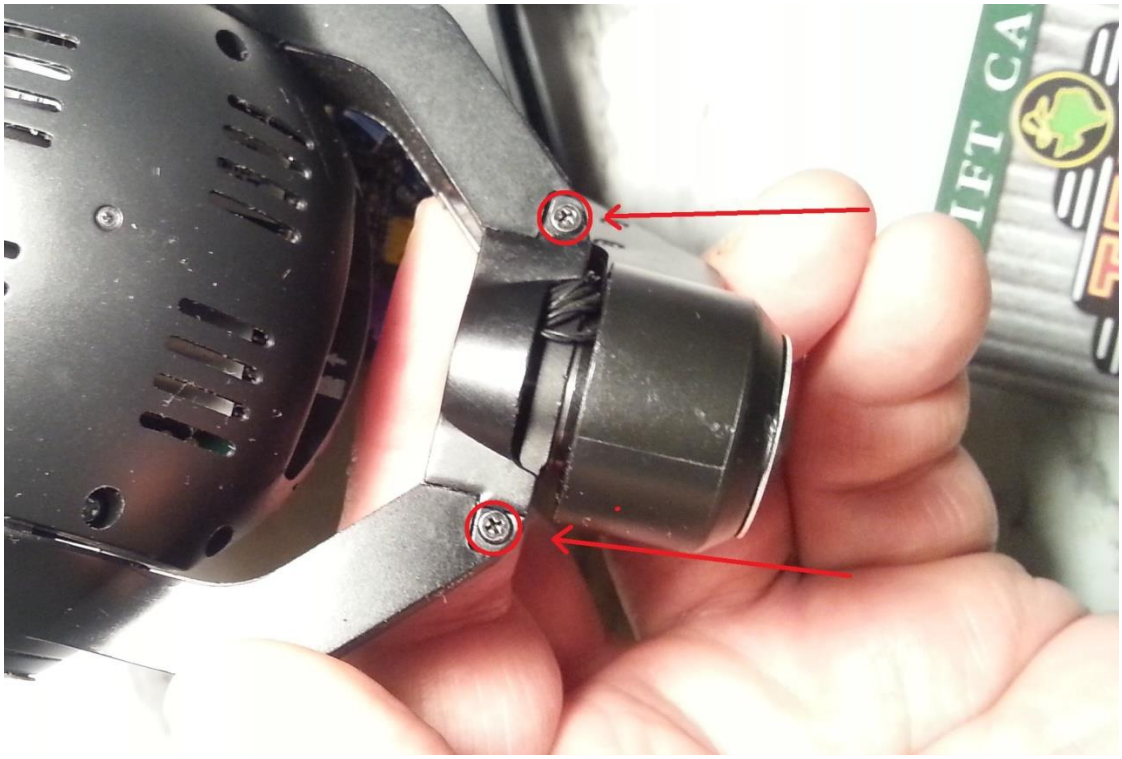
7. Remove the screws from the lower wire cover:



8. Remove the lower wire cover:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

9. Remove the screws from the Upper wire cover:



10. Remove the upper wire cover:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

11. Remove these screws from both sides of the rear arm cover:

12. Use fingernails or thin plastic to remove the label over the Roll motor:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

13. Remove these two screws. Leave the other two.

14. Spread the rear arm covers enough to clear the latch points:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

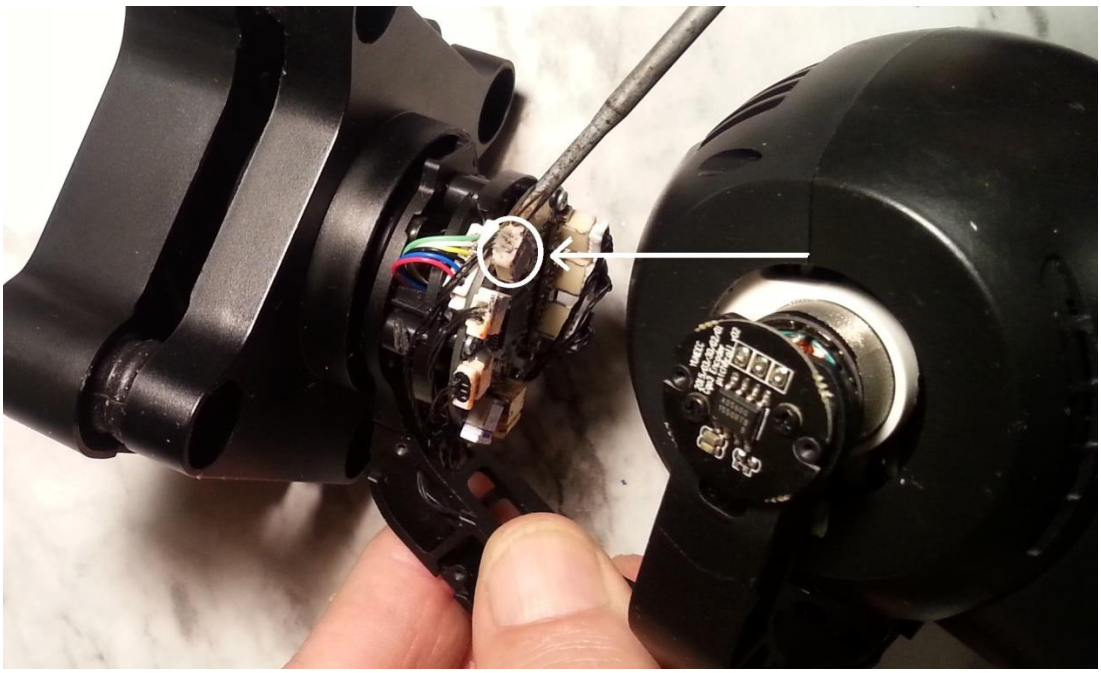
15. Remove the Rear Arm Cover:

16. Spread the pitch arm covers enough to clear the latch points:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

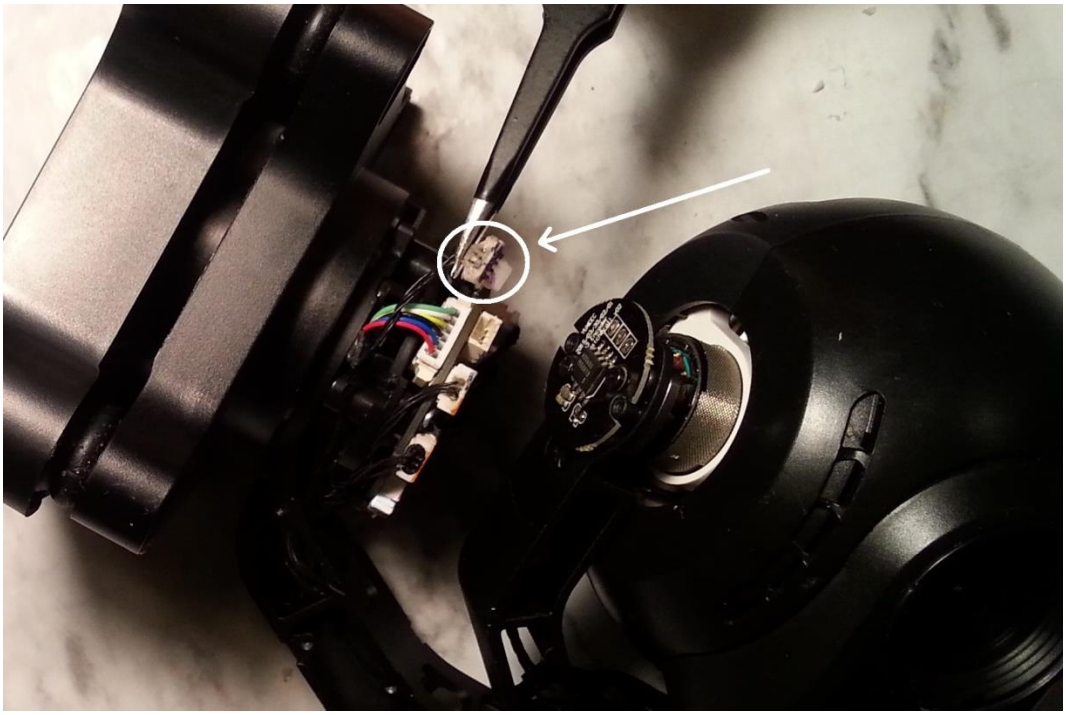
17. Remove the Pitch Arm Cover:

18. Locate the Pitch (tilt) Encoder connector:



Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

19. Unplug the Pitch (tilt) Encoder connector:

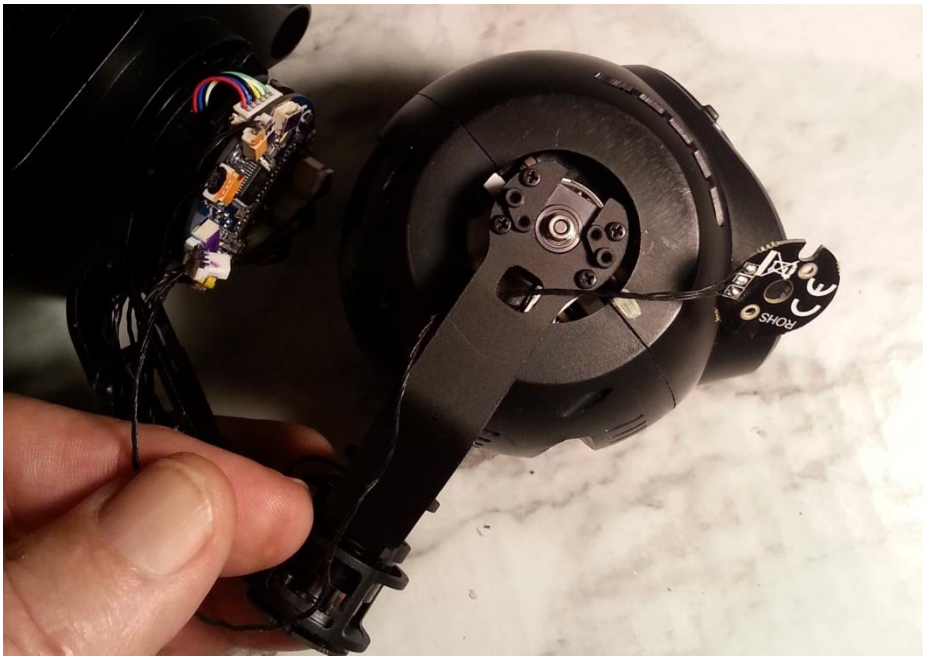


20. Remove the Pitch (tilt) encoder mounting screws:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

Note: Use caution to avoid damage to the encoder wire if there is any possibility you will need it later. This is a tedious task. Use of tools such as tweezers and dental picks can help.

21. Carefully thread the encoder wire out through the rear arm and pitch arm frames:

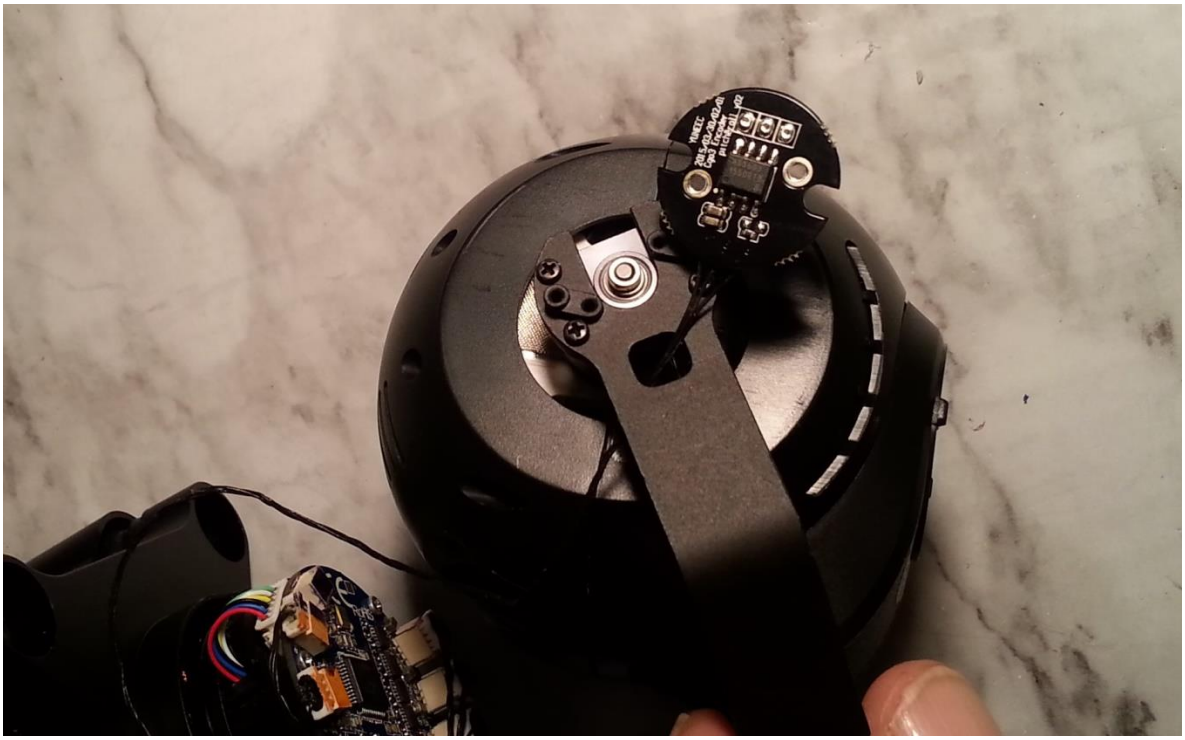


Note: The old encoder should be removed from the work area to avoid any possible confusion regarding which is the old and which is the new.

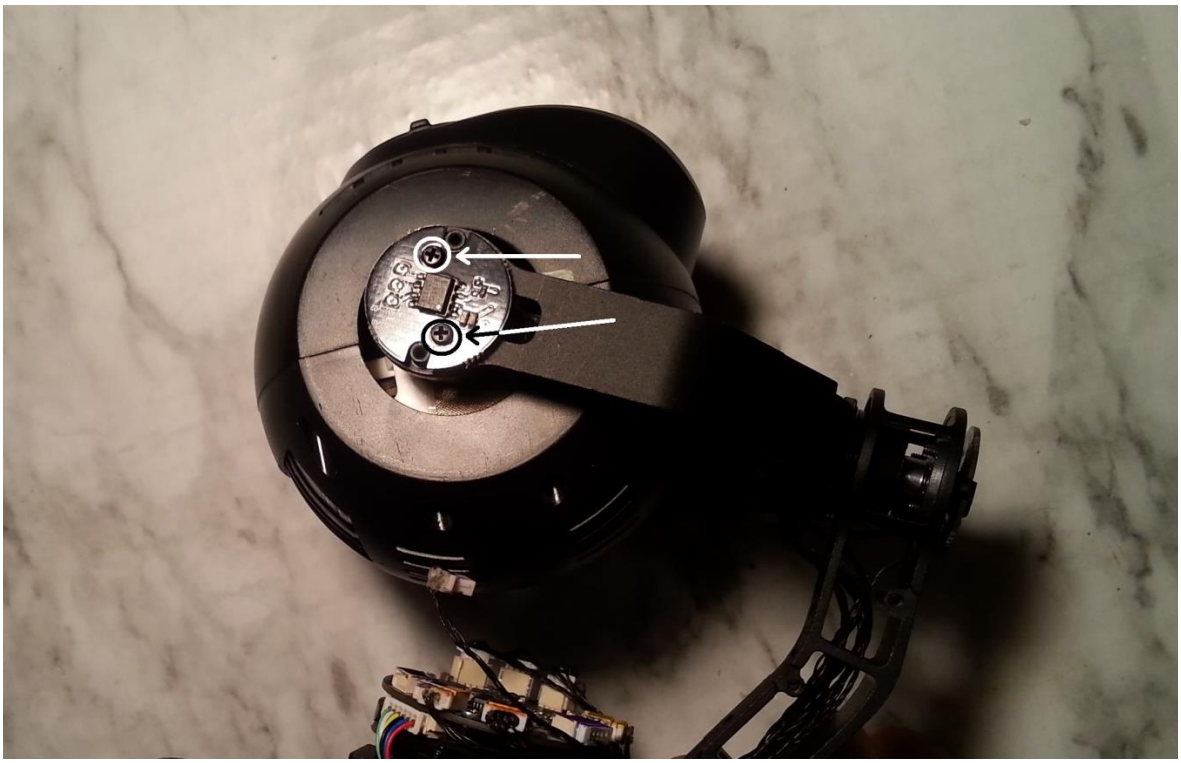
22. Thread the old encoder wire out through the square hole in the Encoder Arm, and set it aside.

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

23. Thread the new encoder wire in through the square hole in the Encoder Arm:



24. Mount the Pitch(tilt) encoder and install the mounting screws:



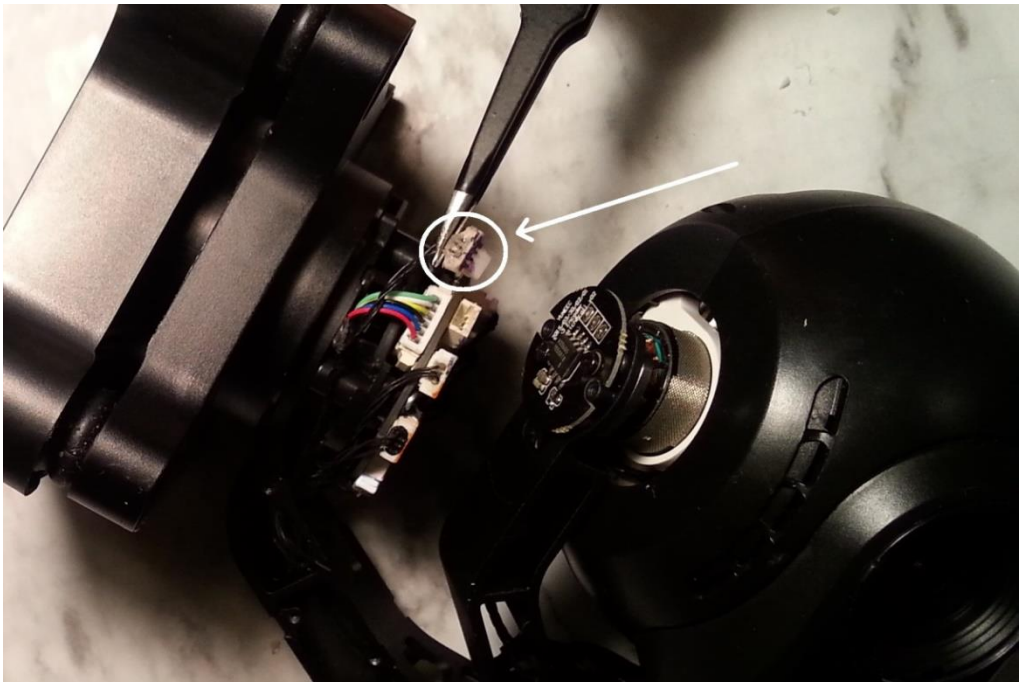
Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

25. IF desired to complete camera assembly without testing the new encoder, then read the NOTE prior to Step 29 and GO TO Step 29.
26. OPTIONAL Step 1 – Plug the new encoder wire into the gimbal board connector.

27. OPTIONAL Step 2 – Power the camera up, and verify proper Pitch (tilt) performance:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

28. OPTIONAL Step 3 – Unplug the new encoder wire from the gimbal board connector:



Note: Use caution to avoid damage to the encoder wire

29. Carefully thread the encoder wire back through the pitch arm, rear arm and plug into the gimbal board connector.

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

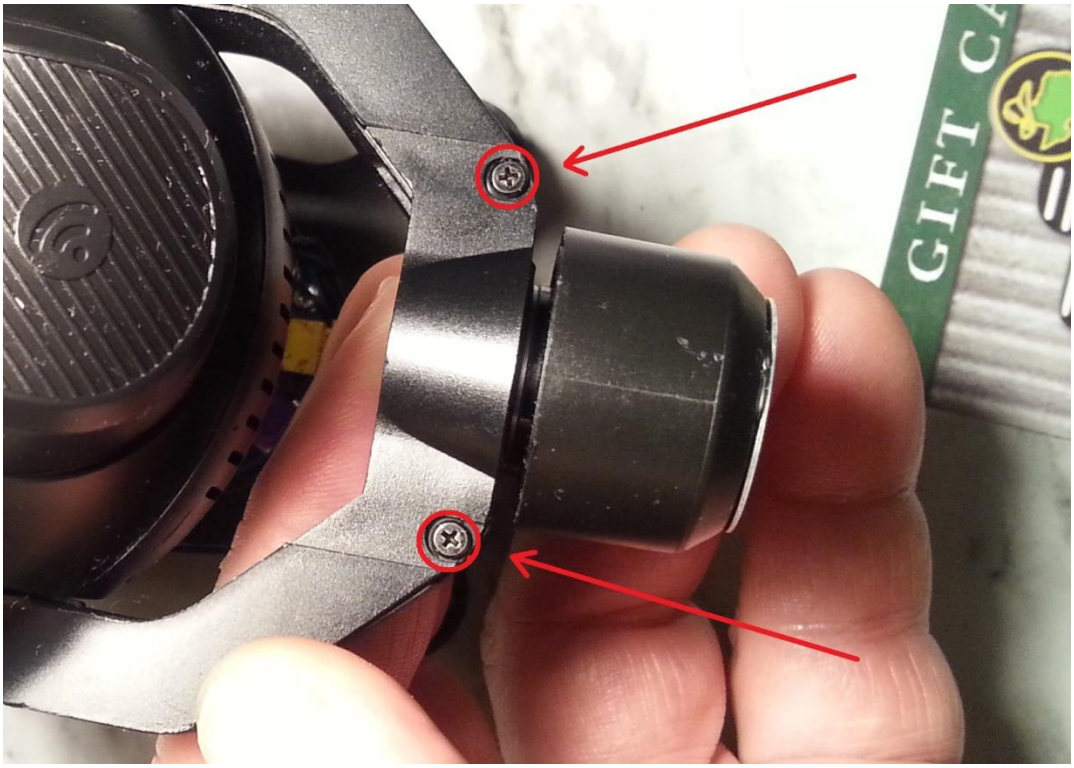
30. Install the Pitch Arm Cover and the two screws at the hub:

31. Install the Rear Arm Cover and the two screws at the hub:

Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

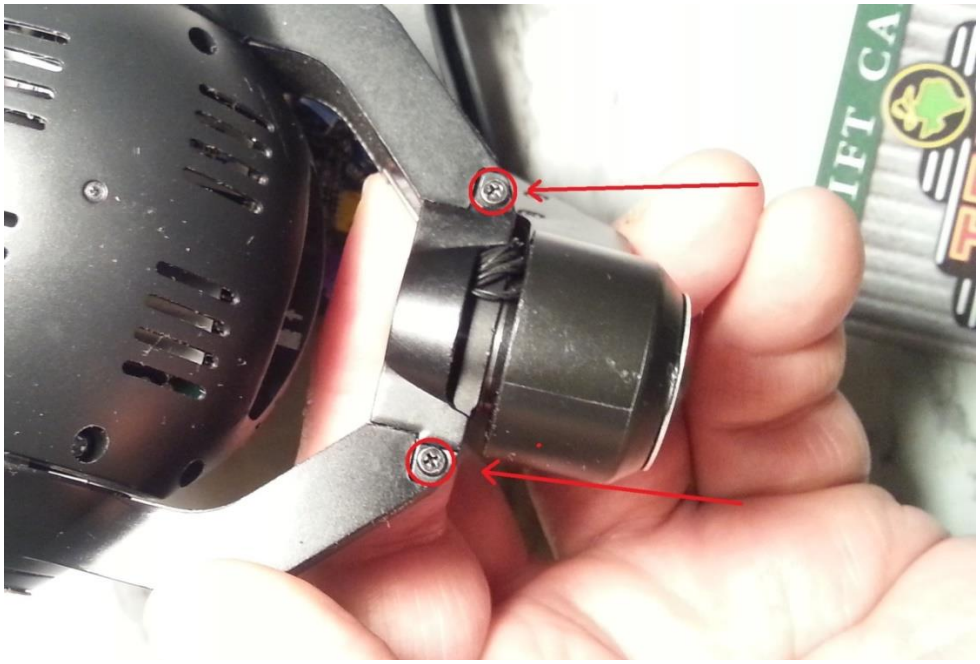
32. Install the screws on both sides of the rear arm cover:

33. Install the lower wire cover and both screws:



Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

34. Install the Upper wire cover and both screws:



Note: Take full advantage of the gap in the enclosure to clear the connectors. Rotate camera as needed to maximize available clearance. Do not apply significant pressure. Work with the angles and move the enclosure into position over the gimbal board.

35. Work Gimbal Board Enclosure into position over the gimbal board:

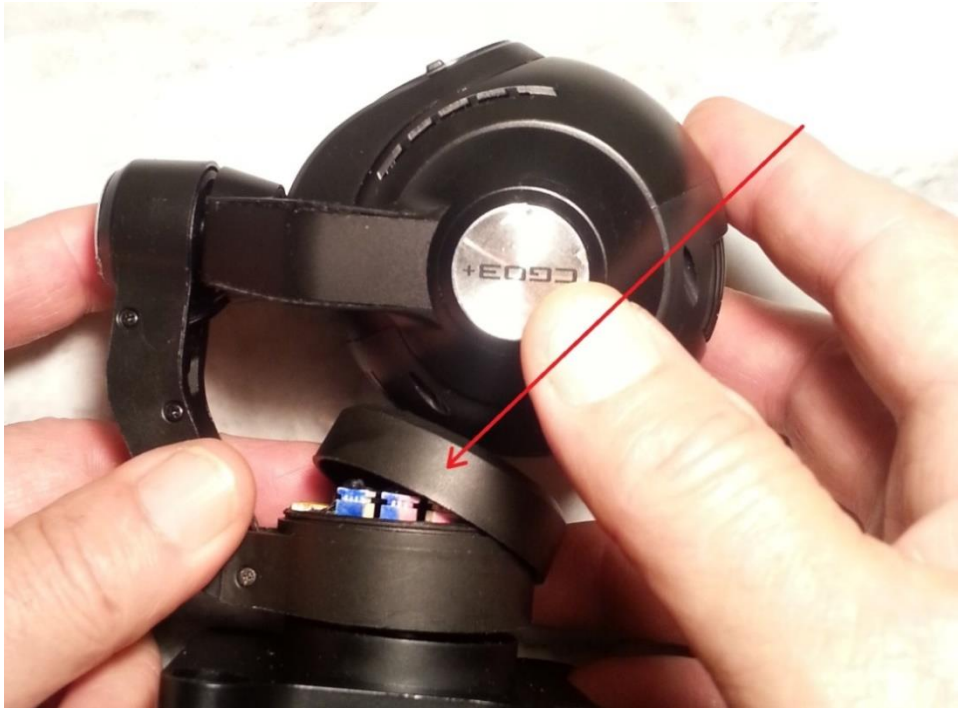
Attachment 12
CGo3+ Tilt (Pitch) Encoder Replacement

Note: Use fingernails or plastic tool to pry the Gimbal Board Enclosure arms over the rear arm tabs.

36. Work Gimbal Board Enclosure into position over the gimbal board, and install screws on both sides:

Note: Rotate camera as needed to maximize available clearance. Do not apply significant pressure. Work with the angles until the cover is aligned with the Gimbal Board Enclosure:

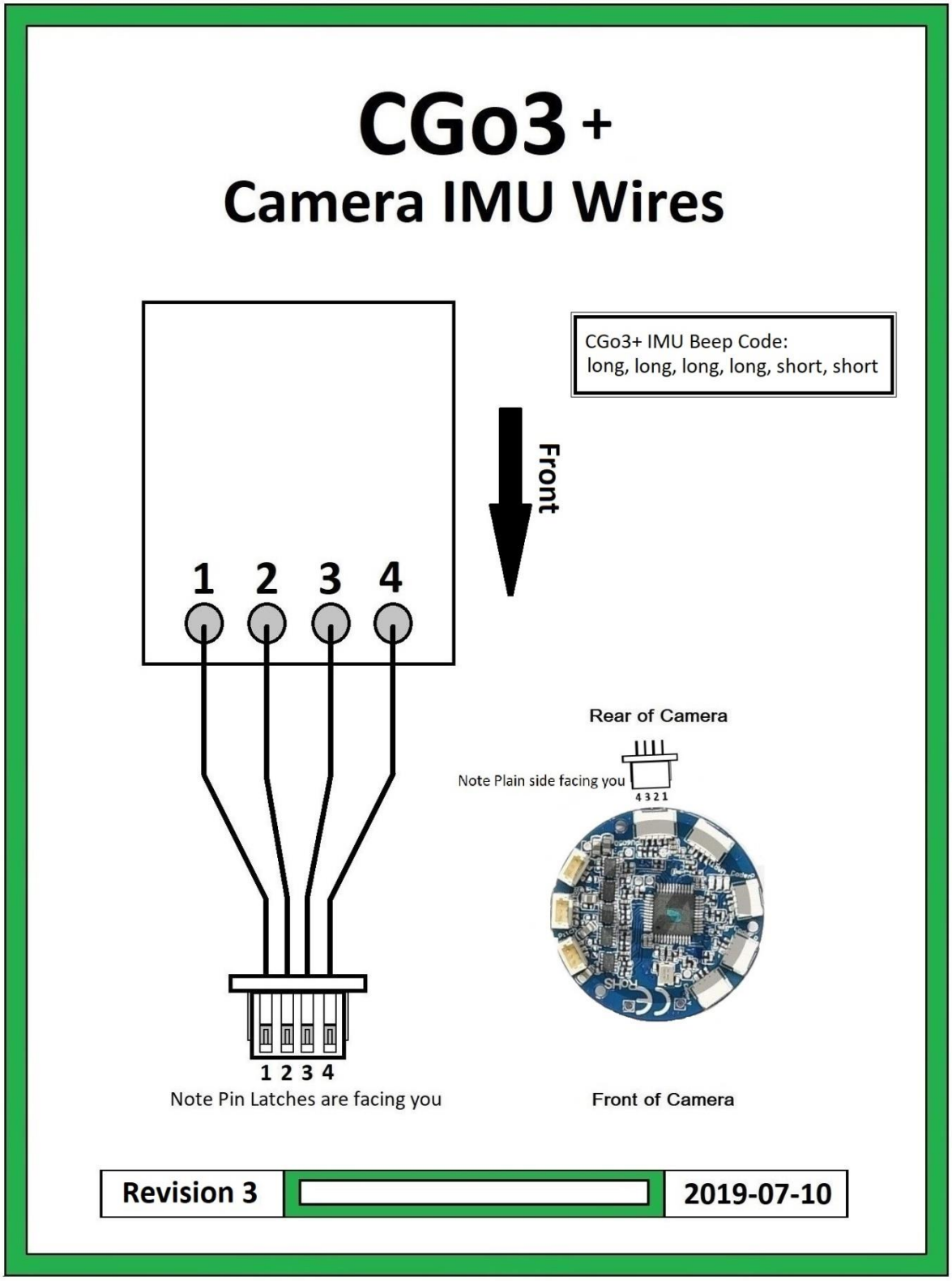
37. Move Gimbal Board Cover into position over gimbal board.



38. Snap Gimbal Board Cover into place.
39. Replace emblems on Pitch Arm and Rear Arm covers.
40. Power up camera and verify proper operation.

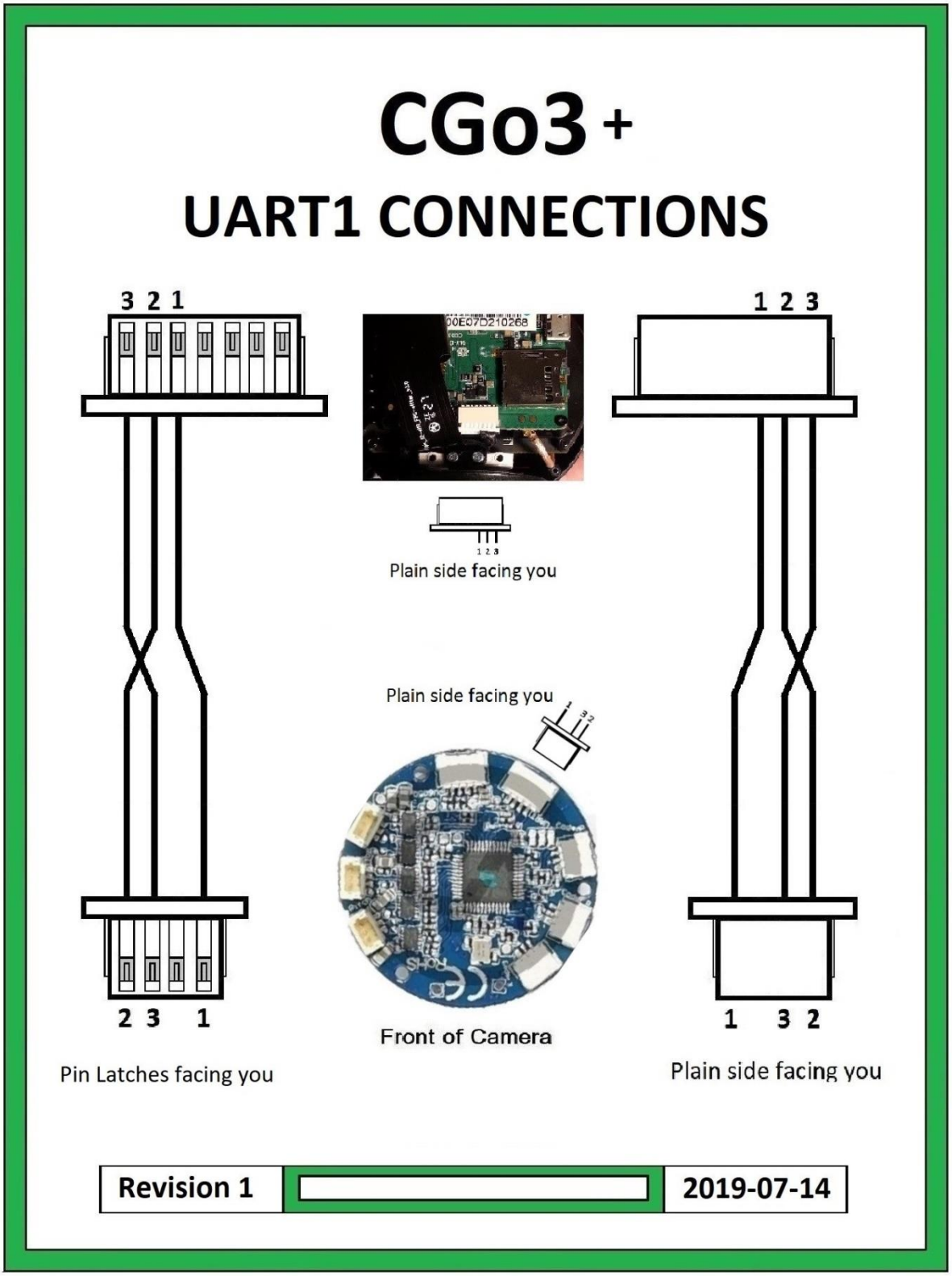
Attachment 13
CGo3+ IMU Pinout

Use of this information is at your own risk.



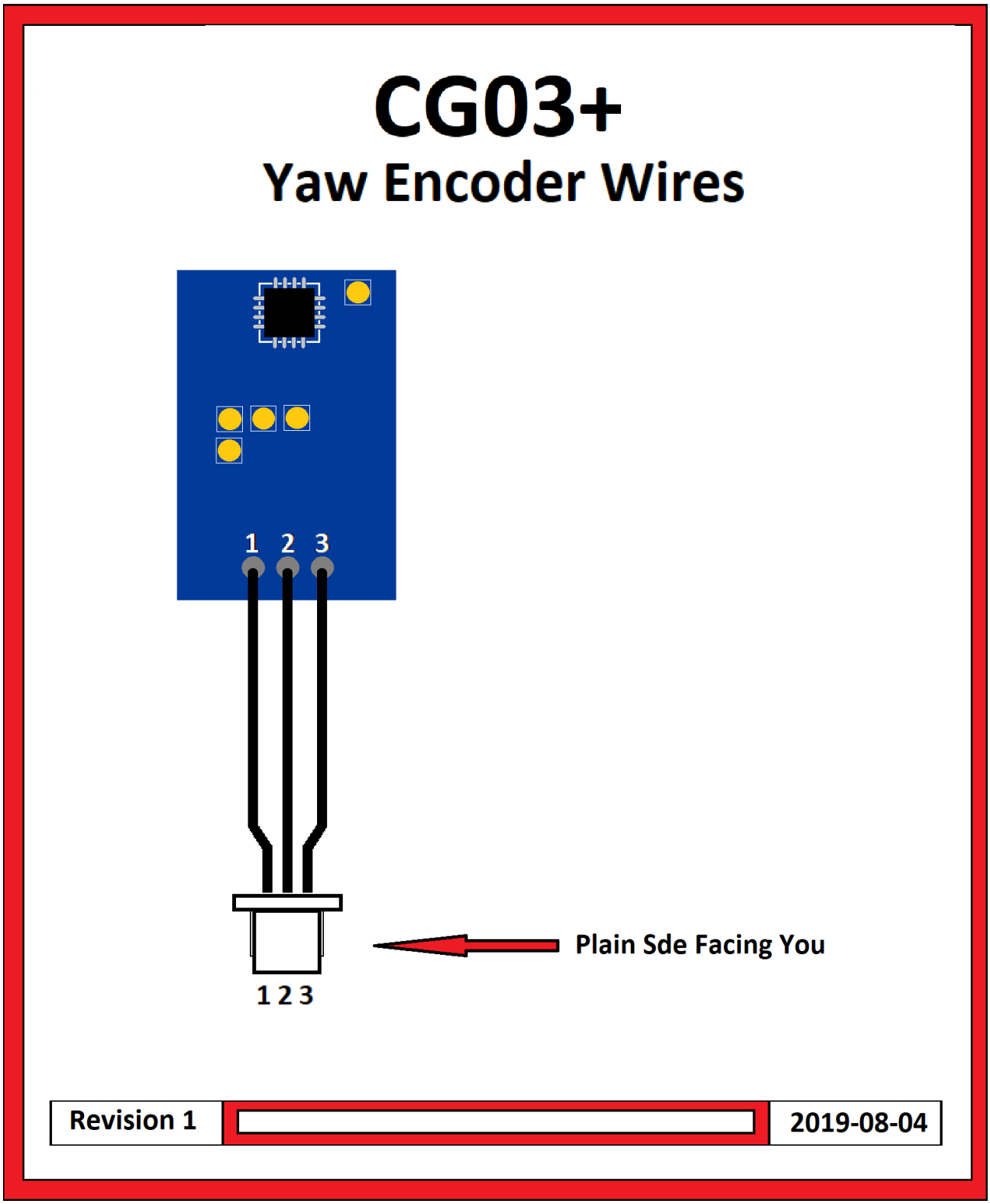
Attachment 14
CGo3+ Uart1 Pinout

Use of this information is at your own risk.



Attachment 15
CGo3+ Yaw Encoder Pinout

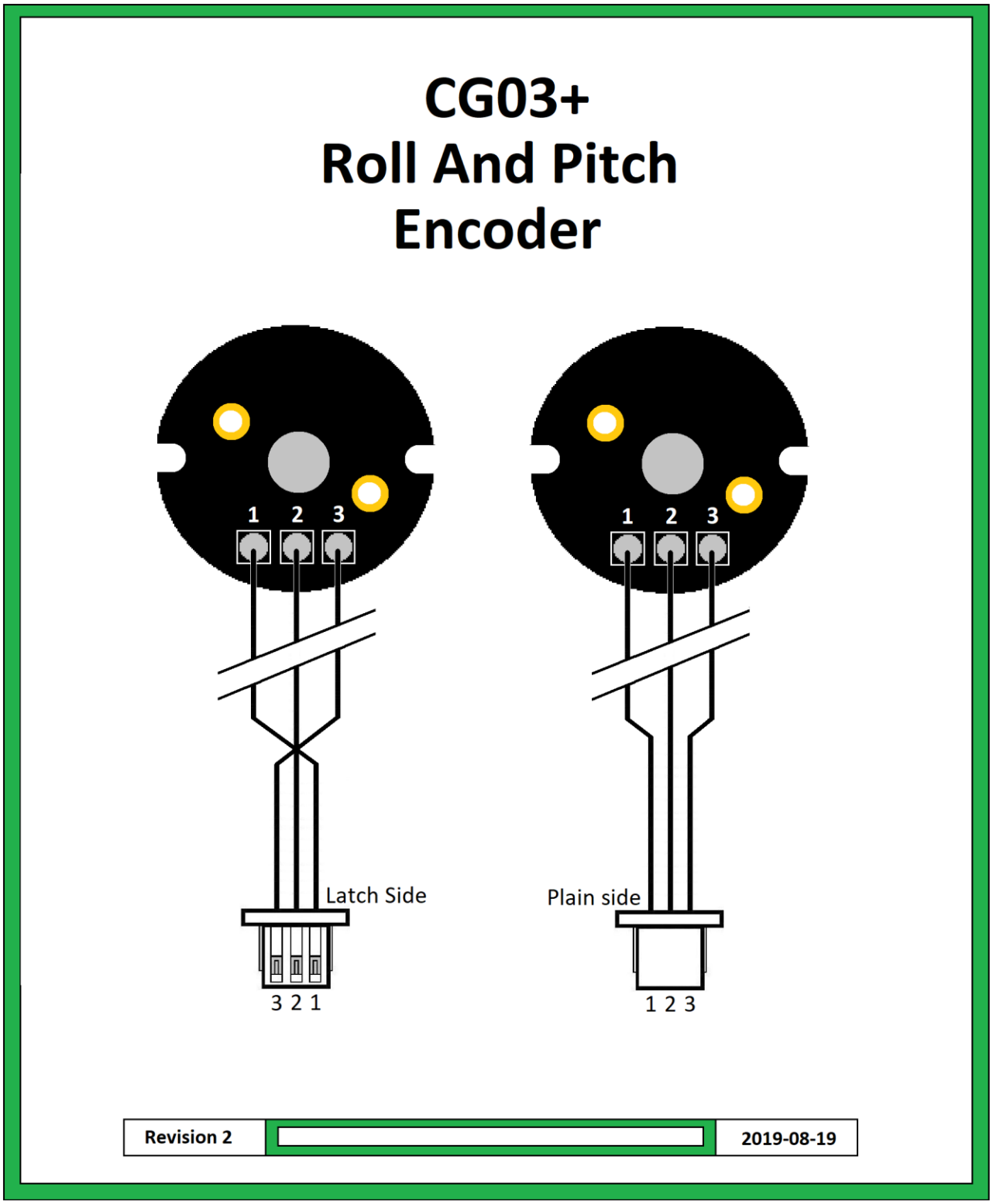
Use of this information is at your own risk.



Attachment 16
CGo3+ Roll and Pitch Encoder Pinout

Use of this information is at your own risk.

-



Attachment 17
CGo3+ Mount Alignment Notes

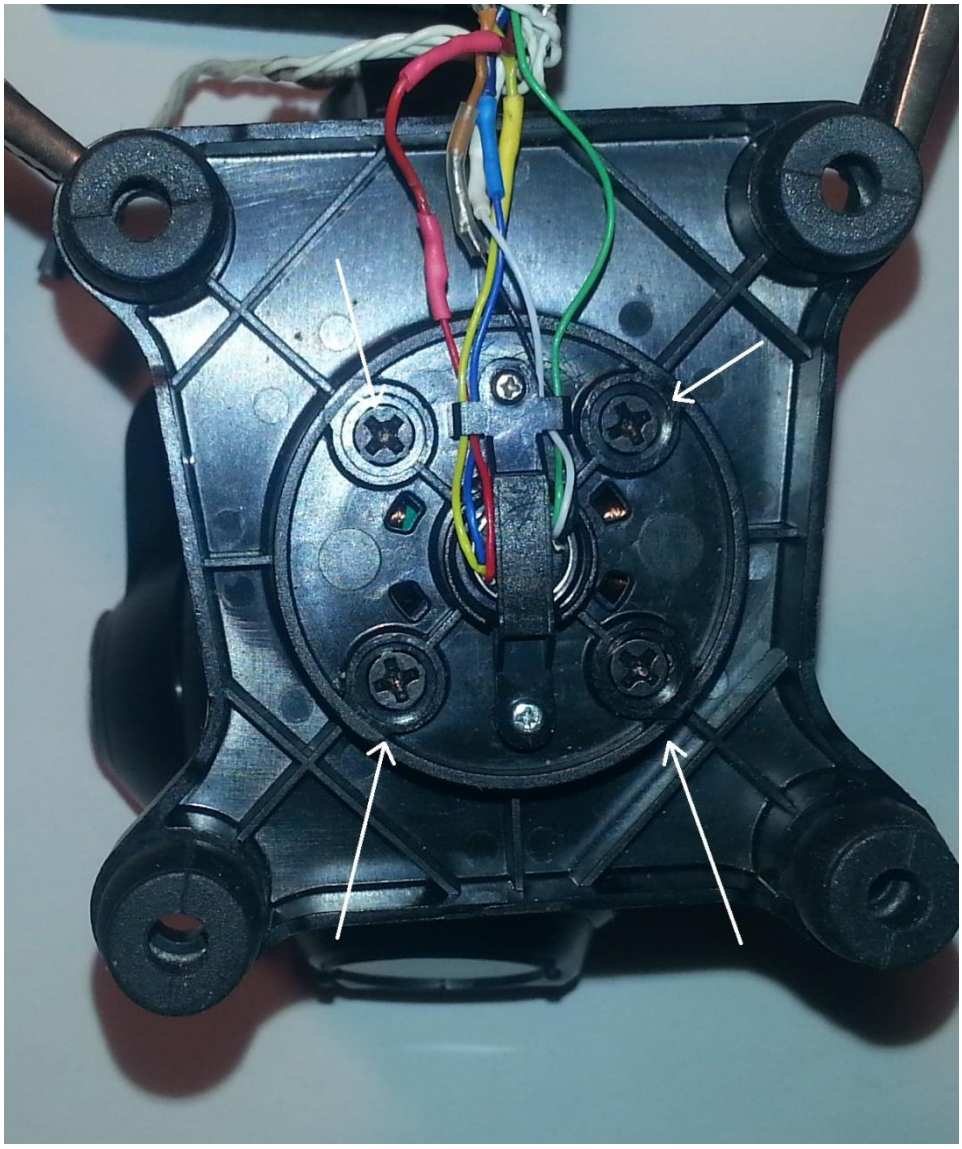
Use of this information is at your own risk.

Purpose:

To show some of the common error traps associated with replacing the camera mount on a CG03+ Camera.

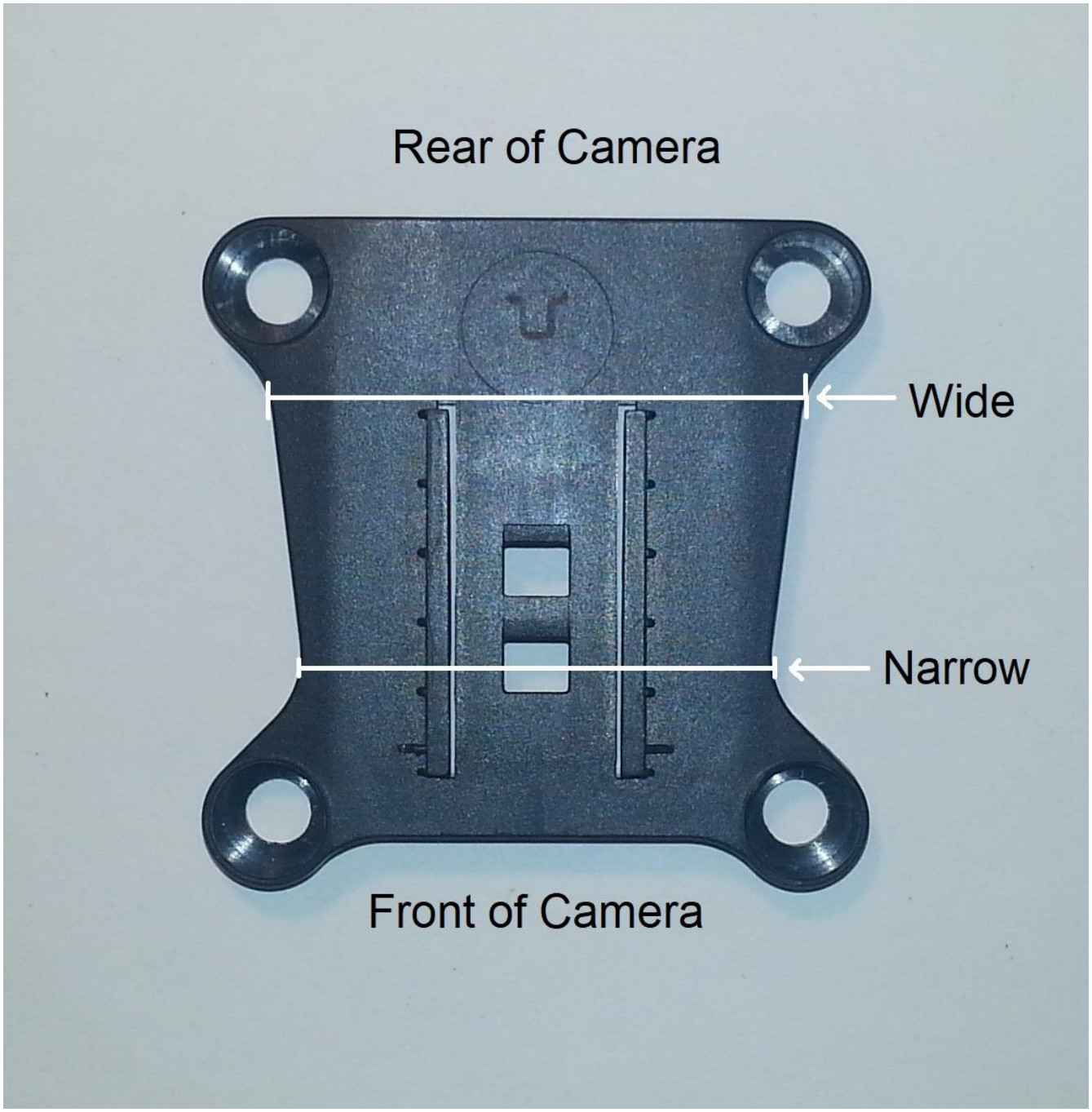
The four screws:

The four screws that attach the mount to the top motor are not marked, and are easily misaligned if care was not taken to mark the original positions during disassembly. Note the motor is not like a common motor that rotates continuously. It is more of a Servo-Motor. It moves to, and holds, whatever position the operator or the system tells it to. There are four screws, evenly spaced. If the mount is attached one screw position to the left, the camera will point 90° right when it should be pointed forward. If the mount is attached one screw position to the right, the camera will point 90° left when it should be pointed forward. Mounted two screw positions off; the camera will point straight to the rear (180°) when it should be pointed forward.



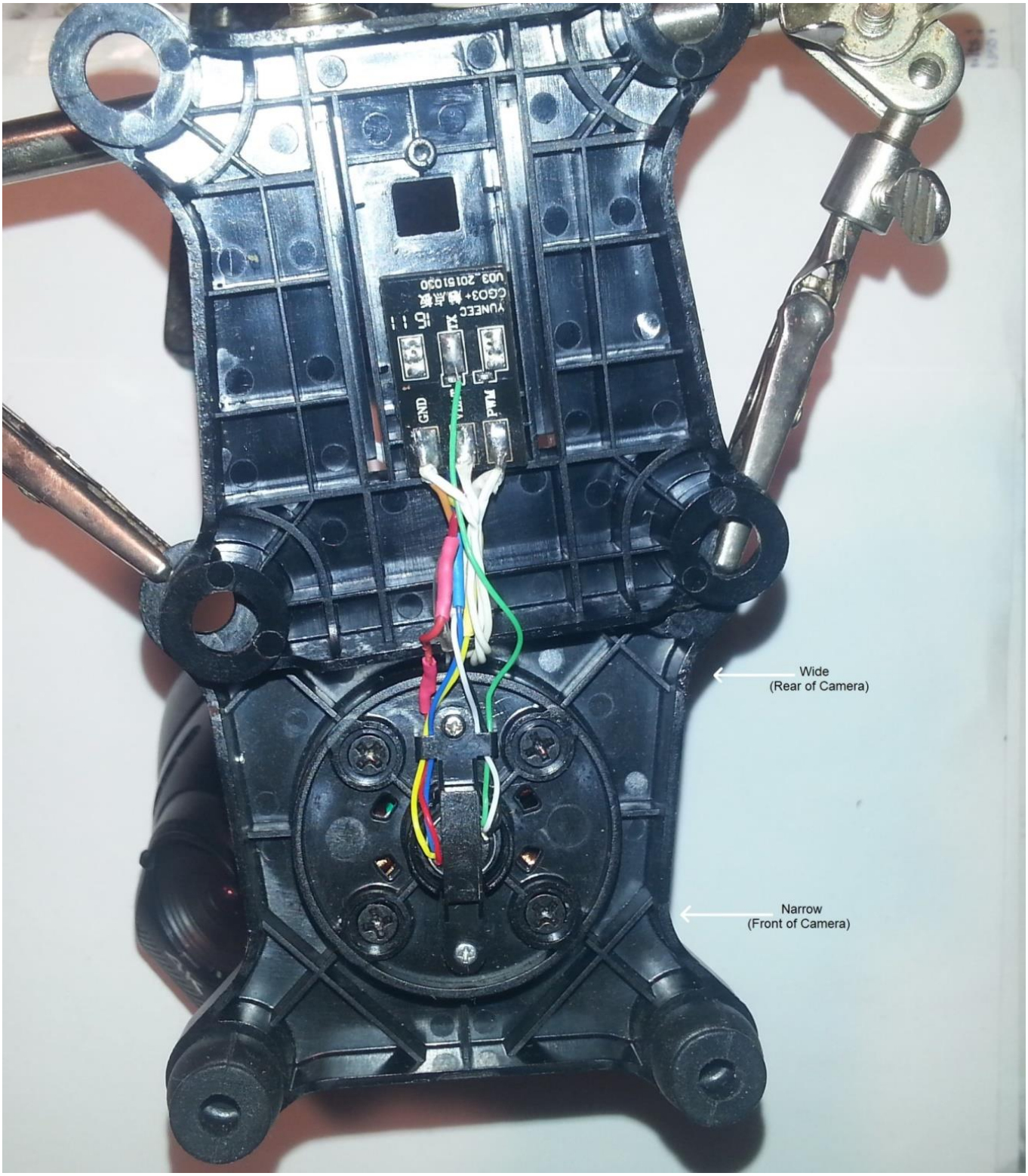
Attachment 17
CGo3+ Mount Alignment Notes

Note that for both upper and lower parts of the mount, the wide end is towards the back of the camera.



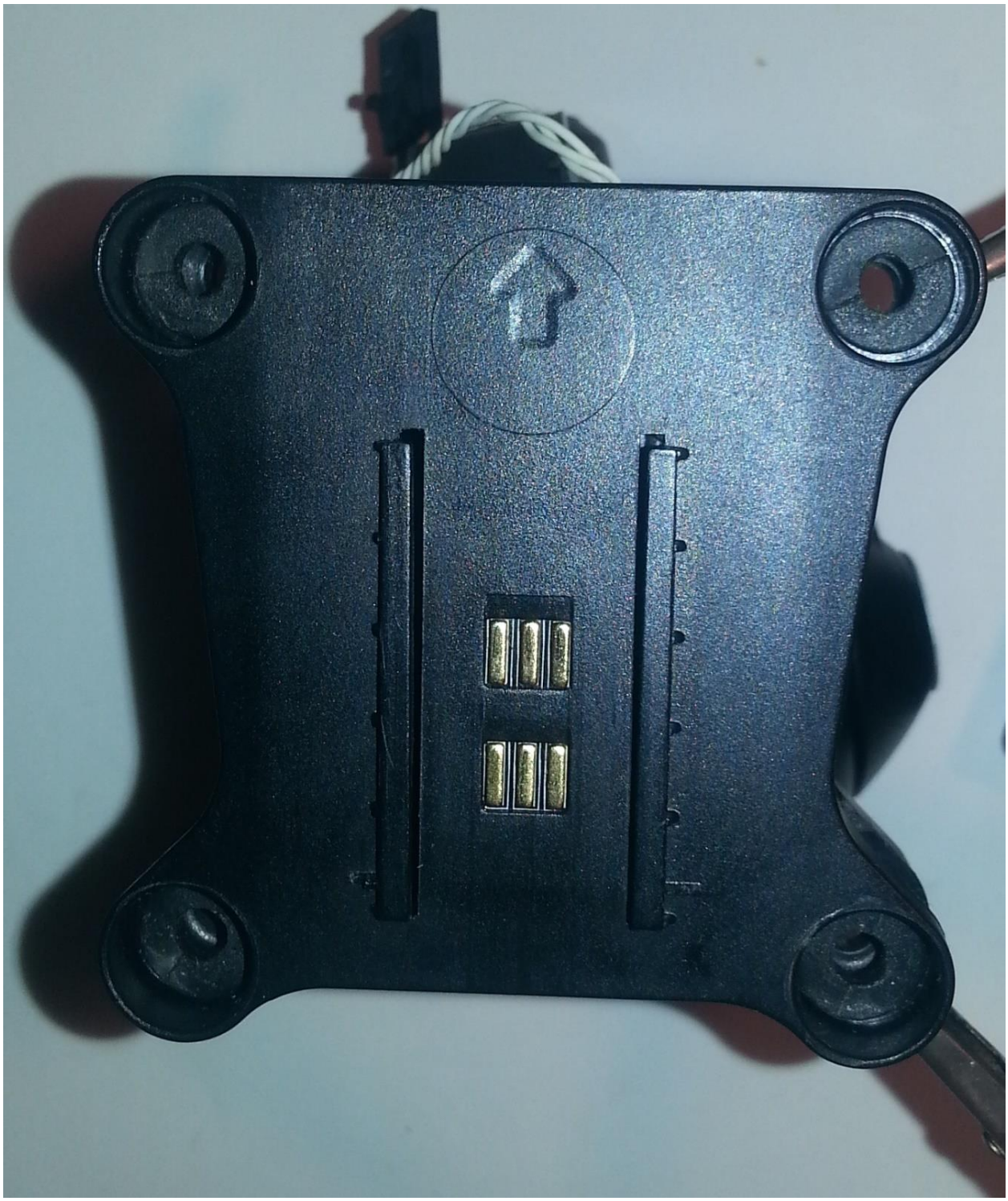
Attachment 17
CGo3+ Mount Alignment Notes

Ensure the slip ring wires are routed towards the BACK of the camera. Routing the wires to the front will create problems with installing and aligning top mount:



Attachment 17
CGo3+ Mount Alignment Notes

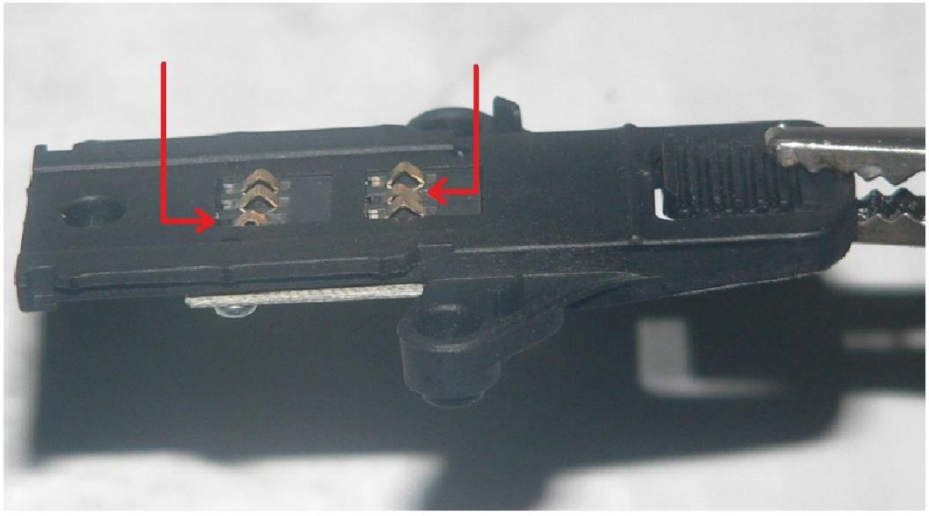
Ensure top and bottom mounts are correctly aligned while installing dampers. Some cameras have enough wire to allow the top mount to go on backwards. This has the same effect as having the “mount to motor” screws installed two screw positions off. (See page one):

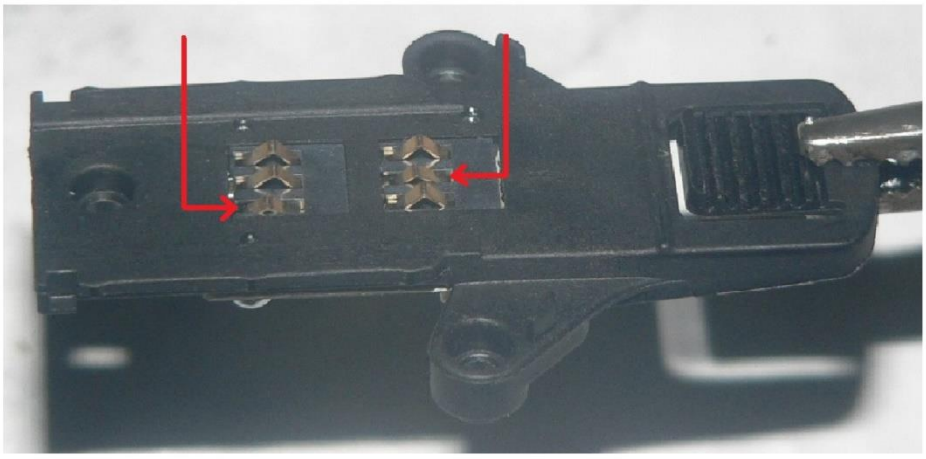


Attachment 18
CGo3+ Stuck Mount Contacts

CGo3+ Stuck Contacts

Discussion: The contacts indicated by red arrows are stuck down, as may happen from a variety of causes. The stuck contacts do not engage the camera contact plate, resulting in loss of the function associated with that contact. The remaining contacts in these images are in the normal condition and may be used for comparison.

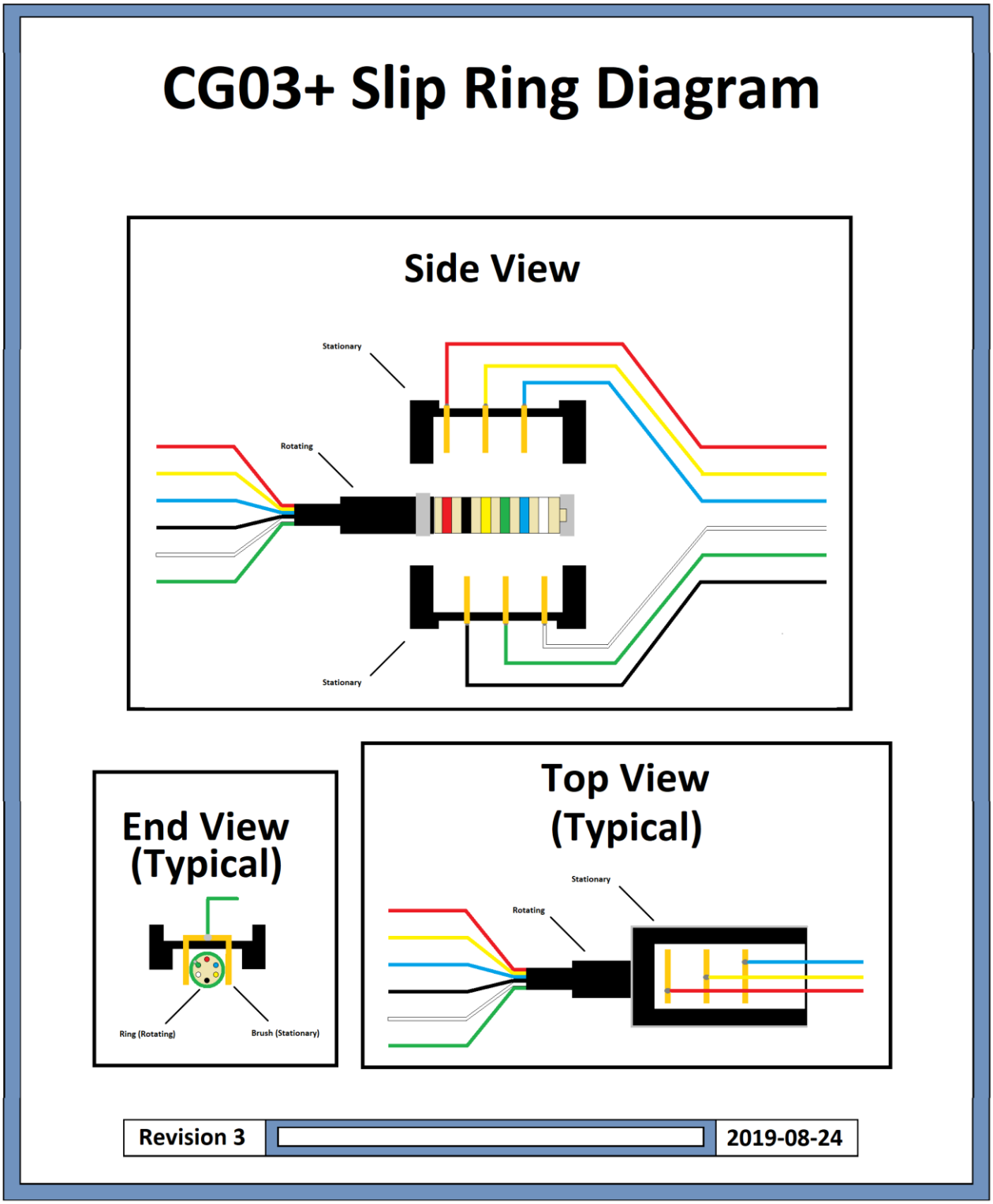




Revision 2		2019-11-04

Attachment 19
CGo3+ Slip Ring Cross Section

Use of this information is at your own risk.



Attachment 20
CGo3+ Slip Ring Wire Color

Use of this information is at your own risk.

CGo3+
Slip Ring Wire Color

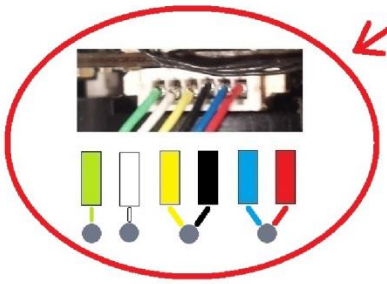
GND (Battery Ground)

VBAT (Battery Positive)

PWM (Manual Tilt, Manual Pan) *

TX (Manual Tilt, Manual Pan) *

**Both Green AND White are required for either Manual Tilt or Manual Pan.*



Revision 4		2019-07-11

Attachment 21
CGo3+ Slip Ring Replacement

Use of this information is at your own risk.

1). Use your fingernails or something thin to pry the label off the rear motor cover. It is held on by contact cement, and if you keep both sides clean, it will go right back on.

2). Remove THESE TWO screws from the rear motor cover. (leave the other two alone for now)

Attachment 21
CGo3+ Slip Ring Replacement

3). Remove these screws from BOTH sides of the rear arm cover:

4). Snap off the gimbal board lower cover, and carefully work it out over the gimbal wire connectors:

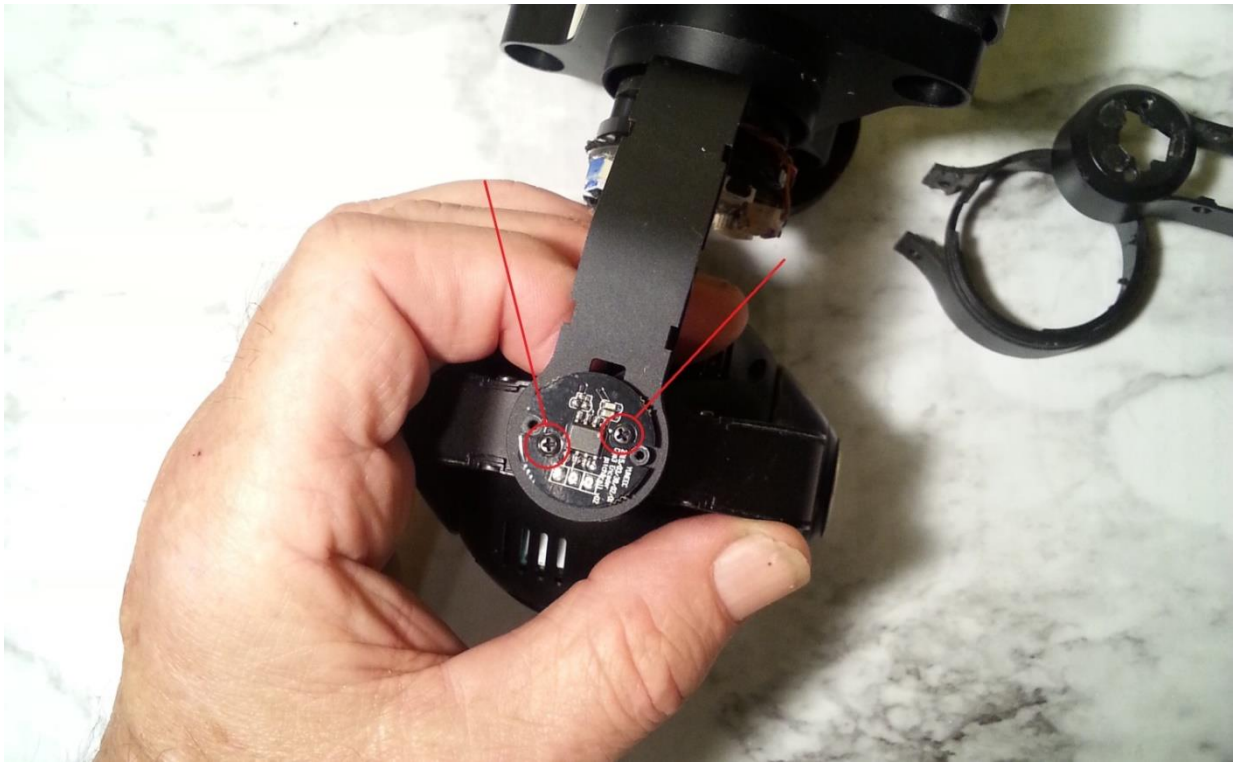
Attachment 21
CGo3+ Slip Ring Replacement

5). Carefully pry the corners out, and remove the gimbal board guard:

6). Remove the rear arm cover:

Attachment 21
CGo3+ Slip Ring Replacement

7). Remove the two screws holding the roll encoder:

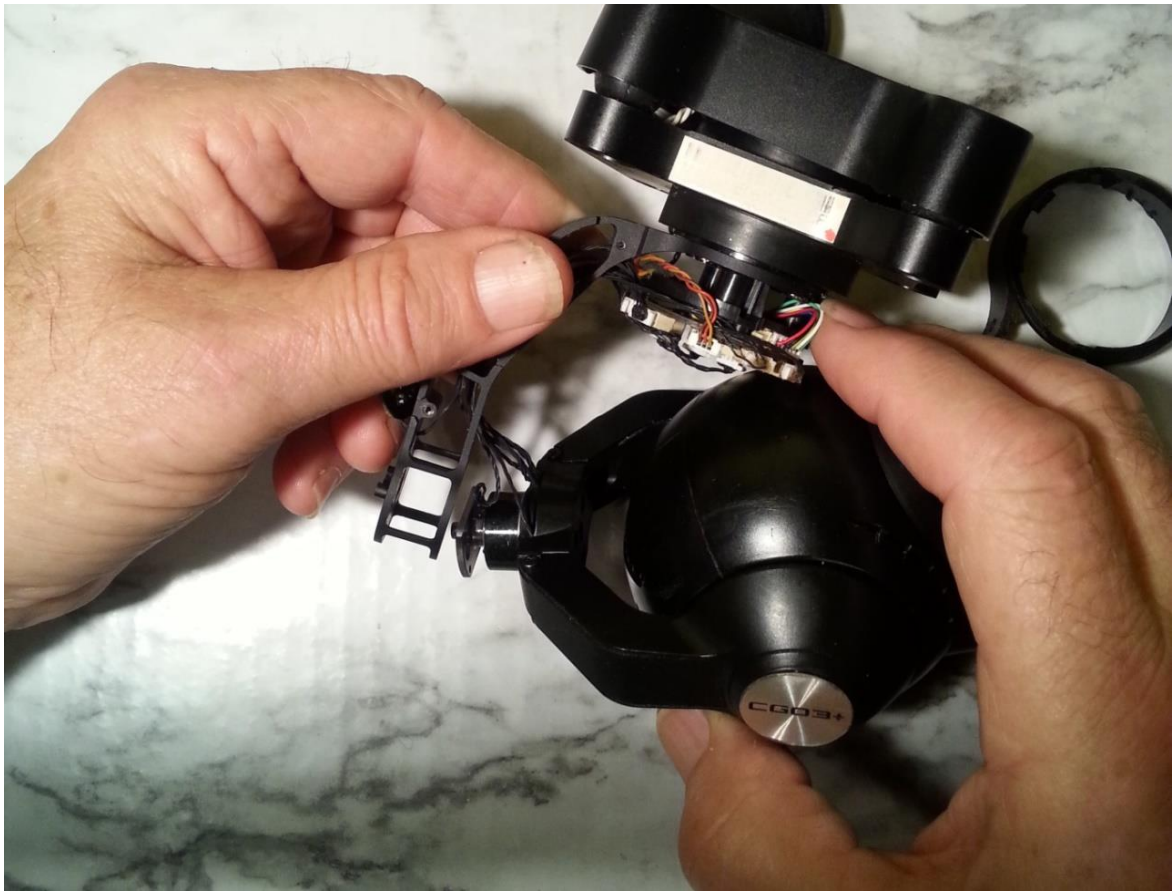


8). Carefully tilt the roll encoder out of the way:

Attachment 21
CGo3+ Slip Ring Replacement

9). Remove the four roll motor screws:

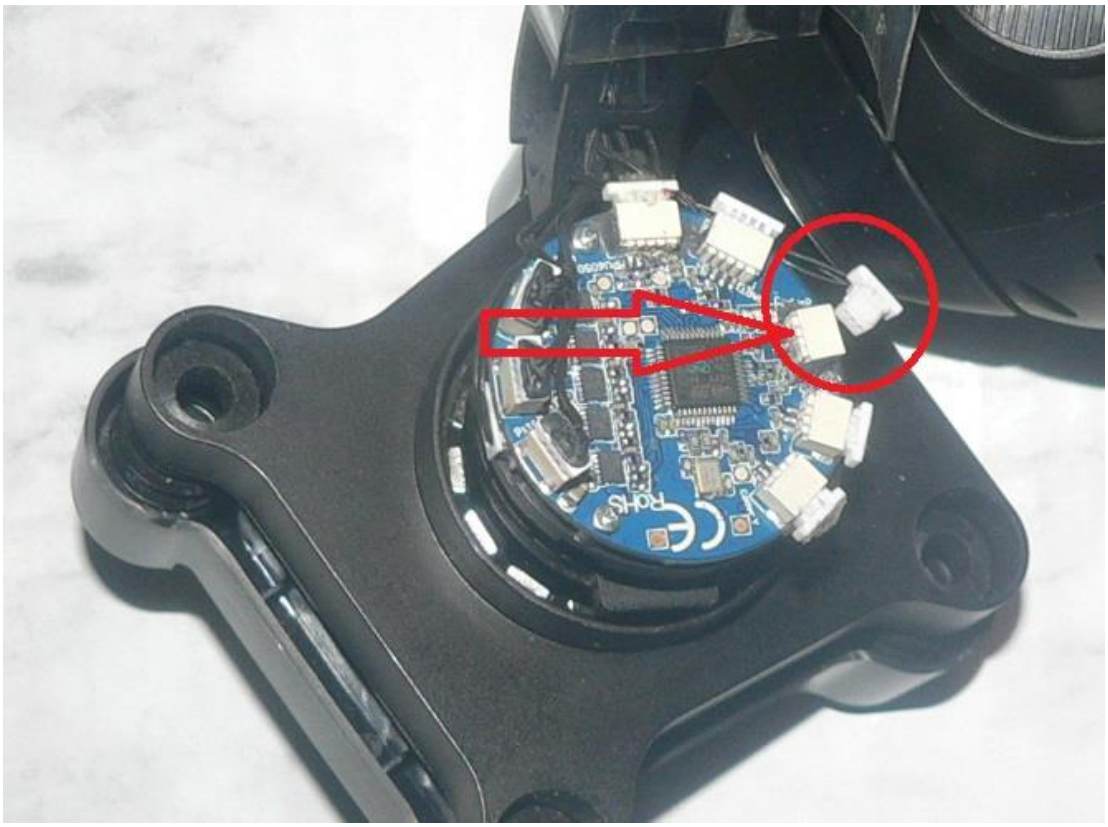
10). Slide the roll motor / camera yoke out of the rear arm:



Attachment 21
CGo3+ Slip Ring Replacement

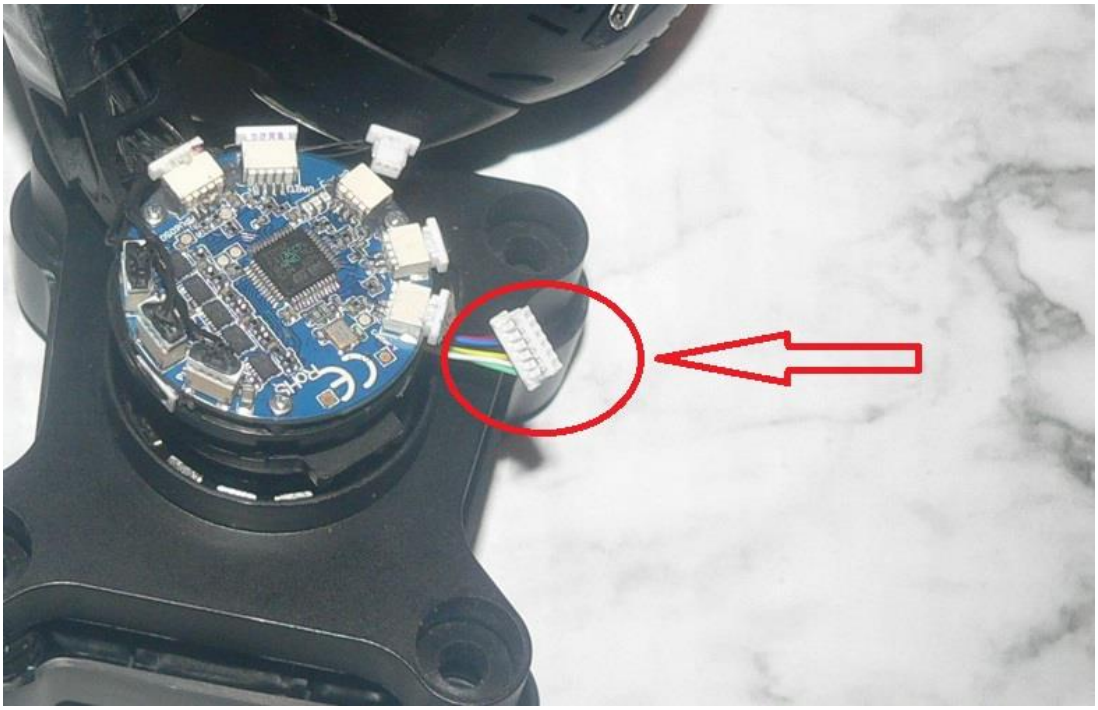
11). Using cellophane tape or other method, strap one arm of the camera yoke securely to the camera vertical arm:

12). Unplug the Yaw Sensor connector:

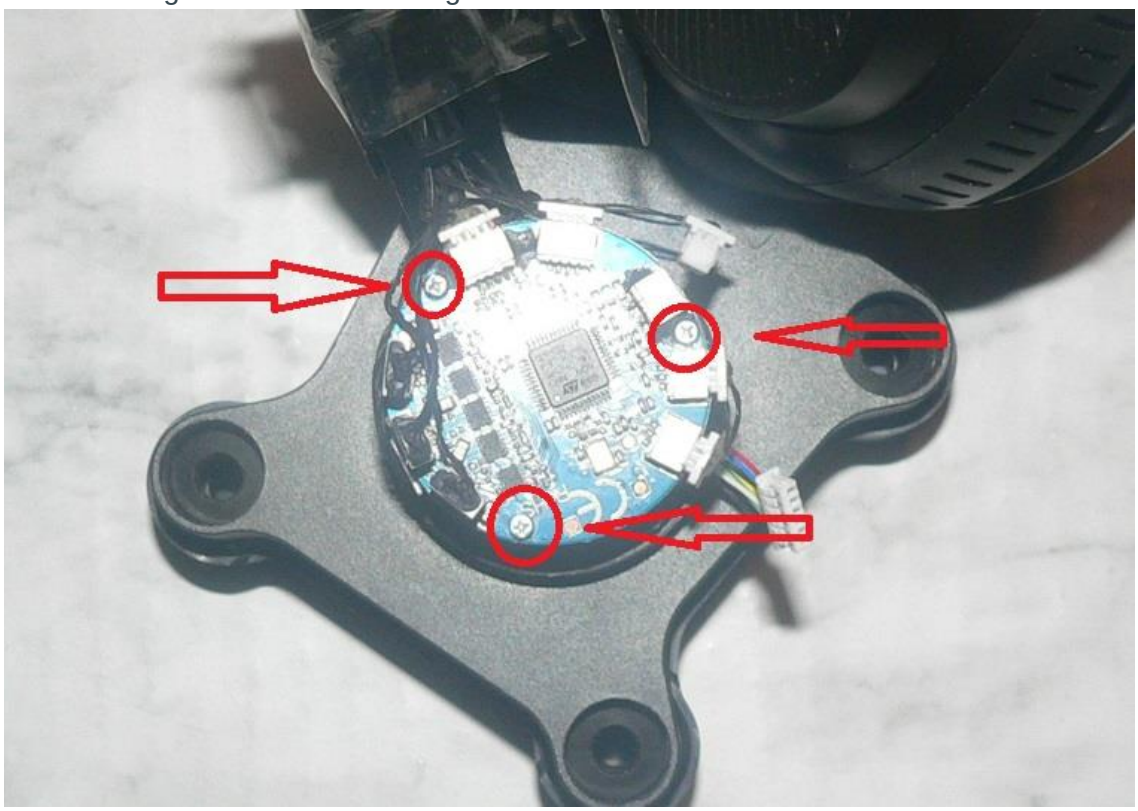


Attachment 21
CGo3+ Slip Ring Replacement

13). Unplug the Slip Ring connector:



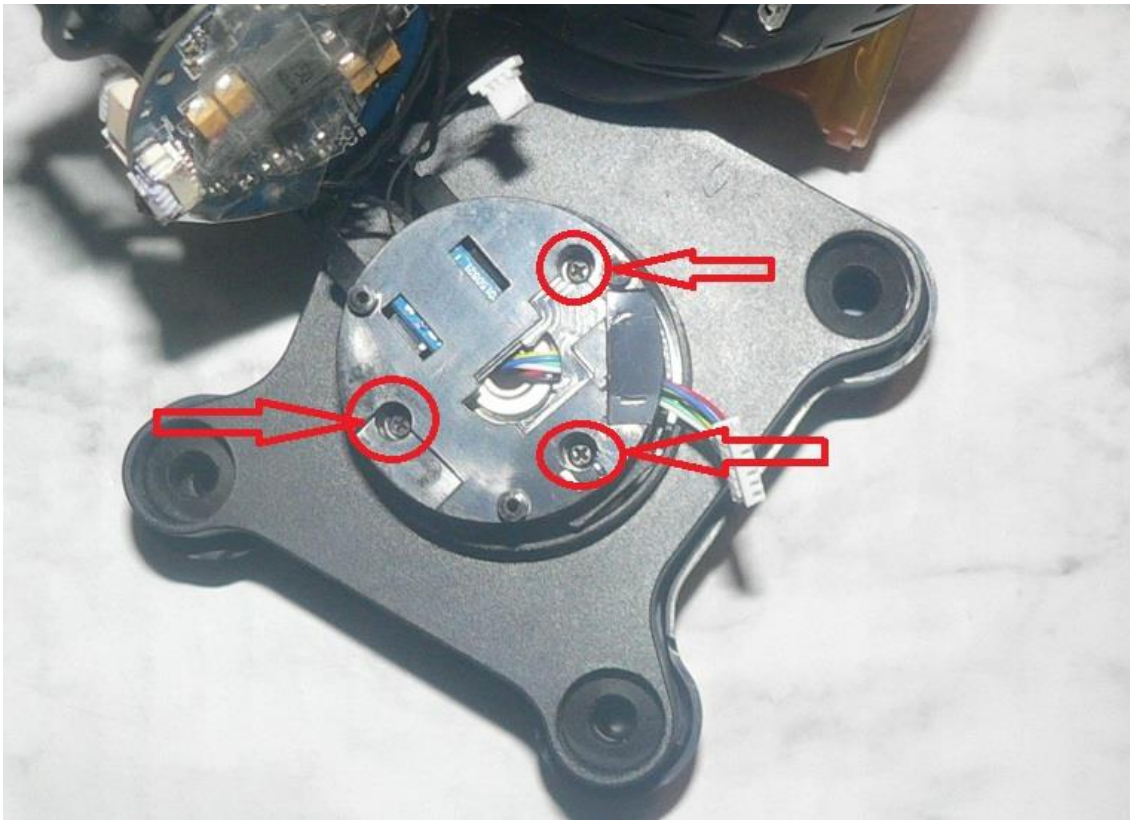
14). Remove the three gimbal board mounting screws:



15). Tilt the gimbal board back against the vertical arm:

16). Using cellophane tape or other method, strap the gimbal board to the camera vertical arm:

17). Remove the three mounting screws from the Gimbal Board /Yaw Sensor Board support mounting screws:

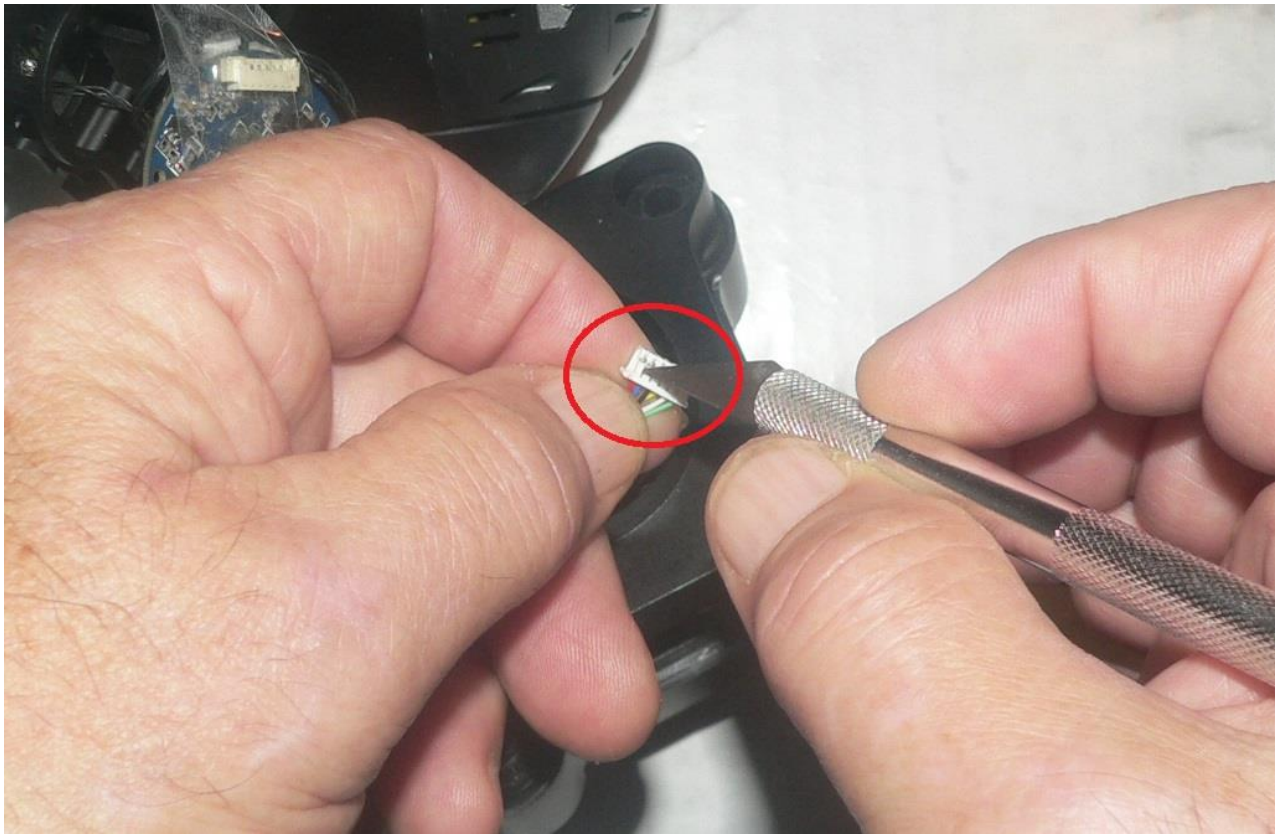


Attachment 21
CGo3+ Slip Ring Replacement

18). Lift the support board (with Yaw Sensor still attached) from the camera frame:

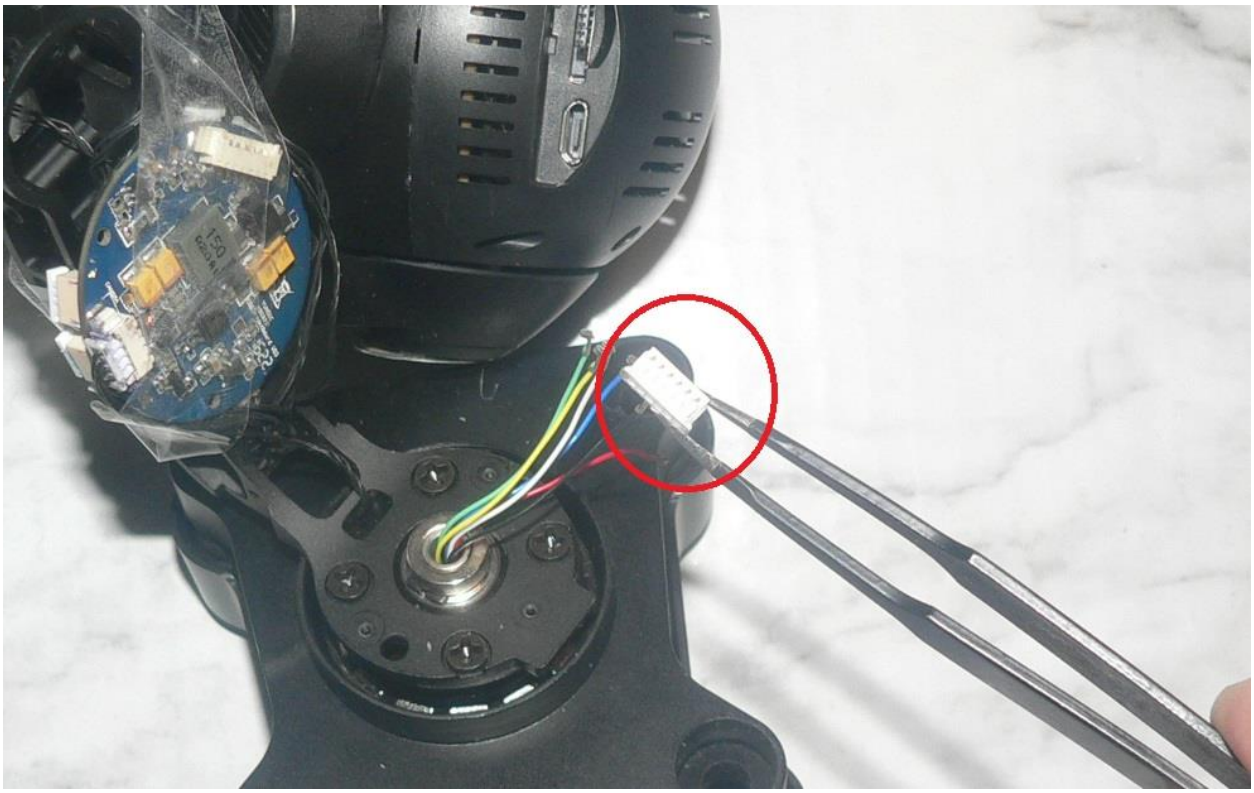
NOTE: The latch pins are reasonably durable, but there are limits to how much bending is tolerable.

19). Using a sharp pointed tool, carefully release each pin latch on the slip ring plug.



Attachment 21
CGo3+ Slip Ring Replacement

20). Remove each wire from the plug:

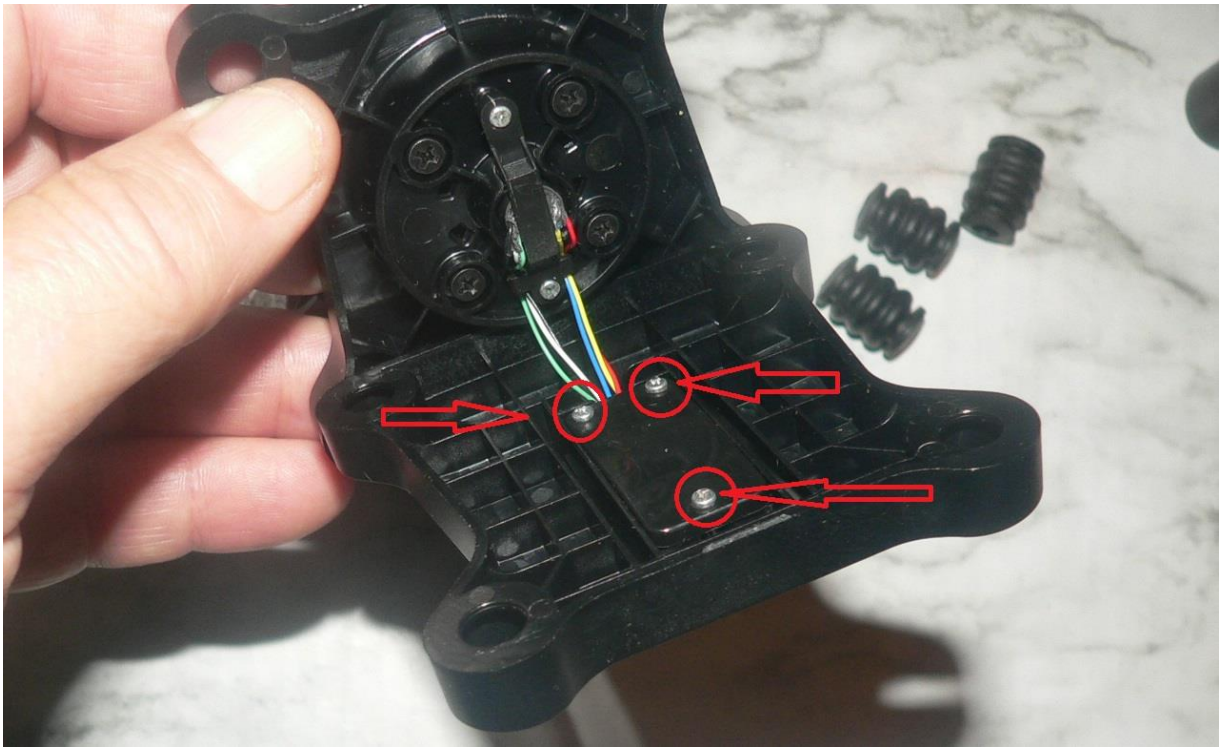


21). Remove Damper guard:

Attachment 21
CGo3+ Slip Ring Replacement

22). Remove Damper Retainers and Dampers from camera mount:

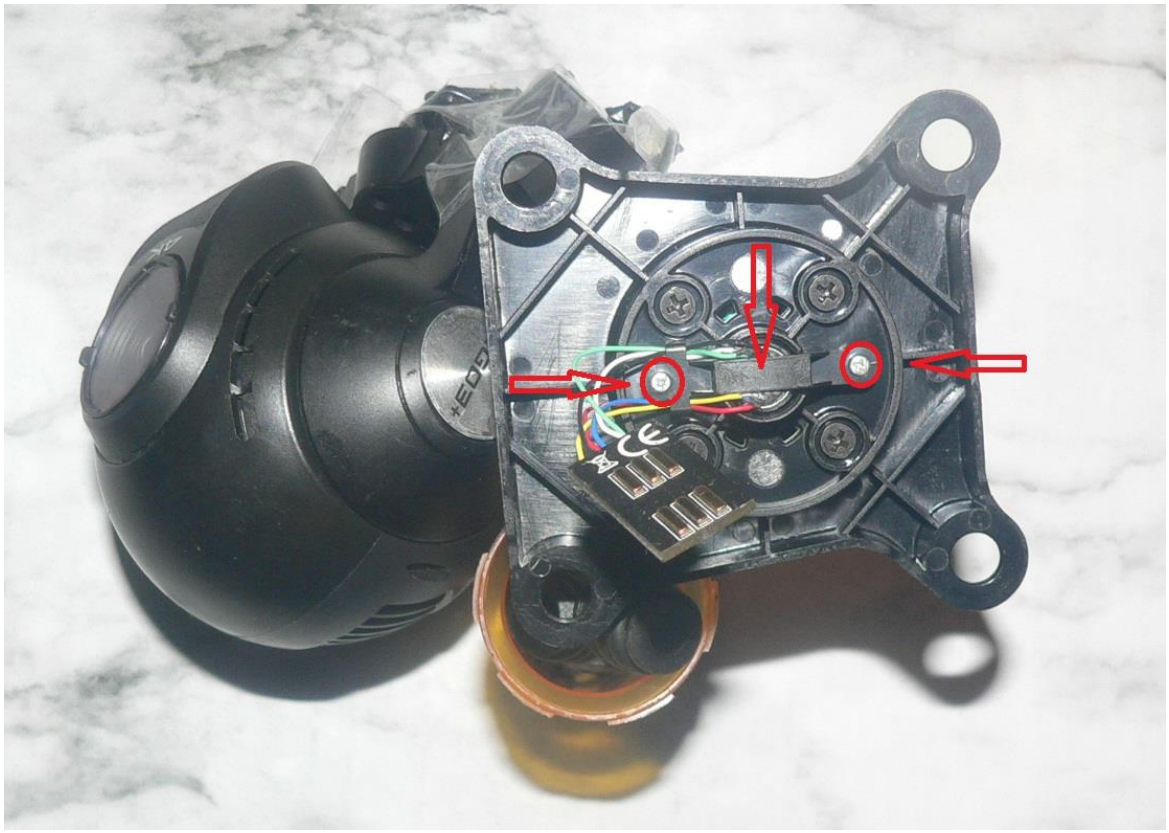
23). Remove the three screws from the contact plate retainer:



Attachment 21
CGo3+ Slip Ring Replacement

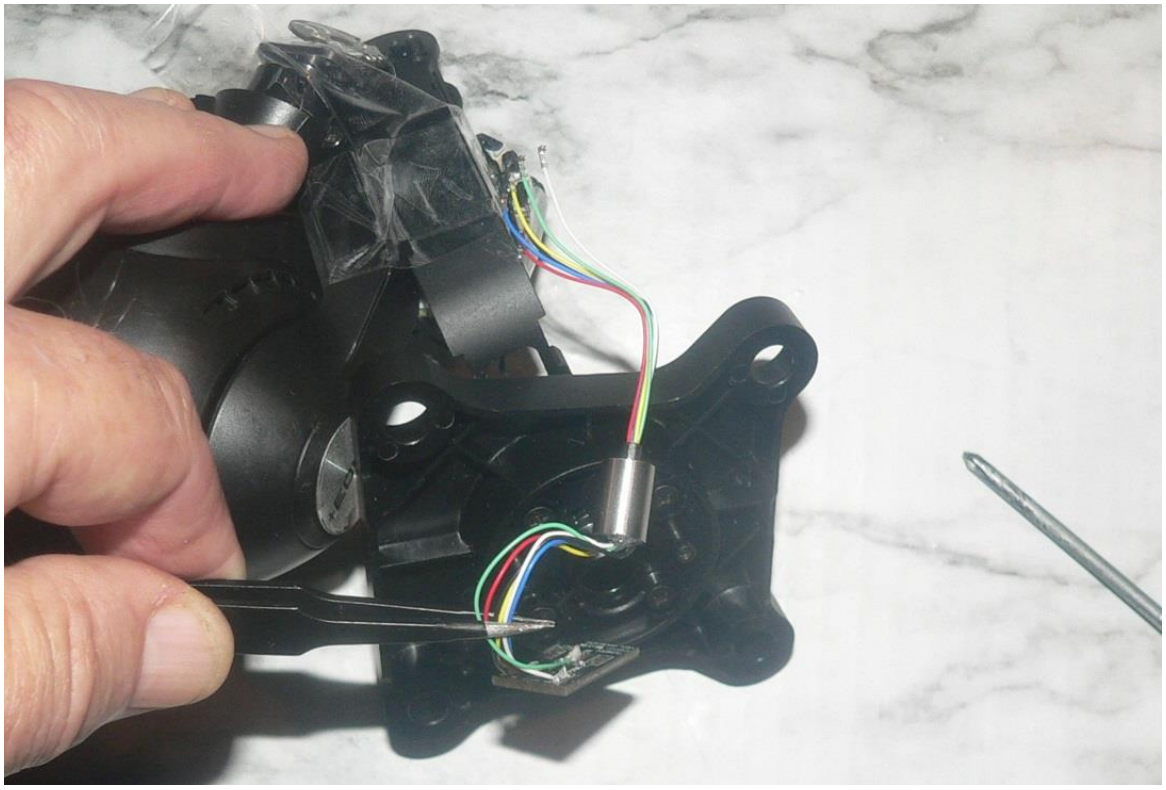
24). Lift the contact plate retainer and contact plate out of the mount:

25). Remove the two screws from the slip ring retainer strap and remove strap:

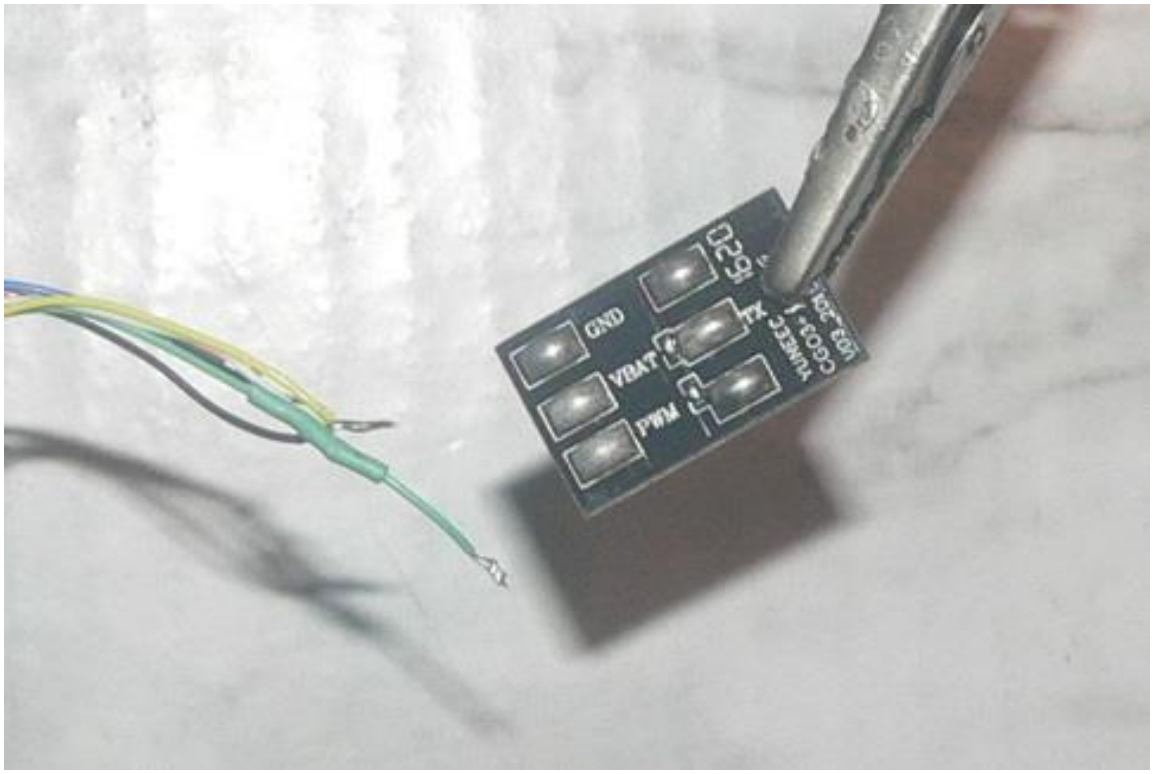


Attachment 21
CGo3+ Slip Ring Replacement

26). Pull the old slip ring out of the camera mount:



27). De-solder the old slip ring wires from the contact plate.

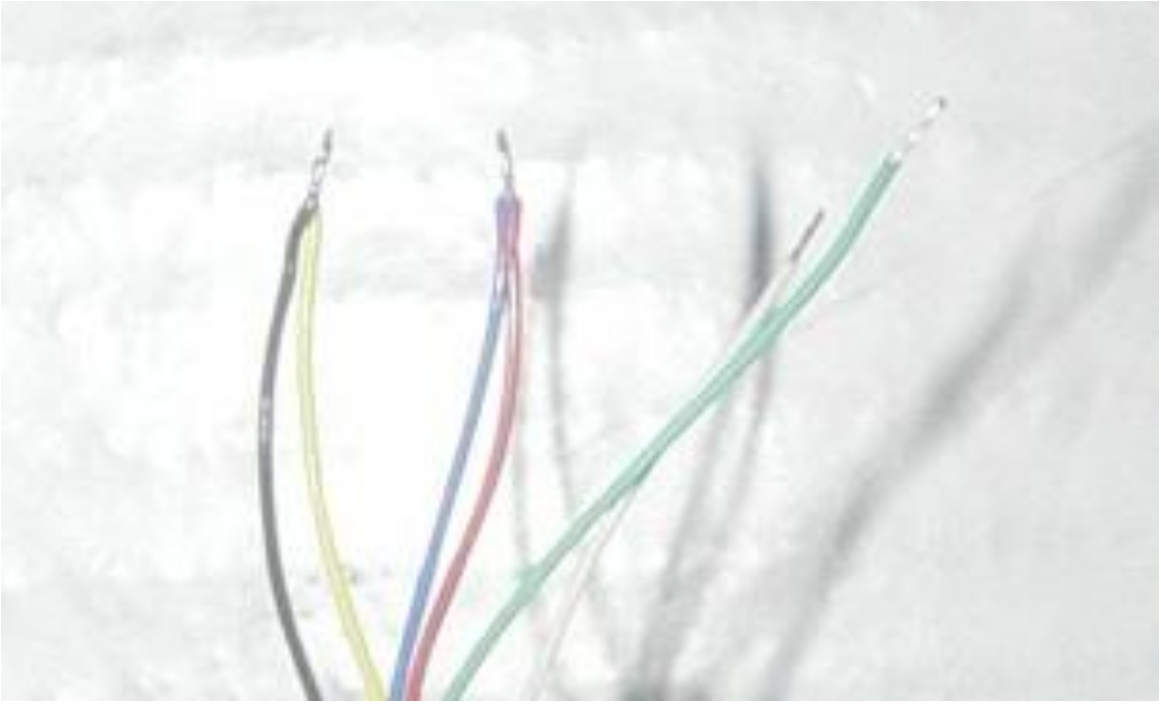


Attachment 21
CGo3+ Slip Ring Replacement

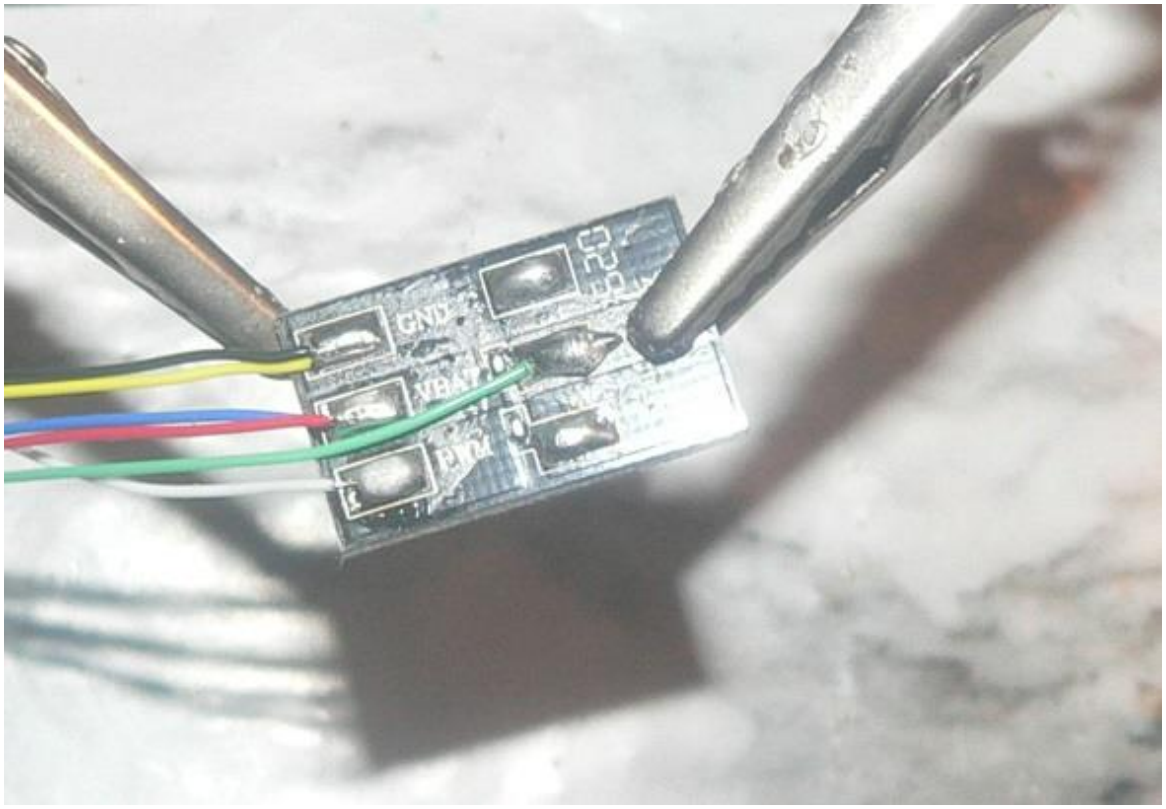
28). Remove the old slip ring from the work area to avoid any possible confusion.

NOTE: New Slip ring wires typically come with a proper twist of black/yellow and blue/red with all ends pre-tinned.

29). Ensure the ends of the new slip ring top wires are twisted and pre-tinned:

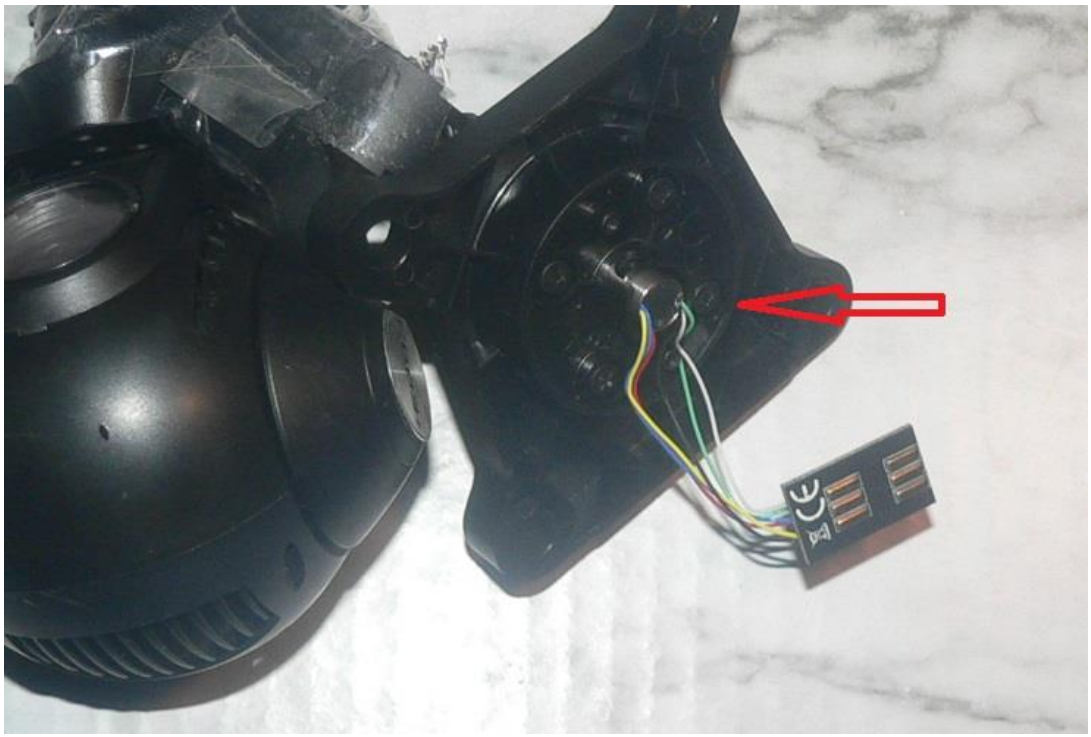


30). Solder the new slip ring top wires to the contact plate:



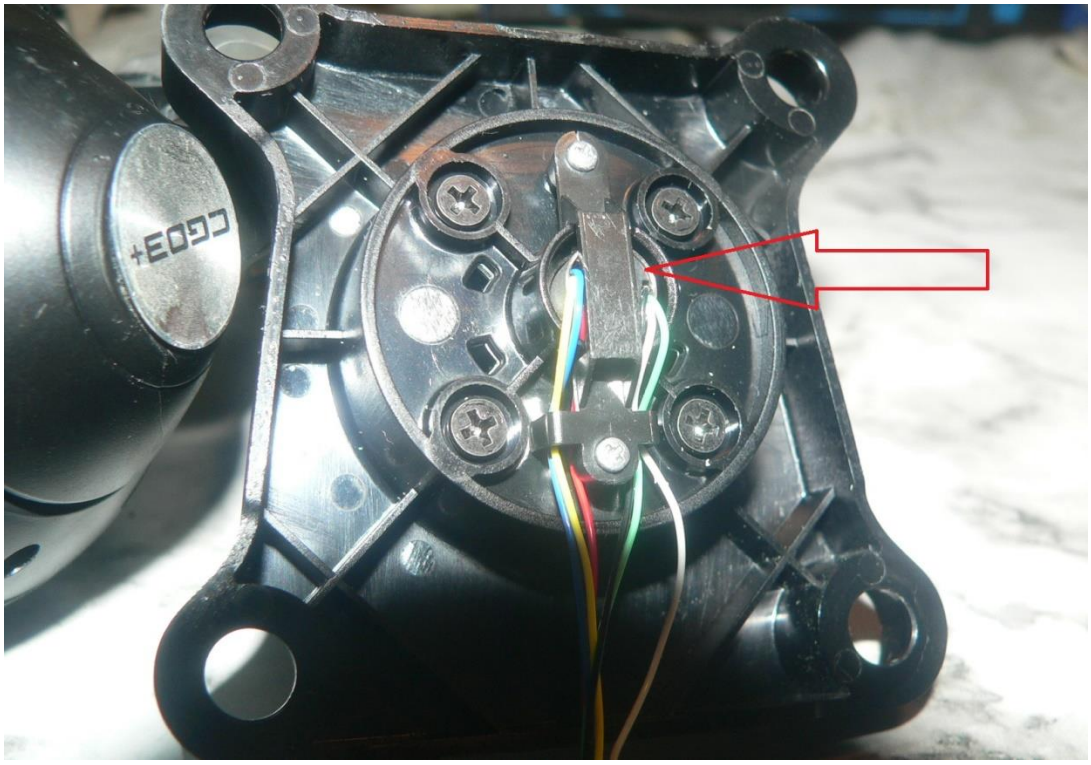
Attachment 21
CGo3+ Slip Ring Replacement

31). Insert the new slip ring lower wires down through the hollow motor shaft until the slip ring barrel is in its correct position:



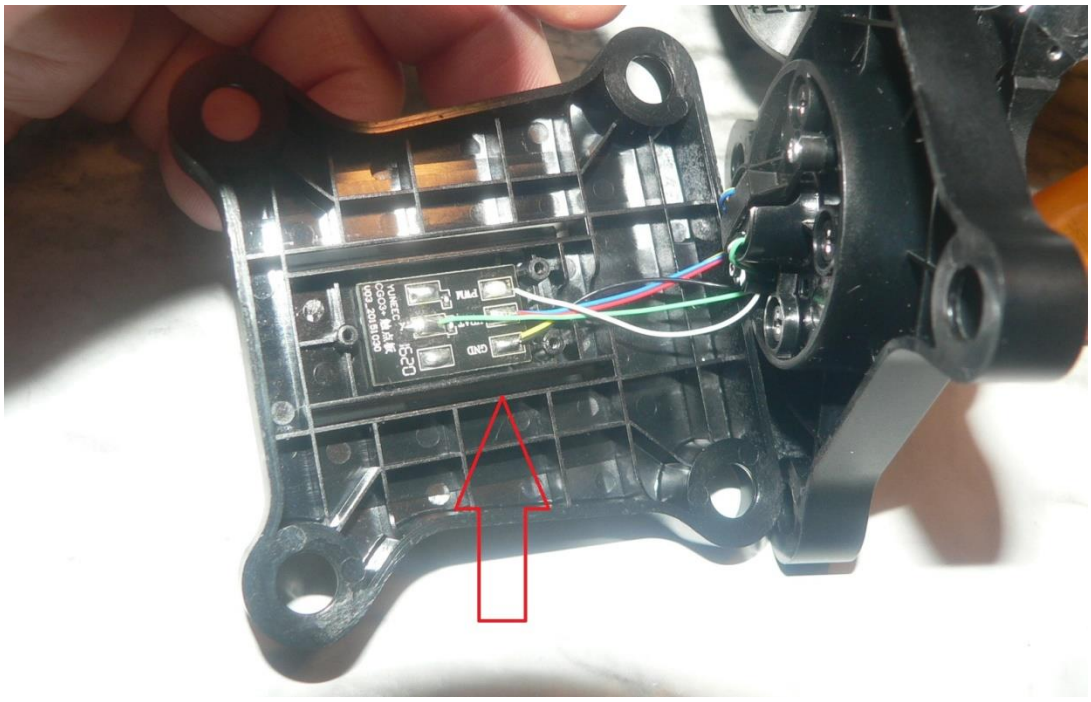
NOTE: Slip ring wires must be divided evenly and routed towards the rear (wider) end of the mount.

32). Install the slip ring retainer strap.

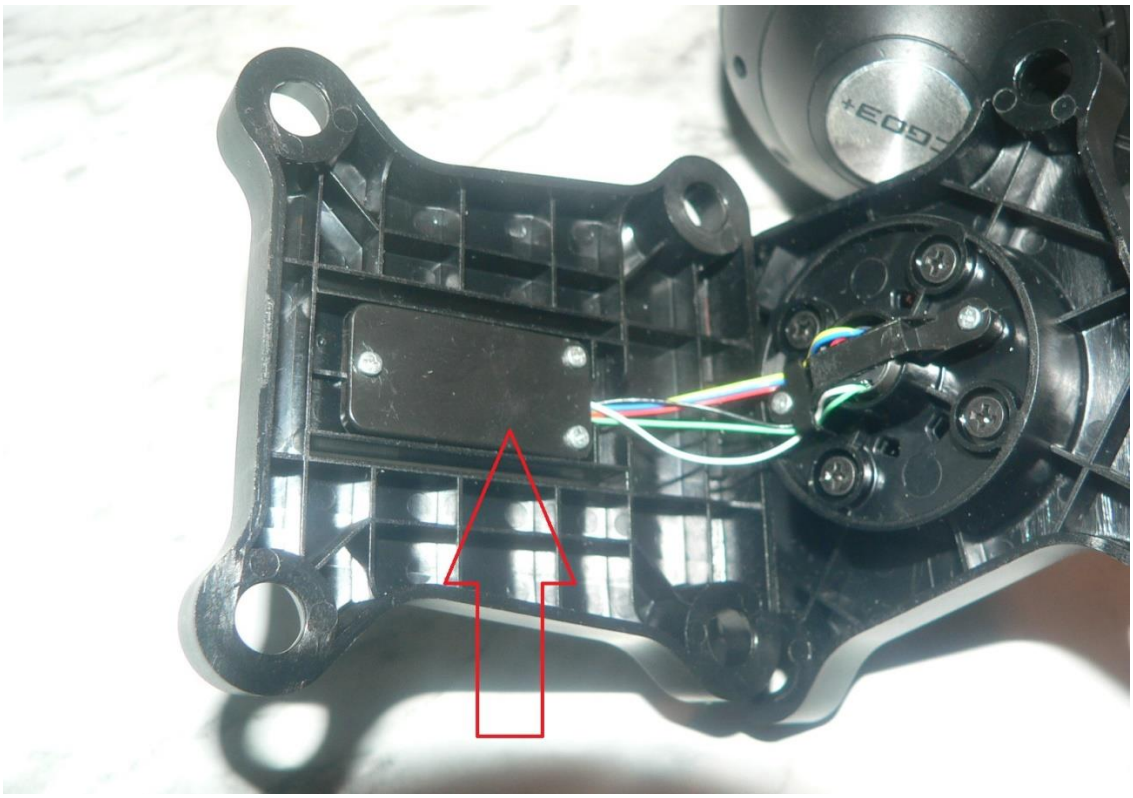


Attachment 21
CGo3+ Slip Ring Replacement

33). Lay the contact plate and wires into the upper camera mount:



34). Install the contact plate retainer:



Attachment 21
CGo3+ Slip Ring Replacement

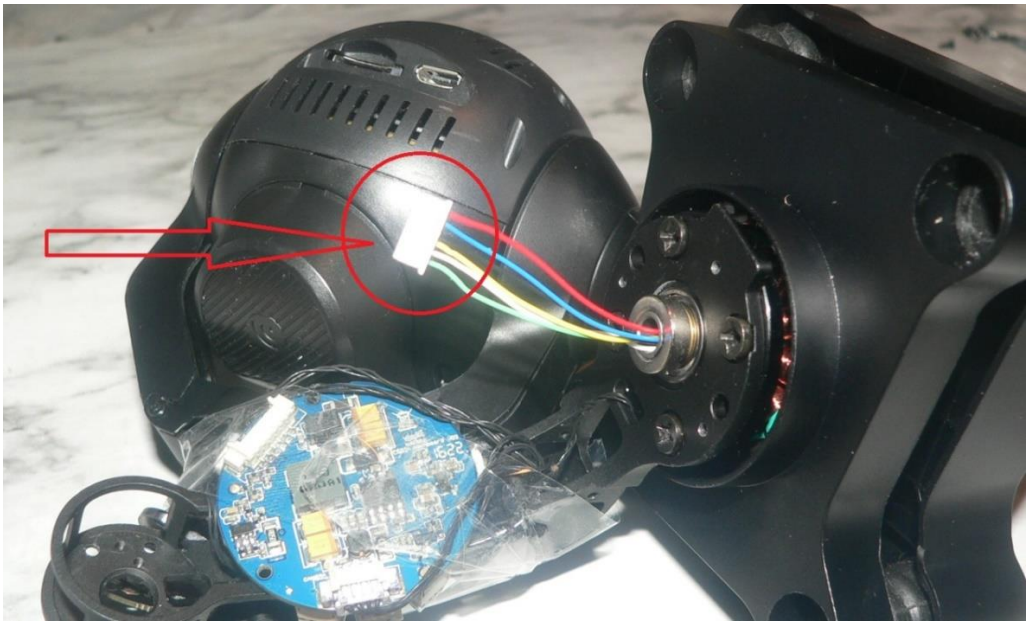
35). Install the rubber dampers, damper retainer pins (if desired) and upper wire guard:

Caution: The slip ring connector is held upside down while inserting the slip ring wires. The order of wires may appear reversed. Ensure wires are inserted in proper order.

Note: Refer to Attachment 21

Addendum 1 (General Latch and Pin Arrangement) as required to properly insert the pins into the connector plug.

36). Install the new slip ring wires into the slip ring connector:

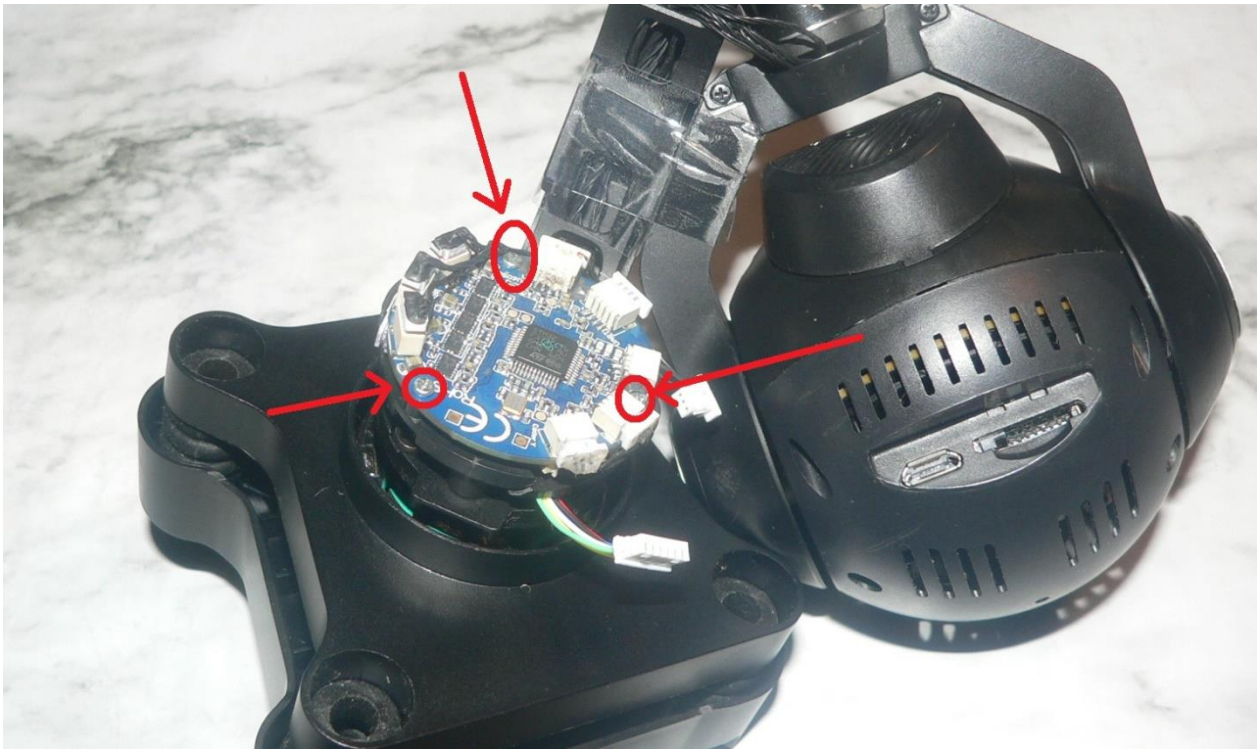


Attachment 21
CGo3+ Slip Ring Replacement

NOTE: Lay the Slip ring wires in the general final position to avoid conflict with the support columns.

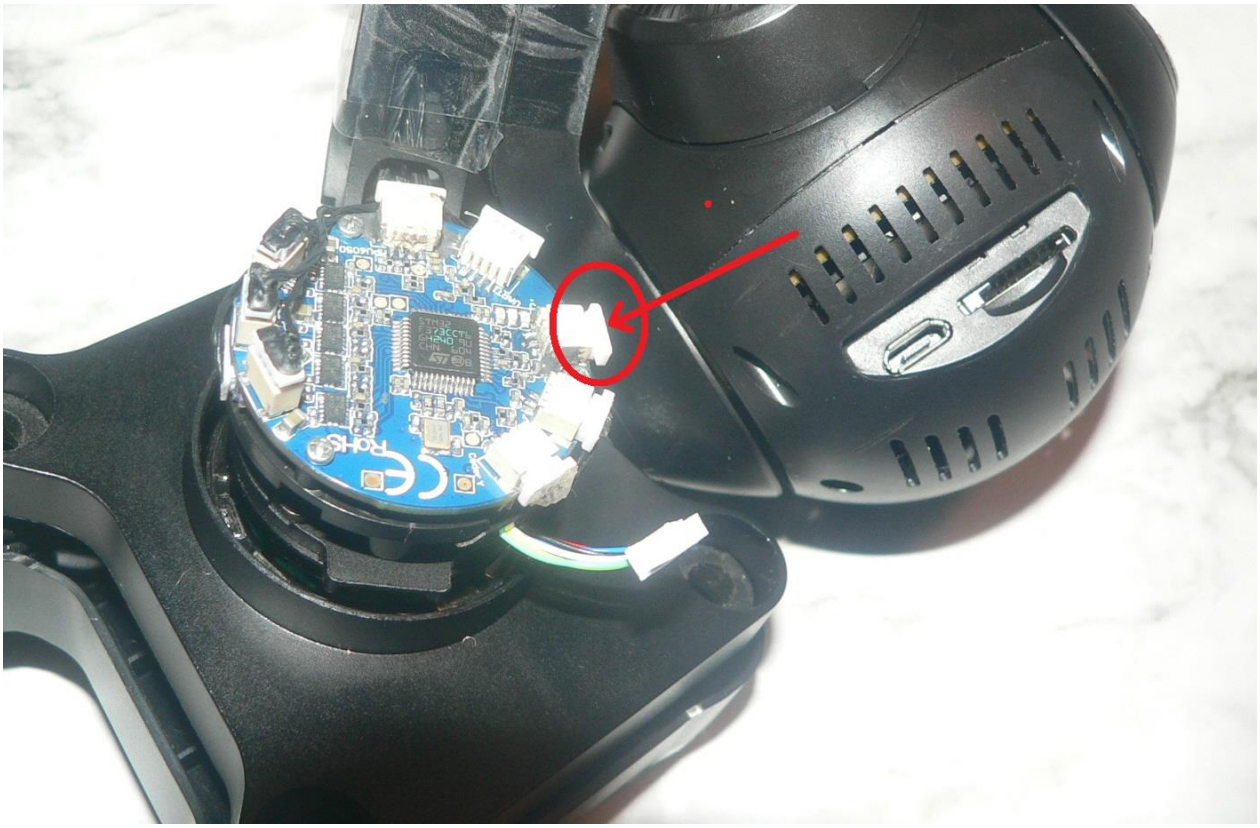
37). Install the Slip Ring/Yaw Sensor Support:

38). Remove tape, and install the gimbal board (3 screws):

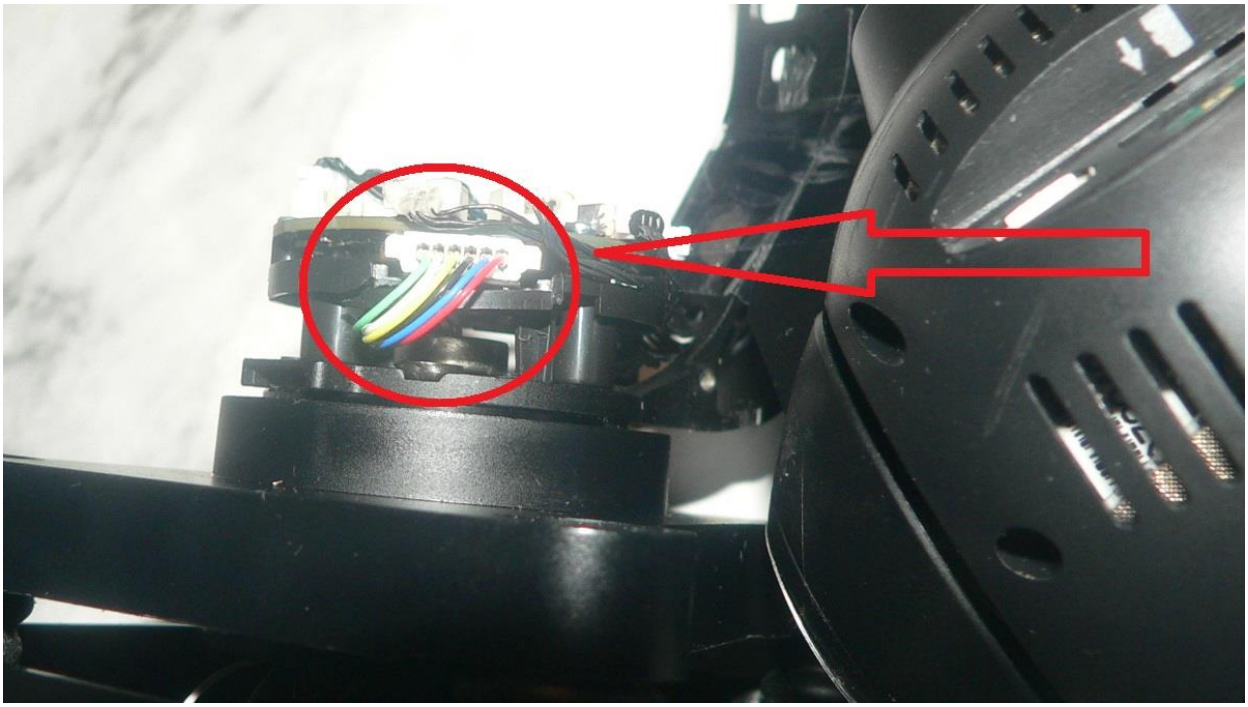


Attachment 21
CGo3+ Slip Ring Replacement

39). Plug in Yaw Sensor:

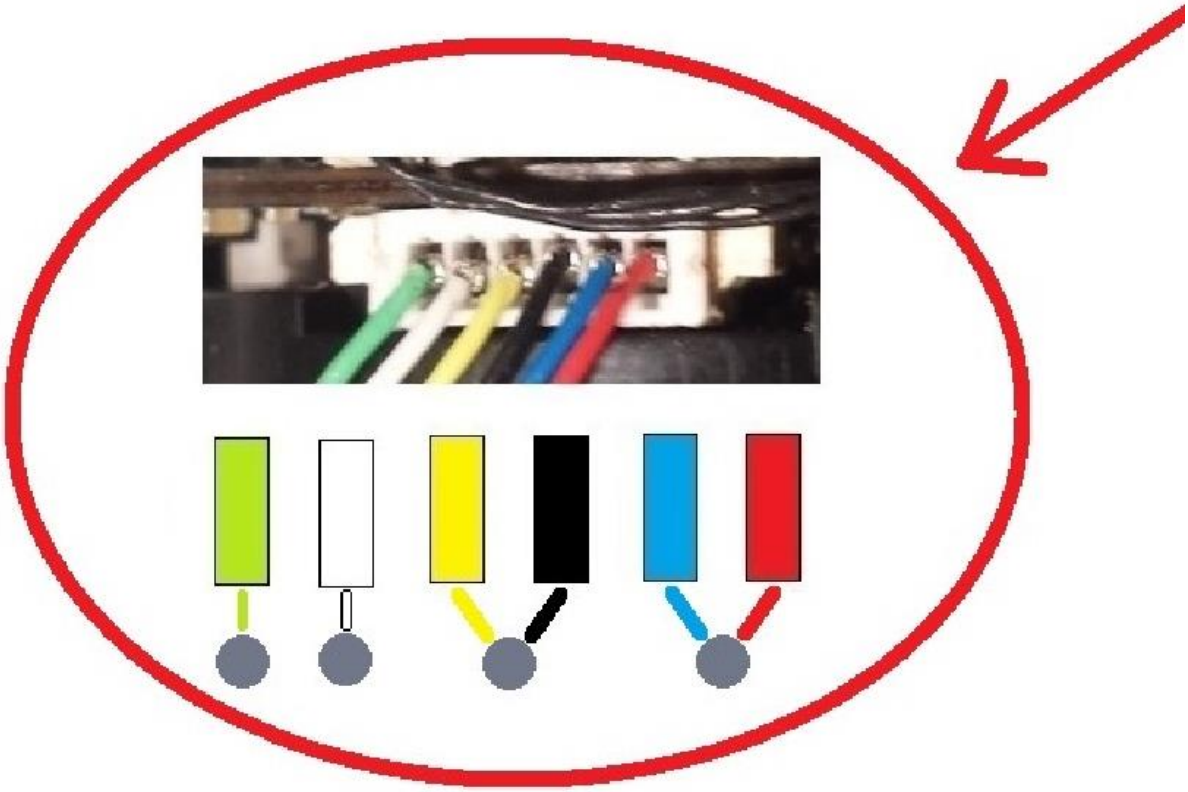


40). Plug in the Slip Ring Connector:



Attachment 21
CGo3+ Slip Ring Replacement

41). Verify Slip Ring Connector wire order one more time:



42). Remove tape and Install the Roll Motor / Camera Yoke:

43). Install the Roll Motor Sensor:

44). **Optional Step:** Power camera up to test installation:

45). Install the rear arm cover:

Attachment 21
CGo3+ Slip Ring Replacement

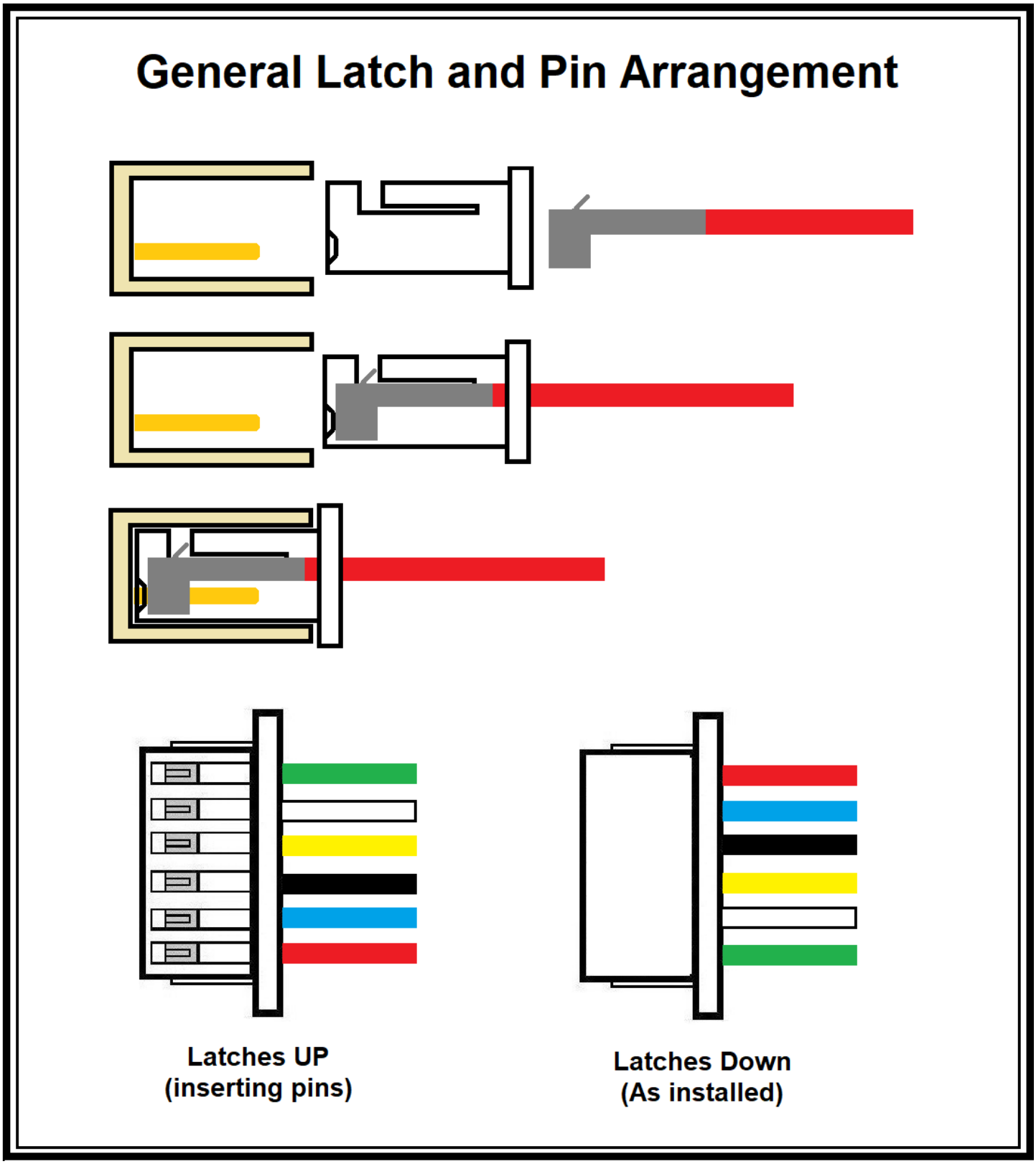
46). Install the Gimbal Board Enclosure:

47). Install the Gimbal Board Enclosure cap:

Attachment 21
CGo3+ Slip Ring Replacement

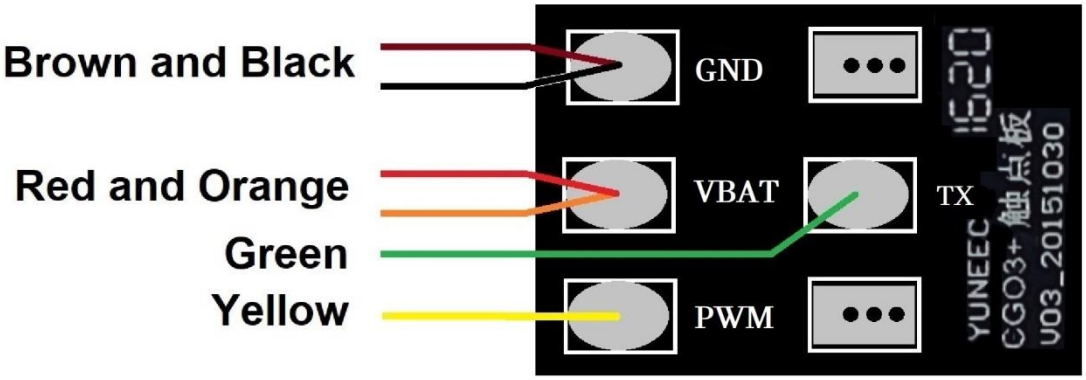
48). Install the rear arm decal using suitable adhesive:

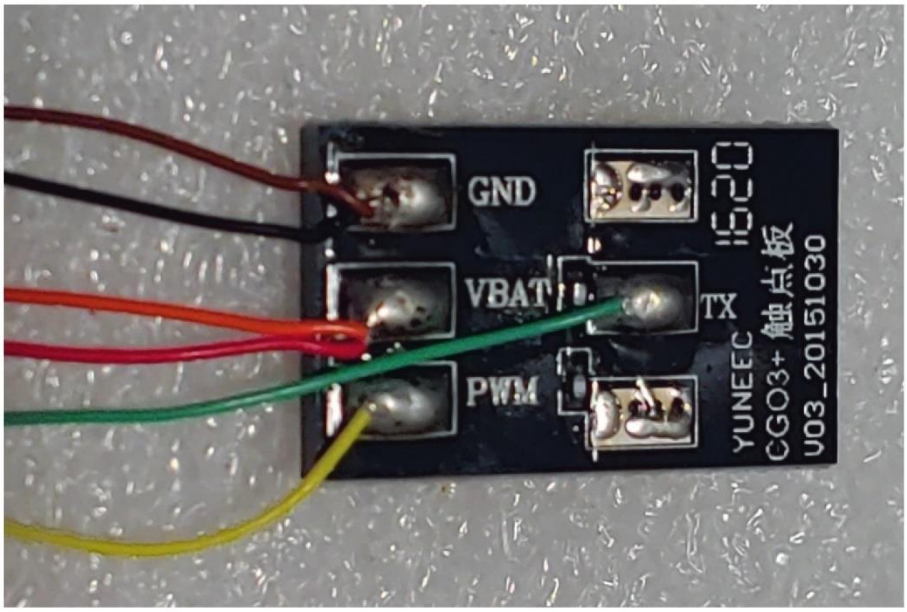
Attachment 21
Addendum 1
General Latch and Pin Arrangement



Attachment 22
C23 / E90 Contact Plate Wire Color

YUNEEC C23 / E90
Contact Plate Wire Color





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Attachment 23
Typhoon H Plus Binding Notes

To bind an H Plus to a new ST16S controller:

1).Invert the Plus until all the motor LEDs are flashing green.
2).Return the H Plus to the upright position.
3).Return to the ST16S Bind Menu.
4).Refresh the ST16S Bind Menu.
The Typhoon H Plus ID number will now on the ST16S Bind Menu.

To bind a C23 camera to a new ST16S controller:

1).If the new camera does not show in the ST16S Bind Menu:
2).Go to Pad.
3).Go to WIFI settings.
4).Select the camera.
5).Enter the password. (Default Password: 1234567890)
6).Return to the ST16S Bind Menu.
7).Refresh the menu.
The C23 camera SSID should now appear in the ST16S Bind menu.

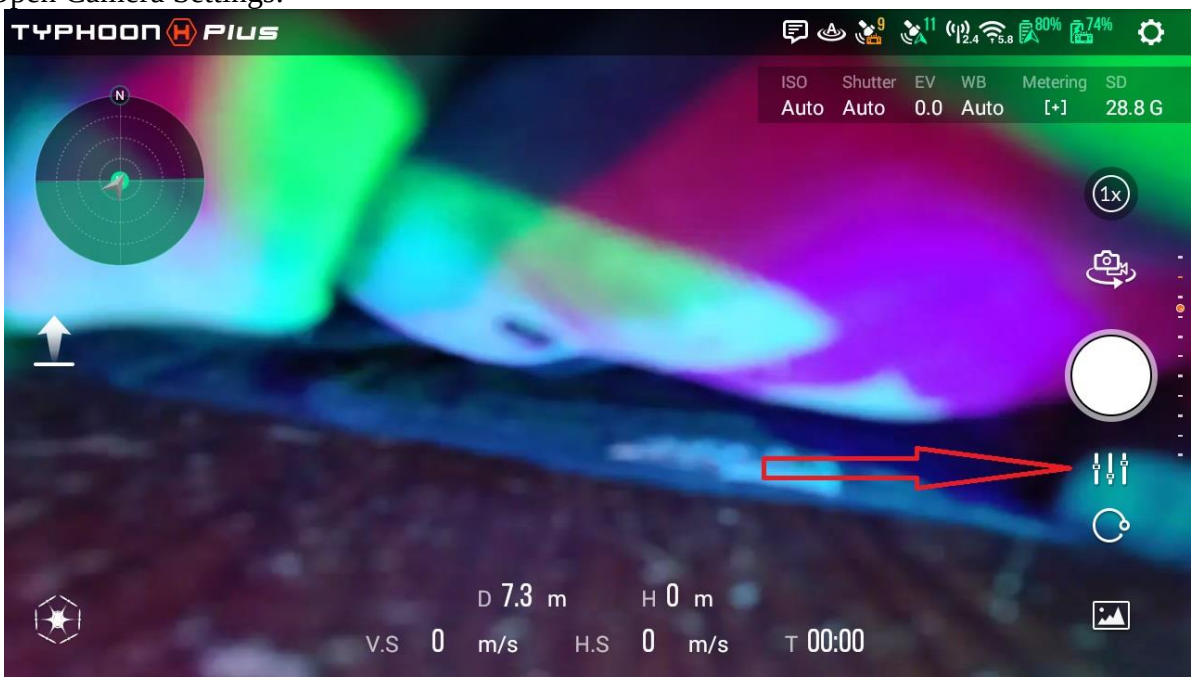
Attachment 24
Format SD Card in C23

Use of this information is at your own risk.

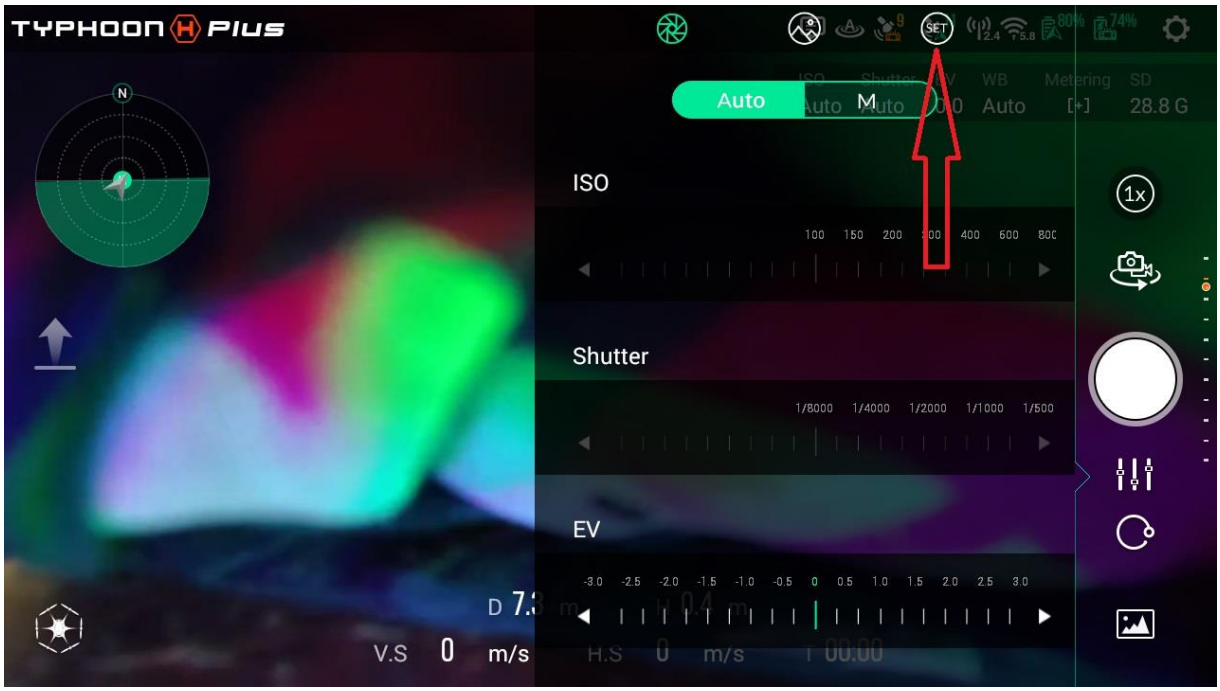
1). Ensure SD Card is in Camera.

2). Ensure H Plus and camera bound to ST16.

3). Open Camera Settings:

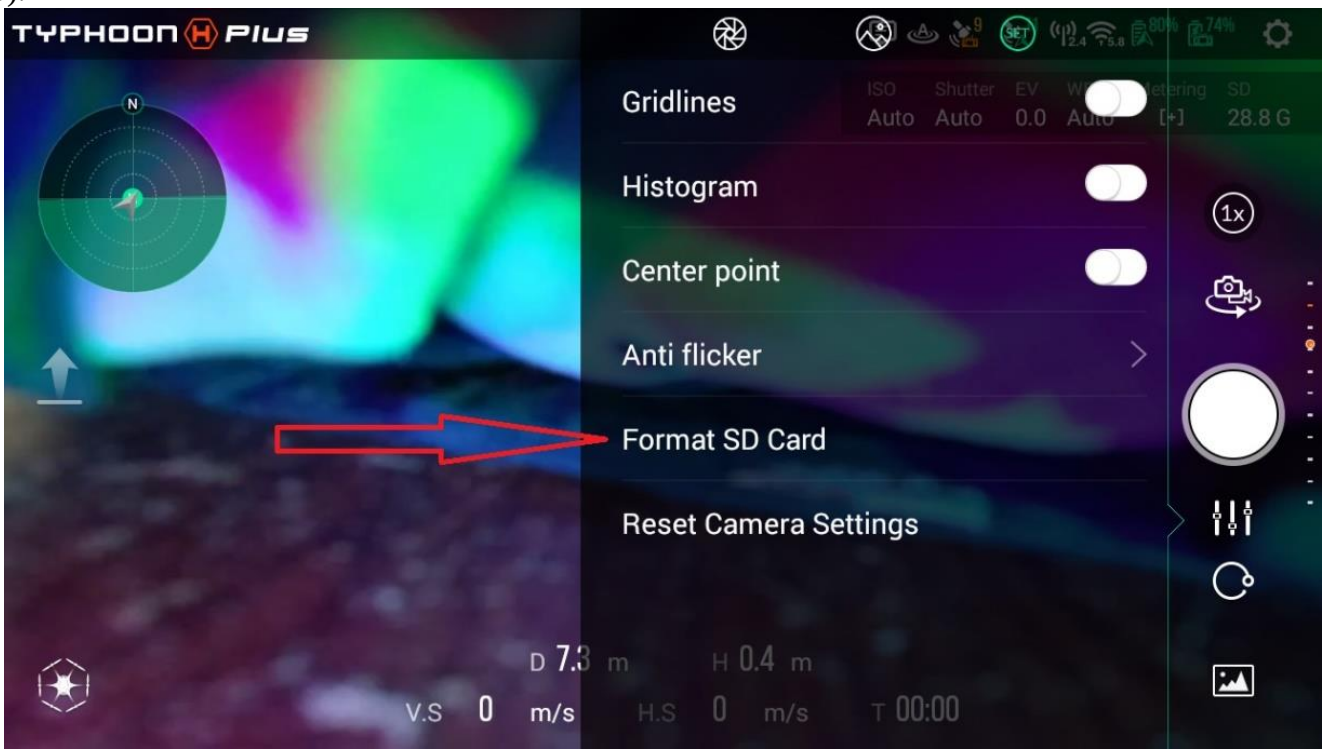


4). Select "SET:

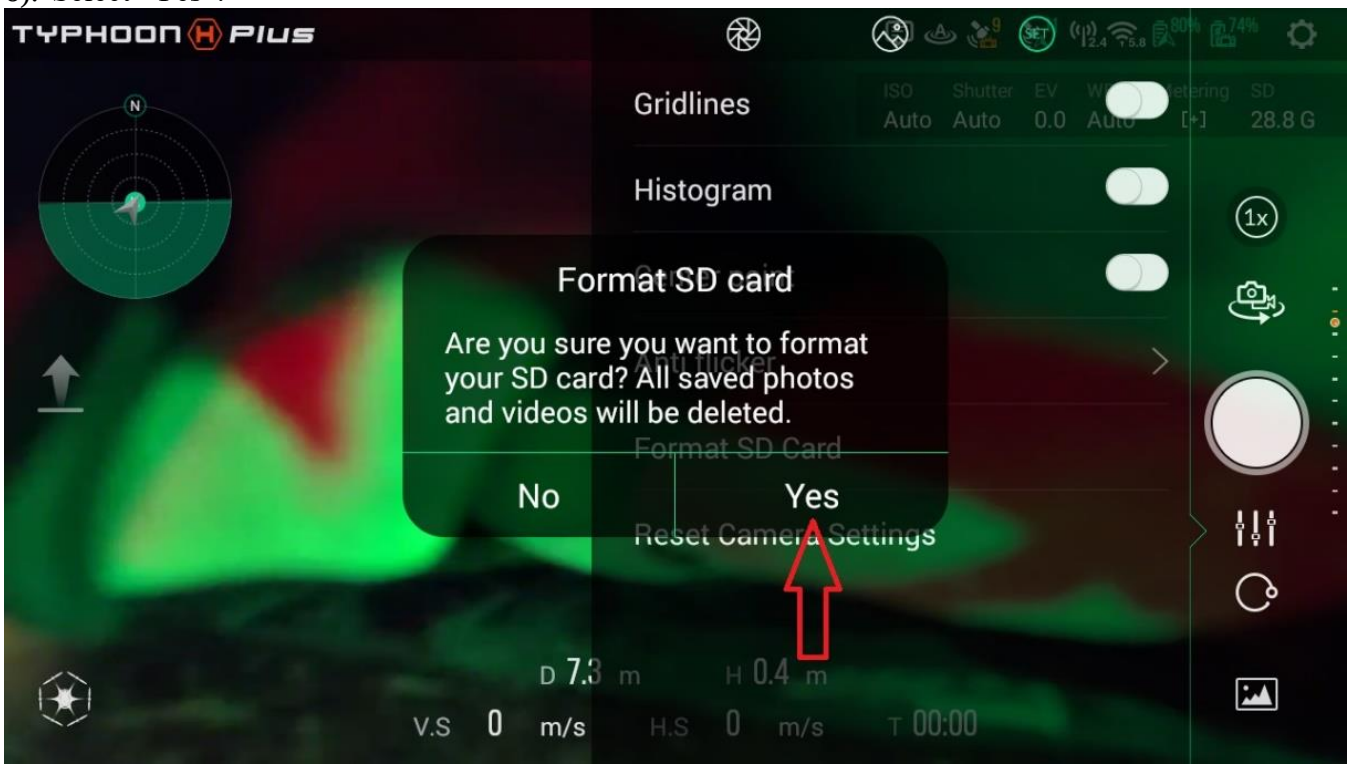


Attachment 24
Format SD Card in C23

5). Select “Format SD Card”:



6). Select “Yes”:



7). Verify SD Card Format Succeeded.

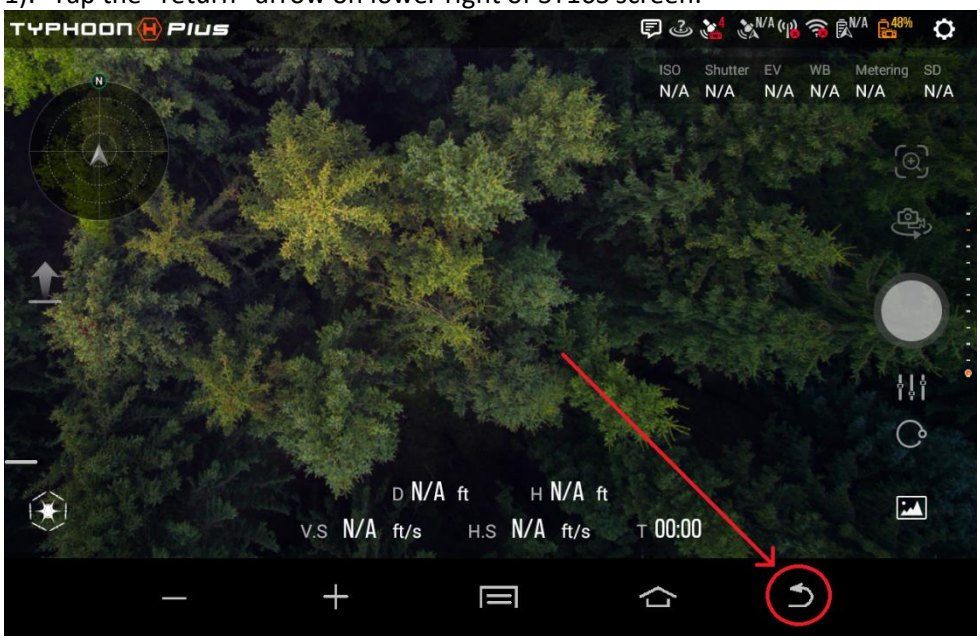
Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

Introduction: This document describes the method to perform an H Plus firmware upgrade or downgrade using SD Cards only. These instructions use Build 822 as the example Build. All file names and numbers are associated with Build 822. The general process is the same for other builds, but may require a different source for the necessary files. Not all builds include all components included in Build 822.

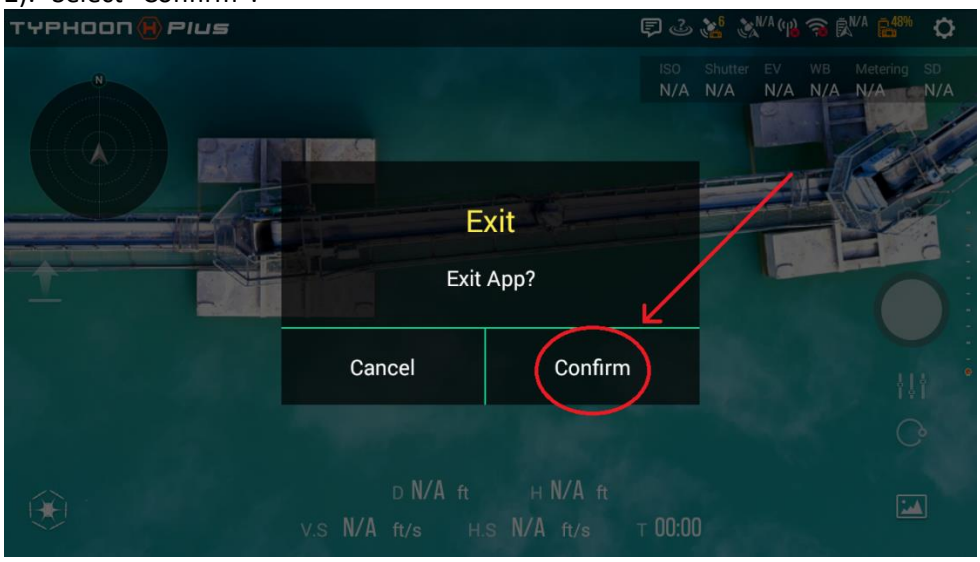
Use of this information is at your own risk.

PREPARATION:

1). Tap the "return" arrow on lower right of ST16S screen:

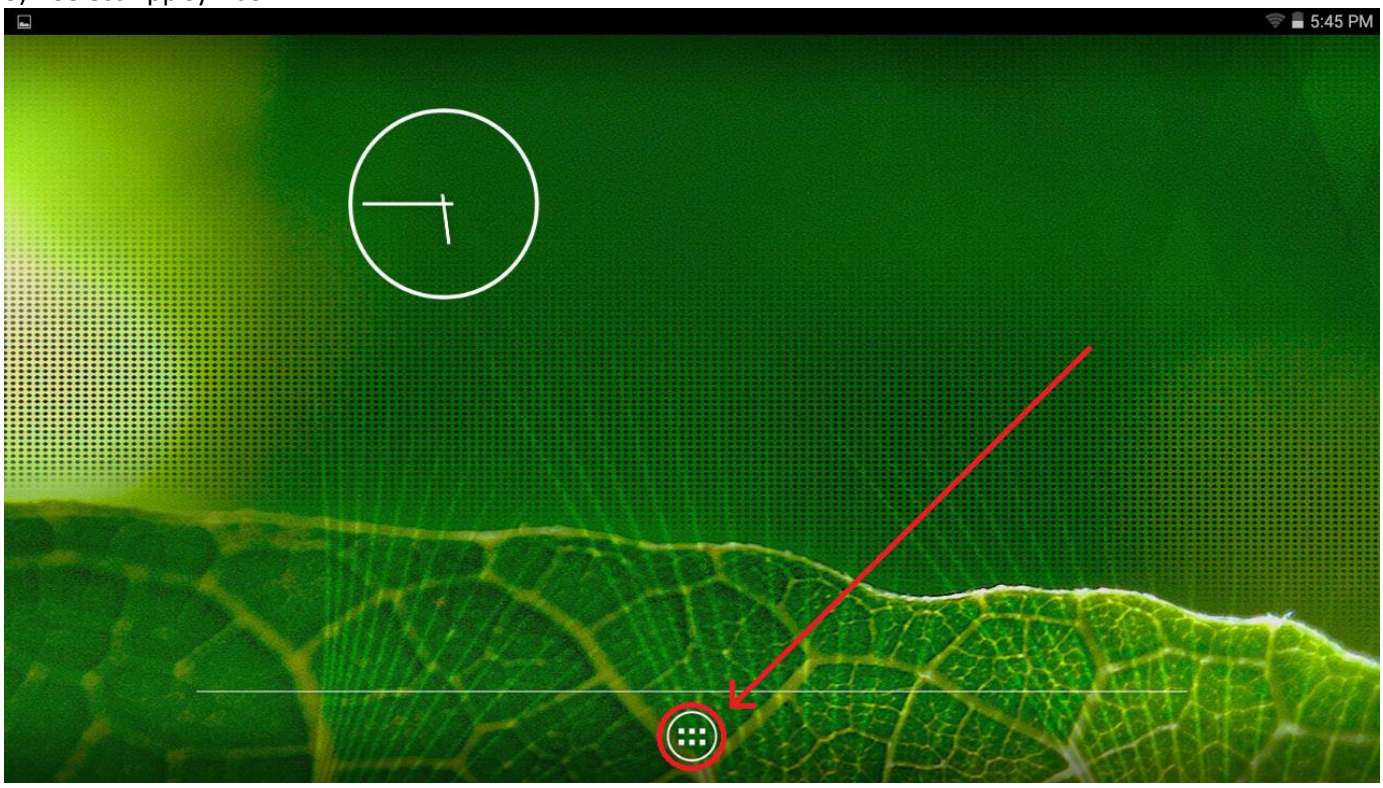


2). Select "Confirm":

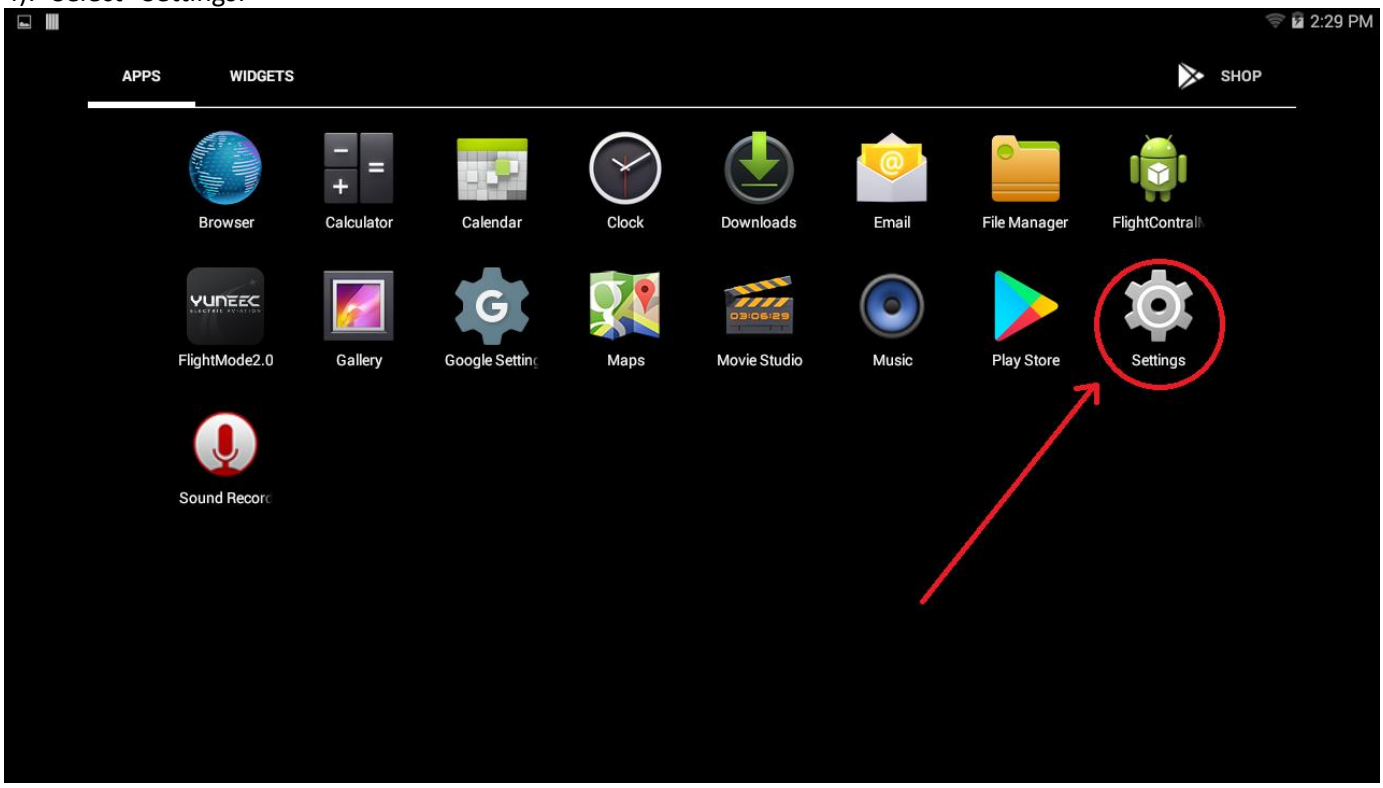


Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

3). Select App symbol:

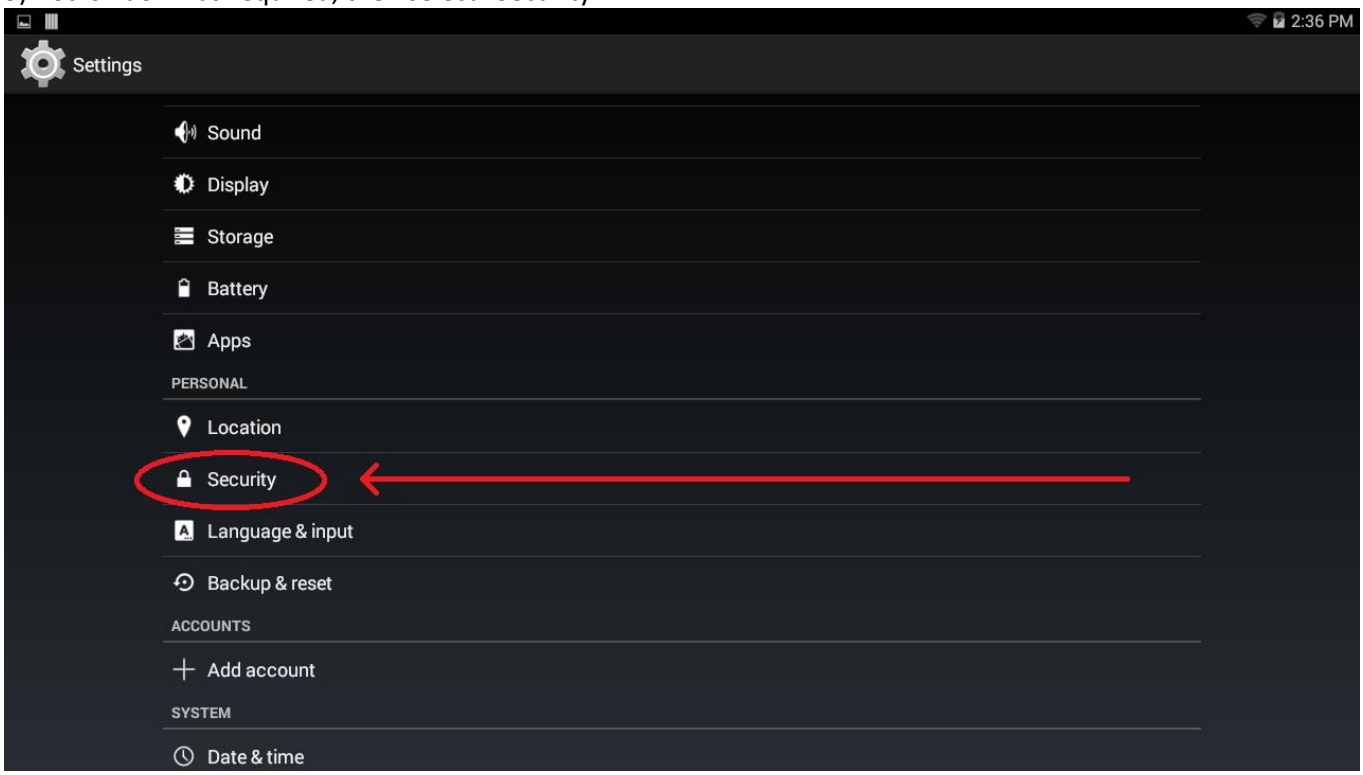


4). Select “Settings:

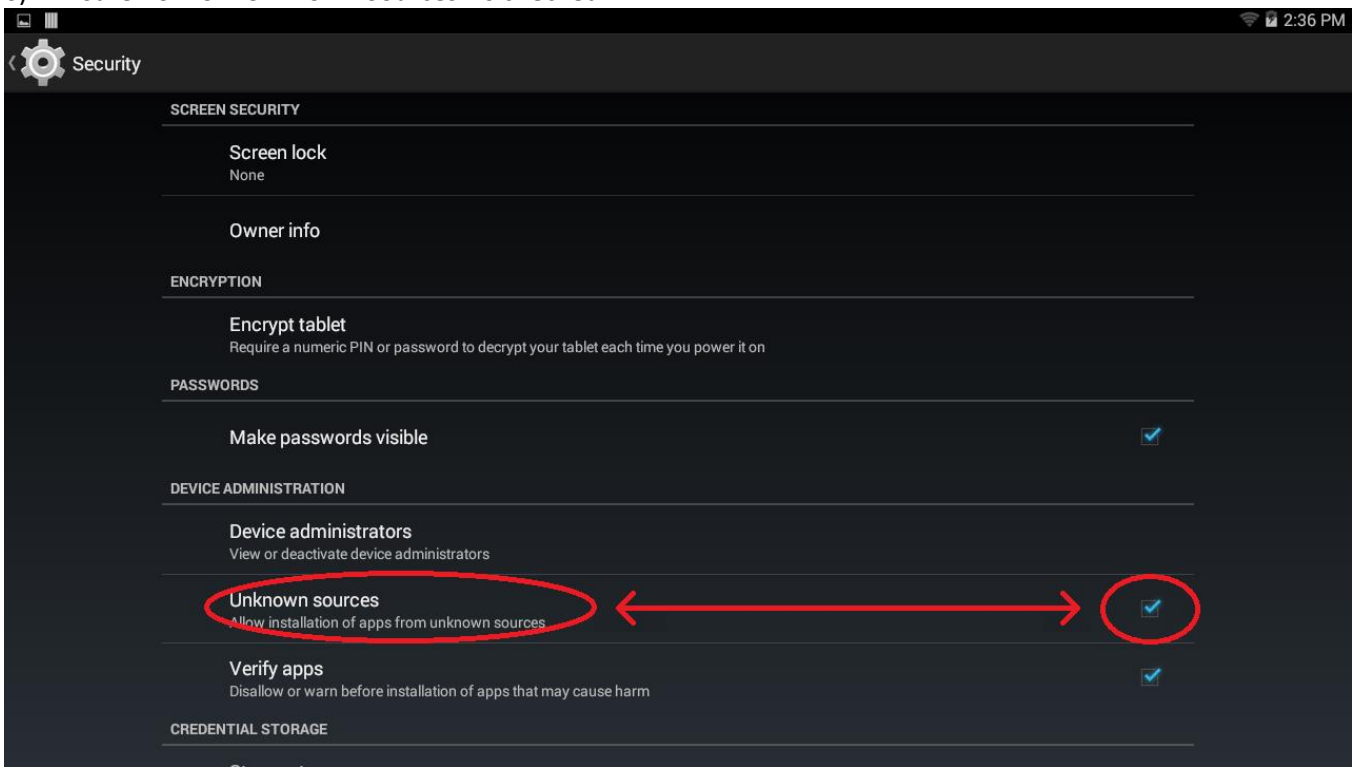


Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

5). Scroll down as required, then select “Security”:



6). Ensure Box for “Unknown Sources” is checked:

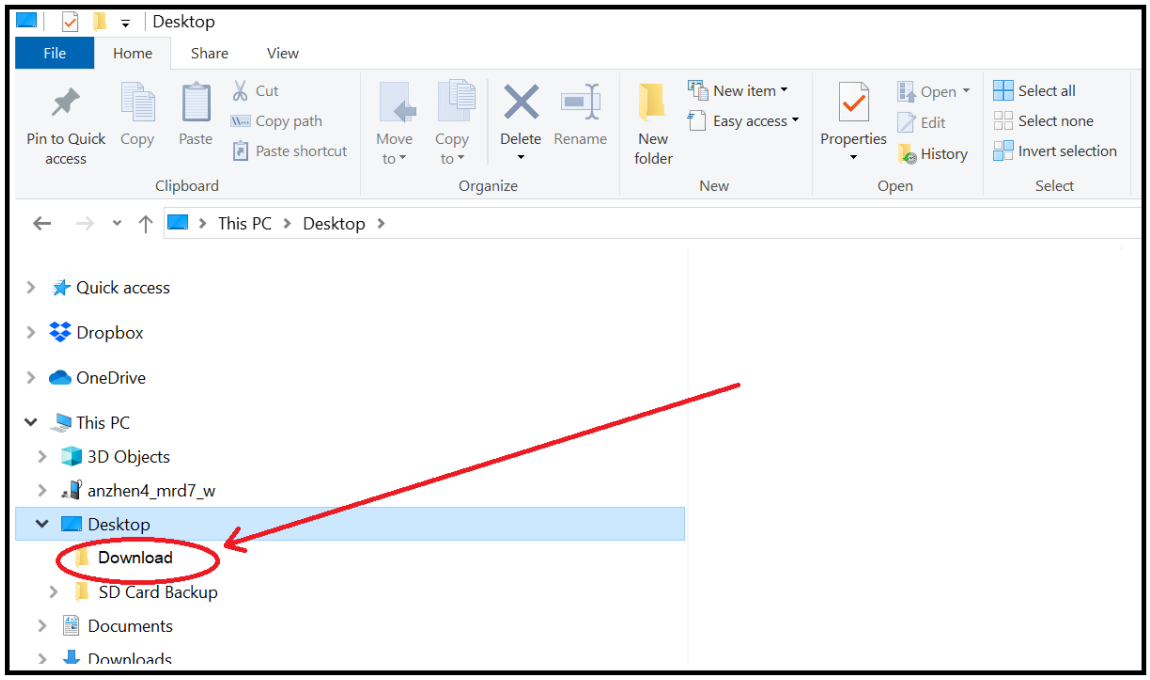


7) Return to the ST16S main screen.

8) Turn OFF the ST16S.

Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

9) Create a folder on your desktop named "Download":



10) Ensure H Plus flight battery is fully charged.

11) Ensure ST16S controller battery is fully charged.

Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

PHASE 1

Note: The first phase of the process is to update the drone , the camera, and the camera gimbal.

1) Format an SD card.
2) Download "TYPHOONHPLUS_C23_C_1.1.03_BUILD822_20190312.yuneec" from https://www.mountainview.enterprises/support.html to the Download directory.

Note: "TYPHOONHPLUS_C23_C_1.1.03_BUILD822_20190312.yuneec" may automatically rename to ".zip" during download.

3) Rename "TYPHOONHPLUS_C23_C_1.1.03_BUILD822_20190312.yuneec" to "TYPHOONHPLUS_C23_C_1.1.03_BUILD822_20190312.zip" as required.
4) Extract "TYPHOONHPLUS_C23_C_1.1.03_BUILD822_20190312.zip" to the formatted SD Card.
5) Ensure the SD card now has four files on it:
   a) Autopilot.yuneec
   b) camera.bin
   c) Gimbal.yuneec
   d) Versioninfo.json (this one does not matter).
6) Eject the SD card
7) Put the SD card in the C23.
8) Mount the C23 on the H Plus
9) Turn on the H Plus.

Note: It will take a minute or so before anything starts to happen. The rear LEDs will initially flash blue as always. When they go "solid" is when things will start to happen.

Note: Generally, the camera will stabilize and flash the green camera LED. The camera will then go limp for a while. Things will go off, then back on a couple times. Various color and pattern arm LEDs and camera LED will show. Eventually, the camera should stabilize, and show a green flashing LED. Allow about three more minutes to ensure the update is complete.

10) When you are sure the update is complete, shut down the drone.
11) Remove the SD Card.
12) Format the SD card again.

Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

PHASE 2

Note: The second Phase of the project is to update the Controller's User Interface (The "APP").

Note: The APP Build shows "829" instead of "822". That is normal for Build 822.

1). Ensure the SD card is formatted again.

2). Download "TYPHOONHPLUS_APP_1.1.03_BUILD829_20190320.yuneec" from https://www.mountainview.enterprises/support.html , to the Download directory.

Note: "TYPHOONHPLUS_APP_1.1.03_BUILD829_20190320.yuneec" may automatically rename to ".zip" during download.

3). Rename "TYPHOONHPLUS_APP_1.1.03_BUILD829_20190320.yuneec" to "TYPHOONHPLUS_APP_1.1.03_BUILD829_20190320.zip" as required.

4). Extract "TYPHOONHPLUS_APP_1.1.03_BUILD829_20190320.zip" to the formatted SD Card.

5). Ensure the SD card now has "Yuneec-App-Release.apk" on it.

6). Eject the SD card.

7). Ensure the controller is OFF.

8). Insert the SD card into the ST16S.

9). Turn on the ST16S.

Note: The controller should start almost normally, maybe a restart or two. It should eventually come up to the normal "splash screen"

10). Go to the ST16S `"Firmware Version" Screen.

11). IF the APP listed is "APP_1.1.03_20190320" then GO TO Step 13). Do not perform Step 12) or it's sub-steps if the correct APP is listed. (It won't hurt anything if you do, but it is not necessary.)

12). IF the APP listed is NOT "APP_1.1.03_20190320" then perform these sub-steps to force an update:
   a) Exit the APP (Return arrow on bar below the main screen).
   b) Select "confirm".
   c) Navigate to "File Manager".
   d) Select External SD card in upper left (if required).
   e) Touch the actual name of "Yuneec-App-Release.apk".
   f) Select "ALL" in the box.
   g) Select "Install" at the bottom of the box.
   h) When "App installed" appears, select "Open" at the bottom of the box.
   i) Check the "Firmware Version" screen to ensure APP listed is now "APP_1.1.03_20190320".

13). Shut the ST16S down.

14). Remove the SD card.

15). Format the SD Card again.

Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

PHASE 3

Note: This phase is the update of the ST16S operating system and the "TX" subsystem. The process takes time to complete. ST16S battery power is crucial. The controller may not let you start if you have less than 30% battery power. 50% should be considered minimum.

1). Ensure adequate ST16S battery charge.
2). Ensure the SD card is formatted again.
3). Download "TYPHOONHPLUS_CONTROLLER_1.1.03_BUILD822_20190312.yuneec" from https://www.mountainview.enterprises/support.html , to the Download directory.

Note: "TYPHOONHPLUS_CONTROLLER_1.1.03_BUILD822_20190312.yuneec" may automatically rename to ".zip" during download.

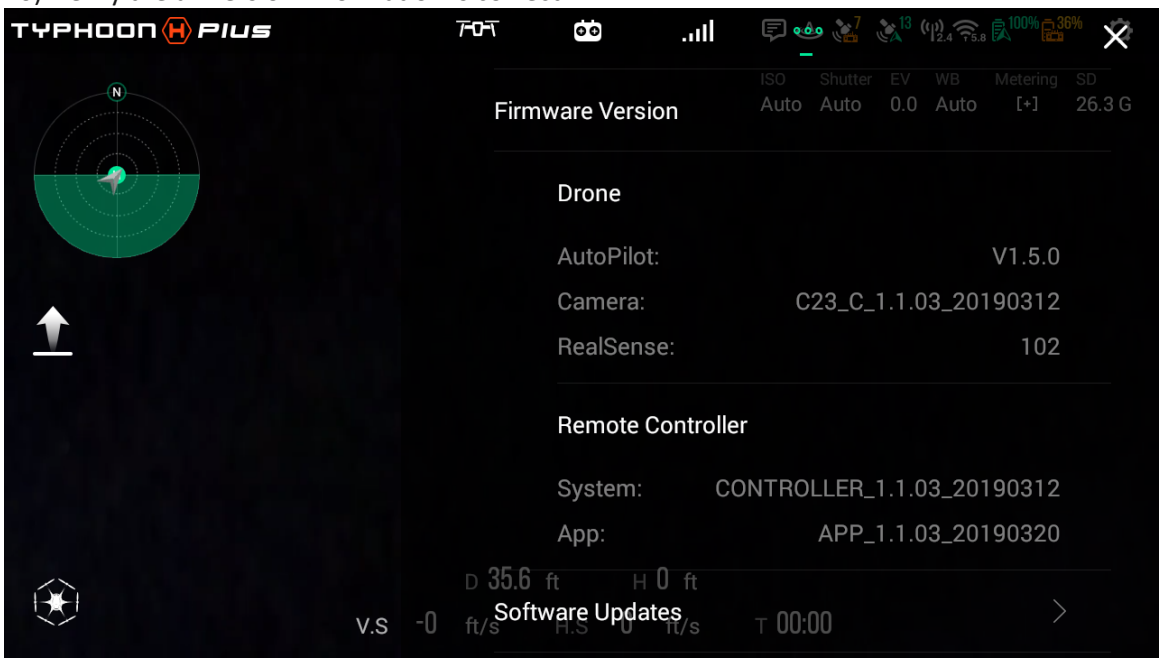
4). Rename "TYPHOONHPLUS_CONTROLLER_1.1.03_BUILD822_20190312.yuneec" to "TYPHOONHPLUS_CONTROLLER_1.1.03_BUILD822_20190312.zip" as required.
5). Extract "TYPHOONHPLUS_CONTROLLER_1.1.03_BUILD822_20190312.zip" to the formatted SD Card.
6). Ensure the card contains these items:
   a. A folder named "firmware"
   b. A file named "Update.zip". DO NOT extract this zip.
7). Copy the "TX" folder out of the "Firmware" folder to the root of the SD card. Ensure the original "TX" folder also remains in the "Firmware" folder.
8). Ensure the card now contains these items:
   a. A new folder named "TX".
   b. The existing folder named "Firmware"
   c. The existing file named "Update.zip". Again, DO NOT extract this zip.
9). Eject the SD card
10). Ensure the ST16S is OFF.
11). Insert the SD card into the ST16S.
12). Turn on the ST16S.

Note: The ST16S will go through several evolutions. The evolutions will Include restarts, display of an android with an energy ball, and progress notifications. Allow the system to perform without interruption until it returns to the splash screen. It may take several minutes. The ST16S will return to the normal Splash Screen when the update has finished,.

13). When the Update has finished, turn off the ST16S.
14). Remove the SD card.
15). Restart the controller.
16). Turn on the drone and camera.
17). Allow time to fully initialize.
18). Bind the Camera and the H Plus to the ST16S.
19). Go to the ST16S `"Firmware Version" Screen.

Attachment 25
SD Card Upgrade/Downgrade H Plus Firmware

20). Verify the all version information is correct:



21). Perform a compass calibration of the H Plus.

Attachment 26
Q500 Binding Verification

Using this standard sequence will allow comparison of expected results to actual results at each significant step. It is a way to determine where the process is failing. This sequence is somewhat tedious. Care should be taken to perform all steps in the designated sequence.

Use of this information is at your own risk.

Before you start:

1. Ensure Q500 battery is adequately charged.
2. Ensure Q500 battery is properly installed.
3. Ensure the memory card under the ST10+ battery is properly aligned in the holder, or is completely removed.
4. Ensure the ST10+ battery is properly installed.
5. Ensure the ST10+ battery is adequately charged.
6. Ensure camera is mounted, connected to power, and camera guard removed.
7. Ensure SD card in camera, if desired.
8. Ensure the Q500 is on a flat, stable surface, with enough room to tilt it forward.
9. Ensure ST10+ Mode Selector Switch (S1) is set to Angle Mode.
10. Ensure both the Q500 and the ST10+ are OFF.

Binding Sequence:

1. Turn on ST10+.
2. Allow time for the ST10+ to fully initialize.
3. Verify RED power indicator above ST10+ power switch is illuminated.
4. Verify the blue WIFI indicator is flashing. (directly above the on/off switch)
5. Press "Model Select" on the lower right of the ST10+ screen twice.
6. **IF** a "WARNING!!!" pop-up appears, press "OK".
7. Verify the "Model Select" screen appears.
8. **IF** you want the new model to have the same name as your existing model, delete the existing model.
9. Press "New Model" on the left of the screen, just above center.
10. Press "Type" button near upper right of the screen.
11. Press the desired Model Type from those displayed.
12. Press the "Please input name" window just below the model picture.
13. Verify the keypad screen appears.
14. Use the keypad to enter the desired model name.
15. Press either of the "Done" buttons at the right side of the screen.
16. Verify the screen returns to the "Edit Model" screen.
17. Press "Save" at the lower right of the screen.

Attachment 26
Q500 Binding Verification

18. Verify screen returns to the “Model Select” screen.
19. Verify your new model is selected as indicated by a blue box around it.
20. Verify the new model name is displayed in small letters at the upper left of the screen.
21. Press the ST10+ return.
22. Verify the main screen appears.
23. Again, verify your new model name appears in the far upper left of the screen.
24. Turn on the Q500.
25. Allow a few seconds for the Q500 to fully initialize.
26. Verify the Main (rear) LED is flashing BLUE at a fast rate.
27. Verify the orange (blue?) LED visible through the air vents of the left wing is flashing slowly, ~ 1/sec. (The LED may be blue depending on model.)
28. Tilt Q500 greater than 45 degrees forward at least two times.
29. Verify the Main (rear) LED is flashing orange at a very fast rate.
30. Verify the orange (blue?) LED in the left wing is flashing more rapidly, ~ 2/sec.
31. Press the “Flight Settings” button.
32. Verify the flight settings menu appears.
33. Select “BIND” at the top of the menu.
34. Verify the bind screen appears.
35. Verify the words “Not connected” appear in orange letters, directly below the word “Model”.
36. Verify the words “Not connected” appear in orange letters, directly below the word “Camera”.
37. Verify the receiver ID is displayed in white letters below the orange “Not connected” label in the “Model” column.
38. Verify the camera ID is displayed in white letters below the orange “Not connected” label in the “Camera” column.
39. Press the white receiver ID in the “Model” column.
40. Verify a “Syncing Model Data” notification briefly appears.
41. Verify the “Connection Status” pop-up appears.
42. Verify the “Connection Status” pop-up displays “Connection Established!”.
43. Press OK on the “Connection Status” pop-up.
44. Verify the receiver ID replaced the words “Not connected” in the “Model” column, and is now in orange letters.
45. Verify the Main (rear) LED continues to flash orange at this point.
46. Verify the orange (blue?) LED in the left wing continues to flash at the faster rate, ~2/sec.
47. Press the return button to return to the flight settings menu screen.
48. Verify the orange (blue?) light in left wing is flashing at a slower rate, ~ 1/sec.
49. Press the return button again to return to the main ST10+ display screen.

Attachment 26
Q500 Binding Verification

50. Verify you hear a short beep from the Q500, indicating the bind process has initiated.
51. Verify you hear another short beep from the Q500, indicating the bind process has completed.
52. Verify the Main (rear) LED changed to Purple.
53. Verify the orange (blue?) LED in left wing is solid orange.
54. Verify main ST10+ screen populates with telemetry data.
55. Press “Flight Settings” twice.
56. Press OK on the “WARNING!!” pop-up.
57. Verify you hear a “down tone” from the Q500.
58. Verify the flight settings menu appears.
59. Verify Main (rear) LED returns to rapid blue flashing.
60. Press “Camera Select” on the flight setting menu.
61. Press the name of the desired camera type from the menu.
62. Press the “Select” button at the lower right of the screen.
63. Verify “Set Status” pop-up displays “Setup Complete!”
64. Press OK on the “Set status” menu
65. Press return to return to the flight settings menu.
66. Verify the flight settings menu appears.
67. Press “Bind” on the flight setting menu.
68. Press the white letters of your camera ID.
69. **IF** the “User Login” pop-up appears, do the following:
    a) Press the checkbox beside “Show password”.
    b) Press the blue line beside the word “Password”.
    c) Use the Touch Screen to enter the camera password. (standard password:1234567890)
    d) Press the blue “Done” button at the lower right of the screen.
    e) Verify User Login screen returns.
    f) Verify the password is entered correctly.
    g) Press OK on the User Login screen.
70. Verify “Connecting to the Flight System” pop-up briefly appears.
71. Verify the “Connection Status” pop-up appears.
72. Verify “Connection Status” pop-up displays “Connection Established”.
73. Press OK on “Connection Status” pop-up.
74. Verify the Bind screen appears.
75. Press return to display flight setting menu.
76. Press return again to return to main display screen.
77. Allow time for camera and ST10+ to finish binding.

Attachment 26
Q500 Binding Verification

78. Verify video appears on-screen.
79. Verify Camera tilt control (K1) will move camera. (Not applicable for C-Go1)
80. Turn off the Drone.
81. Turn off the ST10+.

If all verifications were as expected, the system should now be ready for flight.

Attachment 27
Chroma Binding Verification

Use of this information is at your own risk.

Using this standard sequence will allow comparison of expected results to actual results at each significant step. It is a way to determine where the process is failing. This sequence is somewhat tedious. Care should be taken to perform all steps in the designated sequence.

Before you start:

Note: The orange receiver LED may or may not be visible through the rear vents near the base of the GPS mast. IF not, it may be easier to first run the verification without including the receiver. A second verification can then be run, including the receiver, if needed.

1. If it is desired to include the Chroma receiver in this verification and the receiver LED is NOT visible through the rear vents, perform ONE of the following:
   - Route the receiver outside the Chroma body. Refer to Appendix 1 (Expose Chroma Receiver).

     OR
   - Remove wire guard and turn receiver over, such that LED side is visible through the vents.
2. Ensure Chroma battery is adequately charged.
3. Ensure Chroma battery is properly installed.
4. Ensure the memory card under the ST10+ battery is properly aligned in the holder, or is completely removed.
5. Ensure the ST10+ battery is properly installed.
6. Ensure the ST10+ battery is adequately charged.
7. Ensure camera is mounted, connected to power, and camera guard removed.
8. Ensure SD card in camera, if desired.
9. Ensure the Chroma is on a flat, stable surface.
10. Ensure ST10+ Mode Selector Switch (S1) is set to Angle Mode.
11. Ensure both the Chroma and the ST10+ are OFF.

Binding Sequence:

1. Turn on ST10+.
2. Allow time for the ST10+ to fully initialize.
3. Verify RED power indicator above ST10+ power switch is illuminated.
4. Verify the blue WIFI indicator above power indicator is flashing.
5. Verify the blue GPS indicator (to the right of the WIFI indicator) is at least flashing. (It may go solid blue if sufficient GPS is acquired by the ST10+.)
6. Press "Model Select" on the lower right of the ST10+ screen twice.
7. **IF** a "WARNING!!!" pop-up appears, press "OK".
8. Verify the "Model Select" screen appears.
9. **IF** the Chroma is already modeled on the ST10+, delete the existing model.

Attachment 27
Chroma Binding Verification

10. Press “New Model” on the left of the screen, just above center.
11. Press “Type” button near upper right of the screen.
12. Press the “Chroma” model from those displayed.
13. Press the “Please input name” window just below the larger model picture.
14. Verify the keypad screen appears.
15. Use the keypad to enter the desired model name.
16. Press either of the “Done” buttons at the right side of the screen.
17. Verify the screen returns to the “Edit Model” screen.
18. Press “Save” at the lower right of the screen.
19. Verify screen returns to the “Model Select” screen.
20. Verify your new model is selected as indicated by a blue box around it.
21. Verify the new model name is displayed in small letters at the upper left of the screen.
22. Press the ST10+ return.
23. Verify the main screen appears.
24. Again, verify your new model name appears in the far upper left of the screen.
25. Turn on the Chroma.
26. Allow a few seconds for the Chroma to fully initialize.
27. Verify all four “below motor” LEDs are flashing white at a slow rate. (~ 1 per sec).
28. IF receiver LED is visible, verify receiver LED is flashing orange at a relatively slow rate (~2/sec).
29. Verify four white LEDs on the mainboard are flashing rapidly. (view through each of the four vents).
30. Verify the solid red LED is lit on the main board, near left center. (view through left front vent)
31. Verify Chroma emits a short beep about 1 per 15-30 seconds.
32. Turn the Chroma upside down until all four “below motor” LEDs are flashing blue at a rapid rate.
33. Verify all four “below motor” LEDs flashing blue rapidly (~4/sec)
34. IF receiver LED is visible, verify receiver LED is flashing orange rapidly (~4/sec)
35. Press the “Flight Settings” button.
36. Verify the flight settings menu appears.
37. Select “BIND” at the top of the menu.
38. Verify the bind screen appears.
39. Verify the words “Not connected” appear in orange letters, directly below the word “Model”.
40. Verify the words “Not connected” (or the camera ID) appears in orange letters, directly below the word “Camera”.
41. Verify the receiver ID is displayed in white letters below the orange “Not connected” label in the “Model” column.
42. Verify the camera ID is displayed in white letters below the orange “Not connected” (or orange camera ID) label in the “Camera” column.

Attachment 27
Chroma Binding Verification

43. Press the white receiver ID in the “Model” column.
44. Verify a “Syncing Model Data” notification briefly appears.
45. Verify the “Connection Status” pop-up appears.
46. Verify the “Connection Status” pop-up displays “Connection Established!”.
47. Press OK on the “Connection Status” pop-up.
48. Verify the receiver ID replaced the words “Not connected” in the “Model” column, and is now in orange letters.
49. Verify all four “below motor” LEDs continue to flash rapid blue at this point. (~4/sec)
50. IF receiver LED is visible, verify the orange receiver LED continues to flash at the faster rate. (~4/sec)
51. Press the return button to return to the flight settings menu screen.
52. Verify all four “below motor” LEDs continue to flash rapid blue at this point. (~4/sec)
53. IF receiver is exposed, verify the orange receiver LED is now flashing at a slower rate. (~ 2/sec.)
54. Press the return button again to return to the main ST10+ display screen.
55. Verify you hear a short beep from the Chroma, indicating the bind process has initiated.
56. Verify you hear a second short beep from the Chroma, indicating the bind process has completed.
57. Verify the four “below motor” LEDs changed to Purple. (may not see this if GPS has recently been acquired)
58. The four “below motor” LEDs may sequence in a circular pattern if GPS is not yet acquired.
59. When GPS acquired, verify the rear two “below motor” LEDs changed to solid Purple.
60. When GPS acquired, verify the front two “below motor” LEDs changed to solid White.
61. IF receiver LED is visible, verify the orange receiver LED is solid orange.
62. Verify main ST10+ screen populates with telemetry data.
63. Press “Flight Settings”.
64. Press OK on the “WARNING!!” pop-up.
65. Verify you hear a “down tone” from the Chroma.
66. Verify the flight settings menu appears.
67. Verify all four “below motor” LEDs are flashing white at a slow rate. (~ 1 per sec).
68. IF receiver LED is visible, verify receiver LED is flashing orange at a relatively slow rate (~2/sec).
69. Verify four white LEDs on the mainboard are flashing rapidly.
70. Verify the solid red LED is lit on the main board, near left center.
71. Press “Camera Select” on the flight setting menu.
72. Press the name of the desired camera type from the menu.
73. Verify the selected camera type is highlighted in blue.
74. Press the “Select” button at the lower right of the screen.
75. Verify “Set Status” pop-up displays “Setup Complete!”

Attachment 27
Chroma Binding Verification

76. Press OK on the “Set status” menu
77. Press return to return to the flight settings menu.
78. Verify the flight settings menu appears.
79. Press “Bind” on the flight setting menu.
80. Verify the words “Not connected” appear in orange below the word “Camera”.
81. Press the white letters of your camera ID.
82. IF the “User Login” pop-up appears, do the following:
83. Press the checkbox beside “Show password”.
84. Press the blue line beside the word “Password”.
85. Use the Touch Screen to enter the camera password. (standard password:1234567890)
86. Press the blue “Done” button at the lower right of the screen.
87. Verify User Login screen returns.
88. Verify the password is entered correctly.
89. Press OK on the User Login screen.
90. Verify “Connecting to the Flight System” pop-up briefly appears.
91. Verify the “Connection Status” pop-up appears.
92. Verify “Connection Status” pop-up displays “Connection Established”.
93. Press OK on “Connection Status” pop-up.
94. Verify the camera ID is displayed in orange directly below the word “Camera”.
95. Press return to display flight setting menu.
96. Press return again to return to main display screen.
97. Allow time for camera and ST10+ to finish binding.
98. Verify video appears on-screen.
99. The four “below motor” LEDs may sequence in a circular pattern if GPS is not yet acquired.
100. When GPS acquired, verify the rear two “below motor” LEDs changed to solid Purple.
101. When GPS acquired, verify the front two “below motor” LEDs changed to solid White.
102. IF receiver is exposed, verify the orange receiver LED is solid orange.
103. Verify Camera tilt control (K1) will move camera. (Not applicable for C-Go1)
104. Turn off the Chroma.
105. Turn off the ST10+.

If all verifications were as expected, the system should now be ready for flight.

Attachment 28
ST-10/ST-10+ Flight Control Board Calibration

Use of this information is at your own risk.

Purpose: Provide guidance for calibration of the Yuneec Controllers ST-10 and ST-10+ Flight Control Boards.

Introduction: Bias errors noted on the ST-10 / ST-10+ hardware monitor screen are normally corrected by cycling, cleaning or replacing the affected control component. However, the problem is not always within the affected component(s). All of the flight control components feed through the Flight Control Board. This board requires calibration if a new Flight Control Board is installed, if the current board is out of calibration for any reason, or if flight control components have been replaced. Under these circumstances, the following instructions may assist in returning the Flight Control Board to normal calibration.

This process will not work to correct damaged or dirty control components, or a damaged Flight Control Board. Application of this process under such circumstances may significantly worsen the situation.

Calibration of the board with damaged or dirty (unstable) control components may result in the controller TEMPORARILY appearing to work normally. The problem may reappear, without warning, while in flight, with unpredictable results. For these reasons or any other:

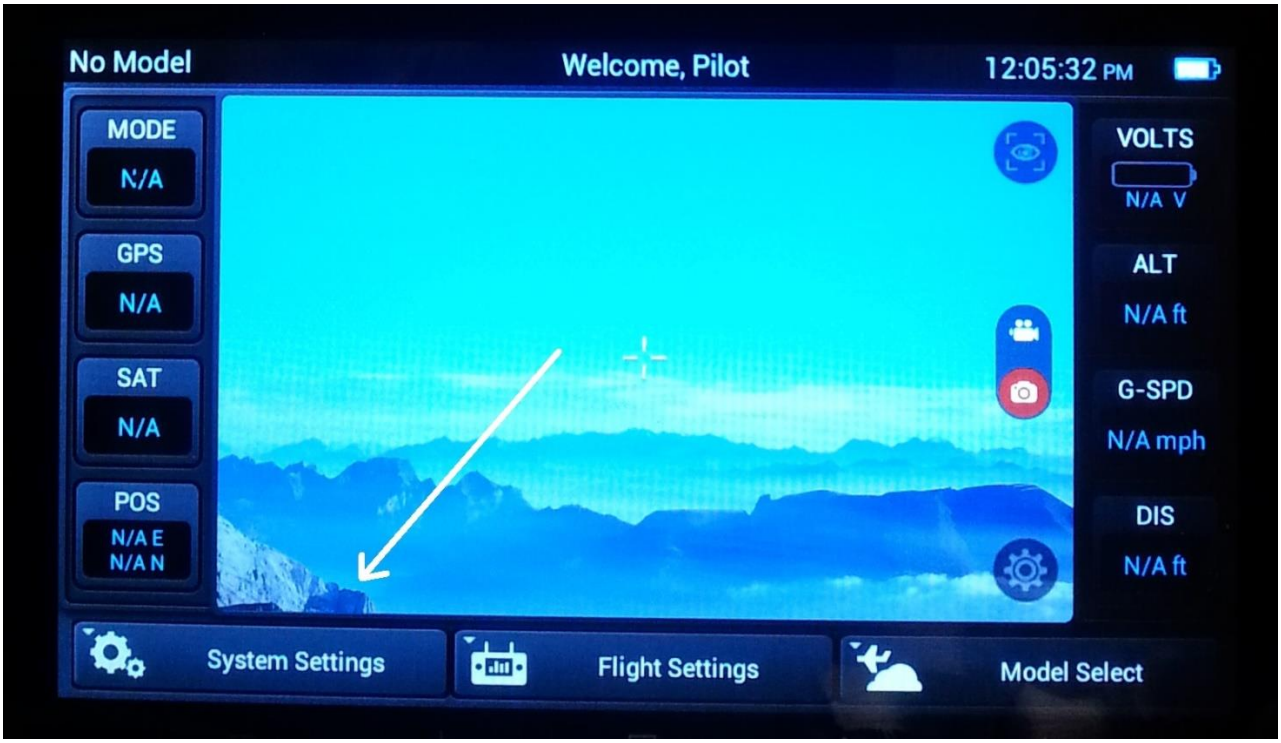
Use of these instructions is at your own risk.

Calibration Sequence:

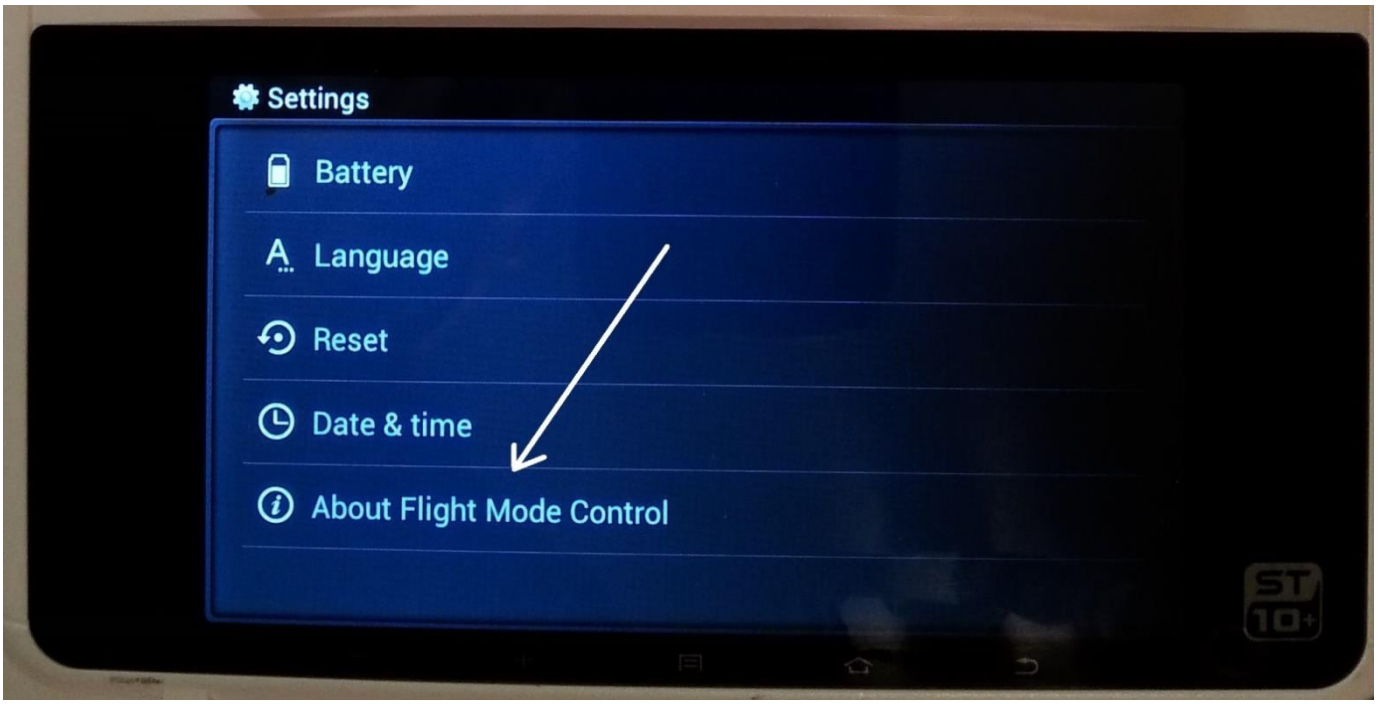
1). Turn on the controller.

2). Let the controller fully boot to the main screen.

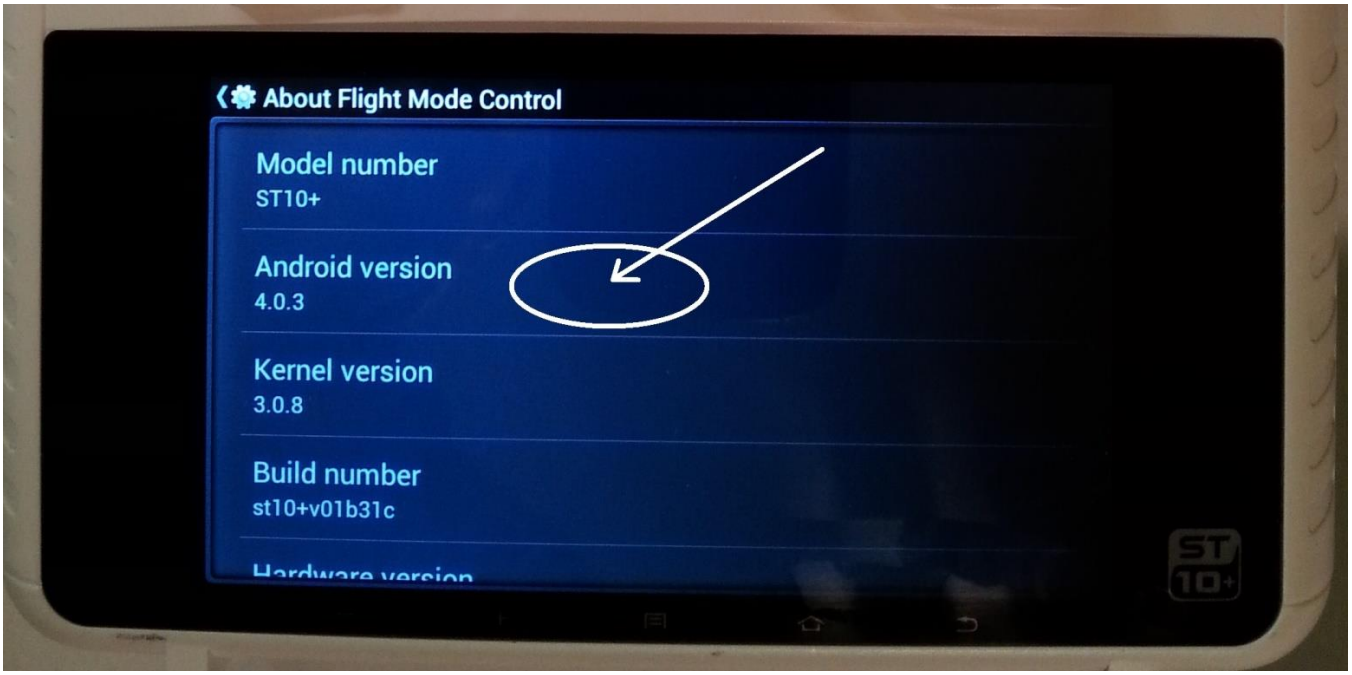
3). When the main screen is displayed, select "System Settings":



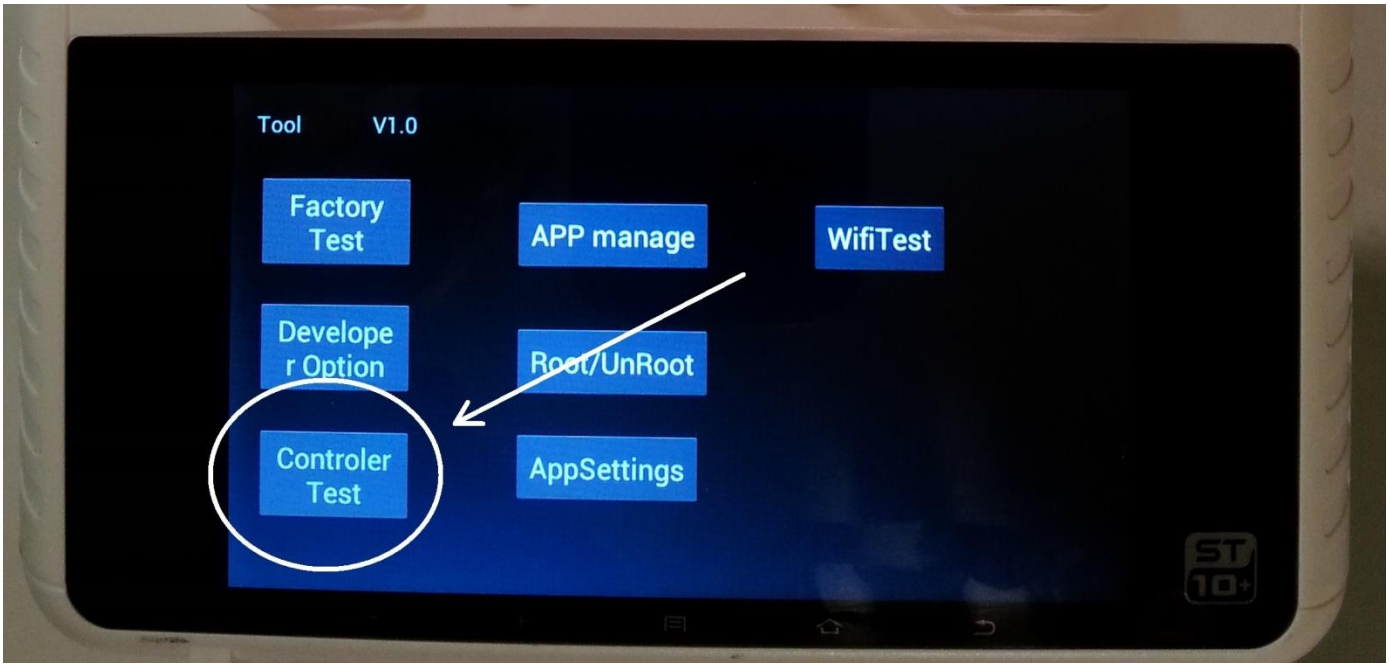
4). Select “About Flight Mode Control”:



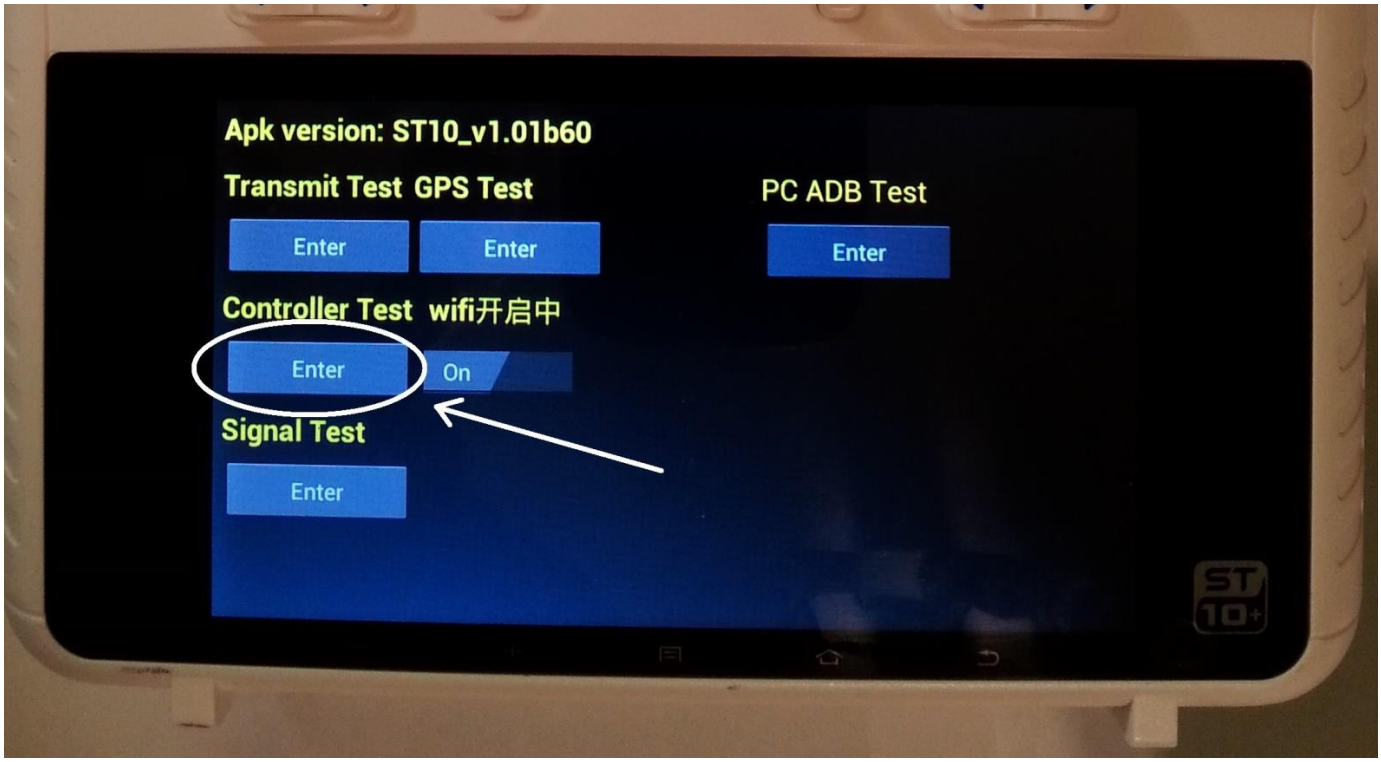
5). Repeatedly tap the “Android Version” line until the “SECRET MENU” opens:



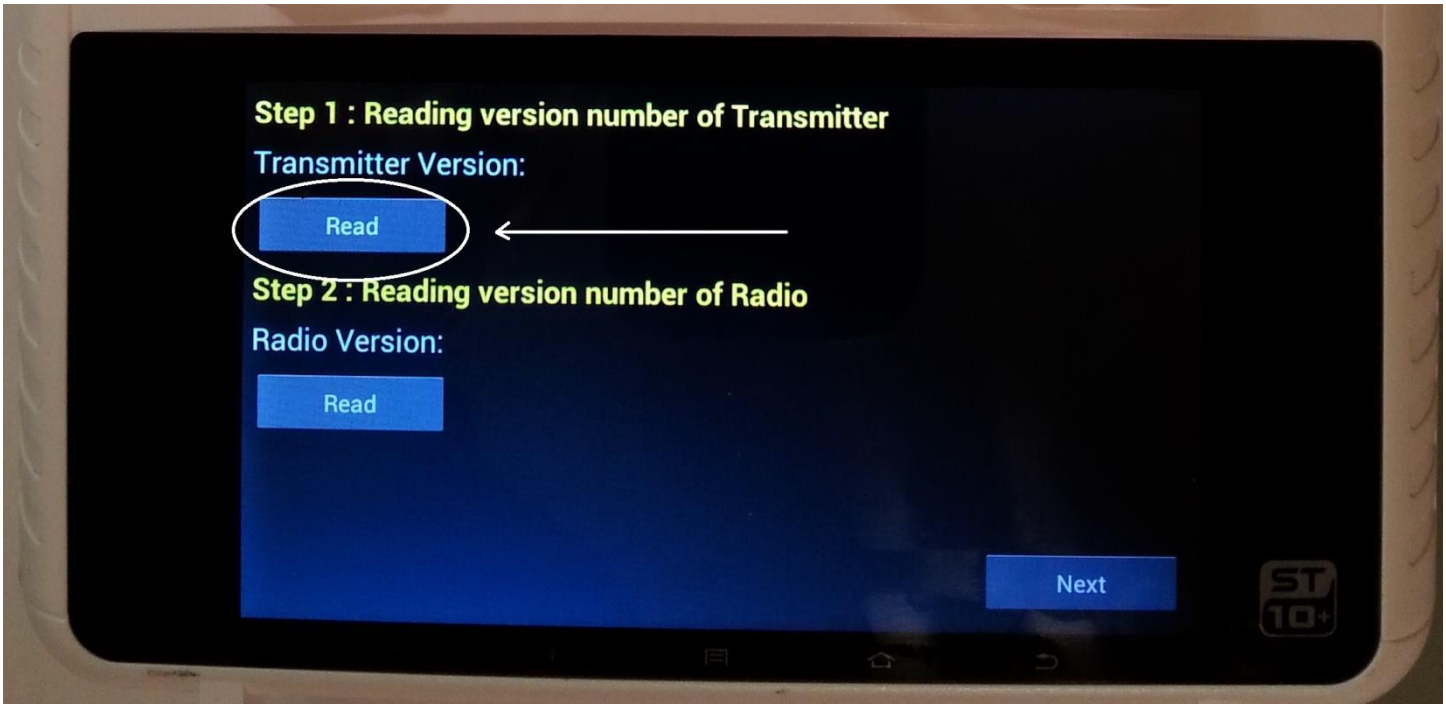
6). Select “Controller Test”:



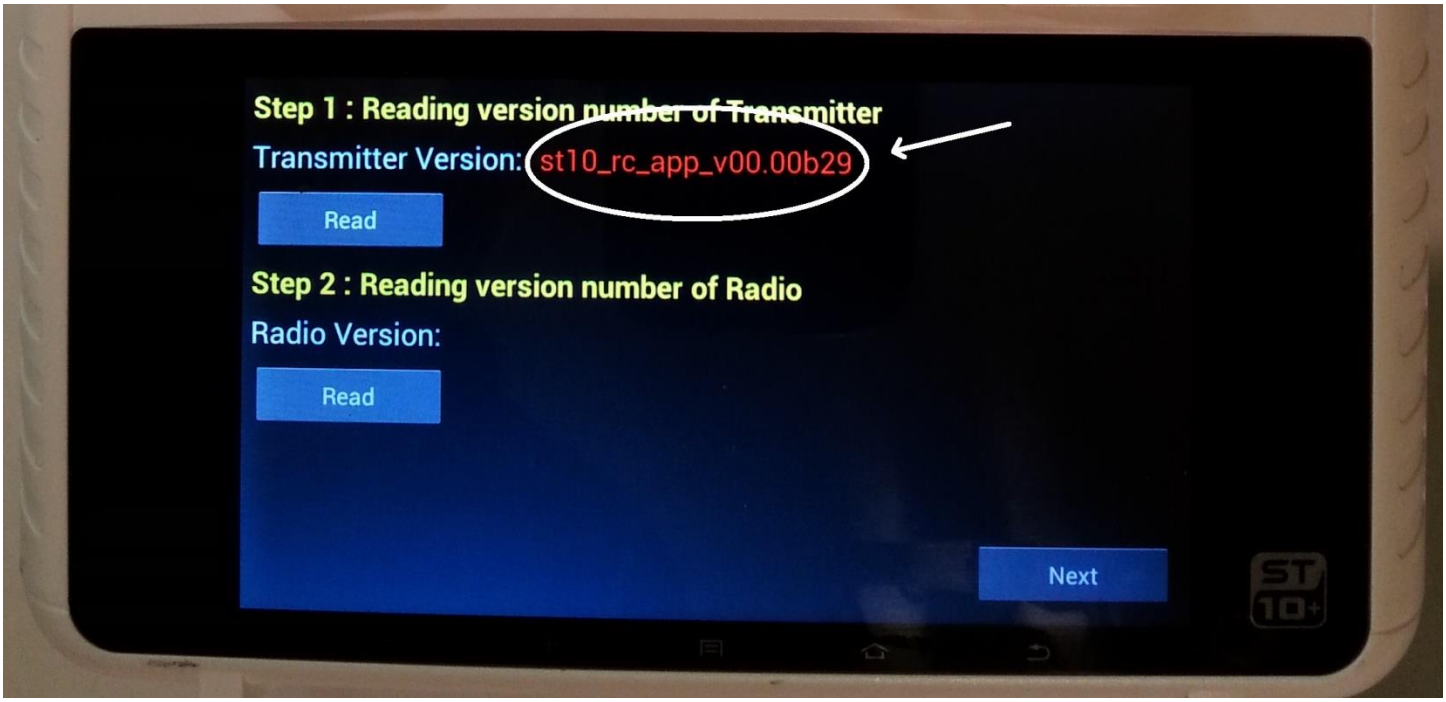
7). Select the “Enter” button under “Controller Test”:



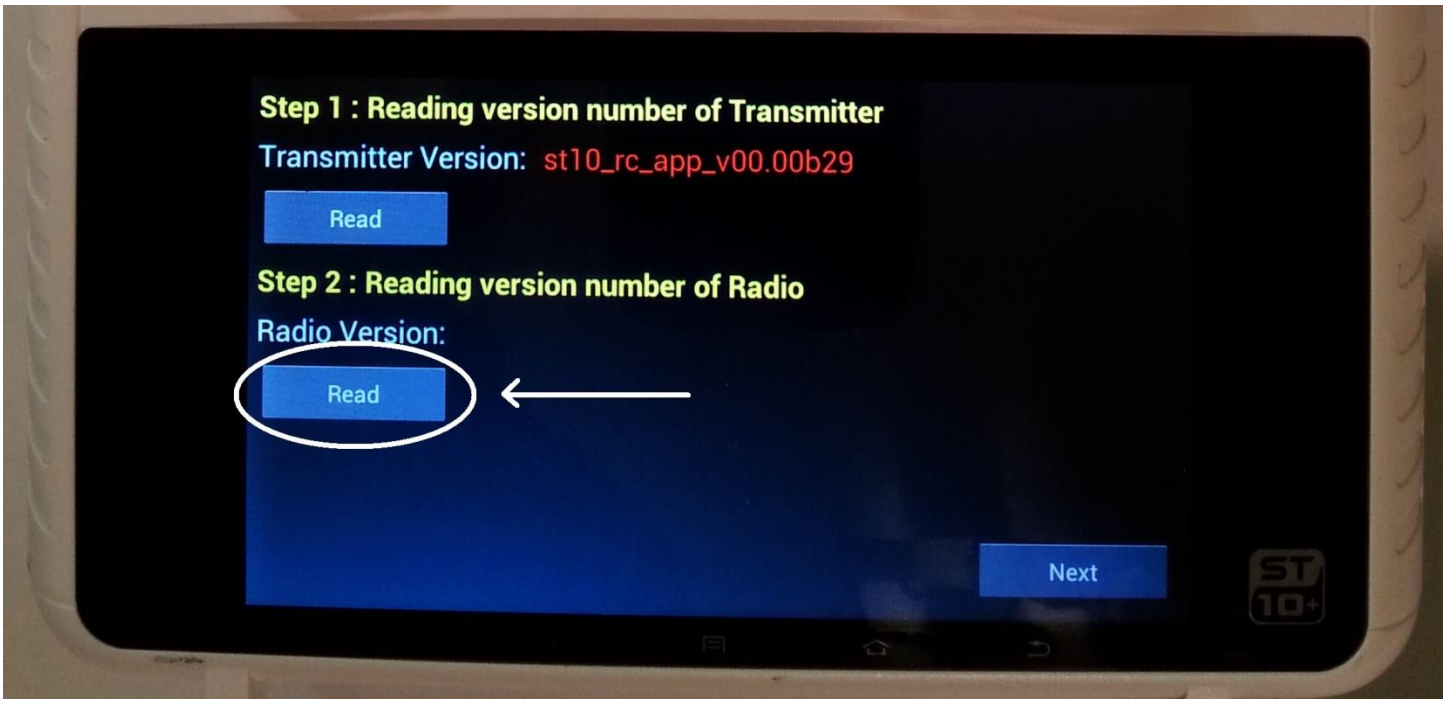
8). Select Transmitter Version “Read” button:



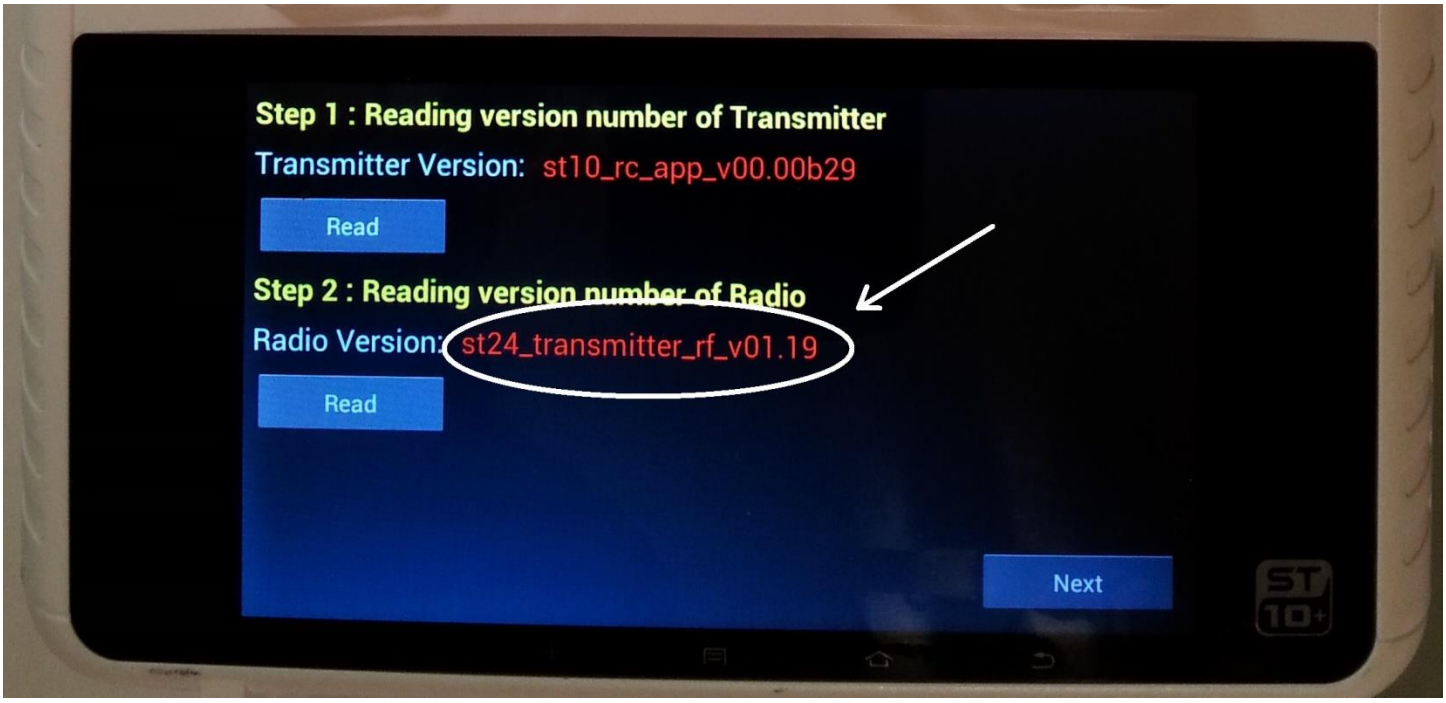
9). Verify transmitter version is displayed:



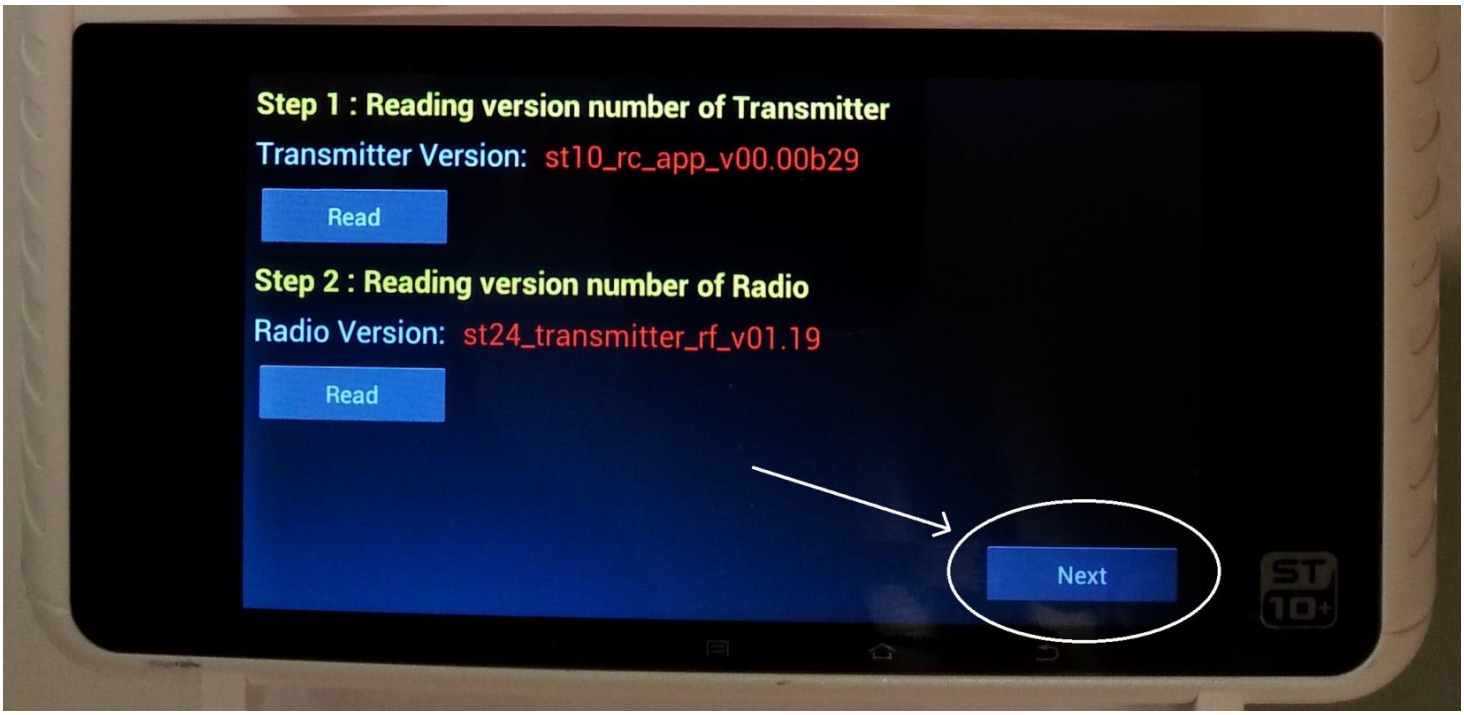
10). Select Radio Version “Read” button:



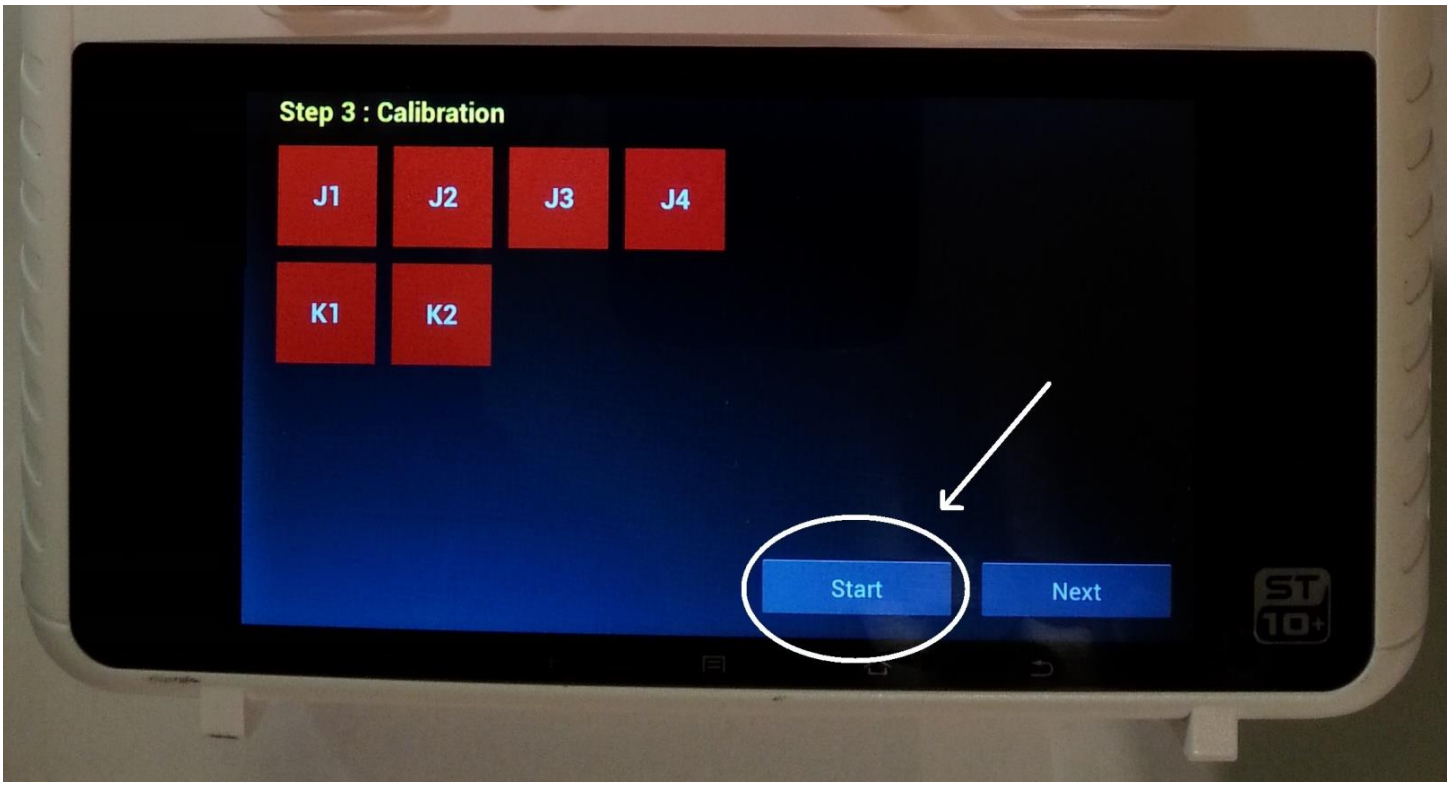
11). Verify radio version is displayed:



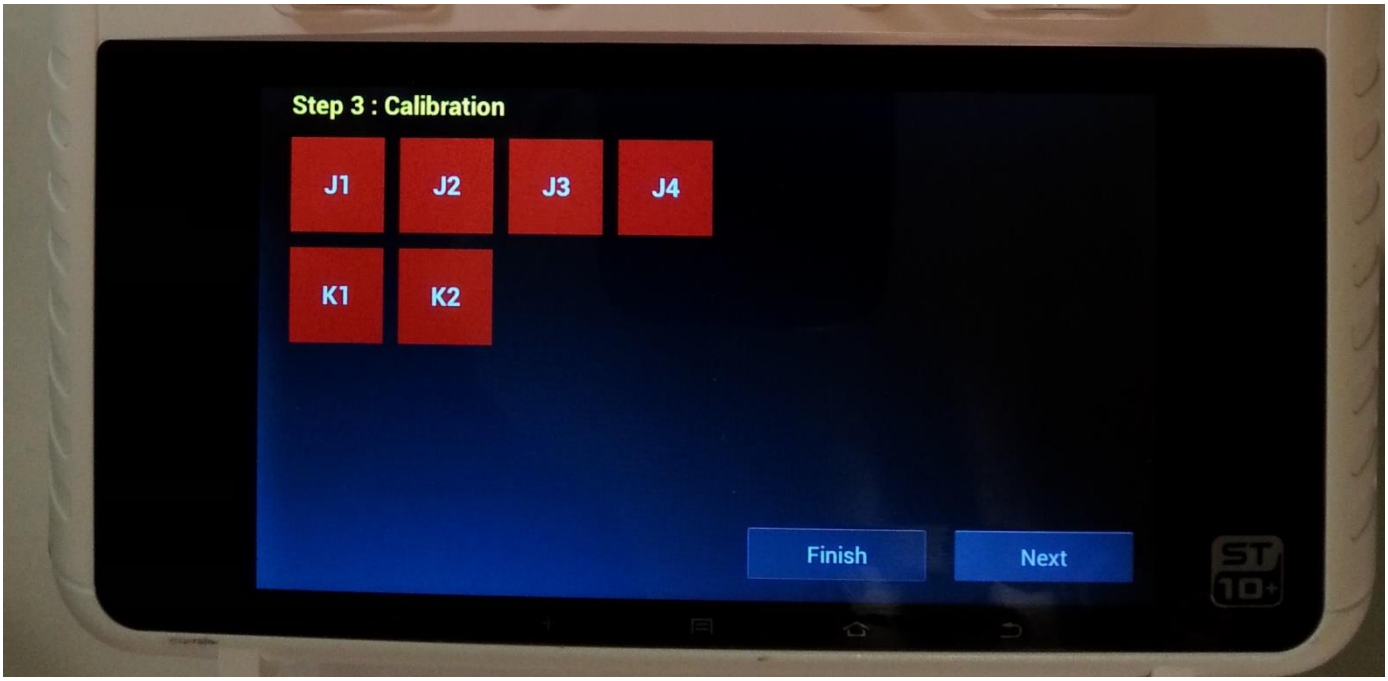
12). Select “Next”:



13). Select “Start” to begin Calibration:



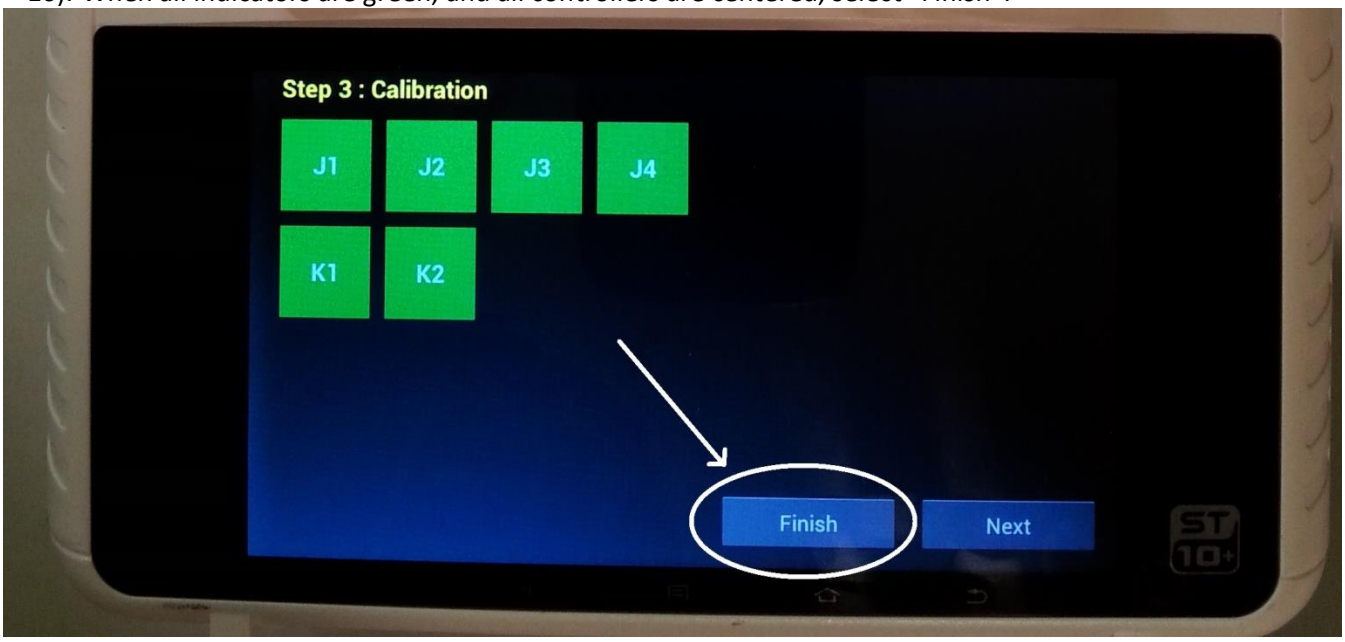
14). Cycle each indicated control device. (Refer to Addendum 1 as required to locate each device.)



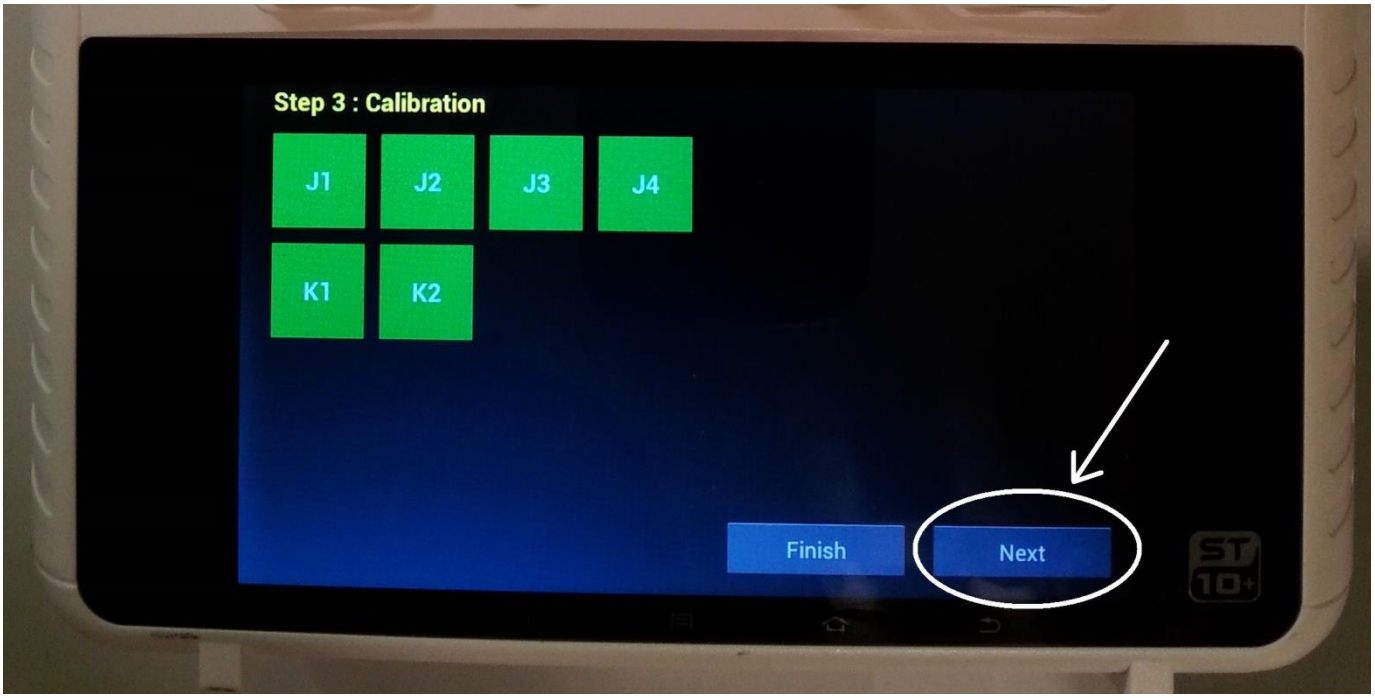
15). **CRITICAL STEP:** Ensure both control sticks and both manual sliders are returned to center positions.

NOTE: When "Finish" is selected in the following step, the current positions will be locked in as the reference point for each of these controllers.

16). When all indicators are green, and all controllers are centered, select "Finish":

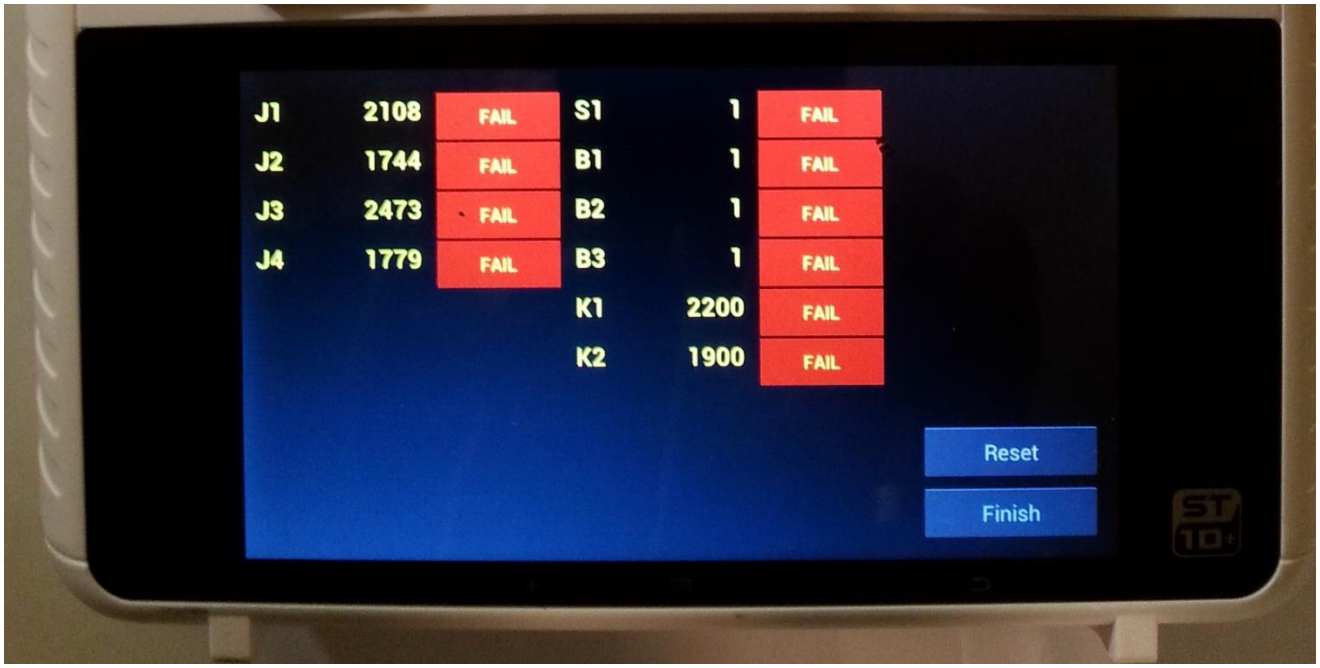


17). Select “Next”:

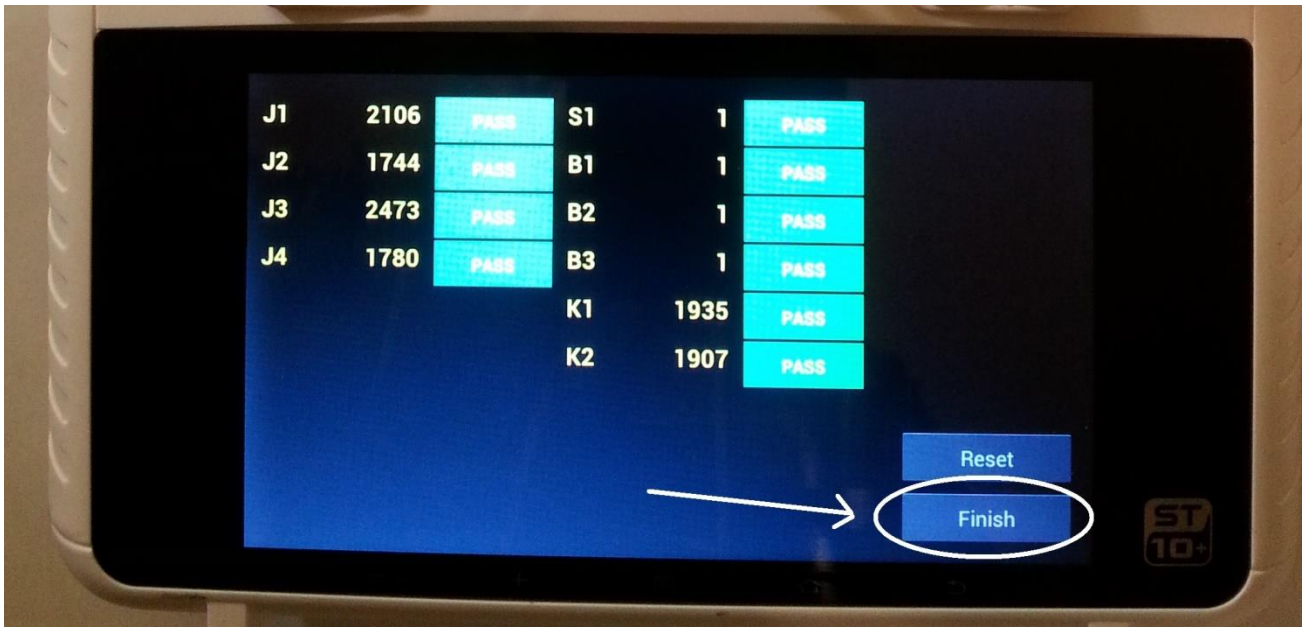


CAUTION: Do **NOT** cycle the main power switch in the following step.

18). Cycle each indicated control device until the associated indicator shows “PASS”. (Refer to Addendum 1 as required to locate each device.)



19). When all indicators show “PASS”, select “Finish”:

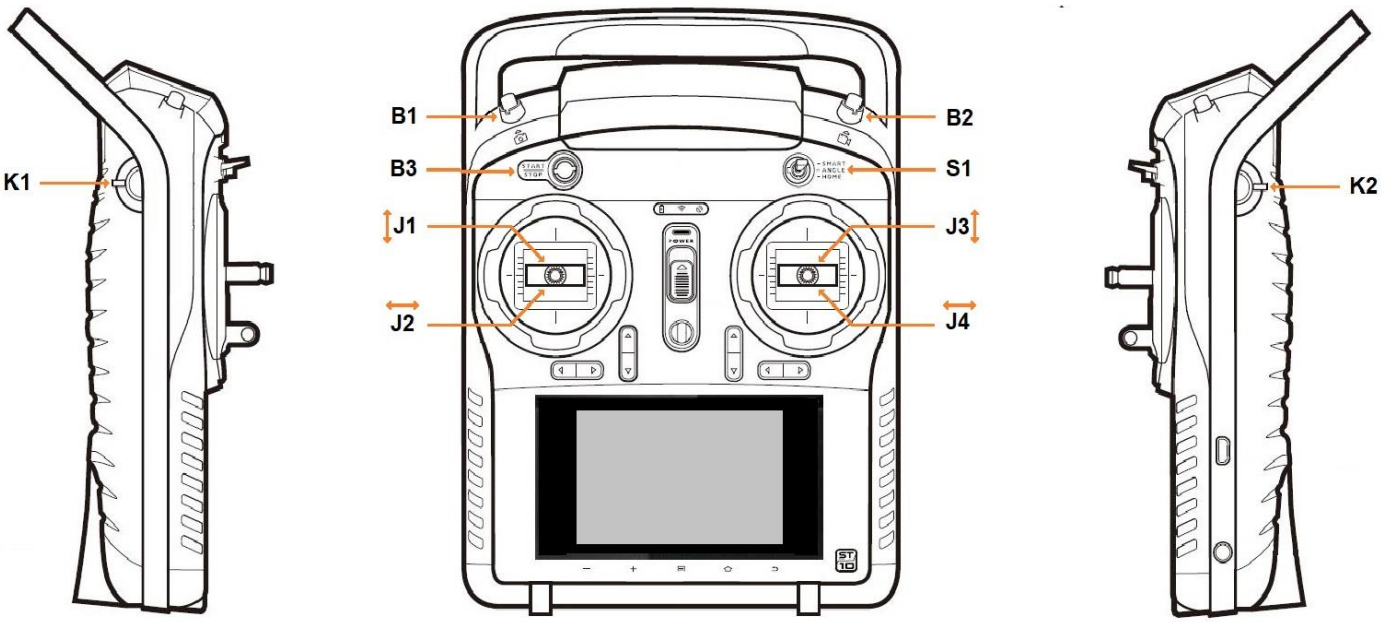


20). Use the “Back” button to return to the Main Menu.

21). Go to “Hardware Monitor”.

22). Verify all control devices are operating as expected.

Attachment 28
Addendum 1
Control Device Locations



K1 – Camera Tilt

K2 - Rabbit/Turtle

B1 – Photo

B2 - Video Record

B3 – Start/Stop

S1 - Mode Switch

J1 – Throttle

J3 – Elevator (Pitch)

J2 – Rudder (Yaw)

J4 – Aileron (Roll)

Attachment 28
Addendum 2
FC Calibration Recommended Videos

There are many YouTube videos for performing the flight control calibration on the ST10 /ST10+. Almost all are either incomplete, or actually wrong. Either can result in serious problems with your controller. The following videos are among the few known to be correct.

https://www.youtube.com/watch?v=zi131w8Nn2s - Most complete. English language.

https://www.youtube.com/watch?v=4pd55EOjitM – Universal language. Does not check results in Hardware Monitor after calibration.

Attachment 29
ST10+ Firmware Update

Purpose: To clarify the instructions provided by Yuneec.

Introduction: The overall process is not complicated, but there are areas that can create issues with this update:

1). The currently available ST10+ firmware is NOT compatible with the earlier ST10 controller. Attempting to load ST10+ firmware onto an ST10 will result in an essentially "bricked" ST10. Note ST10 firmware is no longer available. If you have the earlier ST10, you should stop now, and exit this document.

2). The generic instructions include the phrase "Do not extract it." The presence of that phrase has created confusion, since it refers to a second zip file that is inside the downloaded zip file. Follow the instructions below, and they will provide the correct interpretation of the Yuneec statement.

3). There are many ways to process the files through your system and onto the ST10+ SD card. These instructions will cover only one of them. Other means are available, and may be more compatible with your habits.

4). The images, text and file structures depicted in this document pertain to an update **from** US firmware version "st10+v01b30c" **to** US firmware version "st10+v01b31c", which includes transmitter (Radio Controller) update version "st10plus_tx_b32.bin". **Updates from and to other firmware versions may include somewhat different file structures and file names.**

Use of this information is at your own risk.

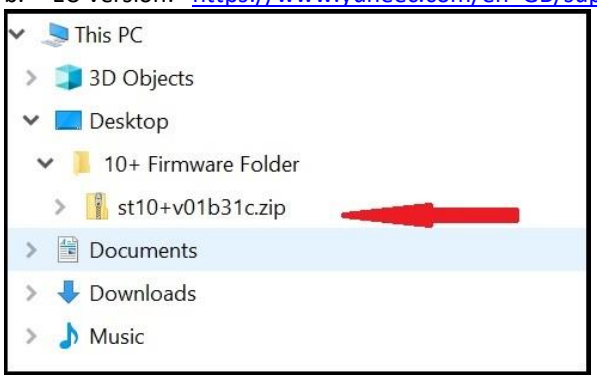
Sequence:

1). Create a new folder on your computer for this task, and provide it with a name you can recognize:

2). Download the current version firmware for your region to the new folder

a. US version: https://us.yuneec.com/downloads-typhoon-q500 (ST10+ Build st10+v01b31c)

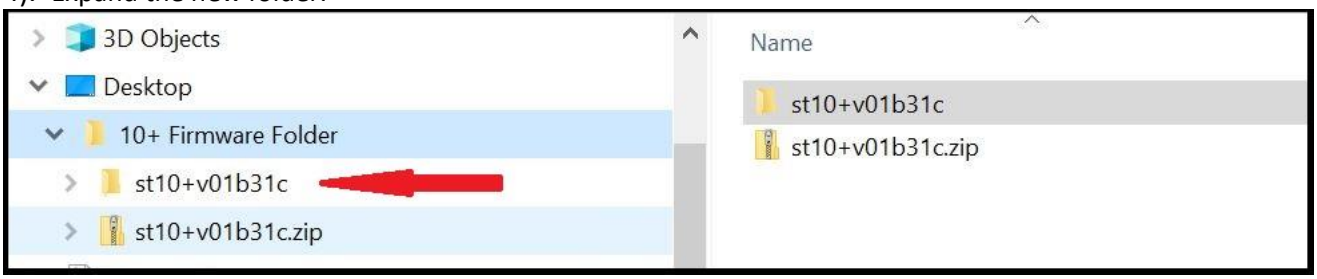
b. EU version: https://www.yuneec.com/en_GB/support/downloads/typhoon-4k-en.html (ST10+Firmware Vst10+v01b30c)



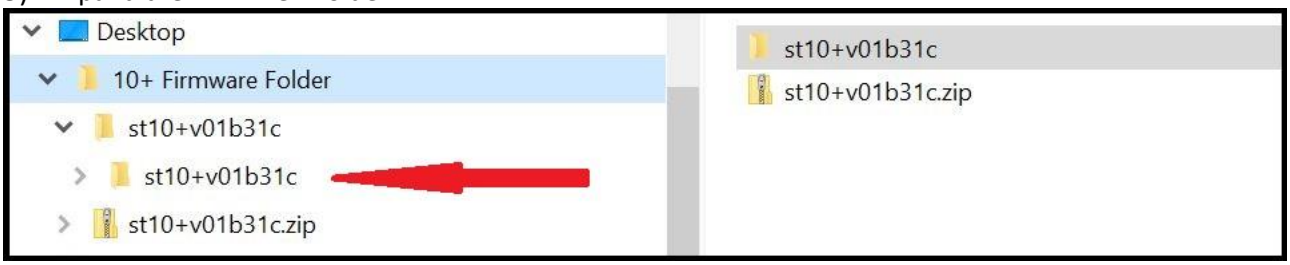
Attachment 29
ST10+ Firmware Update

3). Extract the zip file.

4). Expand the new folder.



5). Expand the NEXT new folder.



NOTE: The file set displayed for different firmware versions may differ from the following example. The following example is from US update version ST10+v01b31c.

6). These are the files you will need:

7). Copy the files to a formatted SD Card:

8). Remove ST10+ Battery.

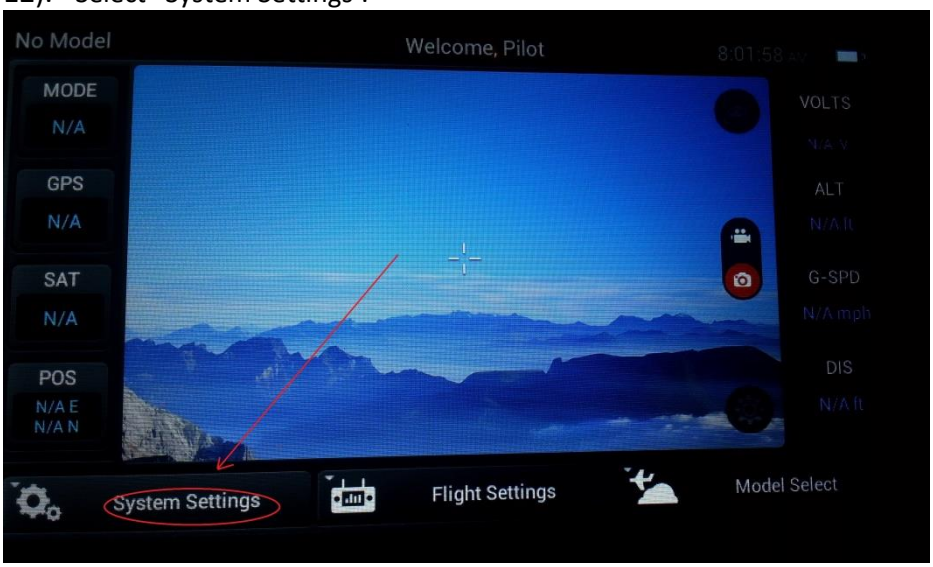
Attachment 29
ST10+ Firmware Update

9). Place SD Card in SD Card Slot of ST10+ Battery Compartment.

10). Install Battery.

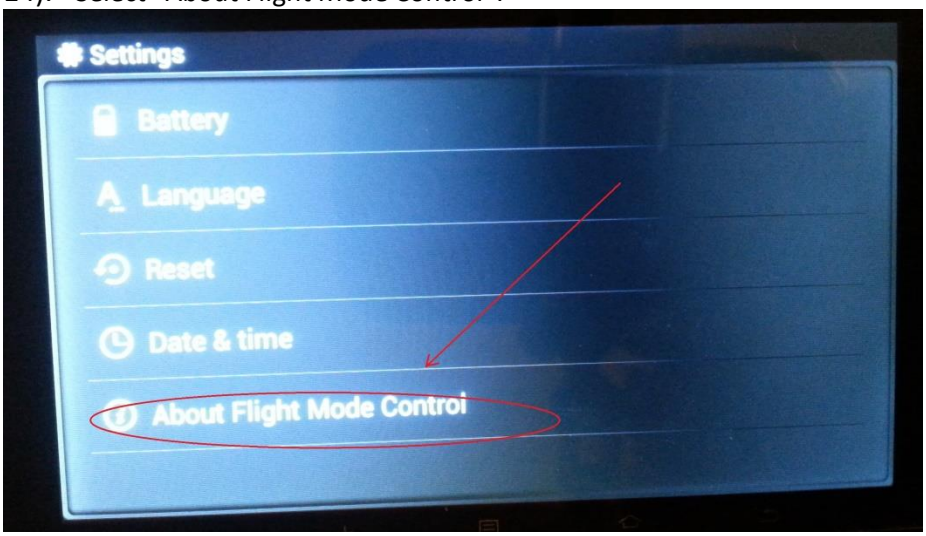
11). Turn on ST10+ and let it boot up.

12). Select “System Settings’:



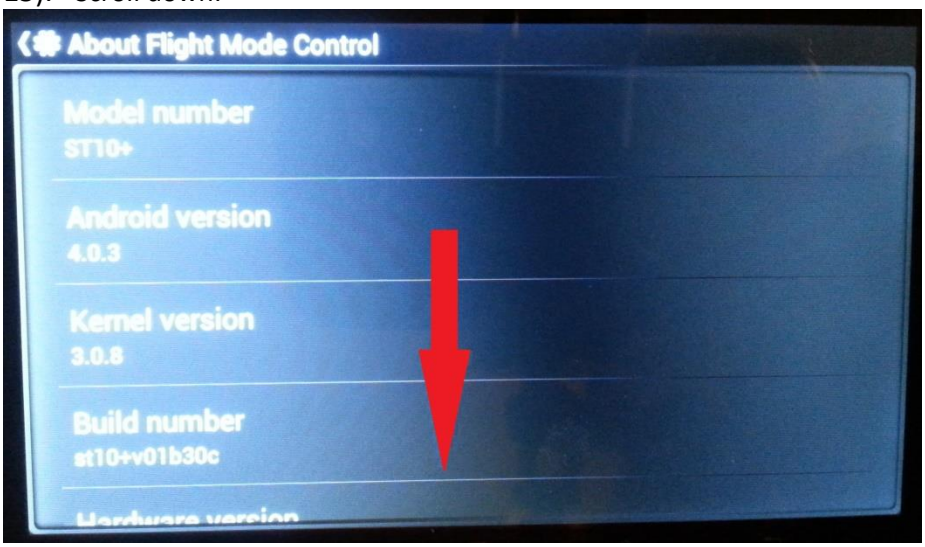
13). Click “OK”.

14). Select “About Flight Mode Control”:

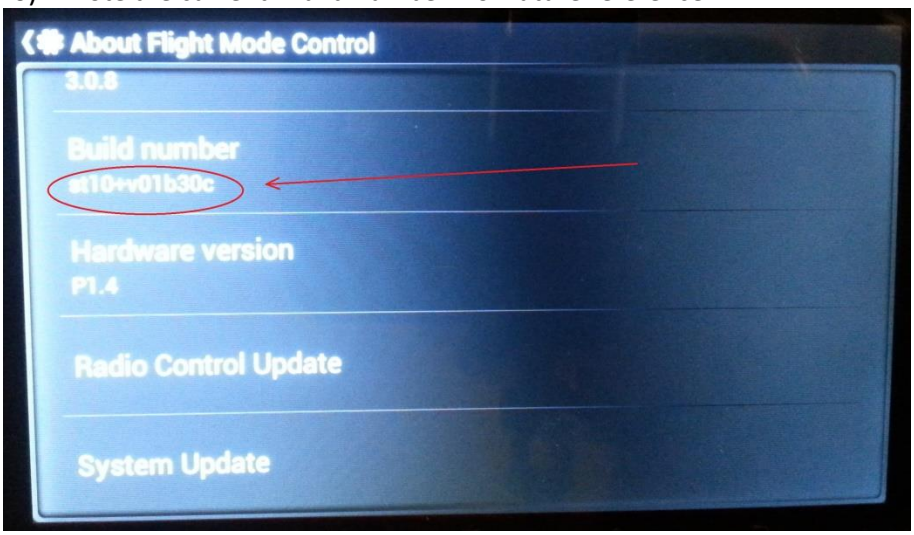


Attachment 29
ST10+ Firmware Update

15). Scroll down:

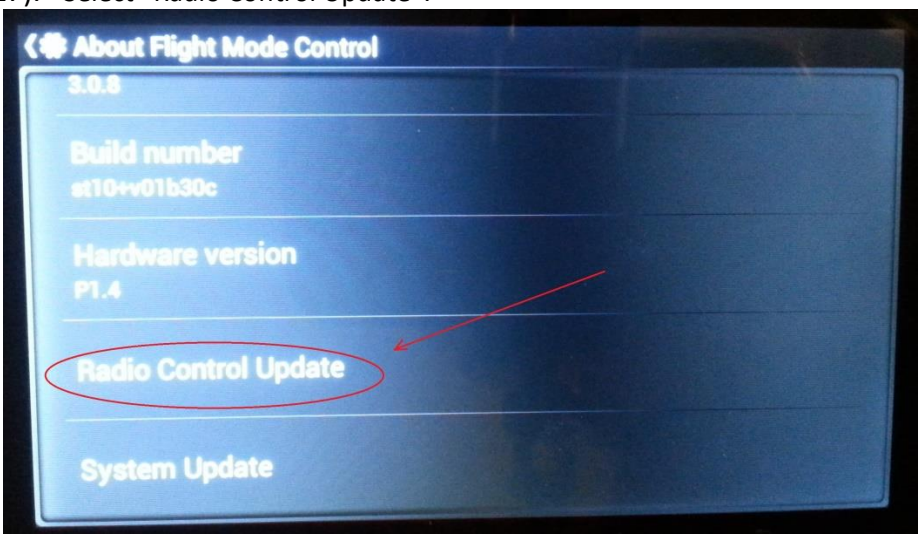


16). Note the current “Build number” for future reference:

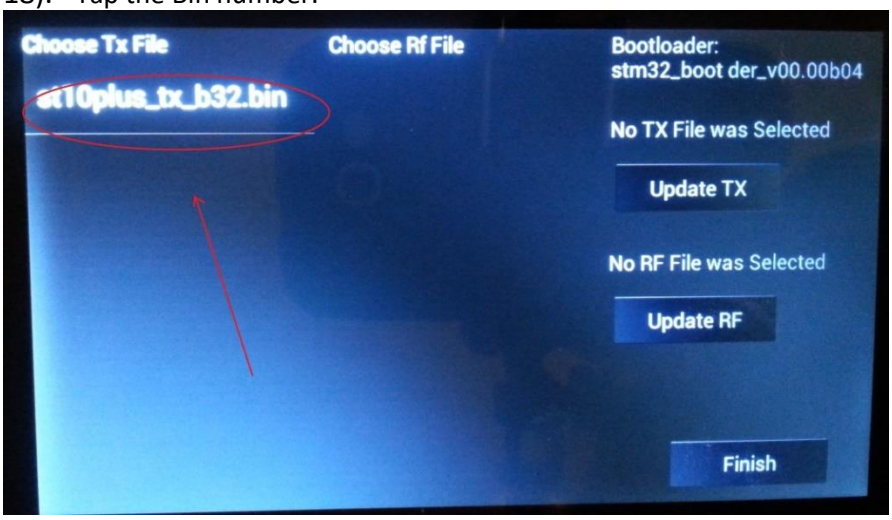


Attachment 29
ST10+ Firmware Update

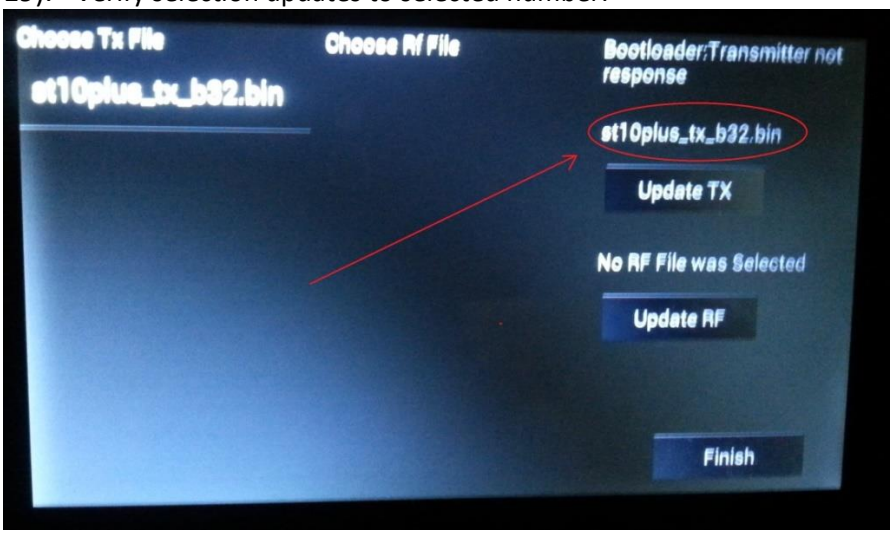
17). Select “Radio Control Update”:



18). Tap the Bin number:

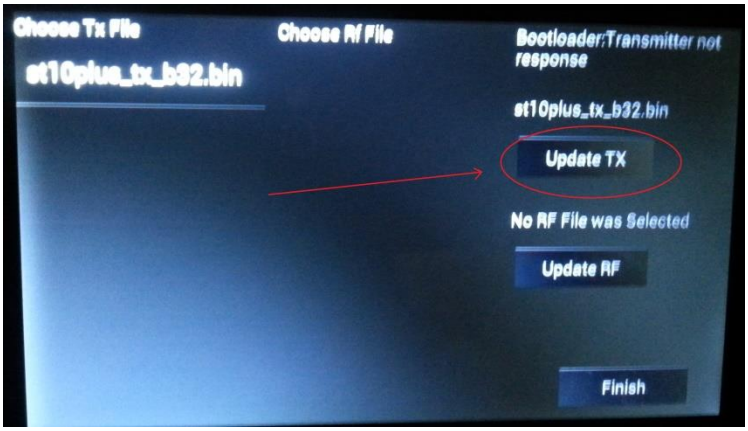


19). Verify selection updates to selected number:

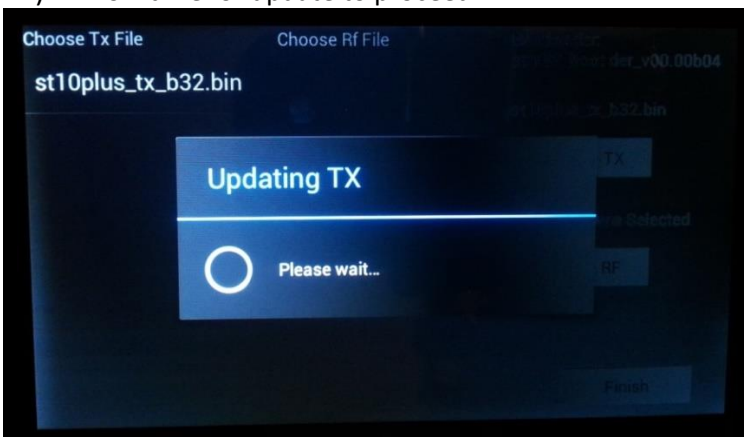


Attachment 29
ST10+ Firmware Update

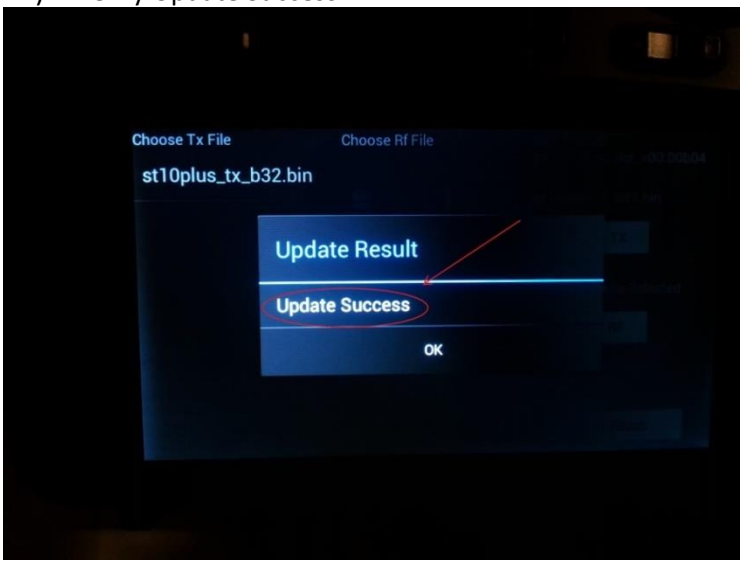
20). Select “Update TX”:



21). Allow time for update to proceed.

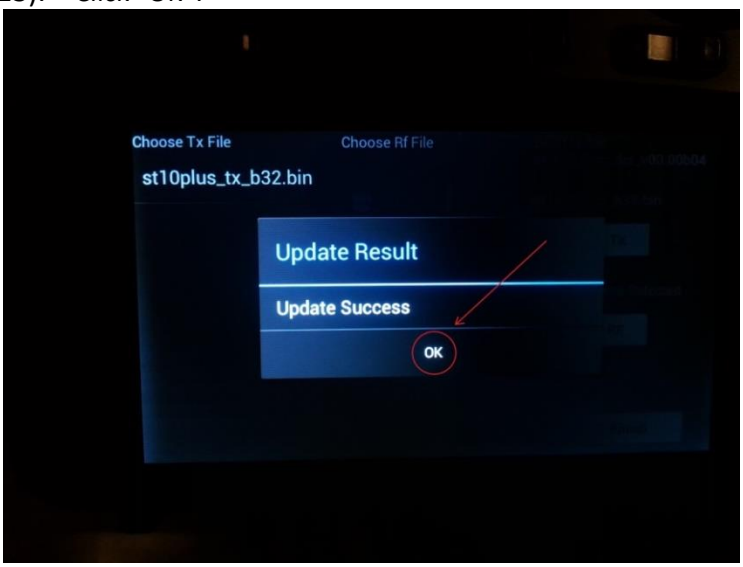


22). Verify Update Success:



Attachment 29
ST10+ Firmware Update

23). Click “OK”:



NOTE: Most updates do not include an RF update. If no RF file is listed under “Choose Rf File”, then no RF update is included.

24). **IF** no update is listed under “Choose Rf File”, **THEN SKIP TO** Step 26).

25). **IF** a file number is shown under “Choose Rf File”, **THEN**:

a. Select file name under “Choose Rf File”.

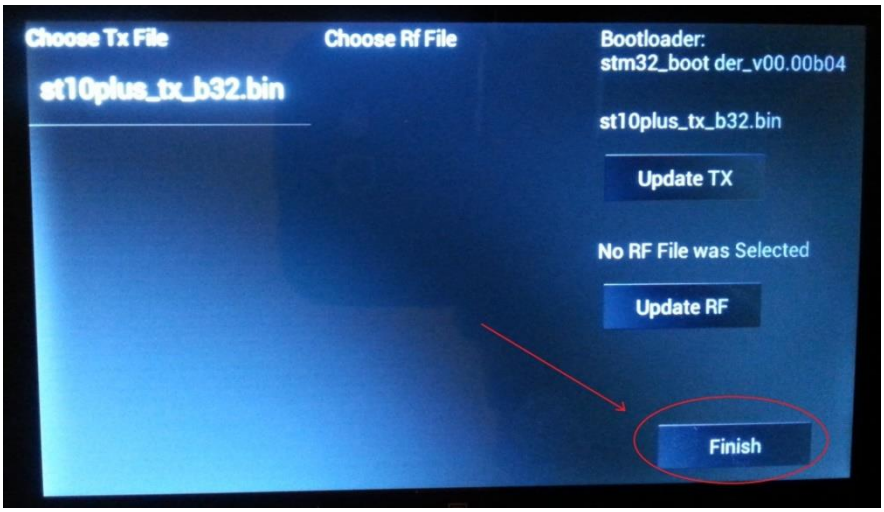
b. Verify RF selection updates to selected number.

c. Select “Update RF”.

d. Verify Update Success.

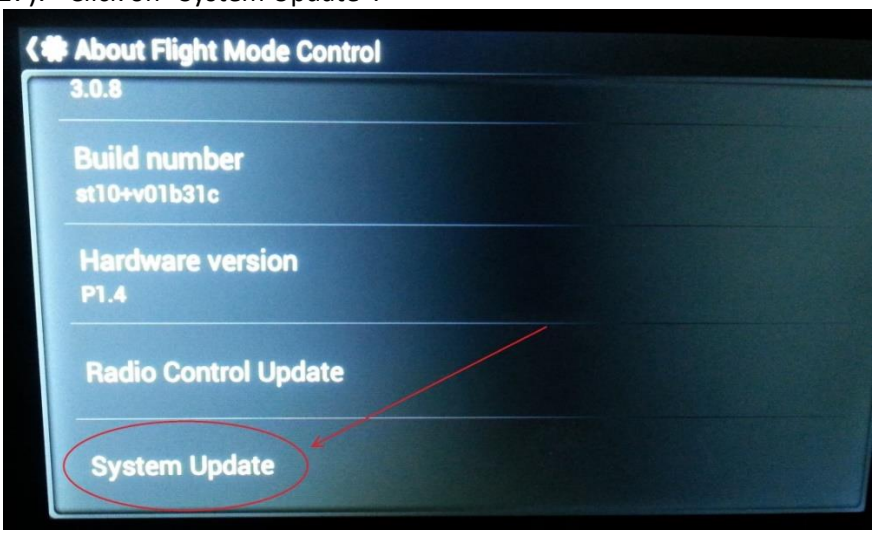
e. Click “OK”.

26). Click on “Finish’:

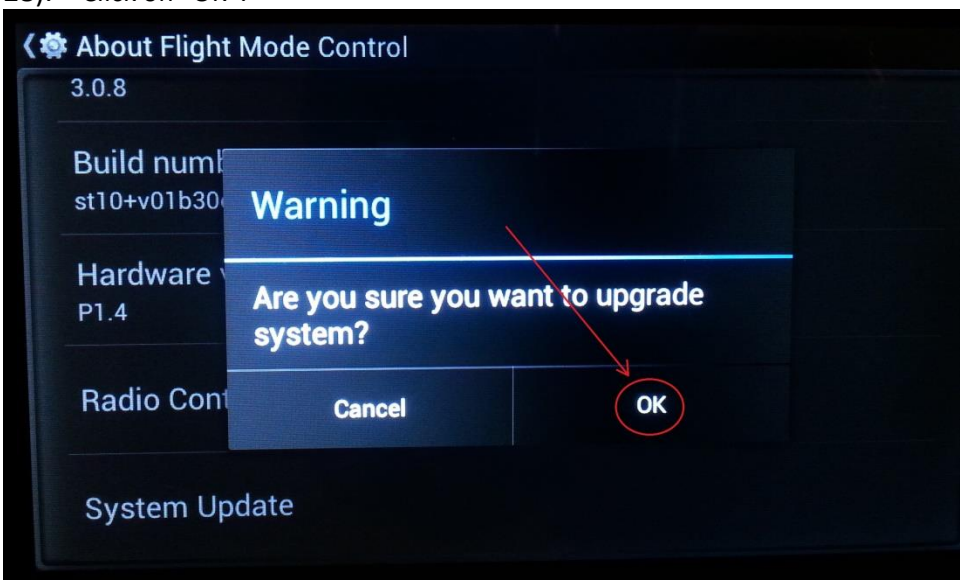


Attachment 29
ST10+ Firmware Update

27). Click on “System Update”:

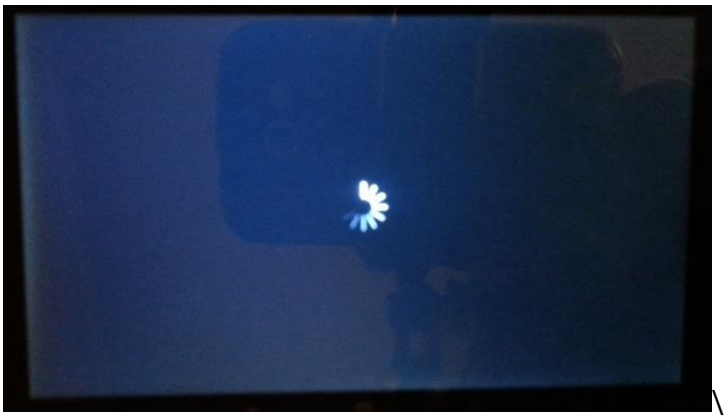


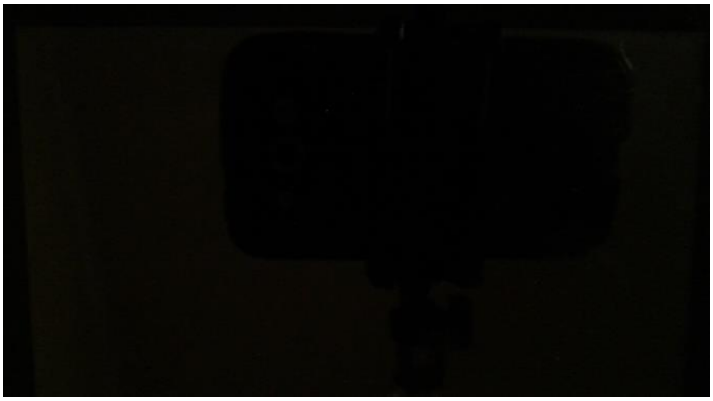
28). Click on “OK”:

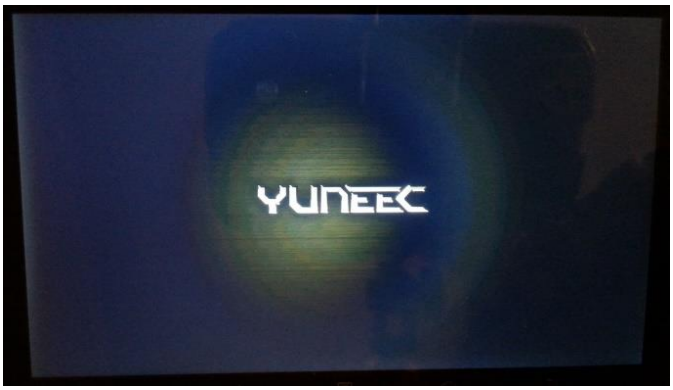


29). The system will go through a sequence of screens **SIMILAR TO** the following sequence. Some screens may seem to freeze at times. Some screens take more time than others:

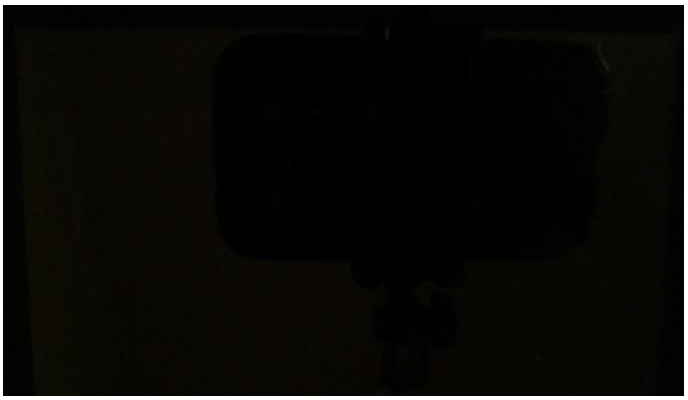
Attachment 29
ST10+ Firmware Update





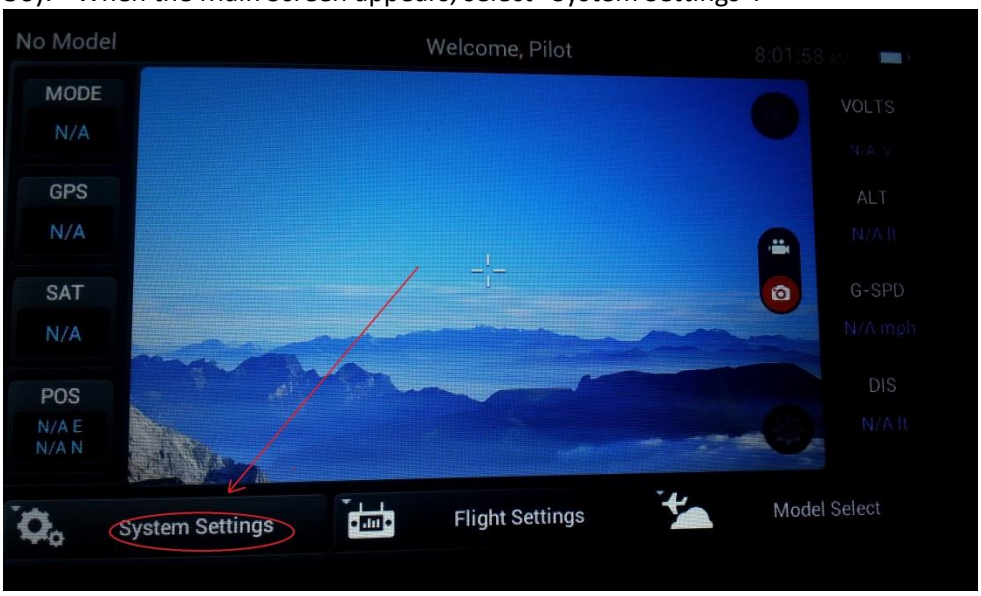


Attachment 29
ST10+ Firmware Update



Attachment 29
ST10+ Firmware Update

30). When the Main Screen appears, select “System Settings”:



31). Click “OK”.

32). Verify “Build number” updated to the build number of the firmware update you just installed:

33). **Delete any existing model(s).**

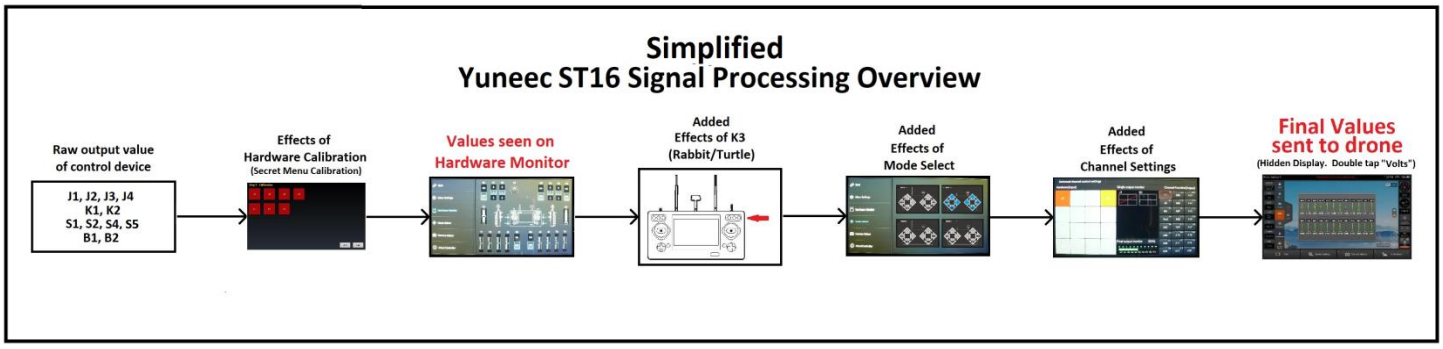
34). **Create new model for your drone.**

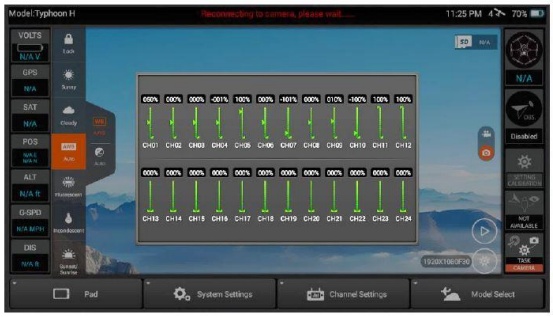
35). **Bind your drone to the new model**.

Attachment 30
ST16 Signal Processing Overview

General discussion about Hardware Monitor and the final outputs:
Hardware Monitor is an EXCELLENT tool for its purpose, which is essentially checking the nearly raw output of each controller. Its main drawback is not in itself, but in us, the pilots. Many pilots believe what is shown in Hardware Monitor is what is going to the drone. It is not. And sometimes dangerously not.

This drawing might help explain why checking the final output display is a better indication of what the controller is sending:





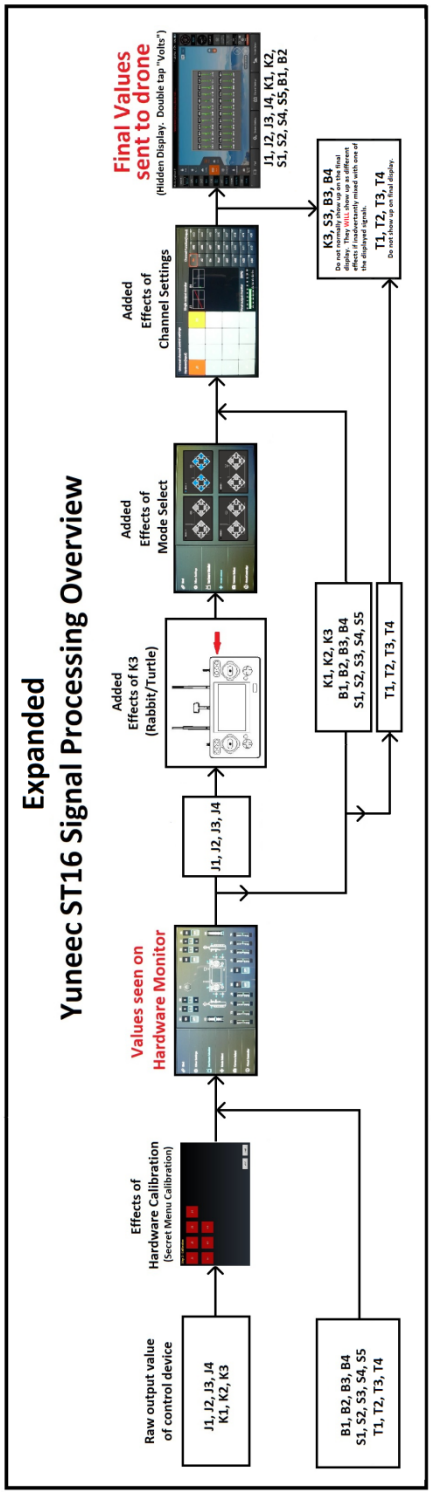
Typical Values for ST16 ONLY, Mode 2 ONLY

Channel	Function	Hardware	Typical Range (%)	Notes
CH01	Throttle	J1 / (B1)	0 to +100* /(-25)	J1-Up/Down / B1-Start/Stop motors
CH02	Roll	J4	-100 to +100*	Left /Right
CH03	Pitch	J3	-100 to +100*	Travel Forward / Backward
CH04	Yaw	J2	-80 to +80*	Drone Pan
CH05	Mode Switch	S4	-100 / 0 /+100	All Switch Positions
CH06	Mode Switch	S4	0 / 0 /+150	Home Position +150
CH07	Camera Tilt	K2	-100 to +100	Manual Camera Pitch
CH08	Camera Pan	K1	-100 to +100	Manual Camera Yaw
CH09	Camera Tilt Mode	S1	+10/+10/+100	Three Switch Positions
CH10	Camera Pan Mode	S2	-100/-40/+100	Three Switch Positions
CH11	Landing Gear	S5	-100/+100	Raise/Lower Landing Gear
CH12	None	B2	-100/+100	No function currently assigned
N/A	Rate Slider	K3	N/A	Rabbit / Turtle (No Display)
N/A	OBS	S3	N/A	No Display
N/A	Trim Tabs	T1,T2,T3,T4	N/A	No Display
N/A	Snapshot	B3	N/A	No Display
N/A	Record	B4	N/A	No Display

*Affected by K3 (Rate Slider)

Attachment 30
ST16 Signal Processing Overview

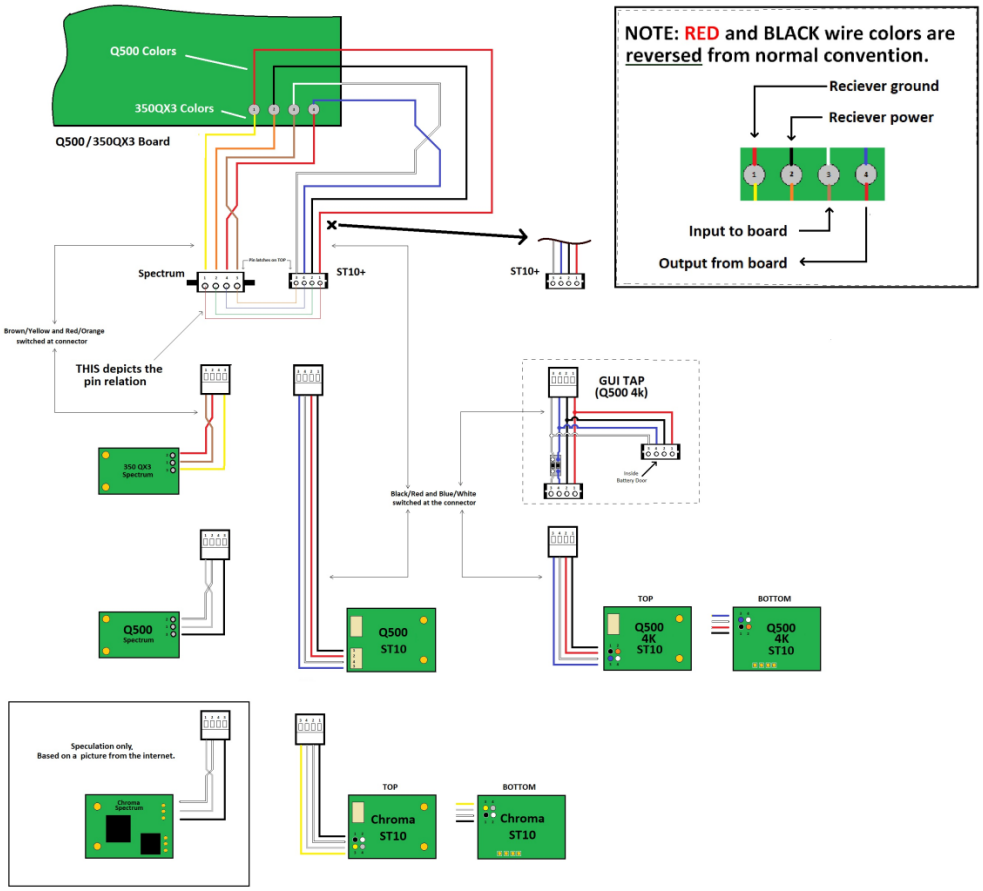
Note: This version of the chart provides extra detail by showing which signals are actually affected by each process, and which signals are not actually transmitted (Do not show an effect on the ST16 final display.)



Attachment 31
350QX / Q500 Receiver Connections

Use of this information is at your own risk.

350QX / Q500 RECEIVER CONNECTIONS

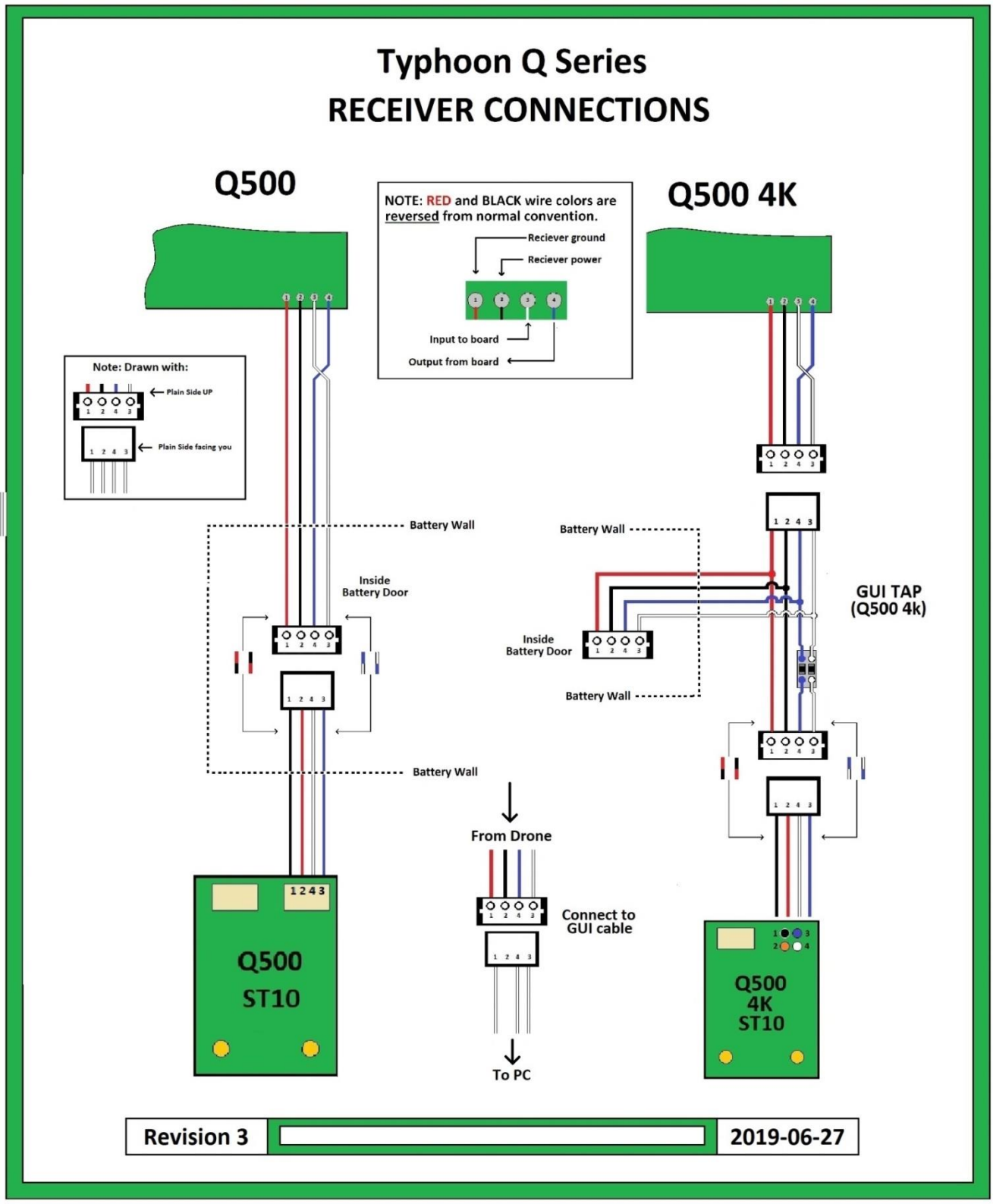


NOTE:
This drawing covers several receiver/drone combinations. The board terminals have NUMBERS and each connection has the corresponding number for each wire. Use the numbers. Don't try to follow the colors. The wire ORDER gets swapped between the board and the first connector. The wire COLORS get swapped at the connector. i.e.: Blue IN does NOT equal Blue OUT, etc. You cannot match wire colors on the receiver side of the connector with wire colors on the board side of the connector.

NOTE:
The connectors are drawn with the OPEN end facing you, and the pin latches ON TOP.

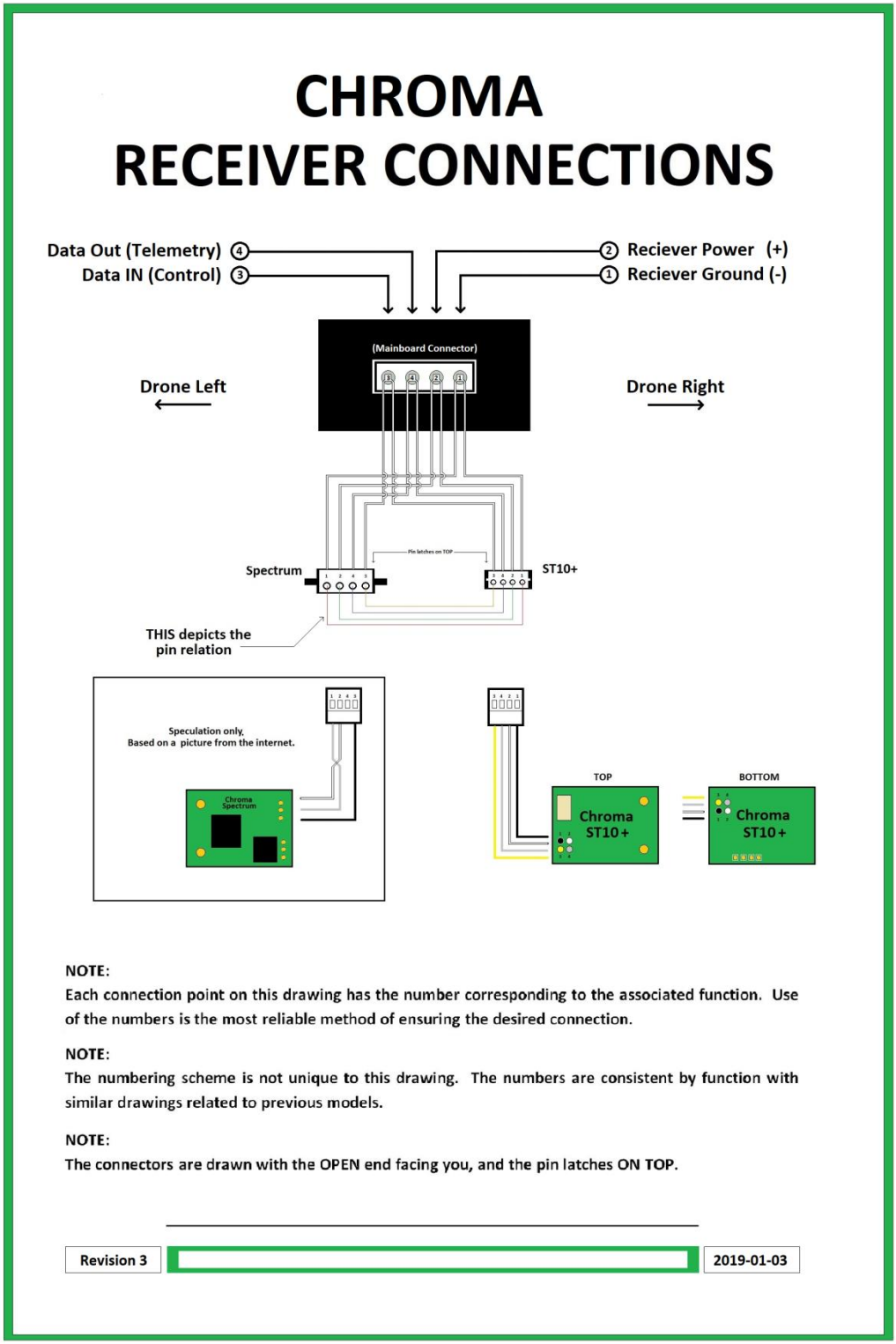
Attachment 32
Typhoon Q Series Receiver Connections

Use of this information is at your own risk.



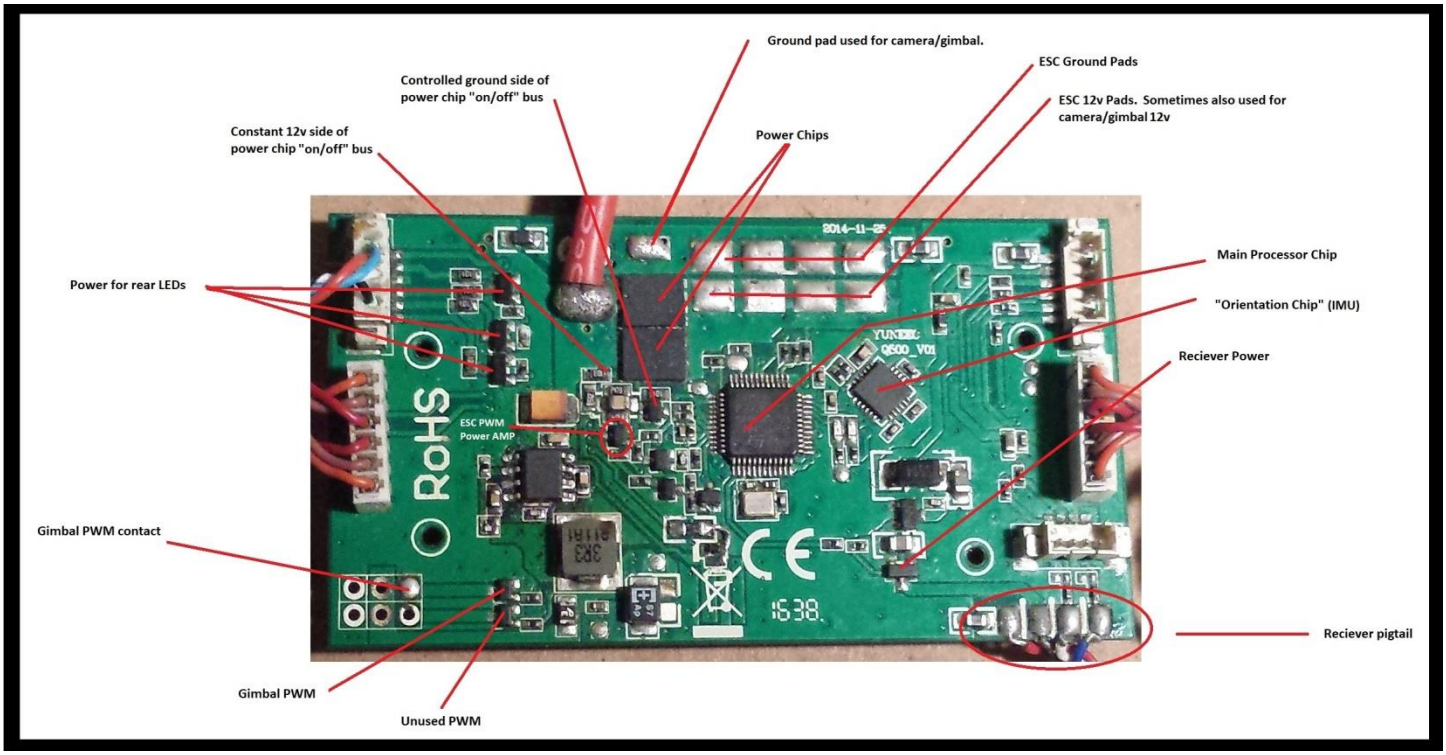
Attachment 33
Chroma Receiver Connections

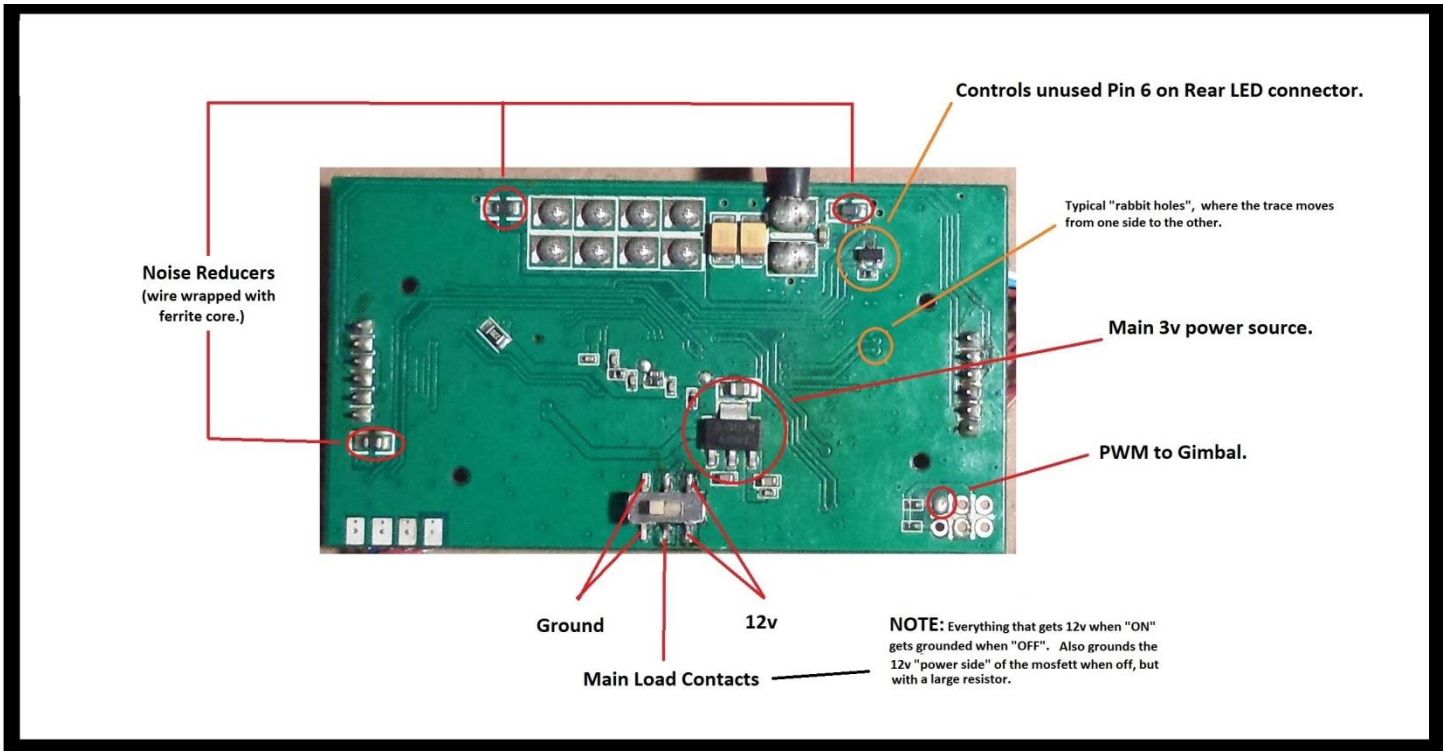
Use of this information is at your own risk.



Attachment 34
Q500 General Mainboard

Use of this information is at your own risk.



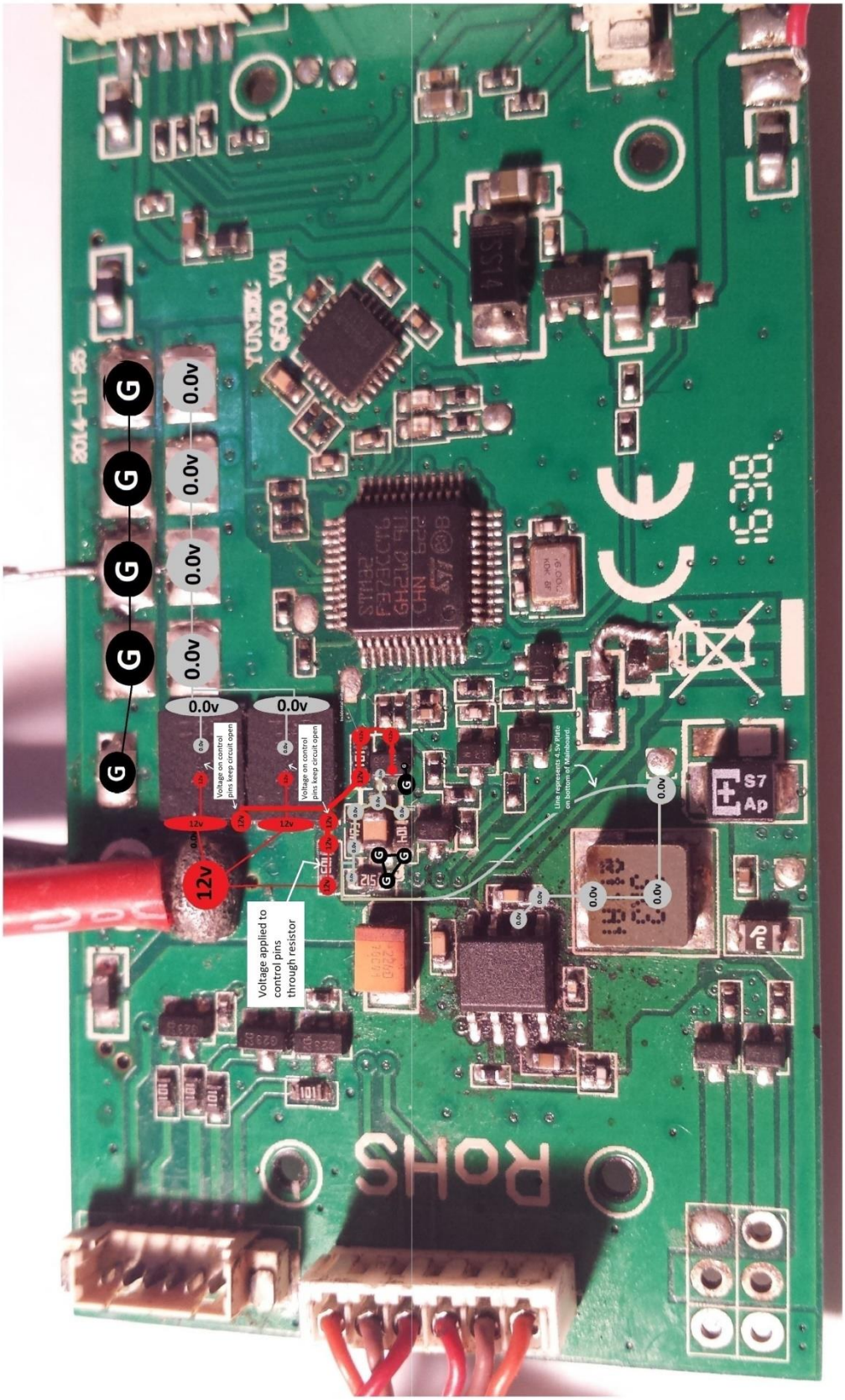


Attachment 35
Q500 “Power ON” Study

Use of this information is at your own risk.

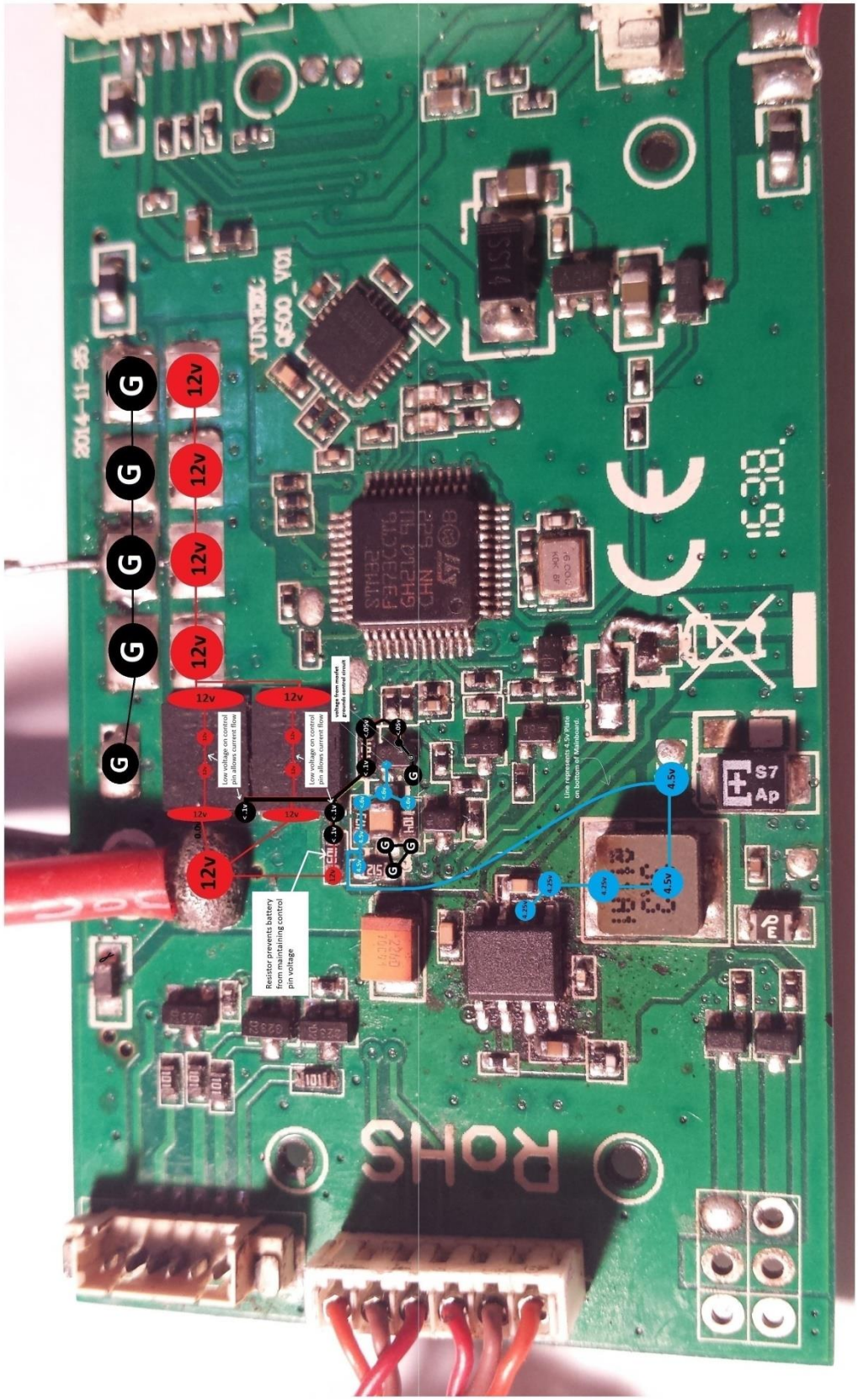
Attachment 35
Q500 “Power ON” Study

Motor Power Circuit
(Battery Connected)



Attachment 35
Q500 “Power ON” Study

Motor Power Circuit
(Switch "ON")

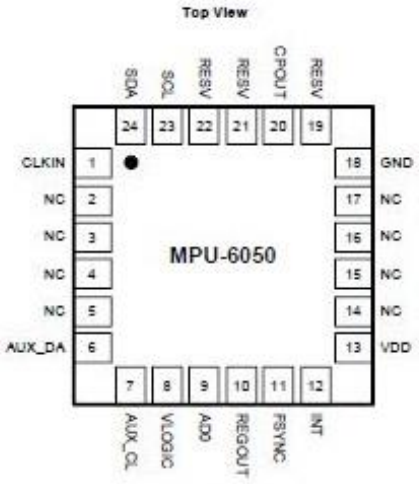


Attachment 36
Q500 IMU Data Sheet

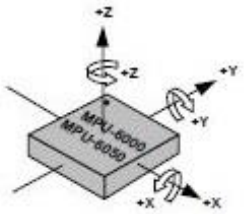
Use of this information is at your own risk.

7.1 Pin Out and Signal Description

Pin Number	MPU-6000	MPU-6050	Pin Name	Pin Description
1	Y	Y	CLKIN	Optional external reference clock input. Connect to GND if unused.
6	Y	Y	AUX_DA	I^2C master serial data, for connecting to external sensors
7	Y	Y	AUX_CL	I^2C Master serial clock, for connecting to external sensors
8	Y		/CS	SPI chip select (0=SPI mode)
8		Y	VLOGIC	Digital I/O supply voltage
9	Y		AD0 / SDO	I^2C Slave Address LSB (AD0); SPI serial data output (SDO)
9		Y	AD0	I^2C Slave Address LSB (AD0)
10	Y	Y	REGOUT	Regulator filter capacitor connection
11	Y	Y	FSYNC	Frame synchronization digital input. Connect to GND if unused.
12	Y	Y	INT	Interrupt digital output (totem pole or open-drain)
13	Y	Y	VDD	Power supply voltage and Digital I/O supply voltage
18	Y	Y	GND	Power supply ground
19, 21	Y	Y	RESV	Reserved. Do not connect.
20	Y	Y	CPOUT	Charge pump capacitor connection
22	Y	Y	RESV	Reserved. Do not connect.
23	Y		SCL / SCLK	I^2C serial clock (SCL); SPI serial clock (SCLK)
23		Y	SCL	I^2C serial clock (SCL)
24	Y		SDA / SDI	I^2C serial data (SDA); SPI serial data input (SDI)
24		Y	SDA	I^2C serial data (SDA)
2, 3, 4, 5, 14, 15, 16, 17	Y	Y	NC	Not internally connected. May be used for PCB trace routing.



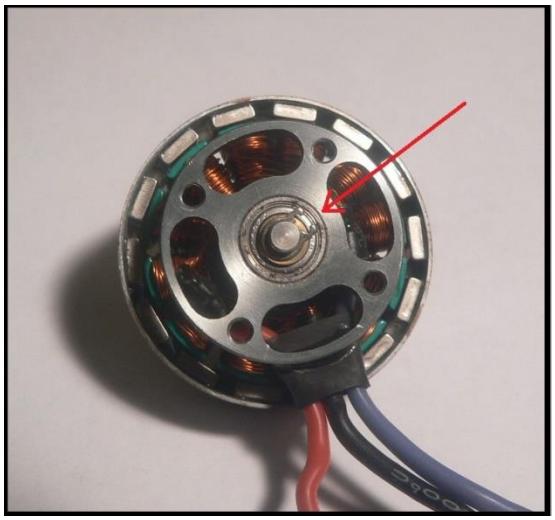
QFN Package
24-pin, 4mm x 4mm x 0.9mm

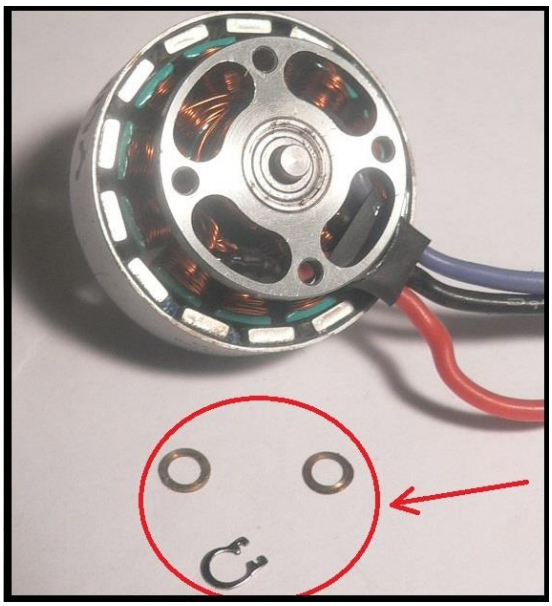


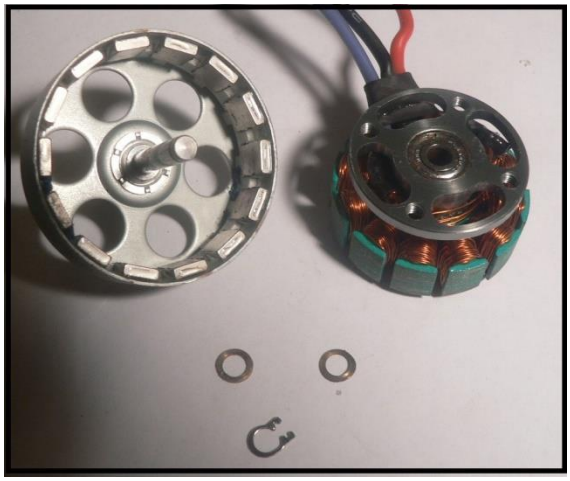
Orientation of Axes of Sensitivity and Polarity of Rotation

Attachment 37
Q500 Motor Disassembly

Use of this information is at your own risk.



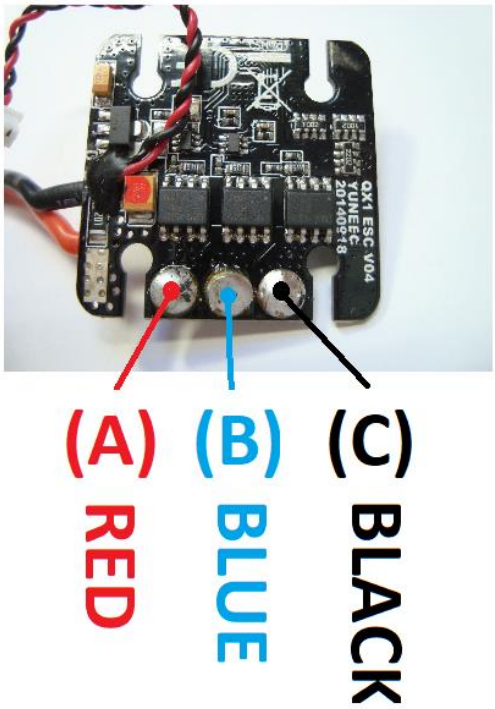




Attachment 38
Q500 ESC Motor Wire Color

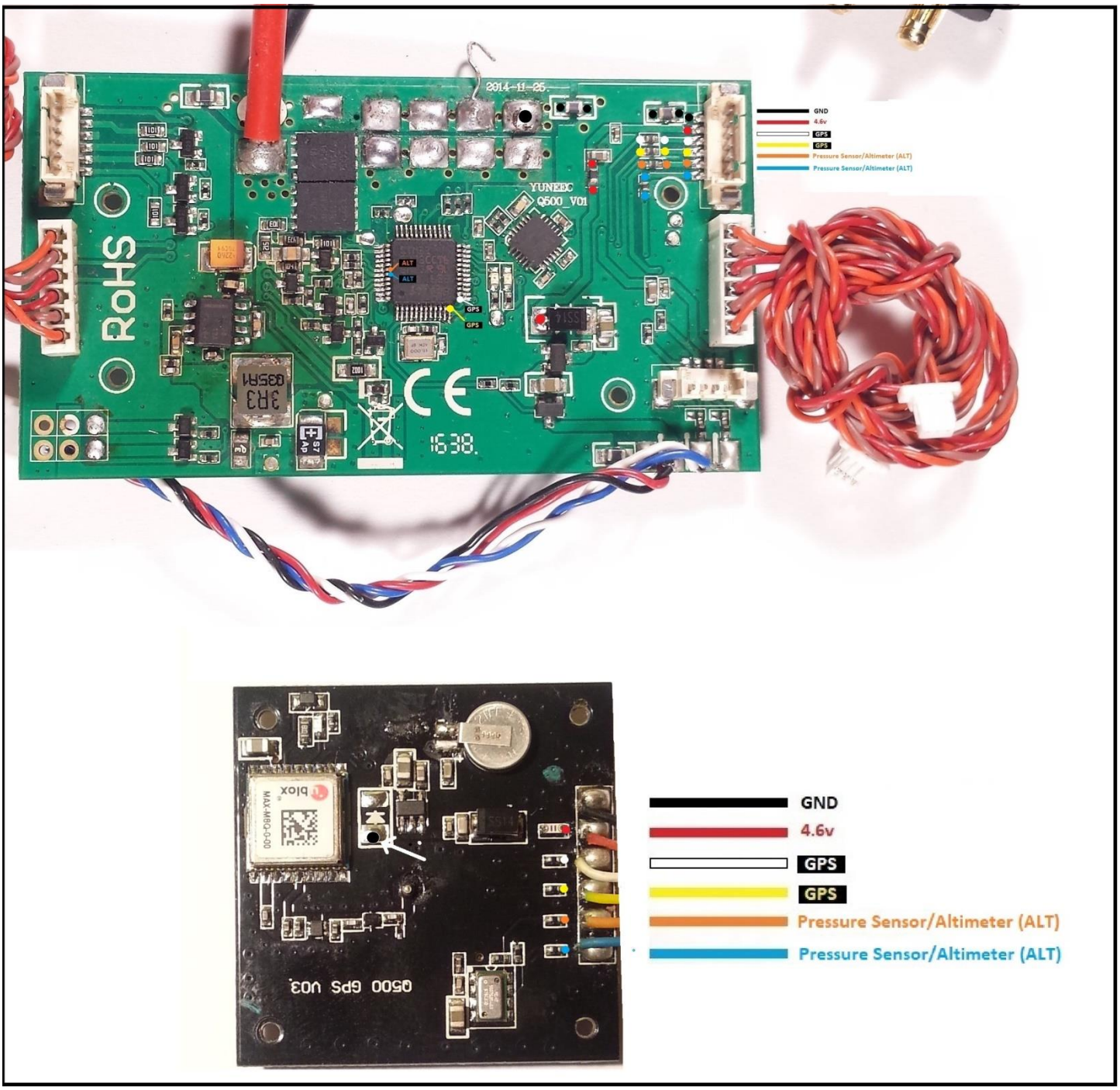
Use of this information is at your own risk.

Q500 ESC Motor Wire Color



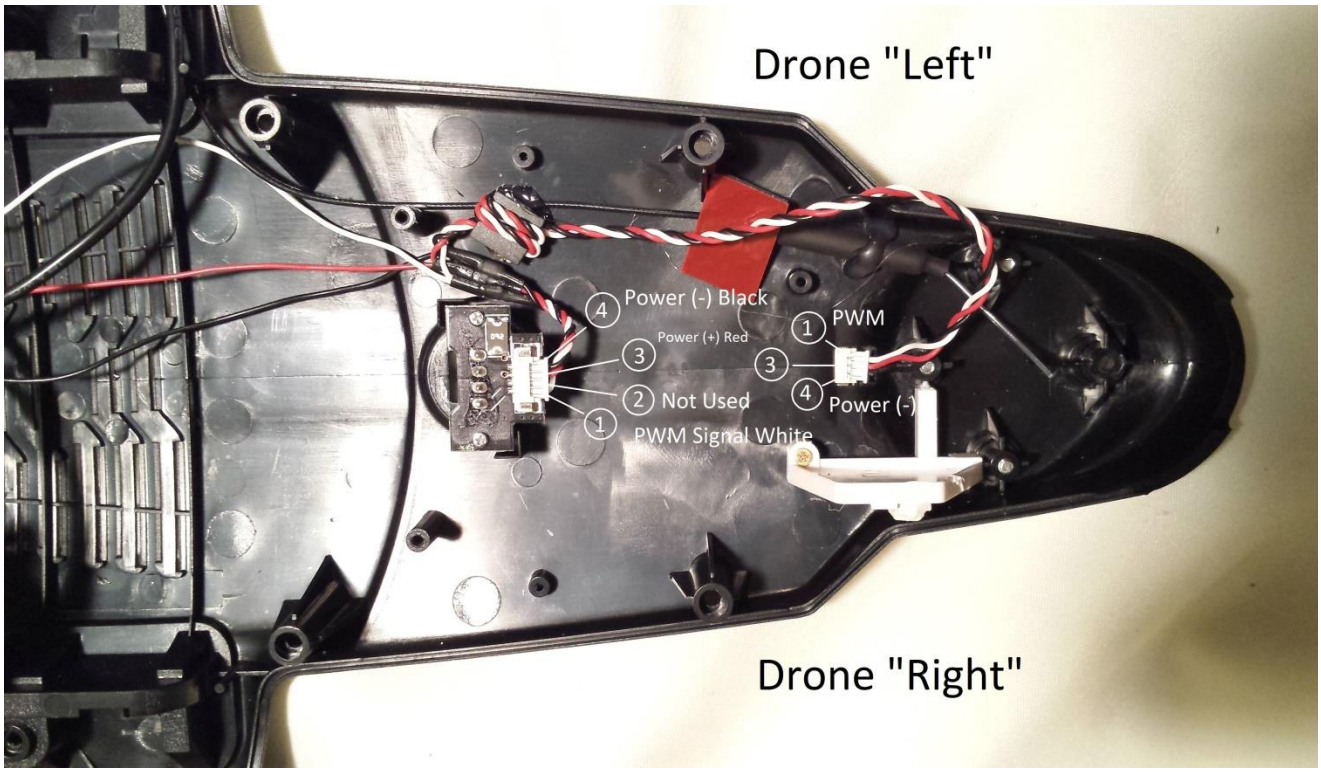
Attachment 39
Q500 GPS Wire Color

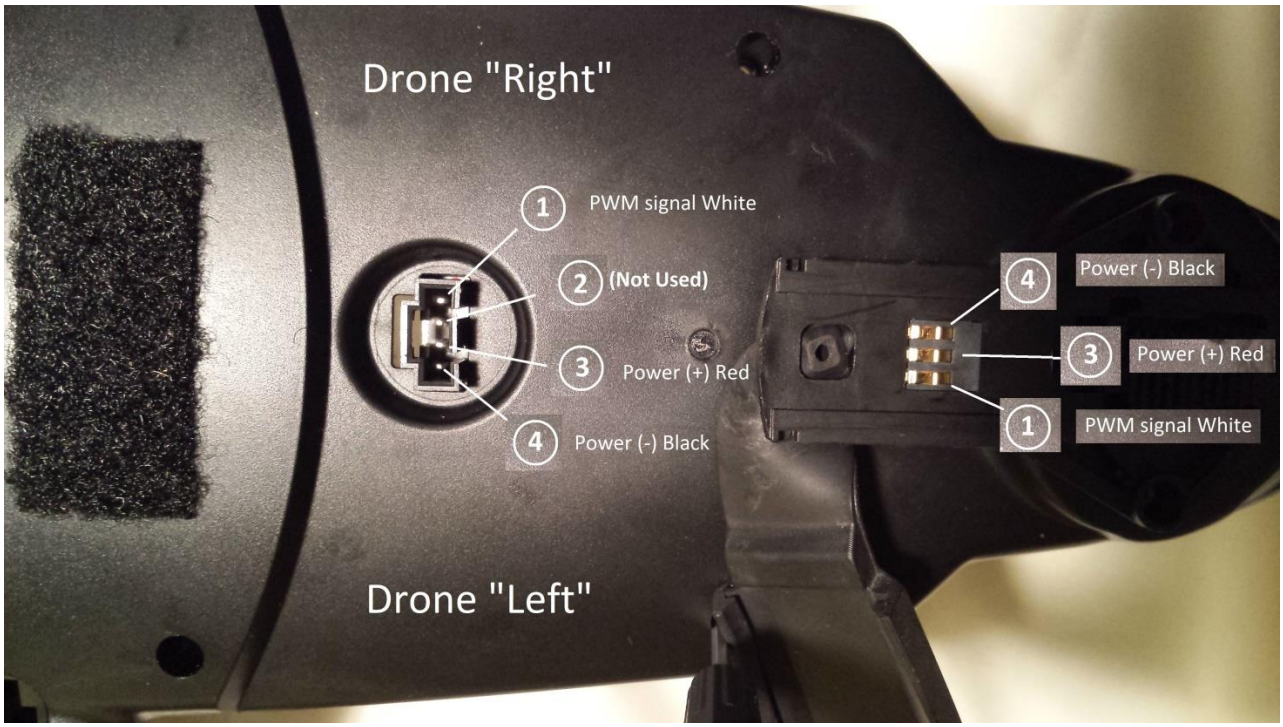
Use of this information is at your own risk.



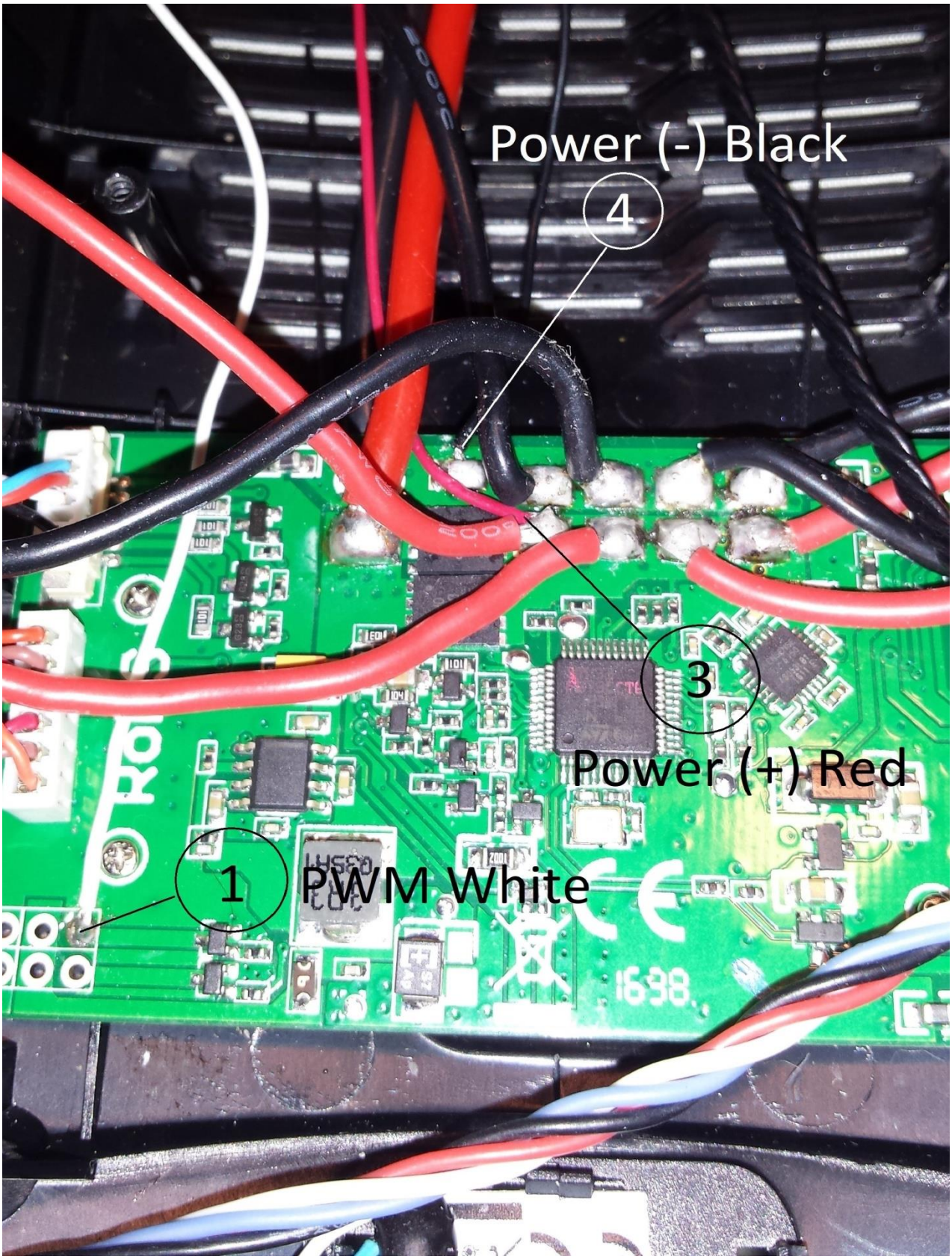
Attachment 40
Q500 Internal Camera Wiring

Use of this information is at your own risk.





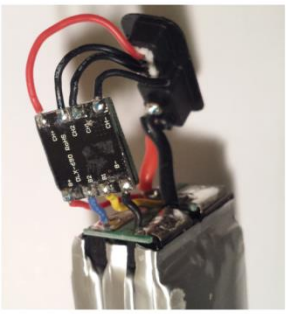
Attachment 40
Q500 Internal Camera Wiring

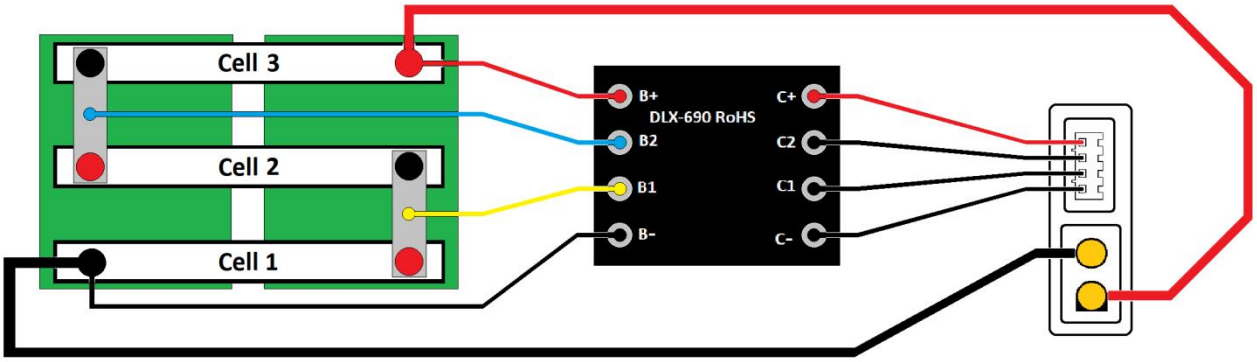


Attachment 41
Q500 Battery Internal Wiring

Use of this information is at your own risk.

Yuneec Q500 Series
Internal Battery Connections





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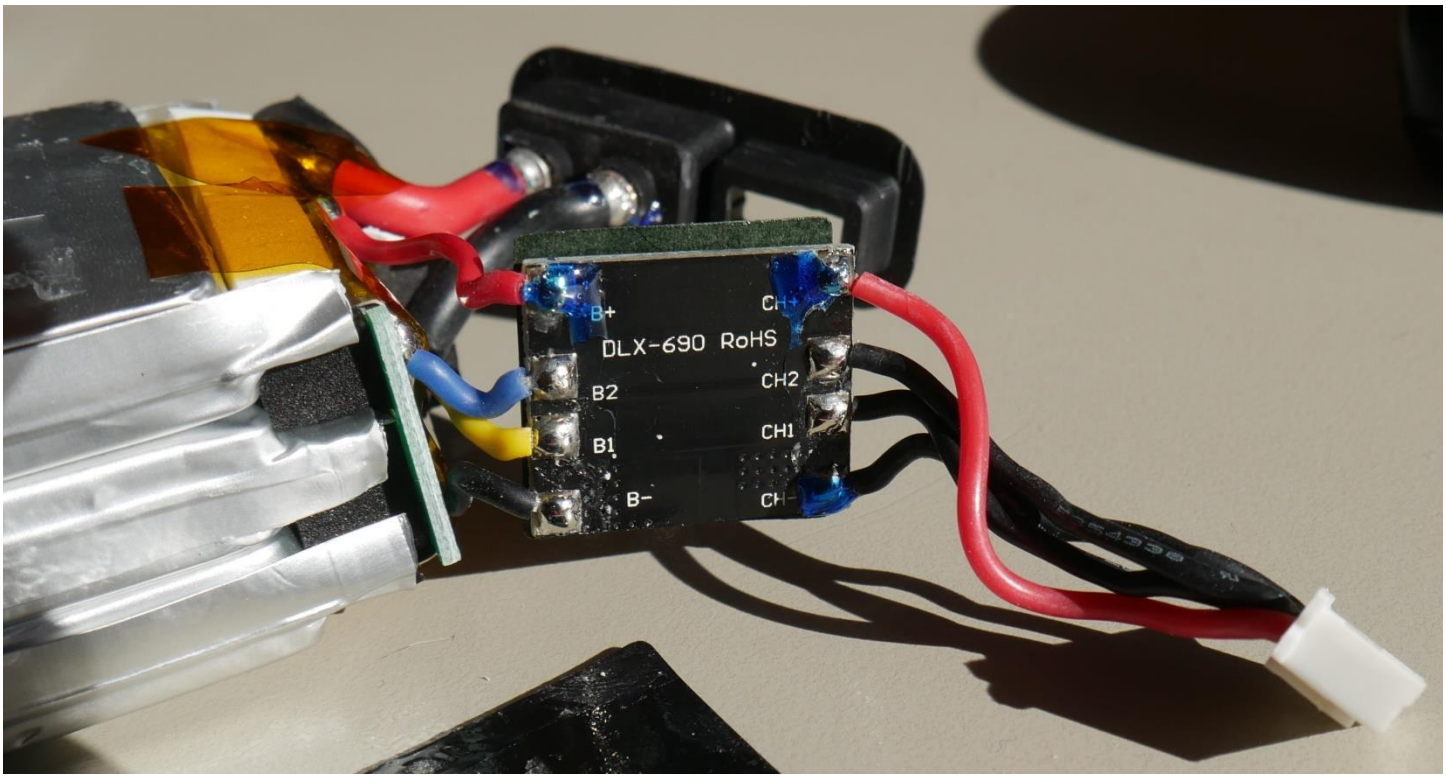
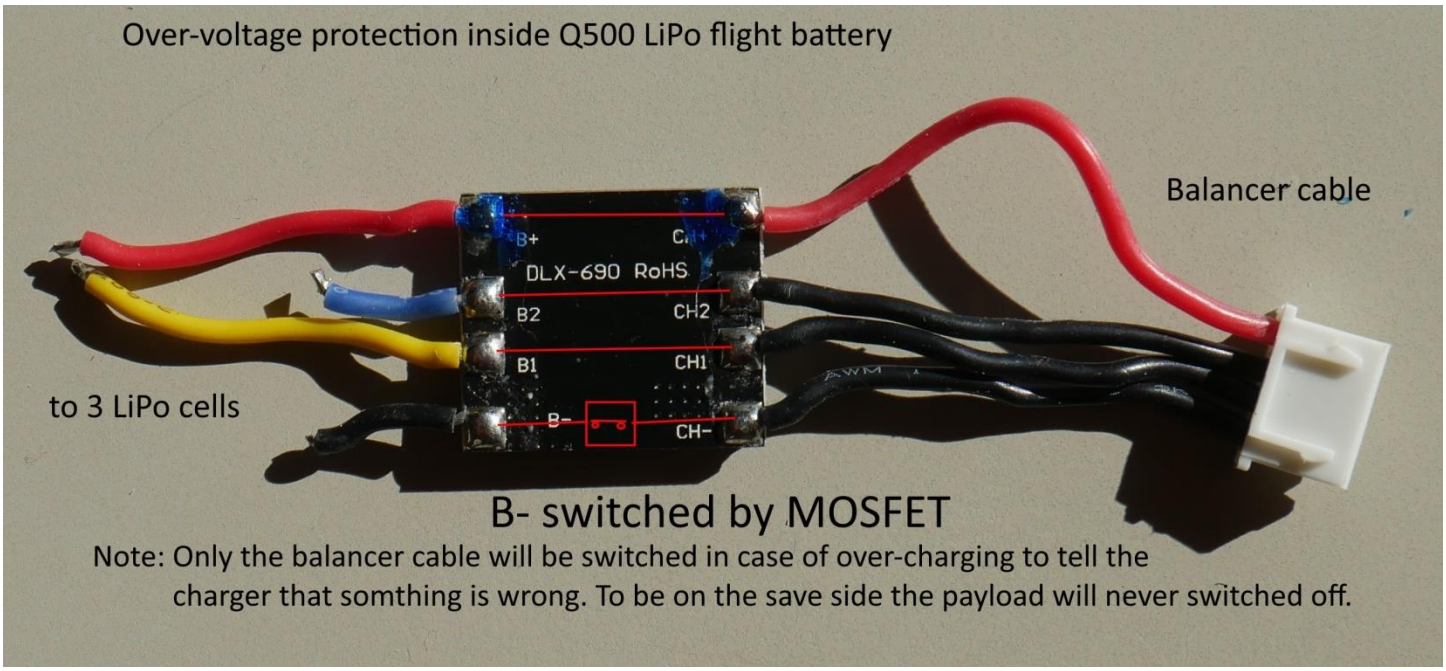
Attachment 42
Q500 Battery Overload Protection

Use of this information is at your own risk.

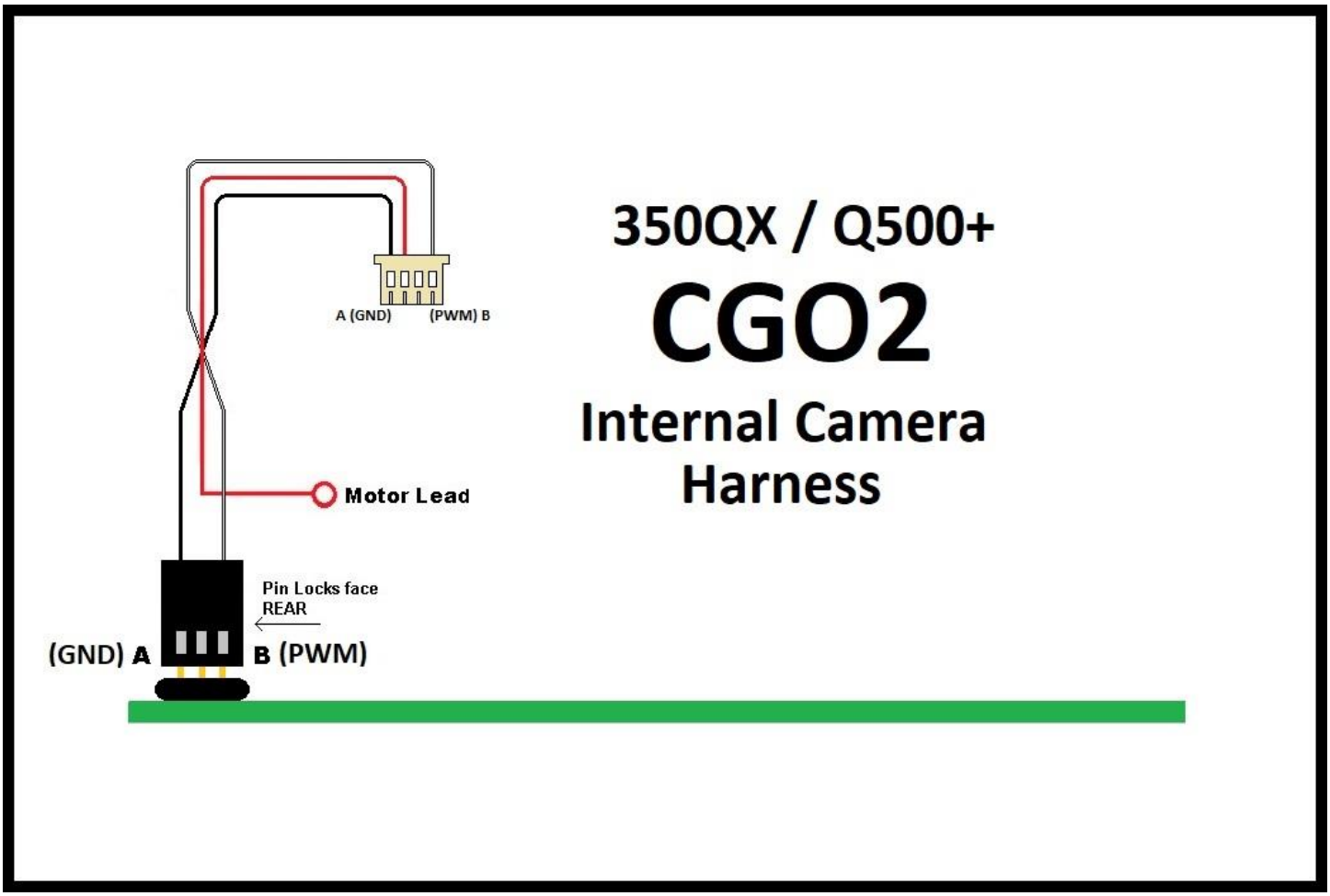
Overload protection at Q500 battery. All three cells will be observed. If one of them has over-voltage then the ground wire of the balancer cable will be cut and the charger stops charging. The main supply will be untouched.





Attachment 43
Q500+ /CGo2 Internal Camera Harness

Use of this information is at your own risk.



Attachment 44
Q500 Series Camera Tilt Transistor

DISCUSSION:

The common main board failure that results in loss of usable PWM signal is the small transistor in the picture below. The problem can often be resolved by simply moving the white PWM wire shown in the drawing to the “Alternate Connection Point” which is associated with the transistor identified as the “Good One”.
In some cases, and for some older board configurations, it may be necessary or more desirable to move the “Good” transistor to replace the “Bad” one. If this is the case, it should be noted the solder seems to have a higher melting temperature than most of the other board components, and can't be removed with a hot air station without damaging the board. It can often be removed with a tip load of hot solder on the end of a soldering iron. Re-soldering is also tricky; it is sometimes difficult to get the new solder to bind.

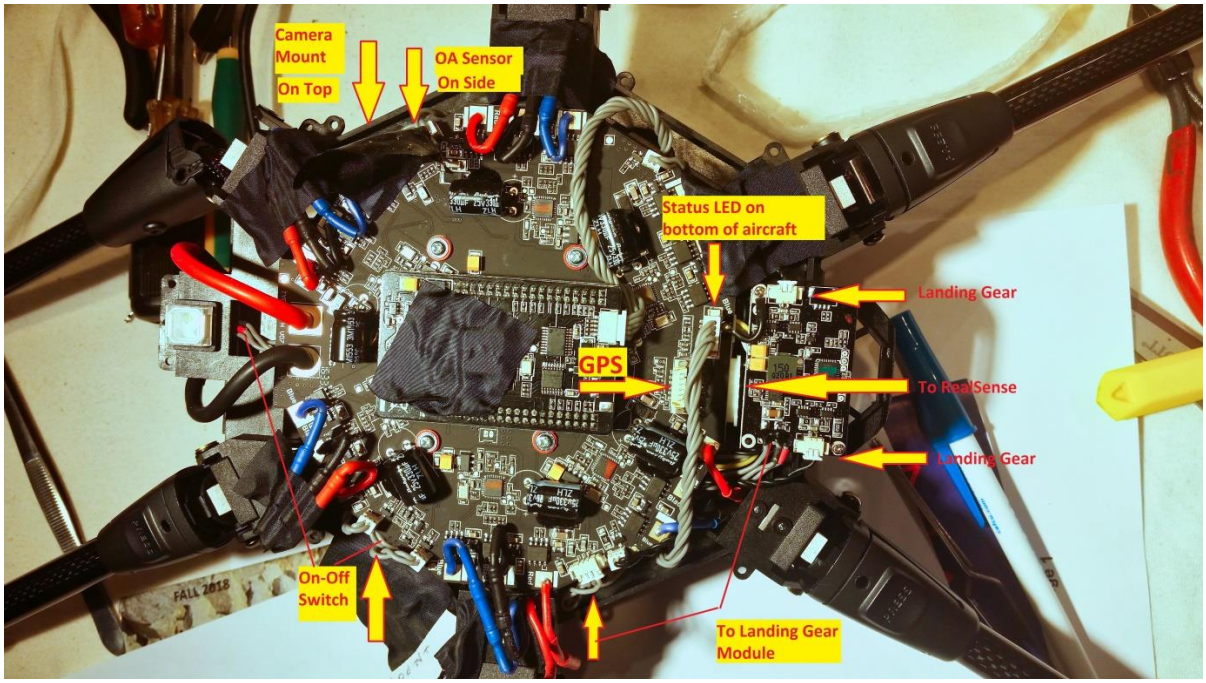
These transistors essentially invert the PWM signal from the main CPU. If you look at the input and output of a normal tilt transistor using an oscilloscope, the on/off cycle for about 80% of the signal is exactly the same pattern except it’s upside down. On a failed tilt transistor, the input and output are identical (or there is no output at all).

Summary:

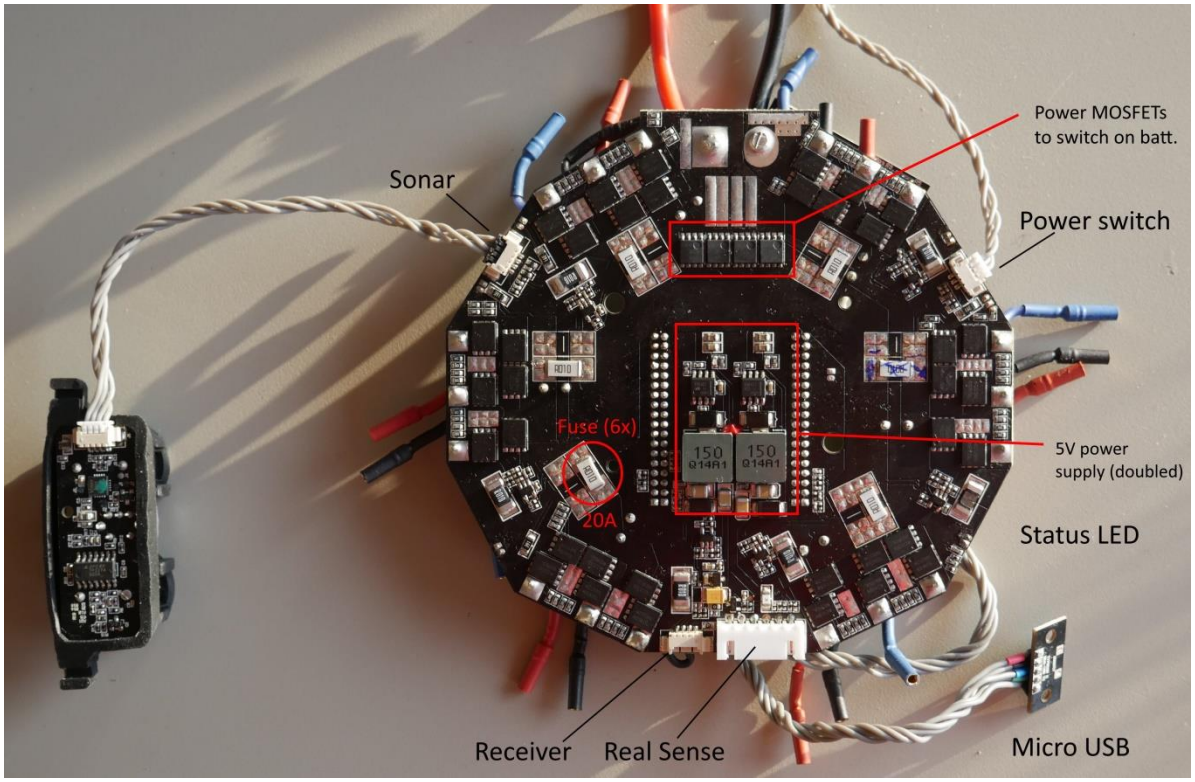
The solution to the problem is to place the “Good” transistor in service. This can be easily done in most cases by moving the wire to the alternate solder point. In some circumstances, it may be necessary to replace the “**Bad**” transistor with the “**Good one**”, while leaving the wire in the original location. (The “Good” one is an unused component on the Q500 Boards.)

Attachment 45
Typhoon H Mainboard

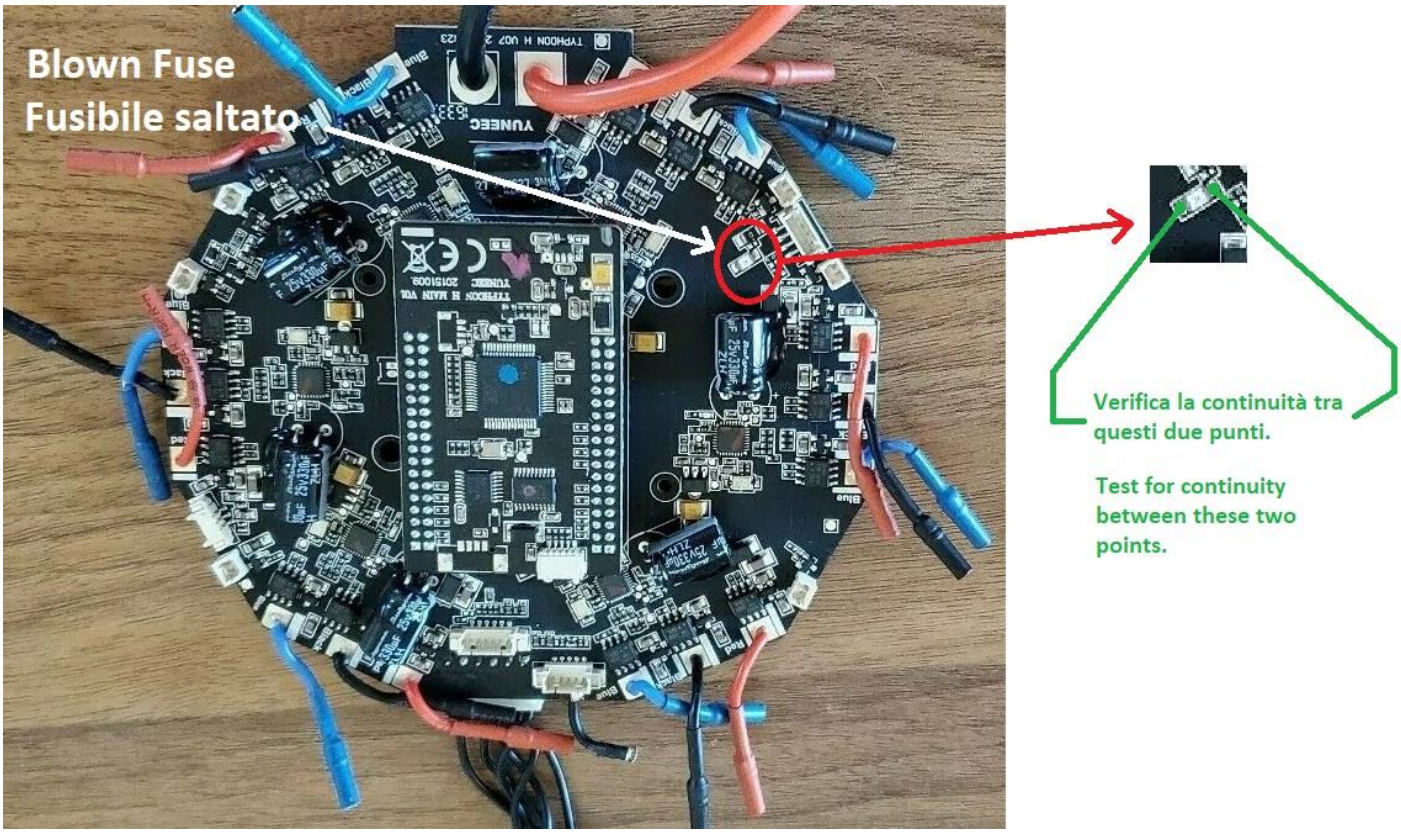
TOP



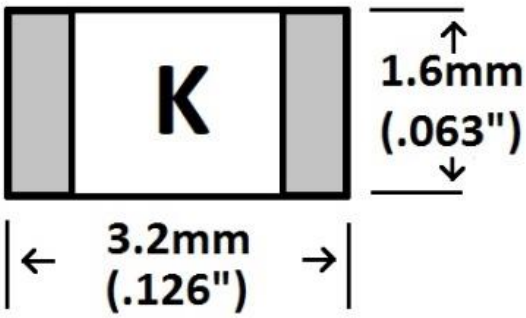
Bottom



Attachment 46
Typhoon H “K” Fuse



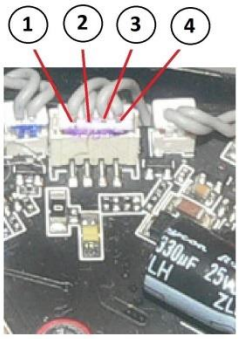
K= 1.5 amps

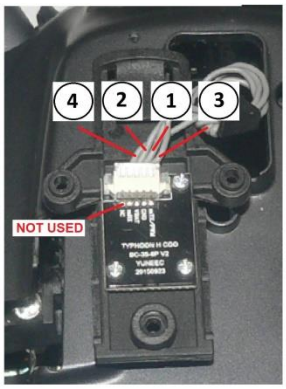


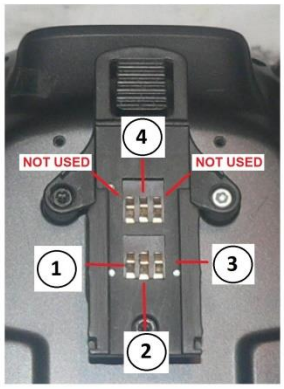
EIA inch code	Dimensions L x W (in)	IEC/EN metric code	Dimensions L × W (mm)
1206	0.126 × 0.063	3216	3.2 × 1.6

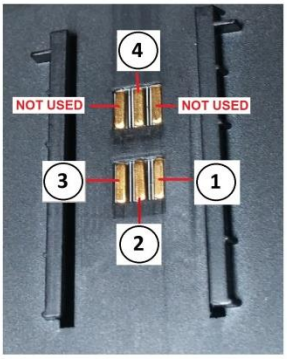
Attachment 47
Typhoon H / CG03+ Continuity

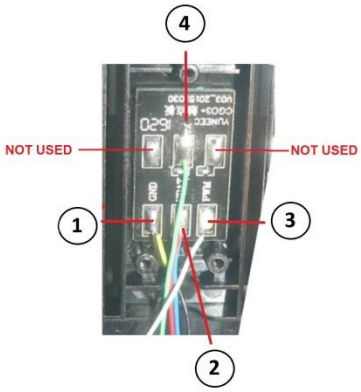
Typhoon H / CGo3+ Continuity

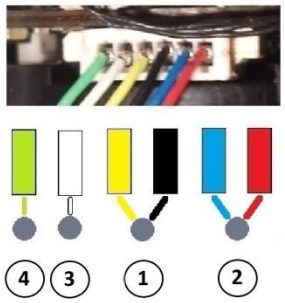












1. **Battery Ground**
2. **Battery Positive**
3. **PWM White**
4. **PWM Green**

Revision 2		2019-11-04

Attachment 48
Q500 and Chroma Flight Log Retrieval

Introduction: The data contained in the Flightlog directory provides the most detailed and accurate means available to research many events that may otherwise be incorrectly diagnosed. There are many ways the flightlogs can be provided to the forum. There are many file locations and transfer techniques that can be used. There are many ways to divide and limit data. This guideline provides one relatively simple method that will upload all available data, and can be used effectively by a wide range of members. The focus of this guidance is the upload of telemetry information for Forum review. Data management and archiving require additional activities that are not part of this guidance.

NOTE: Use of this guidance uploads ALL available flight files, which may have privacy implications. These files include the location of each flight. They are likely to identify items such as where you live, where you bought the drone and if you use your drone for commercial operations, the locations of your customers. If privacy is an issue, please use other means to limit data and upload to the Forum.

Use of this information is at your own risk.

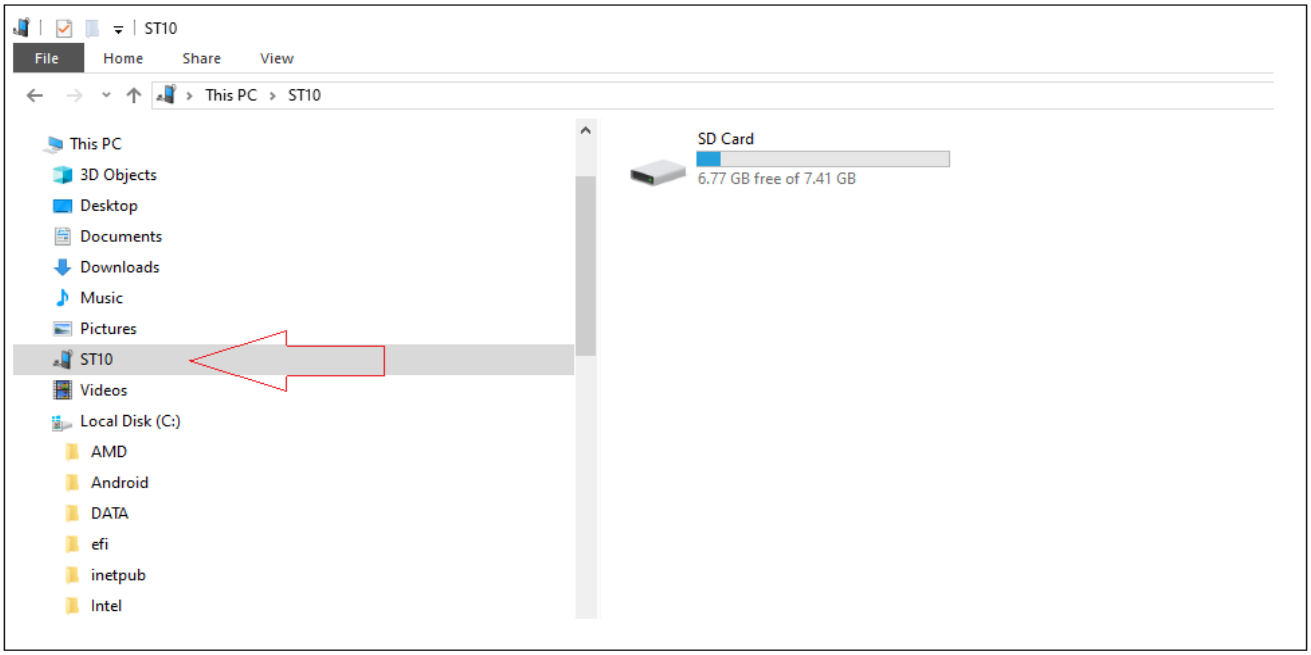
NOTE: The drone does not need to be powered on for this process.

1). Power on the controller and let it come to the main screen.

NOTE: Most common USB charging cables will not work. The USB cable must be data capable, such as the USB cable originally shipped with the Typhoon H.

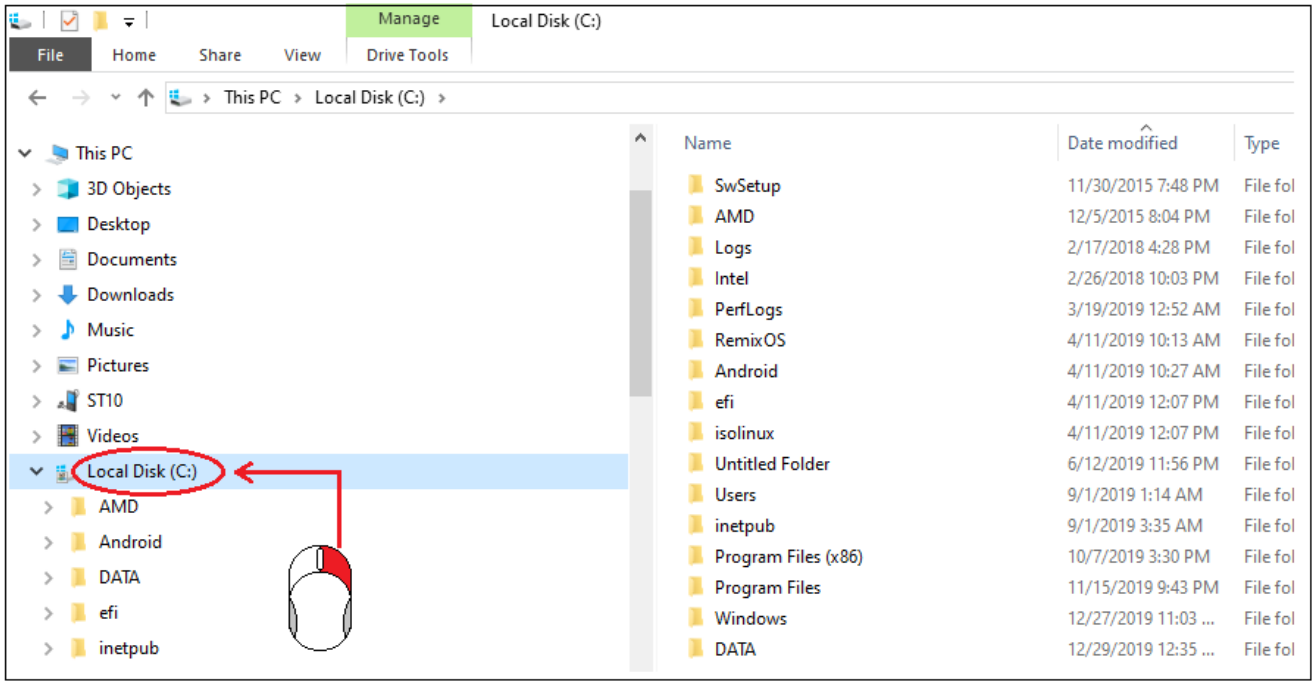
2). Connect ST10 to a computer via data capable USB cable.

3). Open your computer file management system and verify the ST10 is connected:

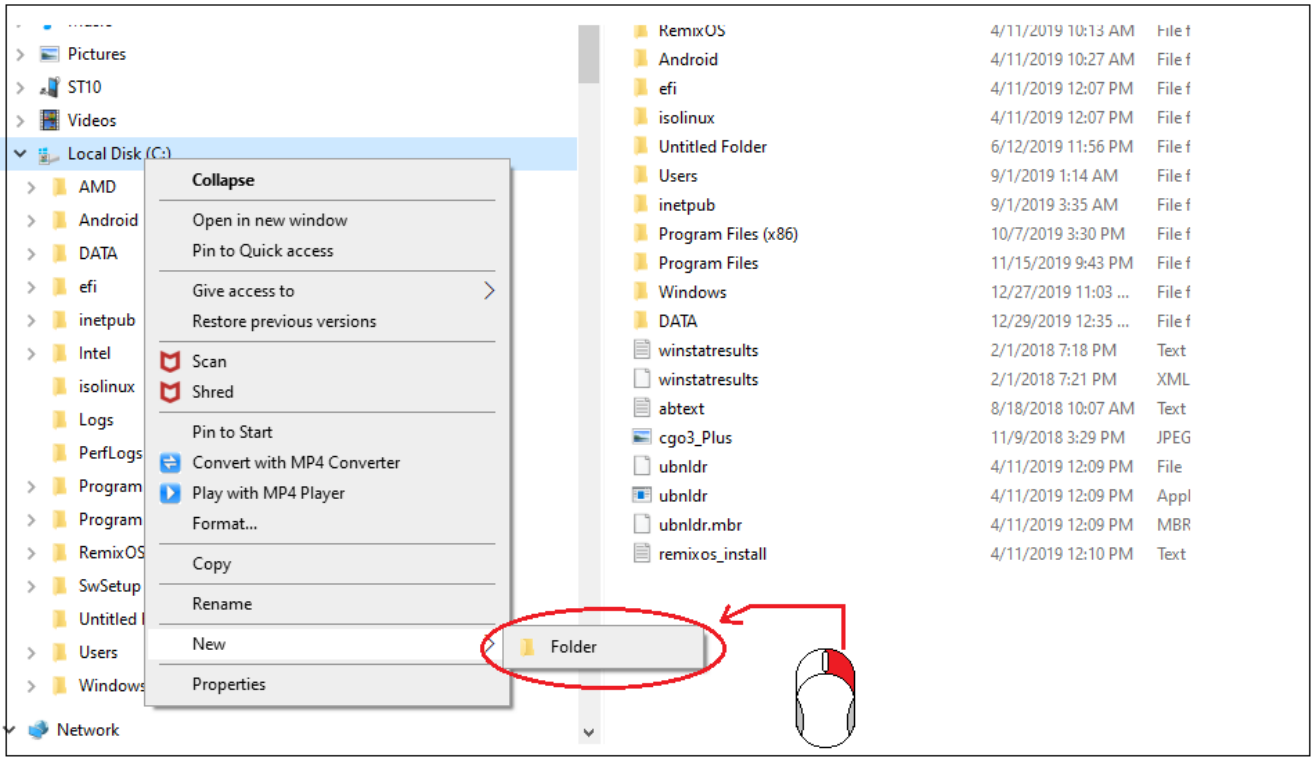


Attachment 48
Q500 and Chroma Flight Log Retrieval

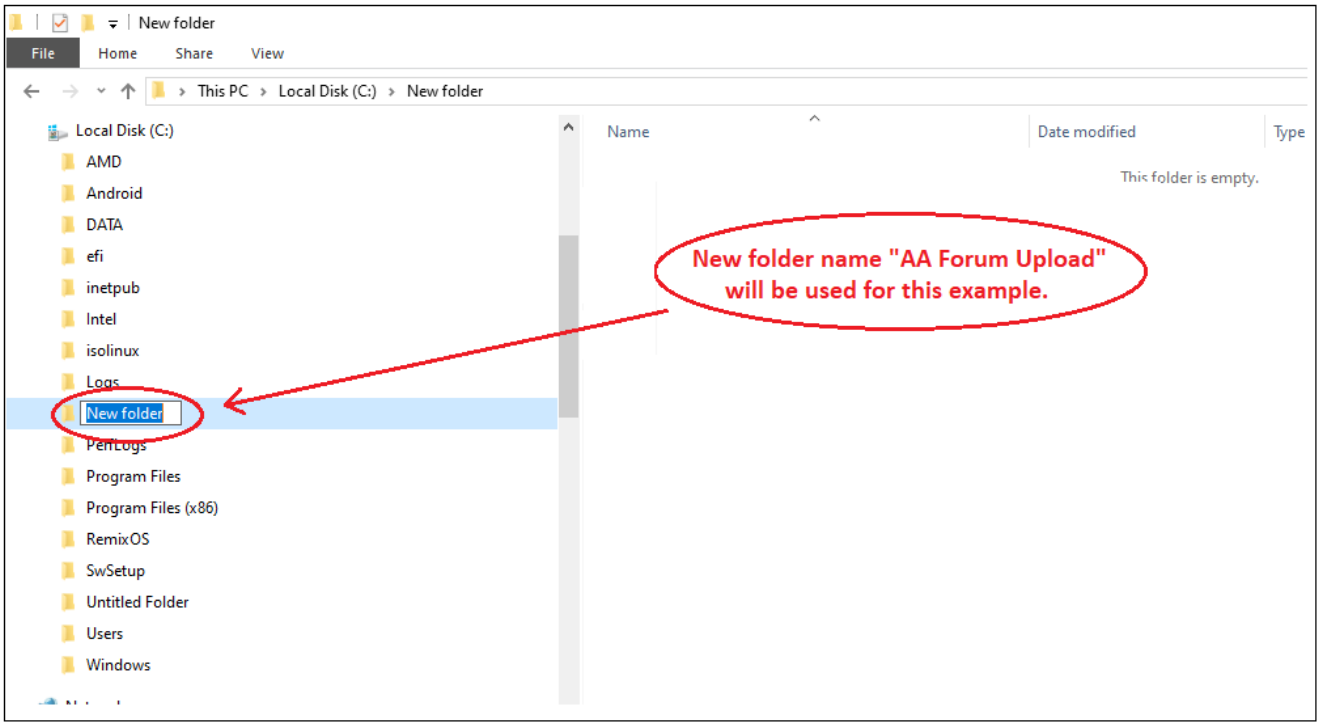
4). Right click the desired location for a temporary upload folder:



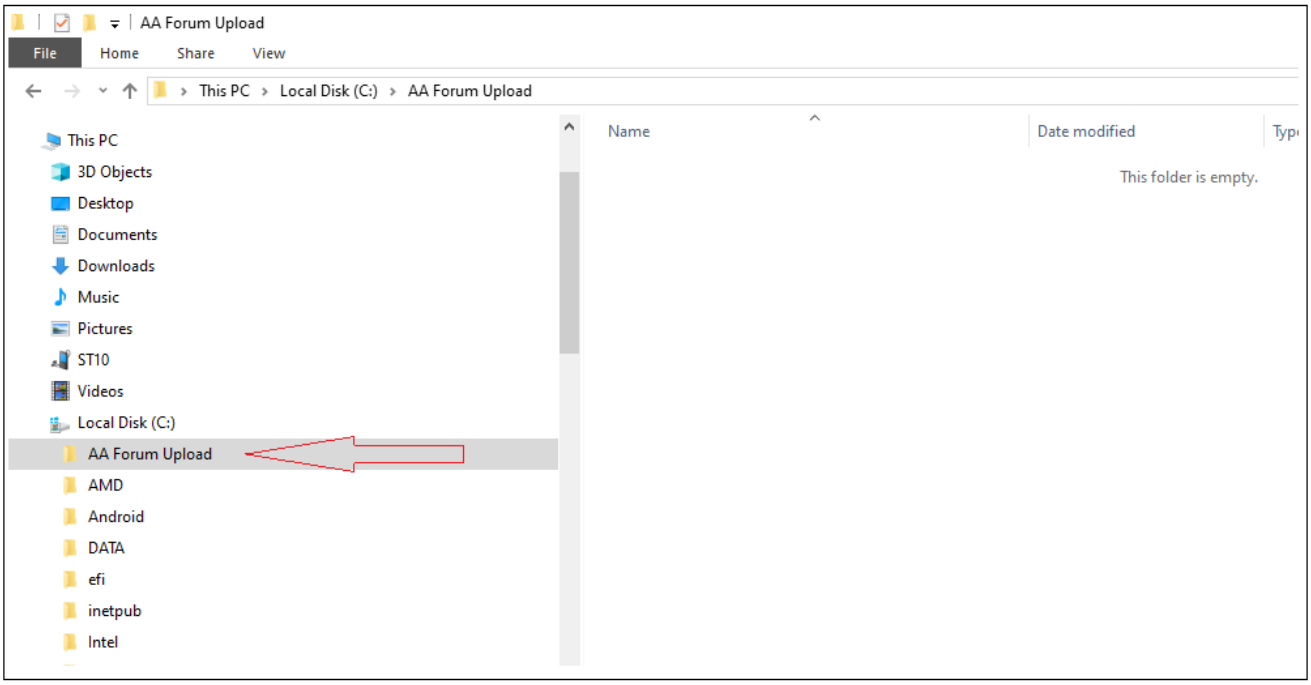
5). Hover the cursor over “New”, then right click “Folder”:



6). Rename “New Folder” as desired, then hit “enter”:

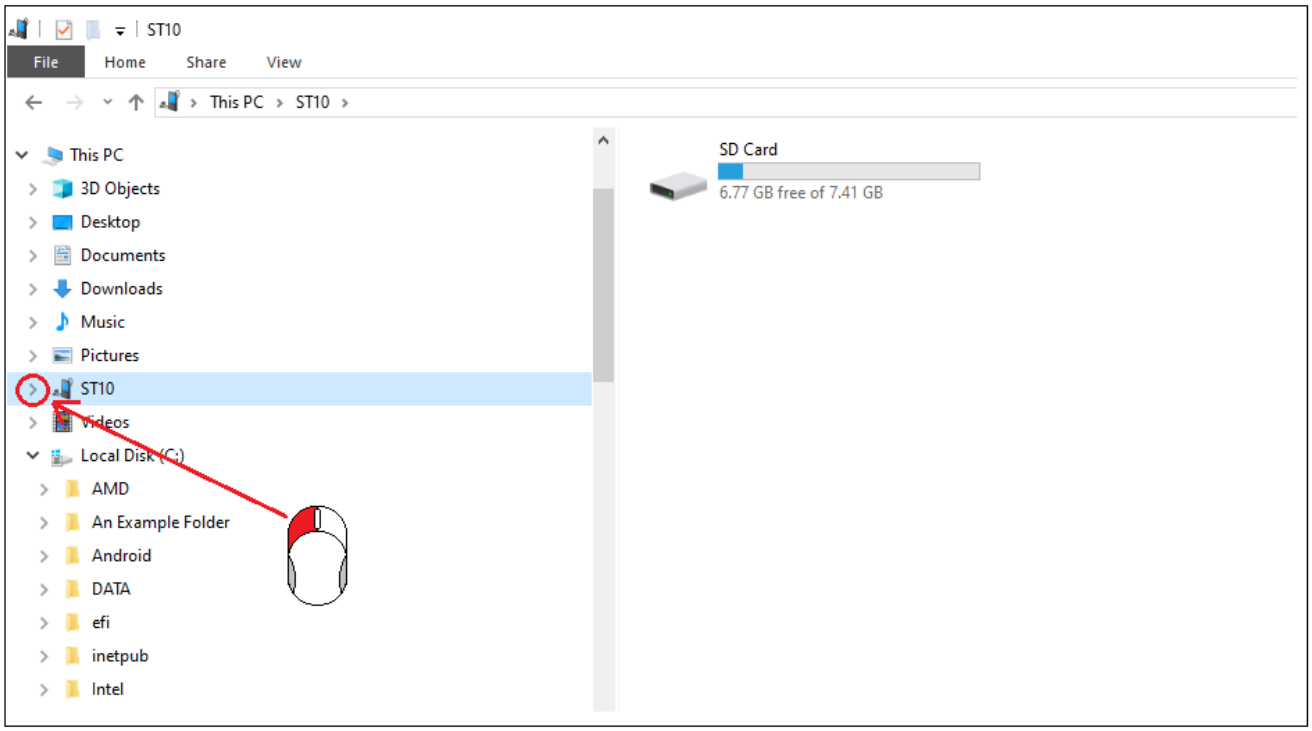


7). Verify Location of the new folder:

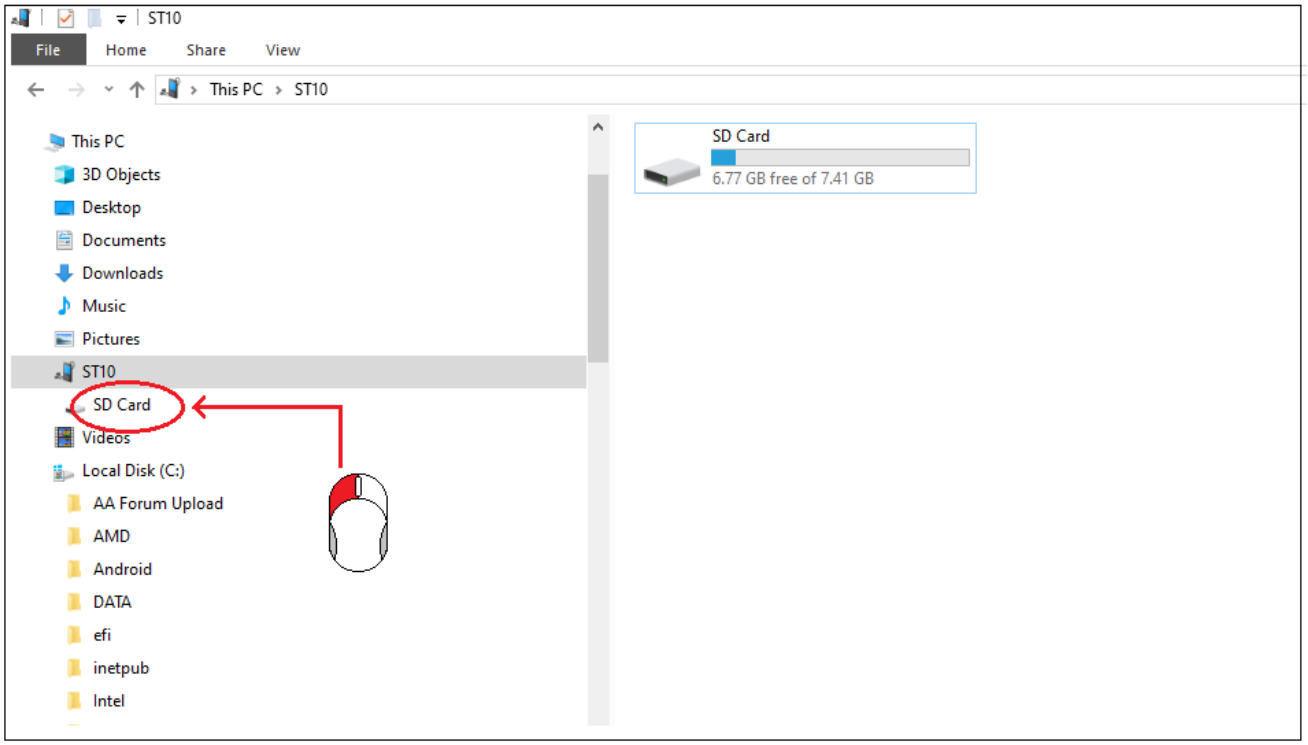


Attachment 48
Q500 and Chroma Flight Log Retrieval

8). Left click the arrow beside ST10:

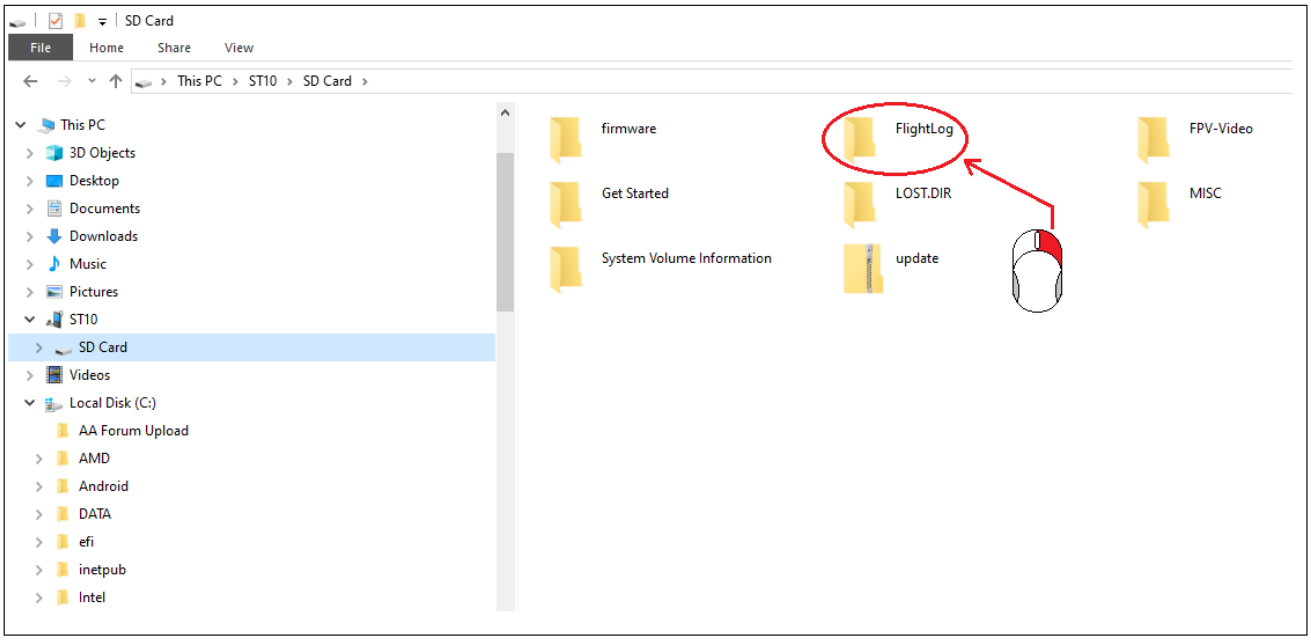


9). Left Click "SD Card":

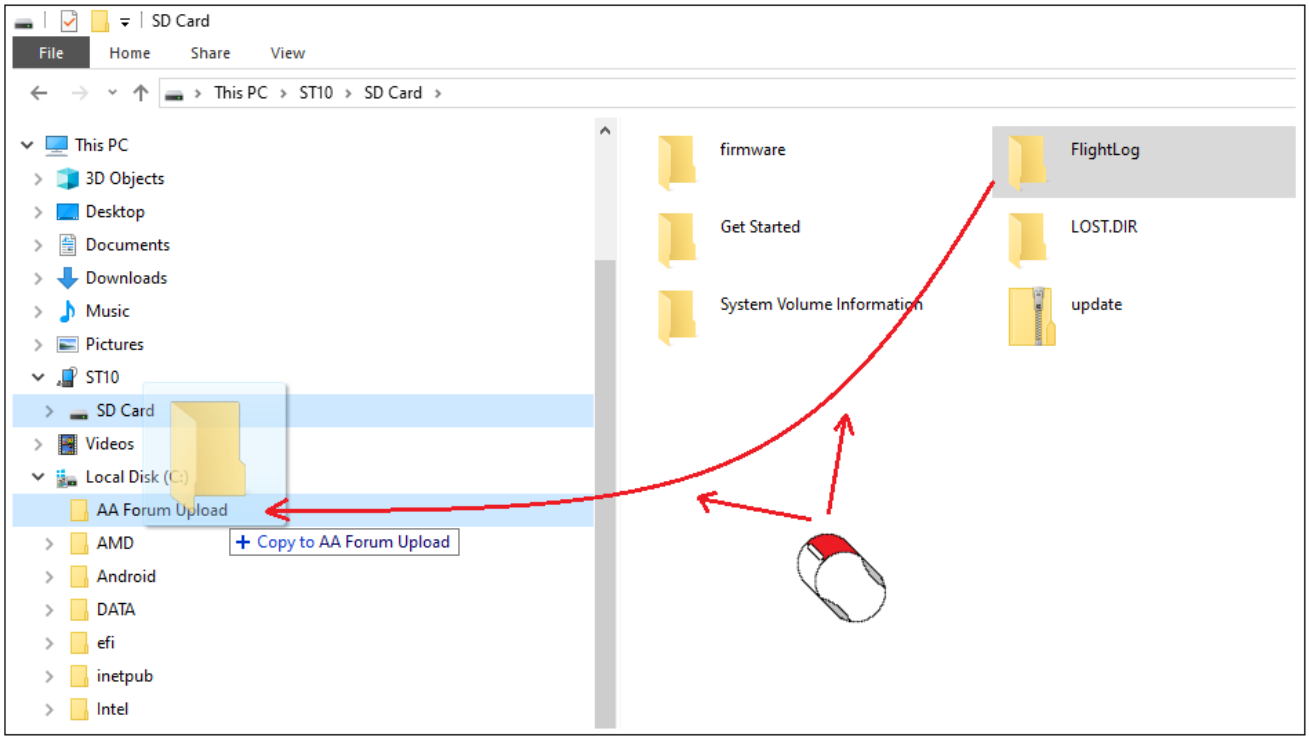


Attachment 48
Q500 and Chroma Flight Log Retrieval

10). Right Click and HOLD “FlightLog”:

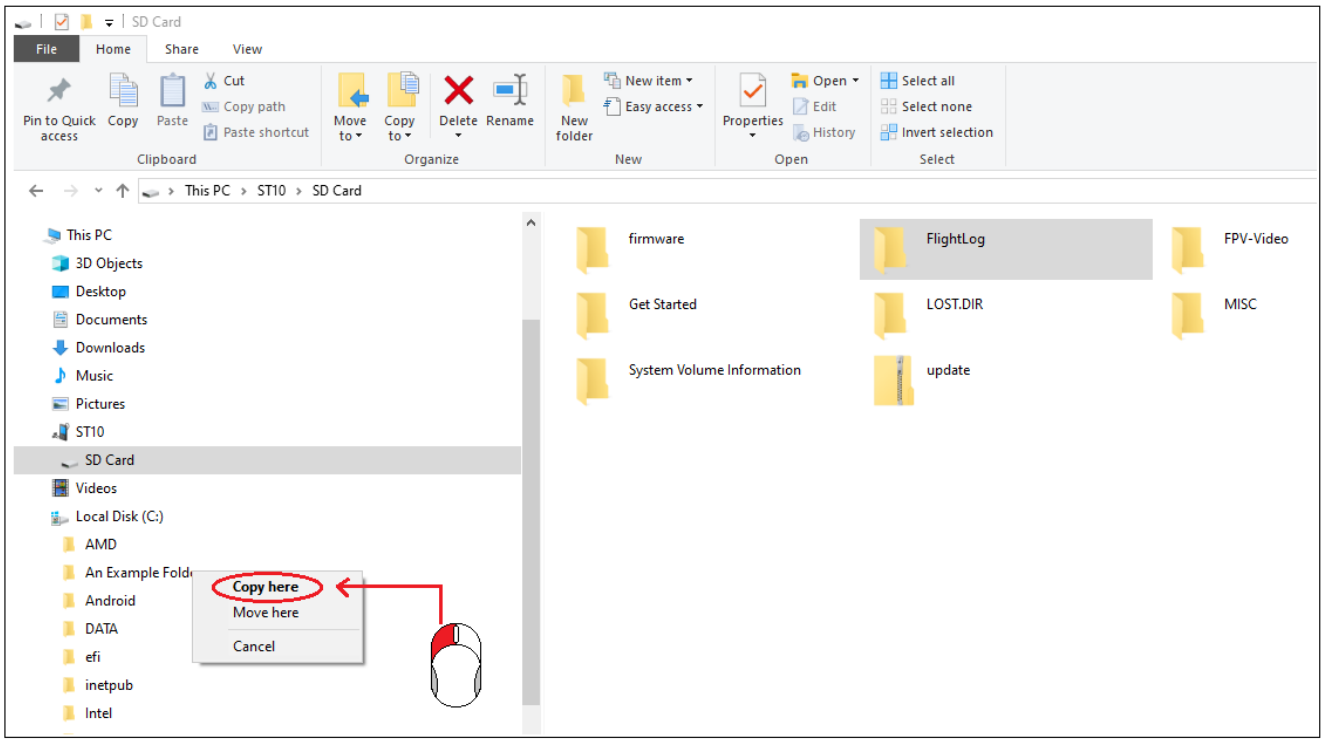


11). Drag the “FlightLog” folder to your newly created folder, then release the mouse button:

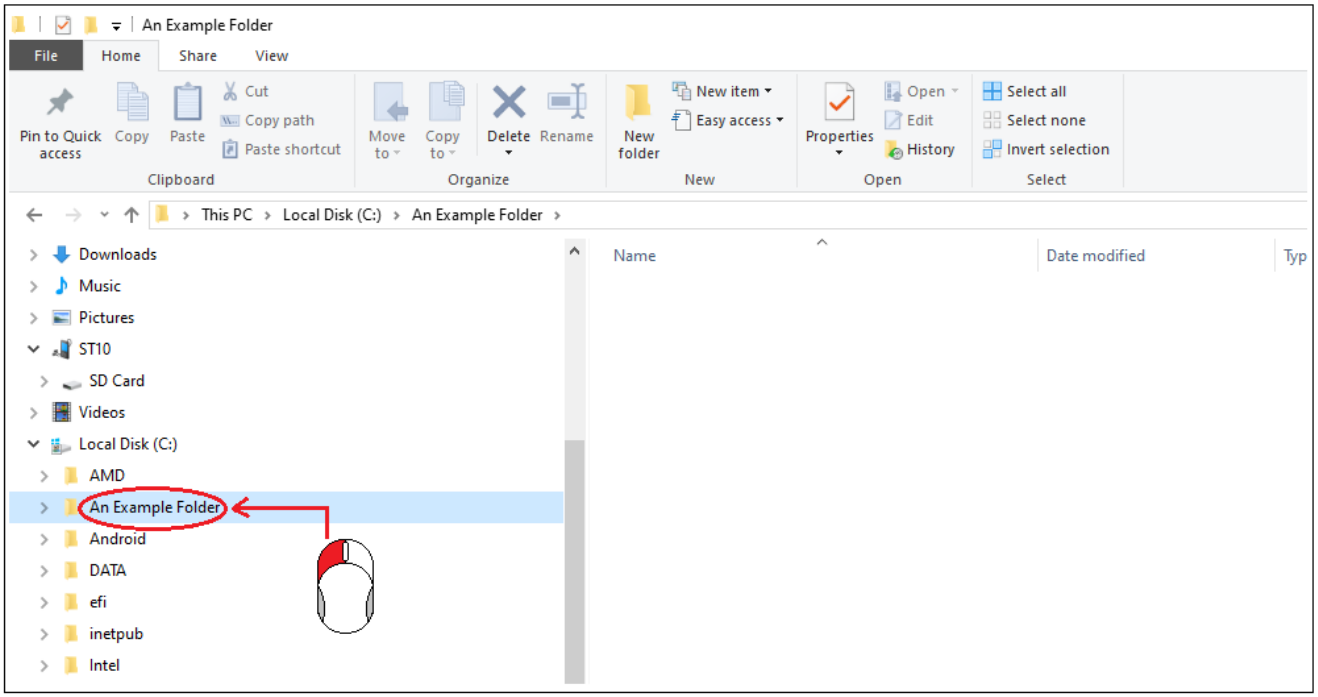


Attachment 48
Q500 and Chroma Flight Log Retrieval

12). Left Click “Copy Here”:

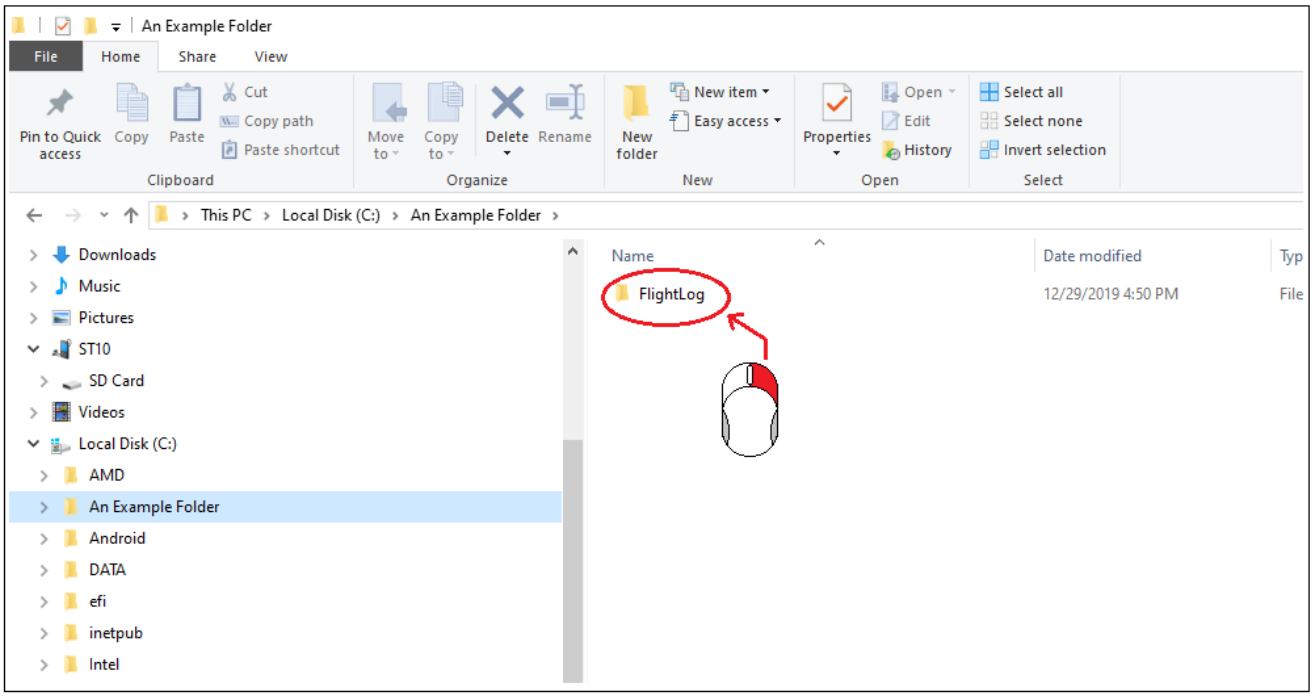


13). Left Click your newly created folder:

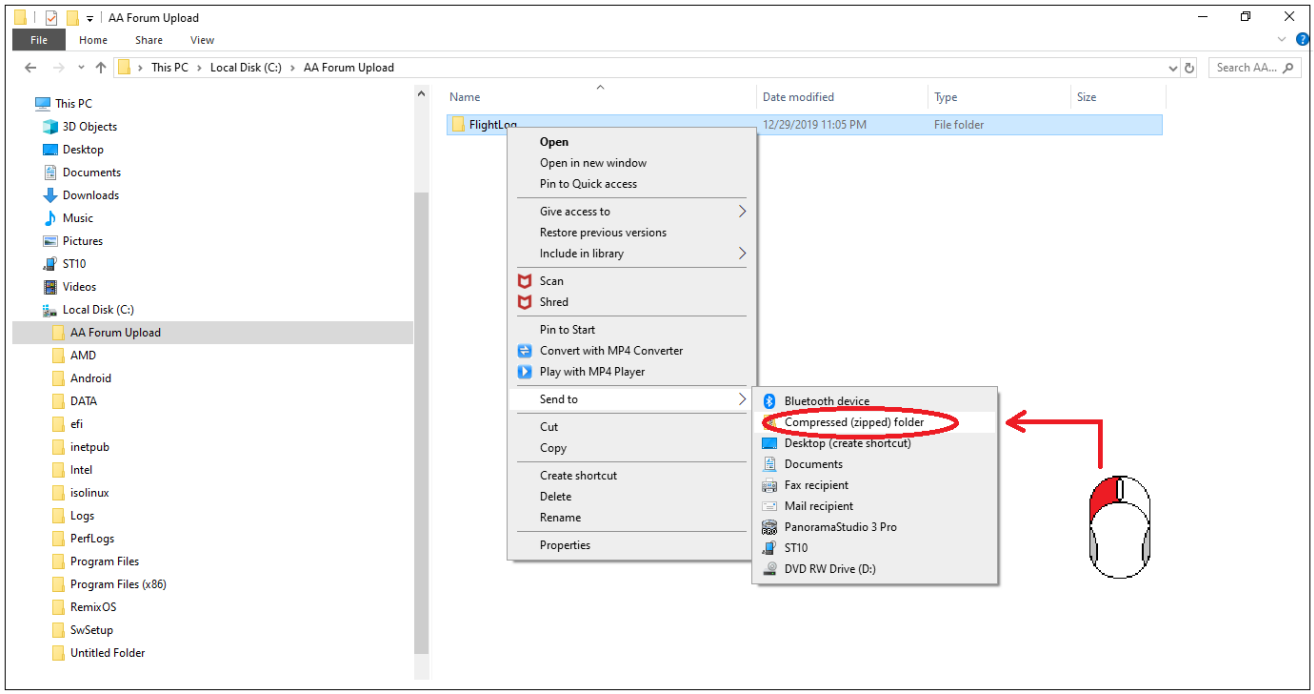


Attachment 48
Q500 and Chroma Flight Log Retrieval

14). Right Click the “FlightLog” folder:

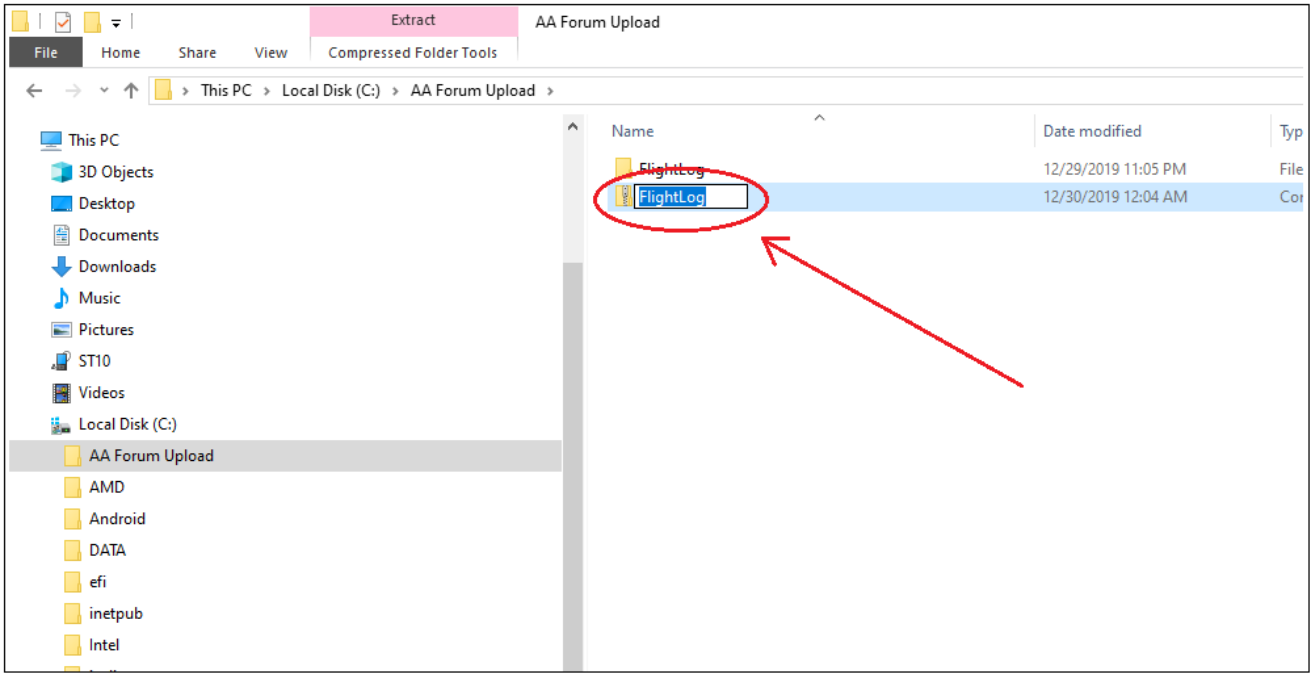


15). Hover cursor over “Send to”, then left Click “Compressed (zipped) folder”:

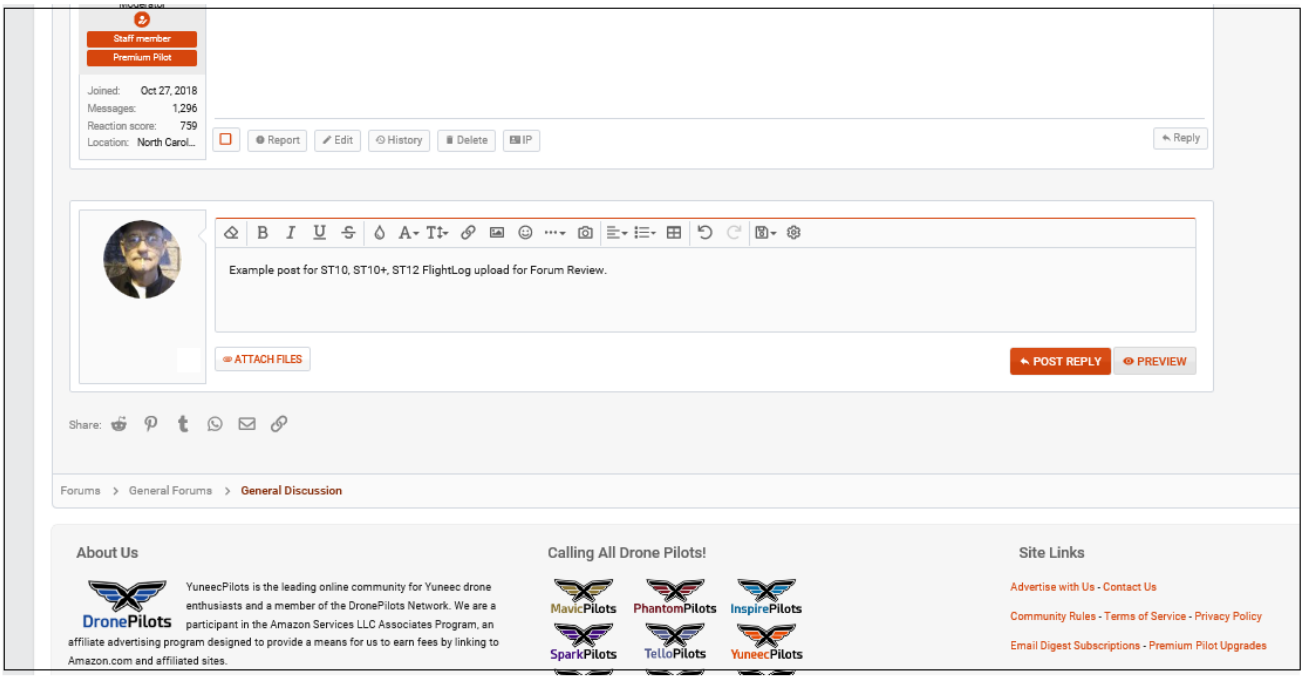


Attachment 48
Q500 and Chroma Flight Log Retrieval

16). Verify new Zip file created (File can be renamed as desired at this point):

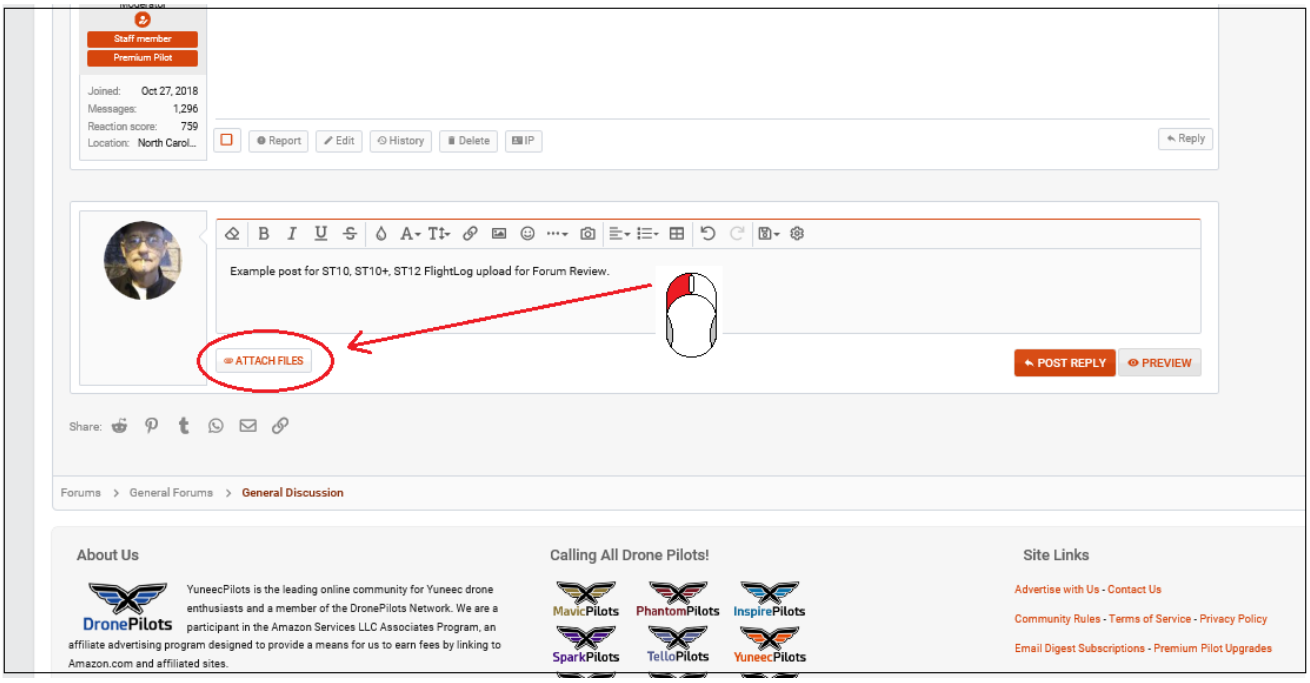


17). Return to the Forum, and create a new post to upload the zip file.

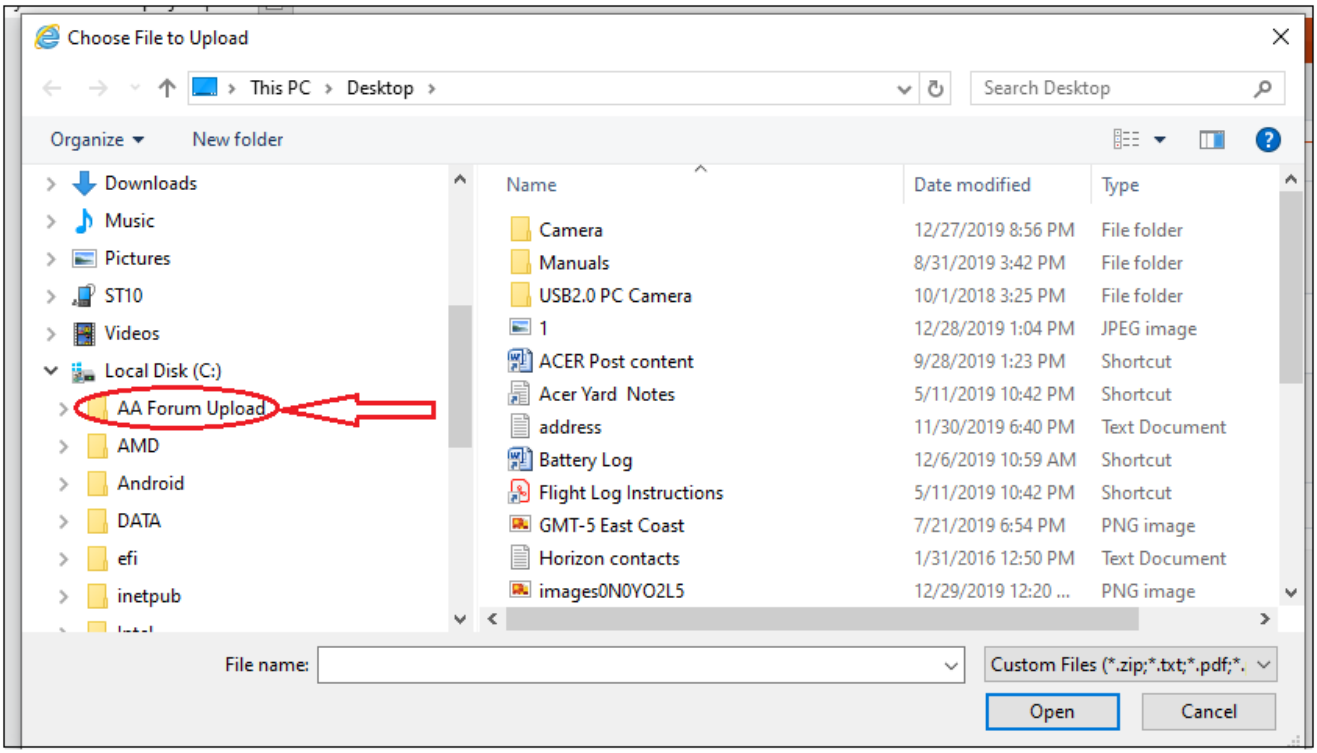


Attachment 48
Q500 and Chroma Flight Log Retrieval

18). Left Click on “ATTACH FILES”:

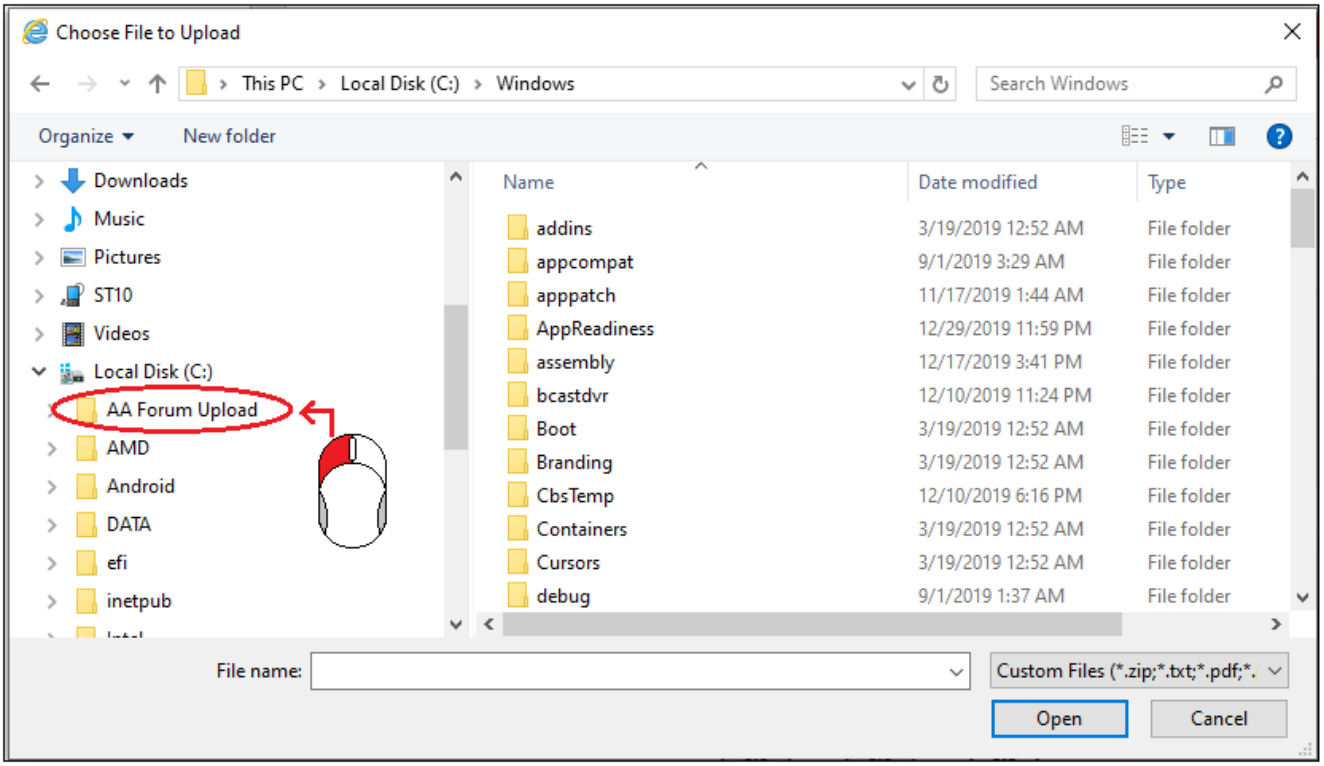


19). Navigate to your newly created folder:

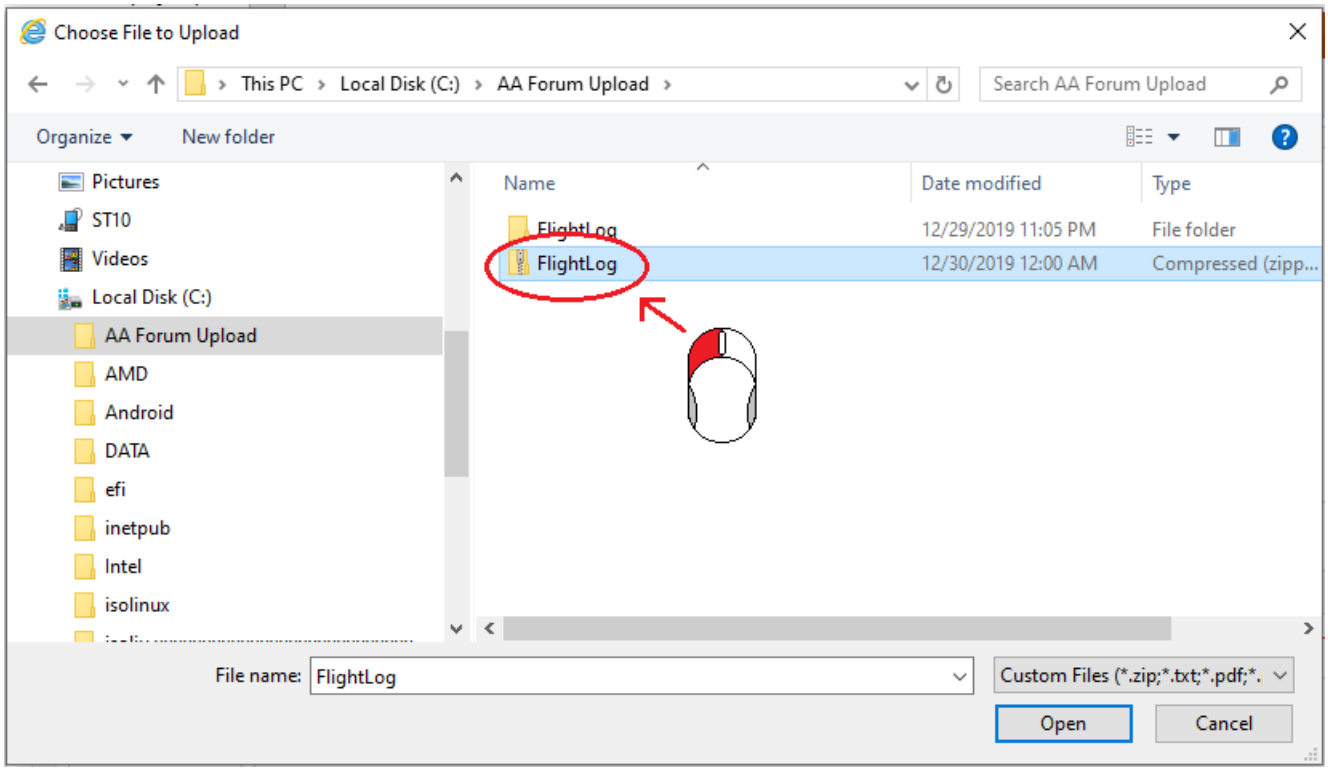


Attachment 48
Q500 and Chroma Flight Log Retrieval

20). Left Click on your newly created folder:

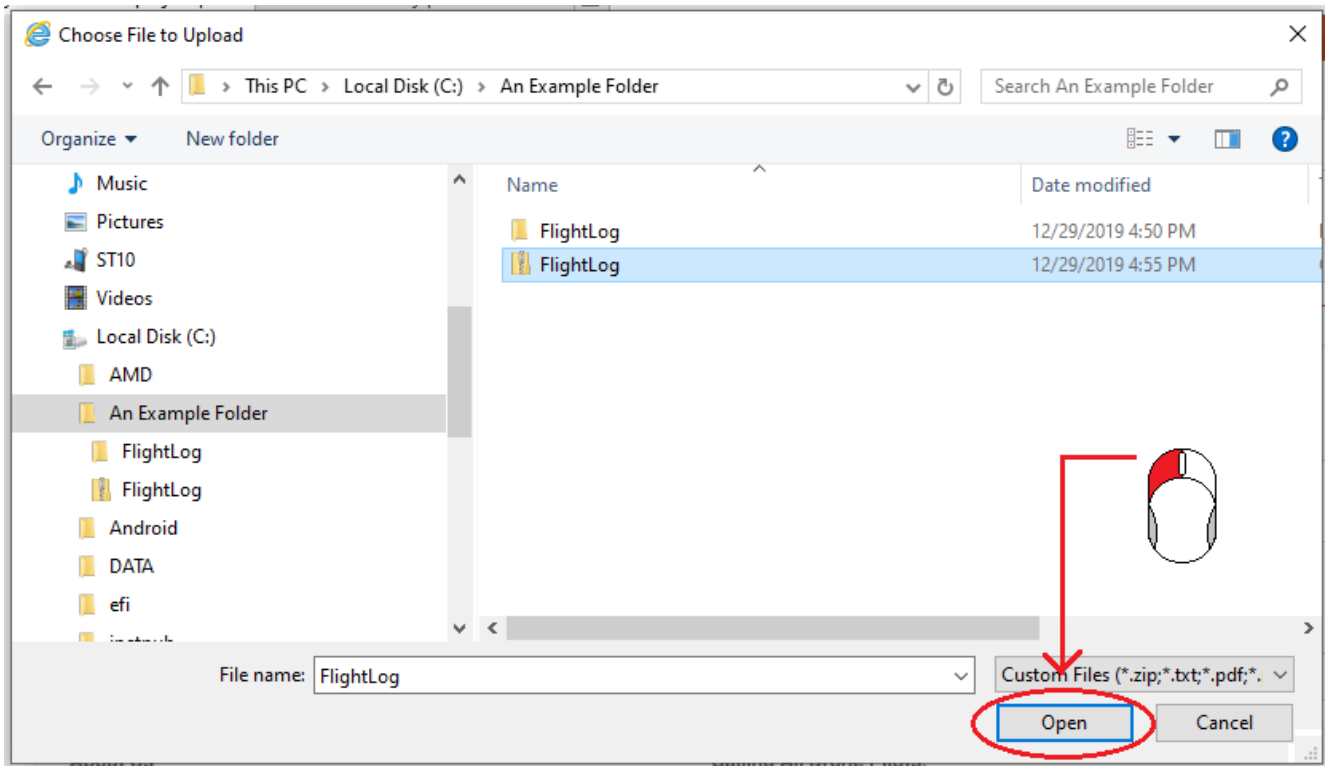


21). Left Click on the Zip file:

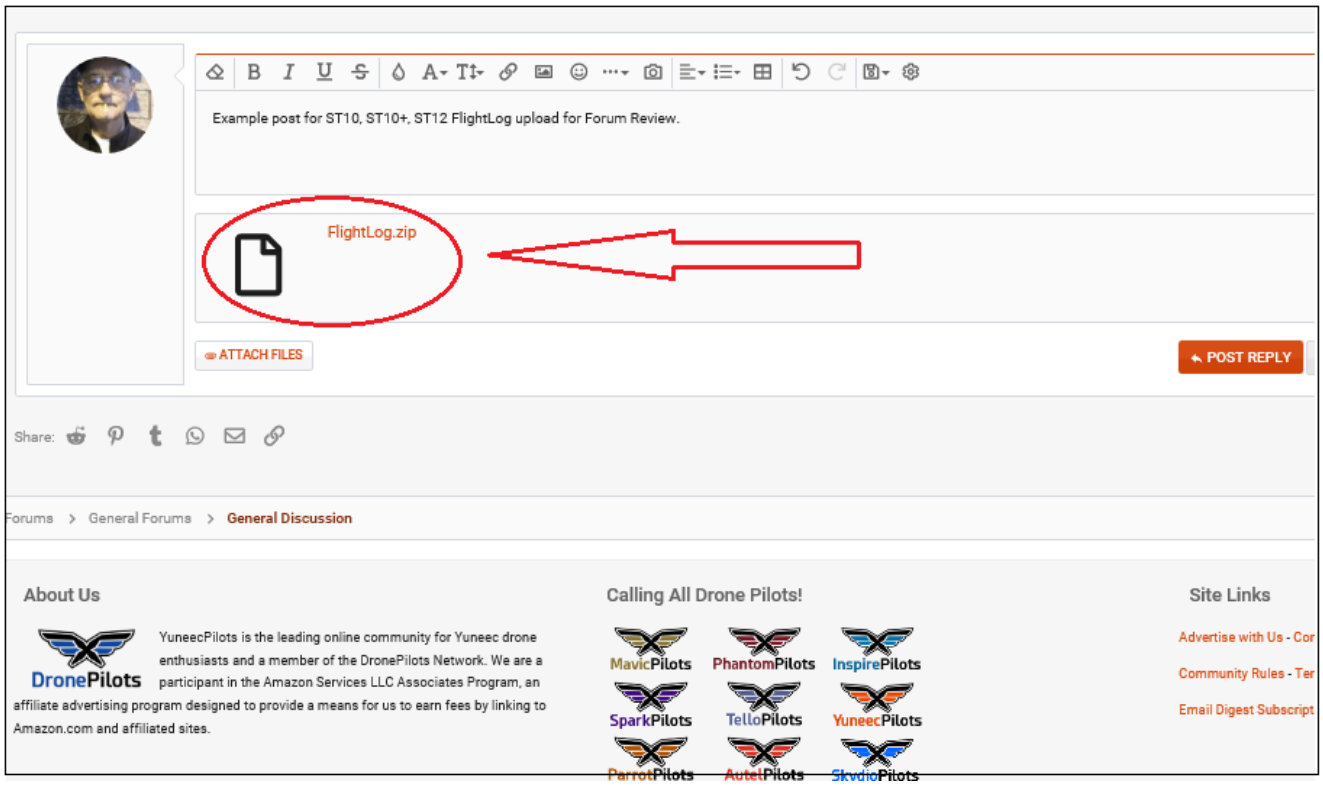


Attachment 48
Q500 and Chroma Flight Log Retrieval

22). Left Click on “Open”:

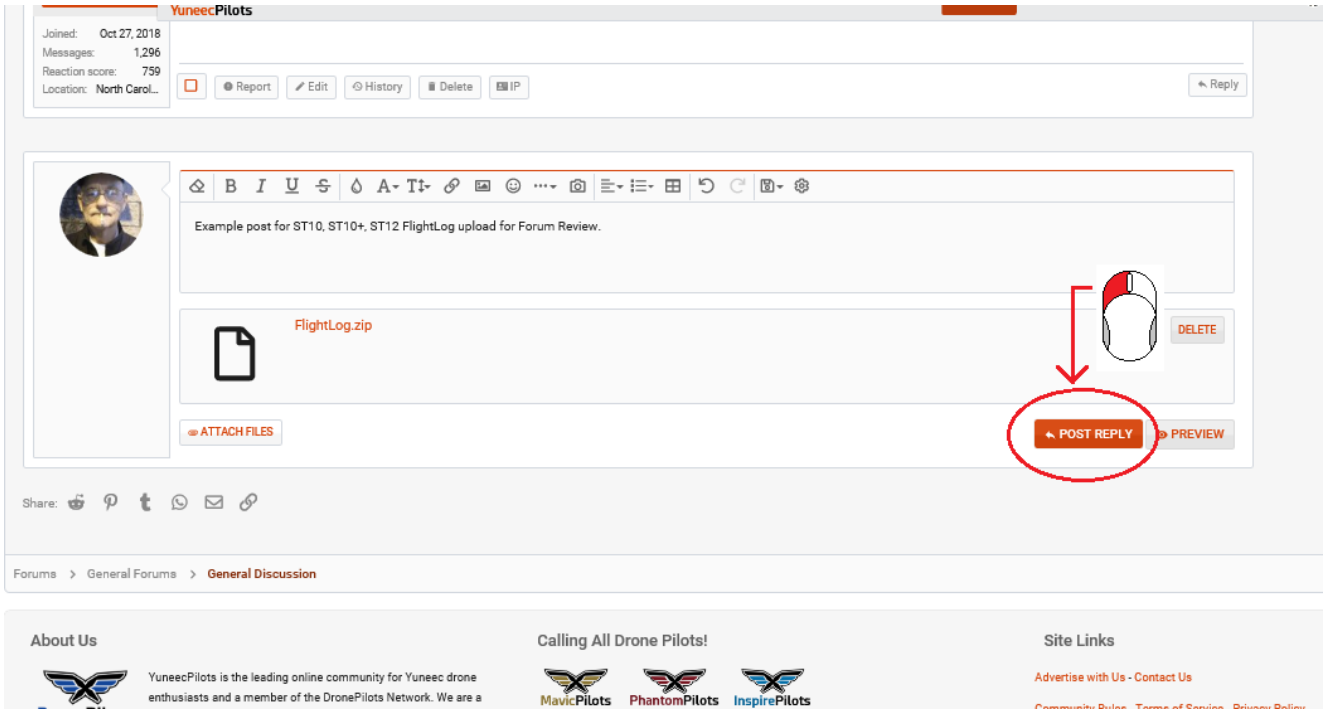


23). Verify the file registers on Forum upload screen:

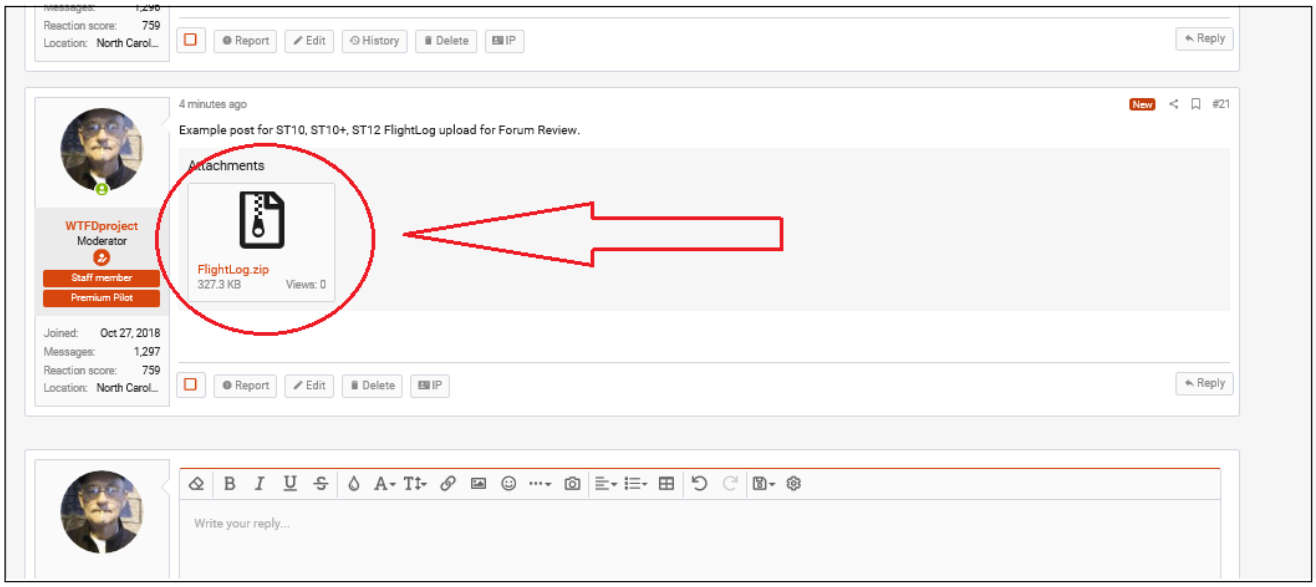


Attachment 48
Q500 and Chroma Flight Log Retrieval

24). Left Click “POST REPLY”:



25). Verify the file uploaded:



Attachment 49
Typhoon H Flight Log Retrieval

Introduction: The data contained in the Flightlog directory provides the most detailed and accurate means available to research many events that may otherwise be incorrectly diagnosed. There are many ways the flightlogs can be provided to the forum. There are many file locations and transfer techniques that can be used. There are many ways to divide and limit data. This guideline provides one relatively simple method that will upload all available data, and can be used effectively by a wide range of members. The focus of this guidance is the upload of flight data for Forum review. Data management and archiving require additional activities that are not part of this guidance.

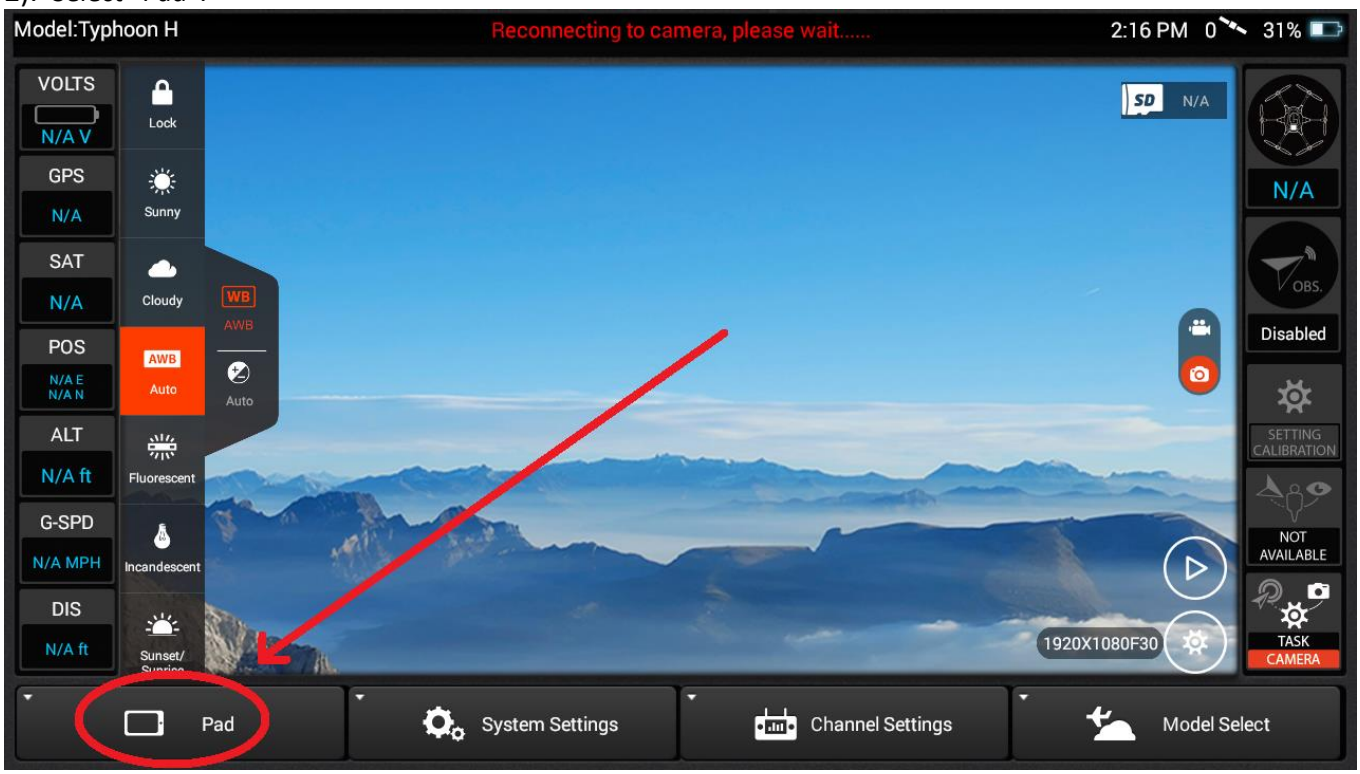
NOTE: Use of this guidance uploads ALL available flight files, which may have privacy implications. These files include the location of each flight. They are likely to identify items such as where you live, where you bought the drone and if you use your drone for commercial operations, the locations of your customers. If privacy is an issue, please use other means to limit data and upload to the Forum.

Use of this information is at your own risk.

NOTE: The Typhoon H does not need to be powered on for this process.

1). Power on the ST16 and let it come to the main screen.

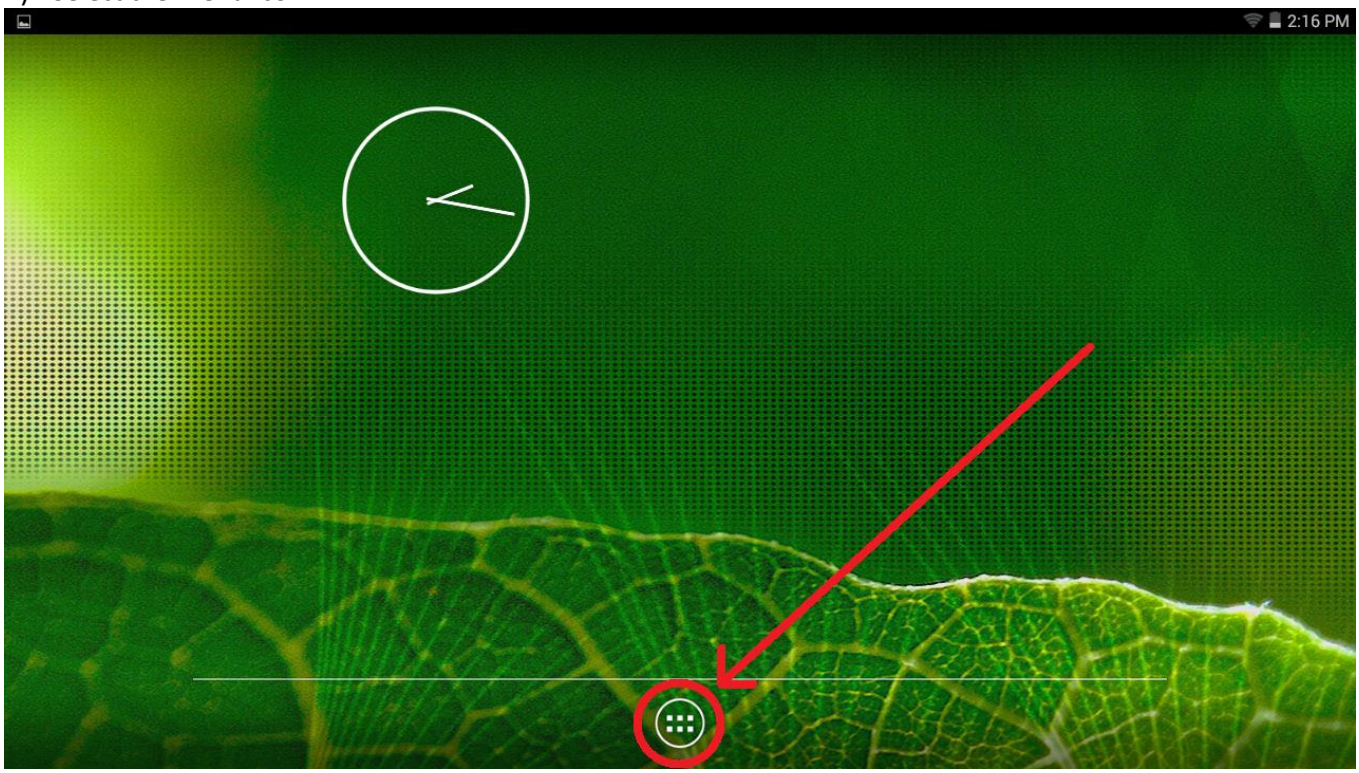
2). Select "Pad":



Attachment 49
Typhoon H Flight Log Retrieval

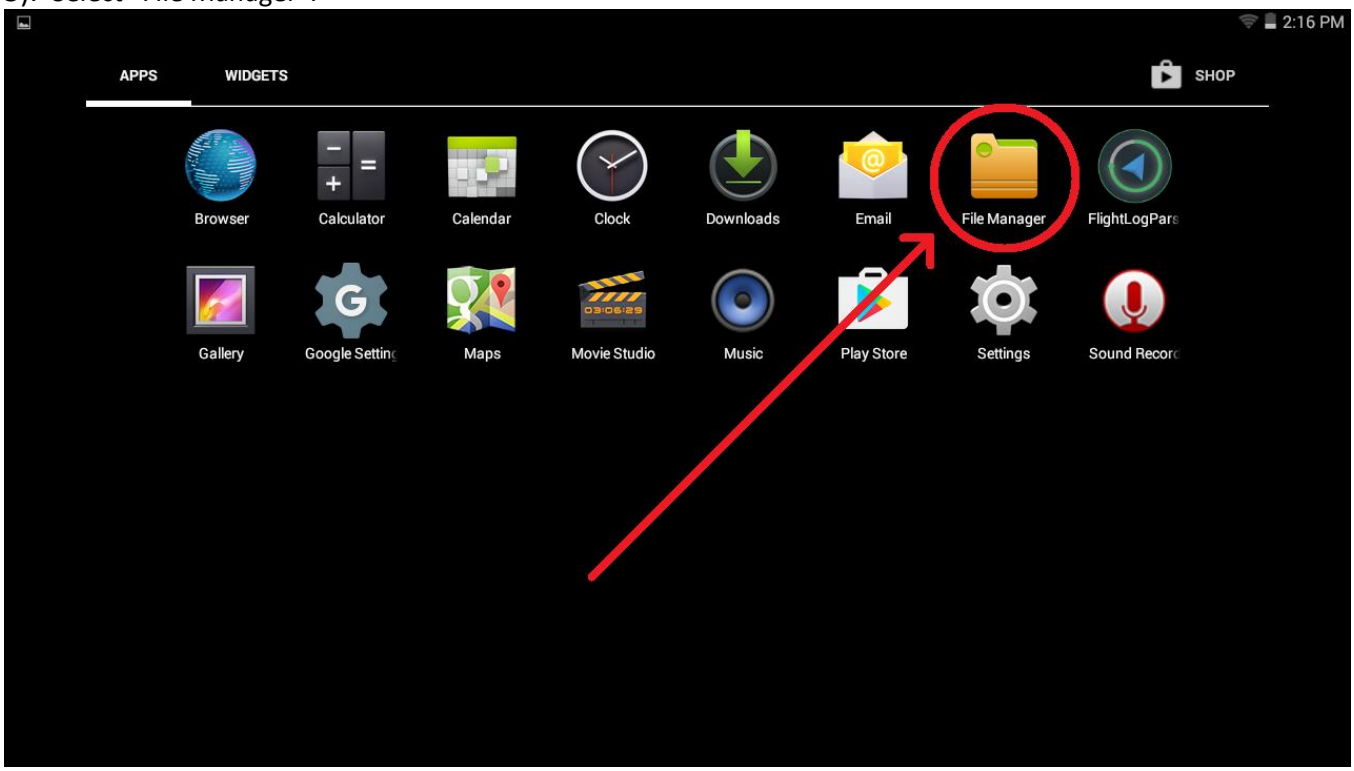
3). Select “OK”:

4). Select the Menu Icon:

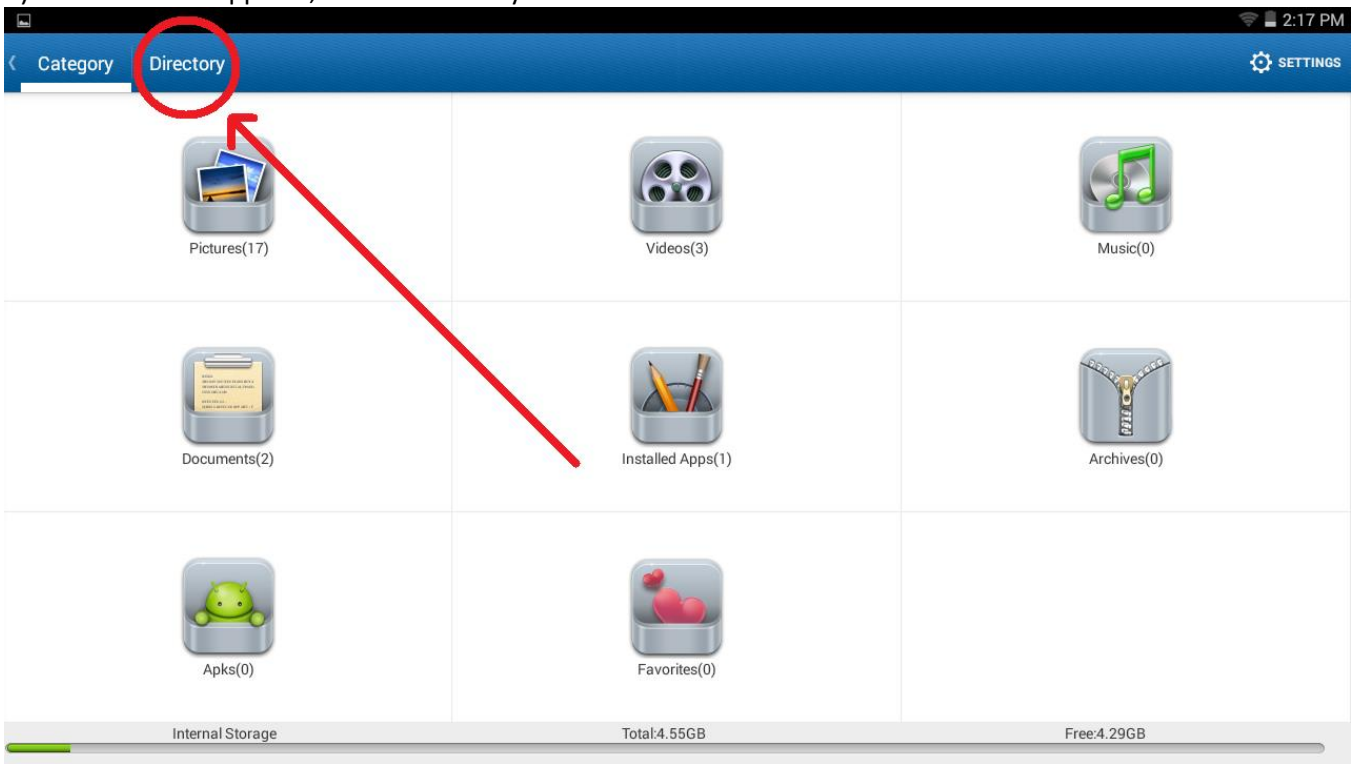


Attachment 49
Typhoon H Flight Log Retrieval

5). Select “File Manager”:



6). IF this screen appears, select “Directory”:



Attachment 49
Typhoon H Flight Log Retrieval

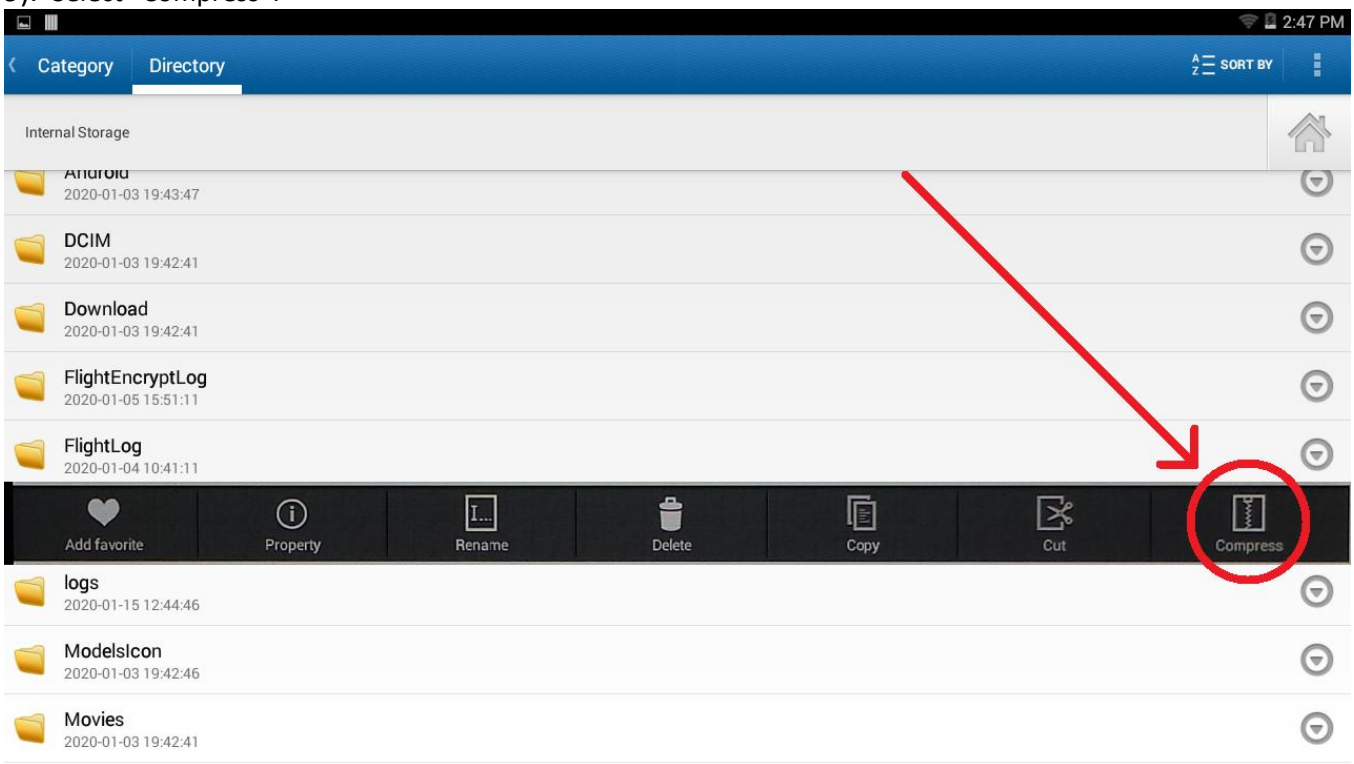
NOTE: Do **NOT** actually select "FlightLog" in the following step.

7). Scroll down as required to locate the "FlightLog" directory:

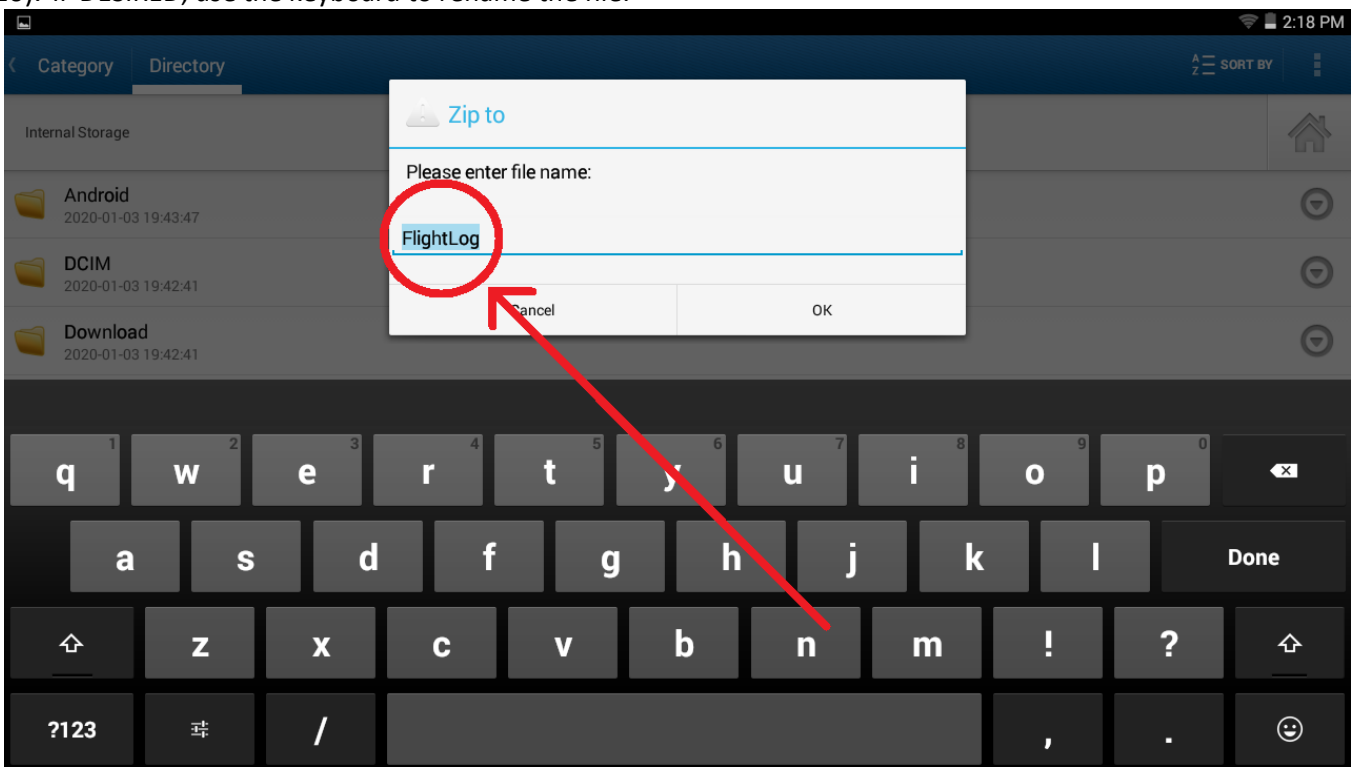
8). Select the pull down icon associated with the "FlightLog" directory:

Attachment 49
Typhoon H Flight Log Retrieval

9). Select “Compress”:

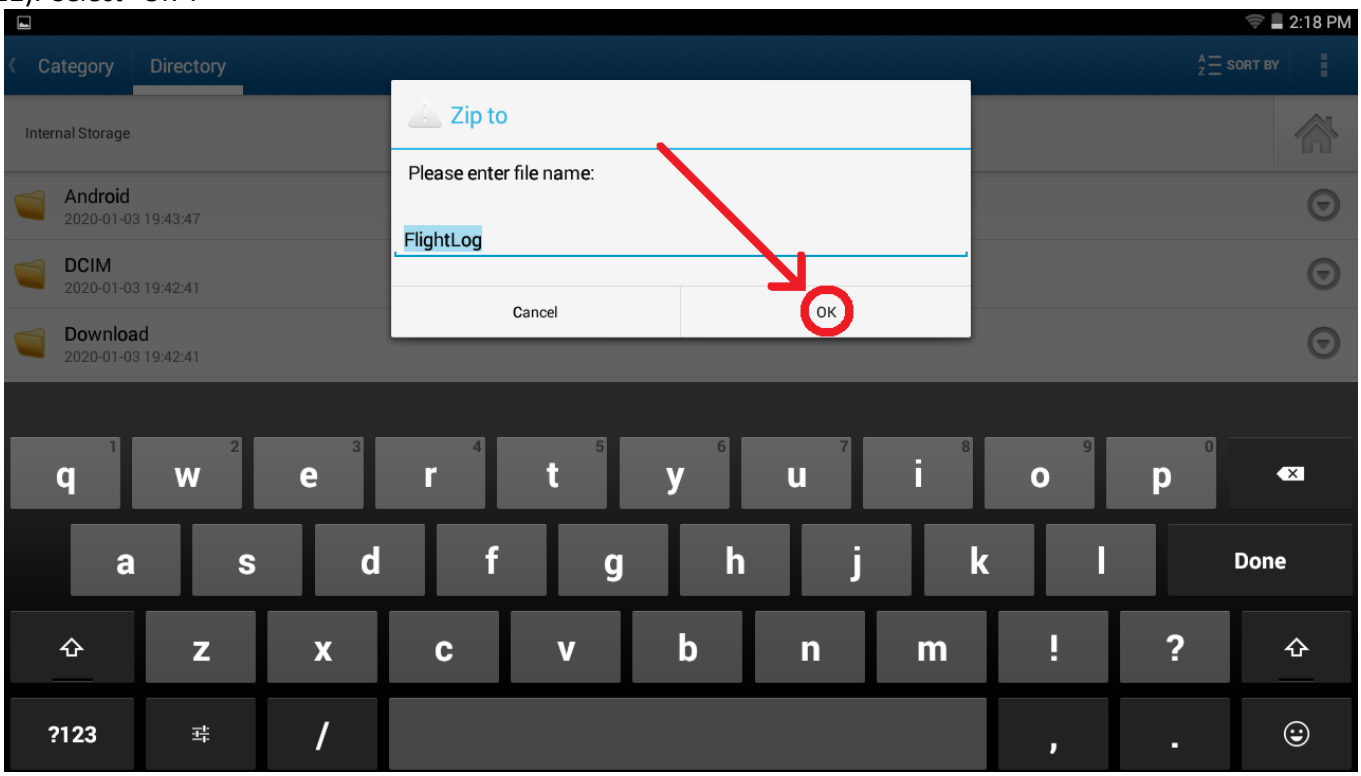


10). IF DESIRED, use the keyboard to rename the file:

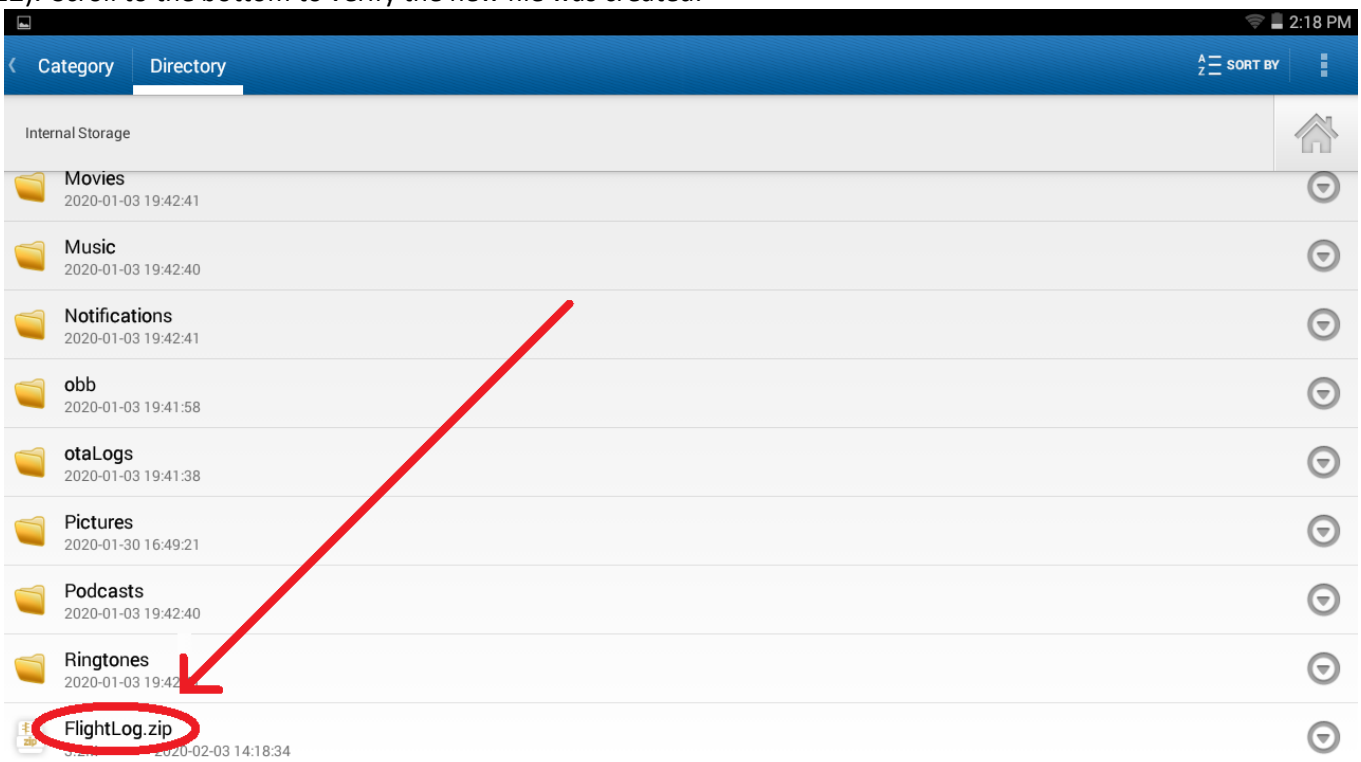


Attachment 49
Typhoon H Flight Log Retrieval

11). Select “OK”:



12). Scroll to the bottom to verify the new file was created:

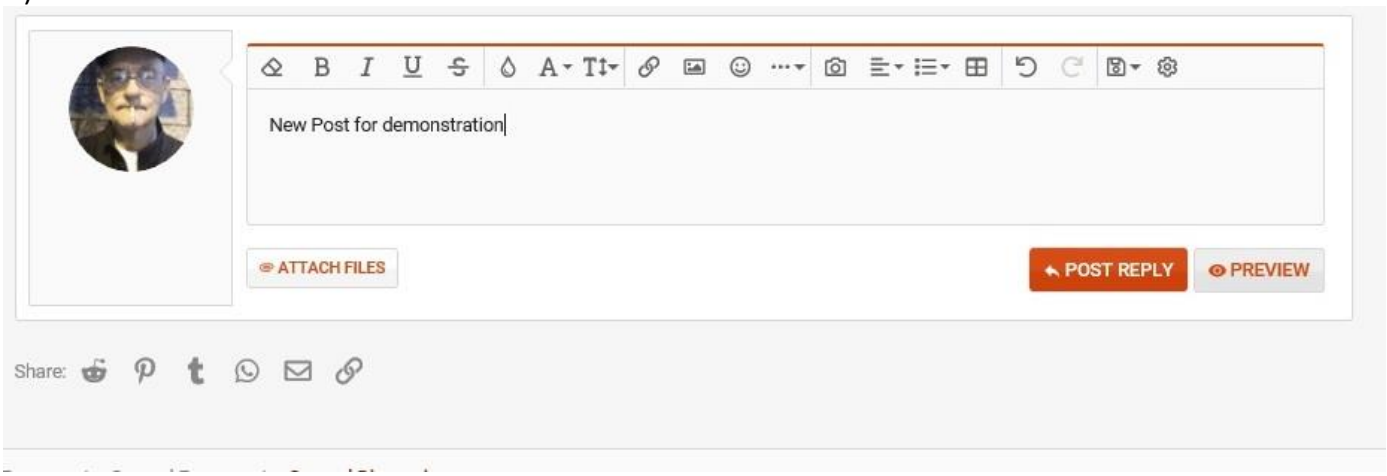


Attachment 49
Typhoon H Flight Log Retrieval

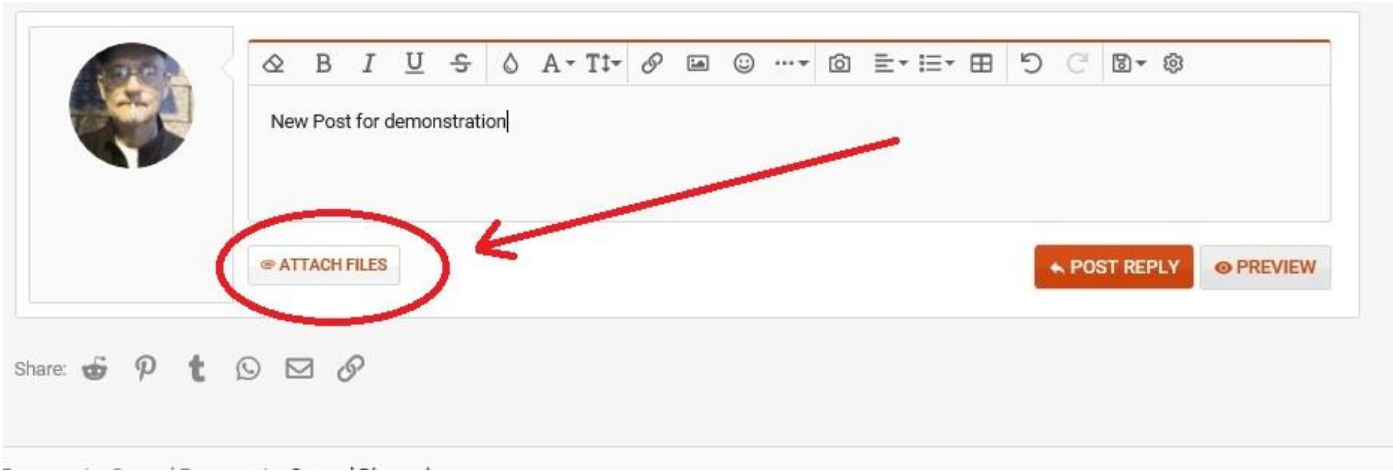
NOTE: Most common USB charging cables will not work. The USB cable must be data capable, such as the USB cable originally shipped with the Typhoon H.

13). Connect ST16 to a computer via data capable USB cable.

14). Return to the Forum and create a new Post:



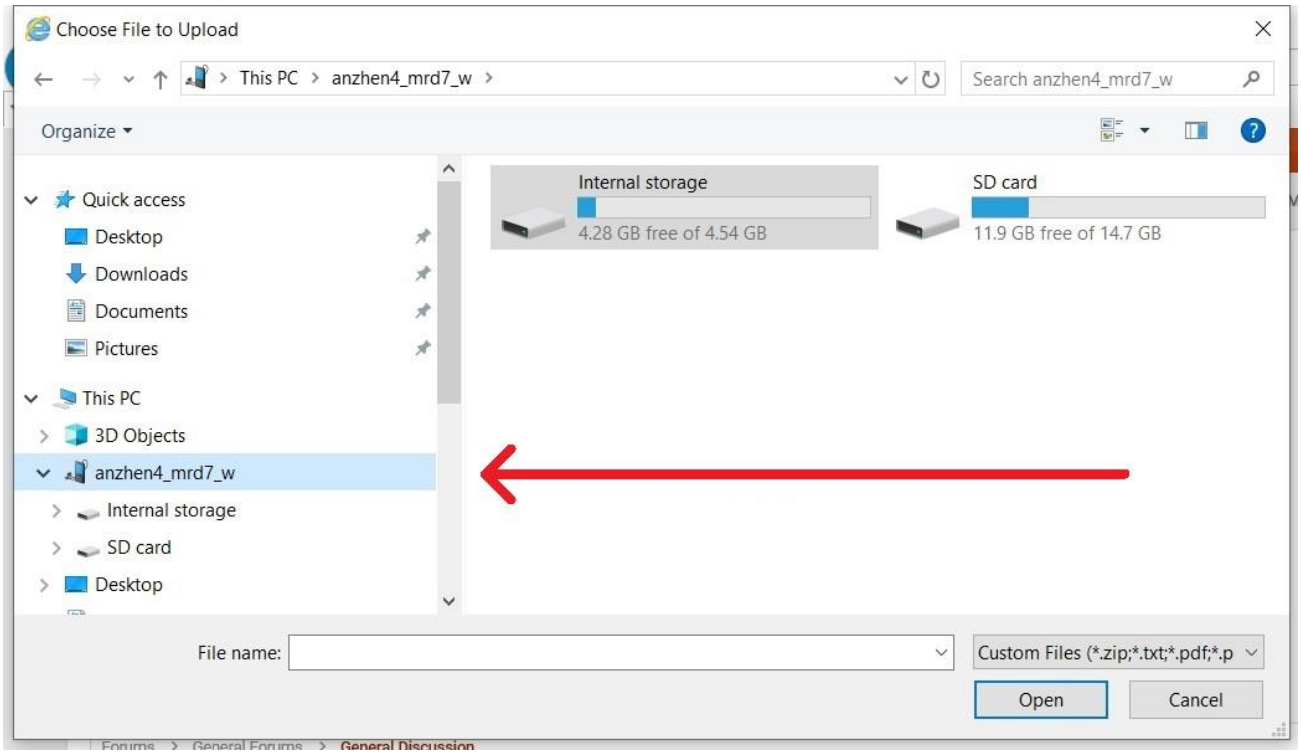
15). Select “ATTACH FILES”:



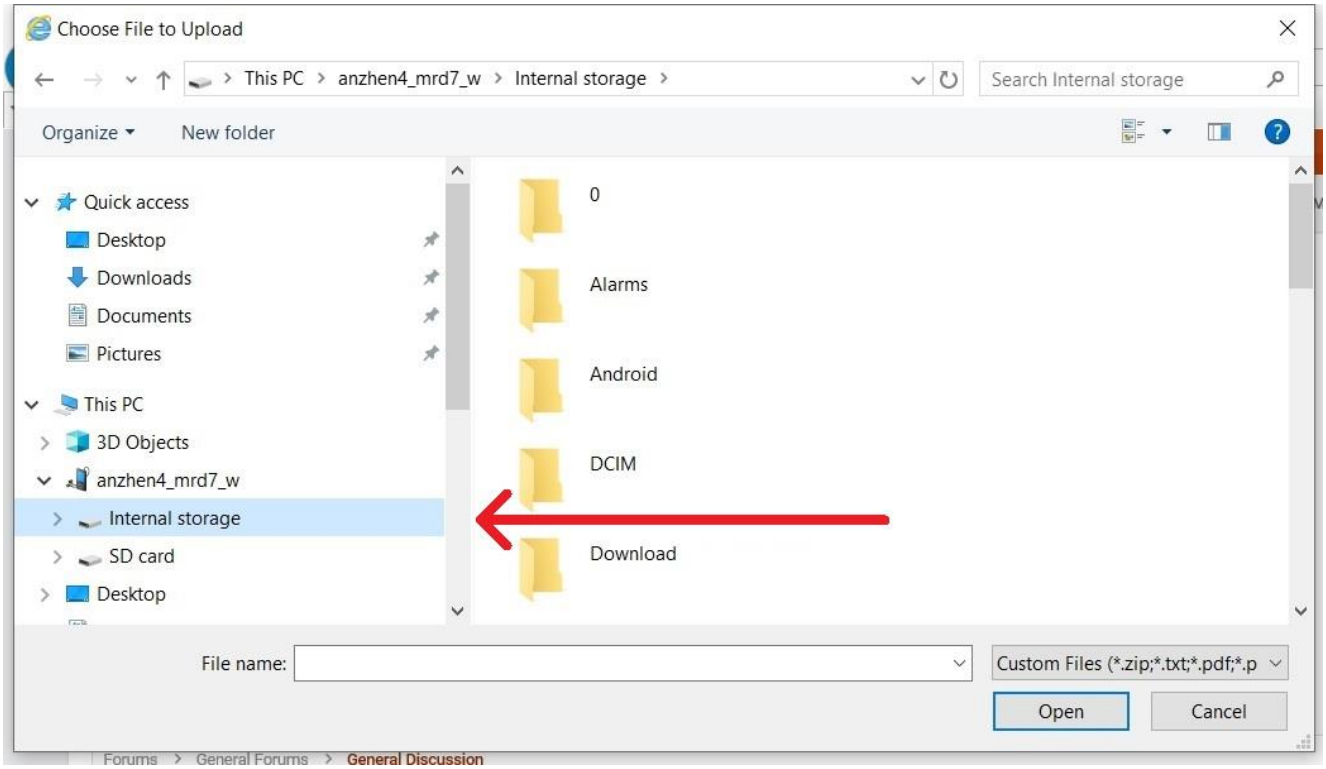
Attachment 49
Typhoon H Flight Log Retrieval

NOTE: The ST16 registers on the computer as "**anzhen4_mrd7_w**" unless it has been renamed.

16). Navigate the computer file system to the ST16 (anzhen4_mrd7_w) and open it:

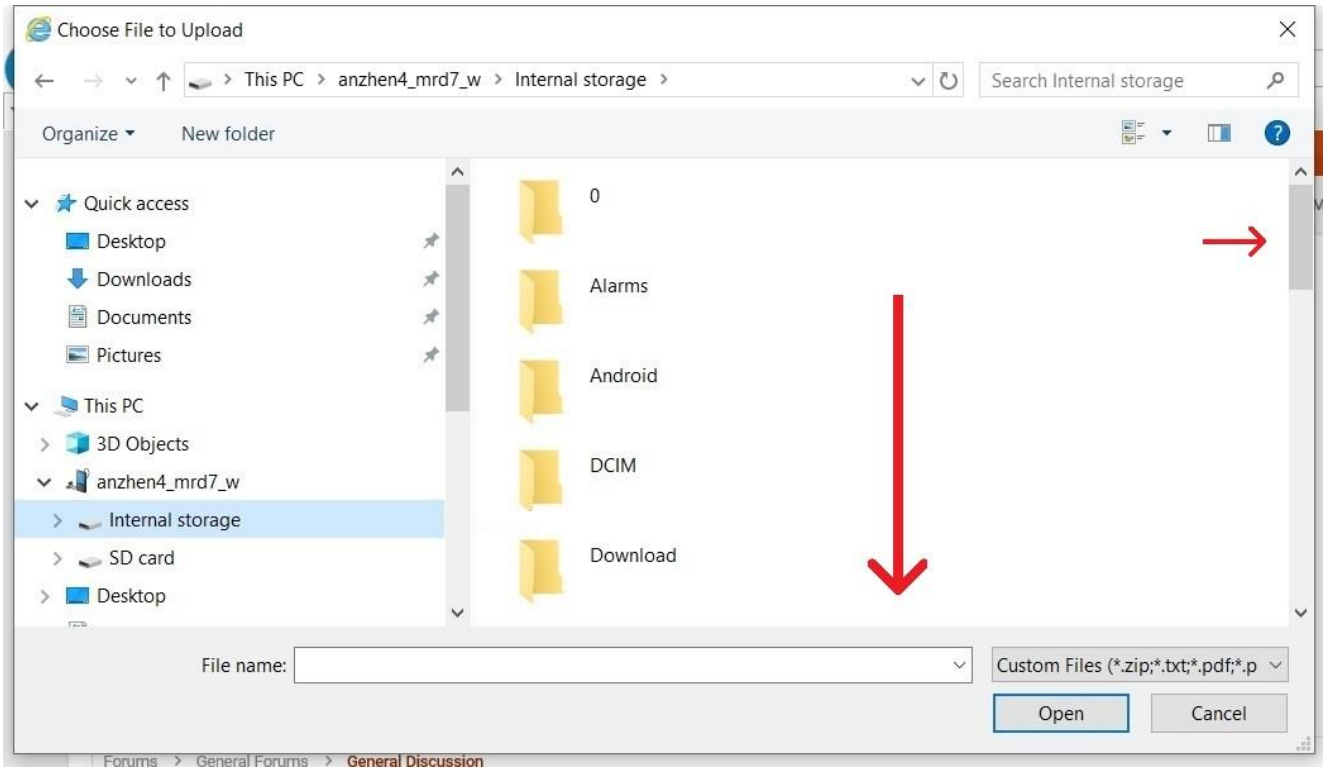


17). Select "Internal Storage":

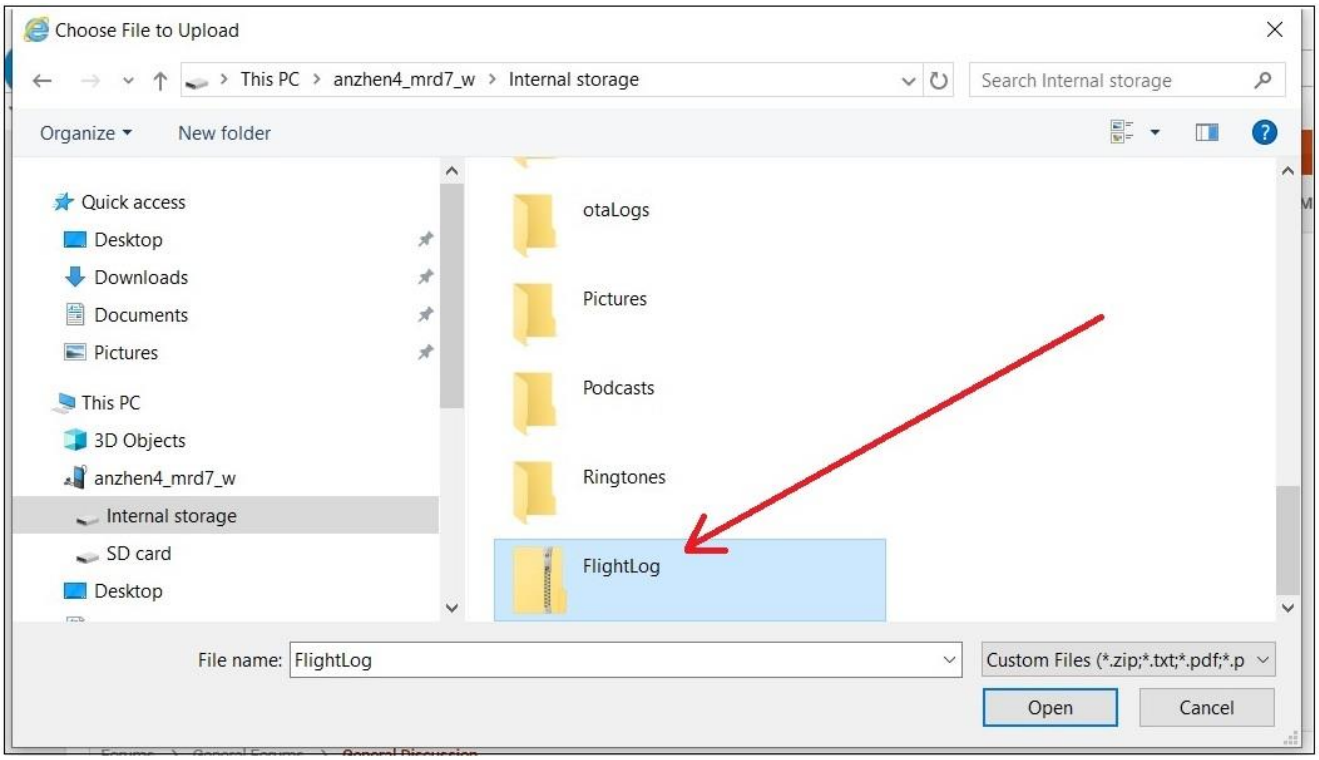


Attachment 49
Typhoon H Flight Log Retrieval

18). Scroll to the bottom of "Internal Storage":

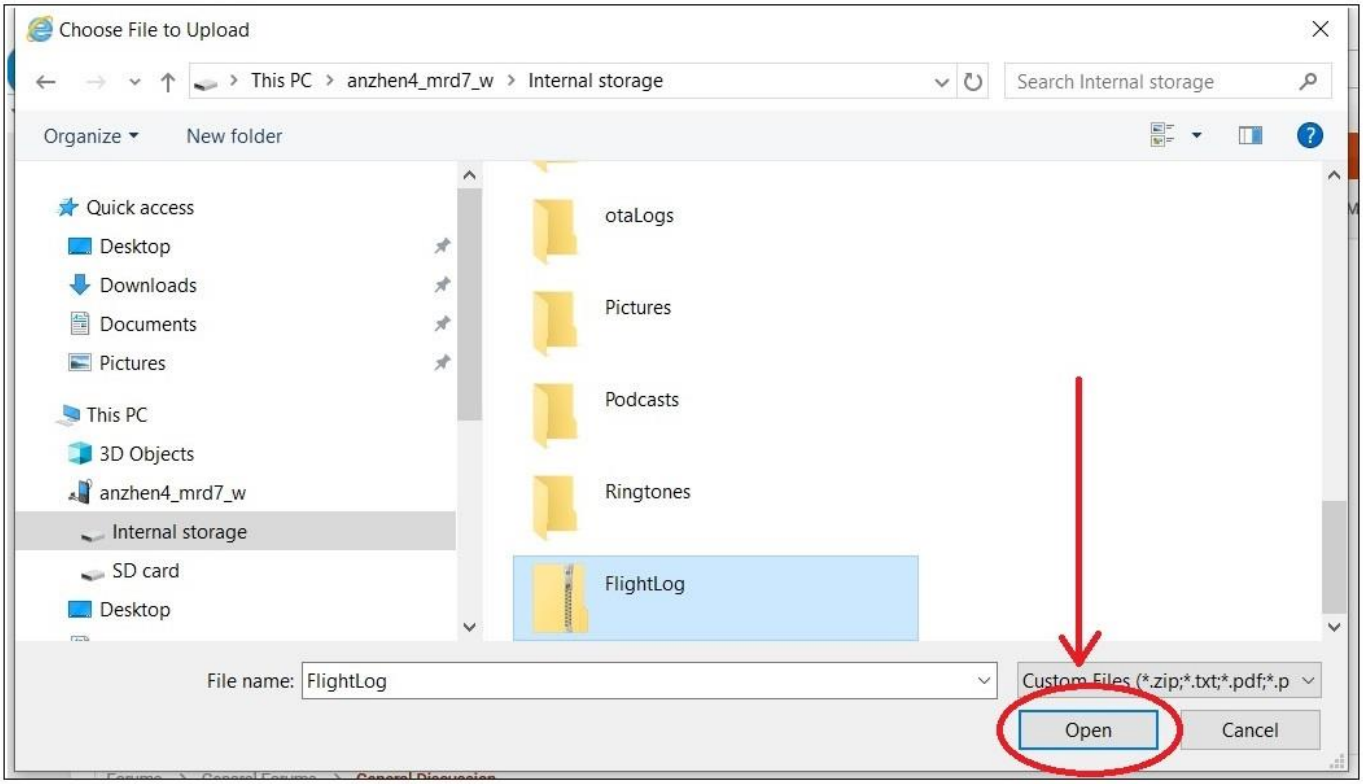


19). Select "FlightLog.zip" (or as you renamed it) to highlight the filename:

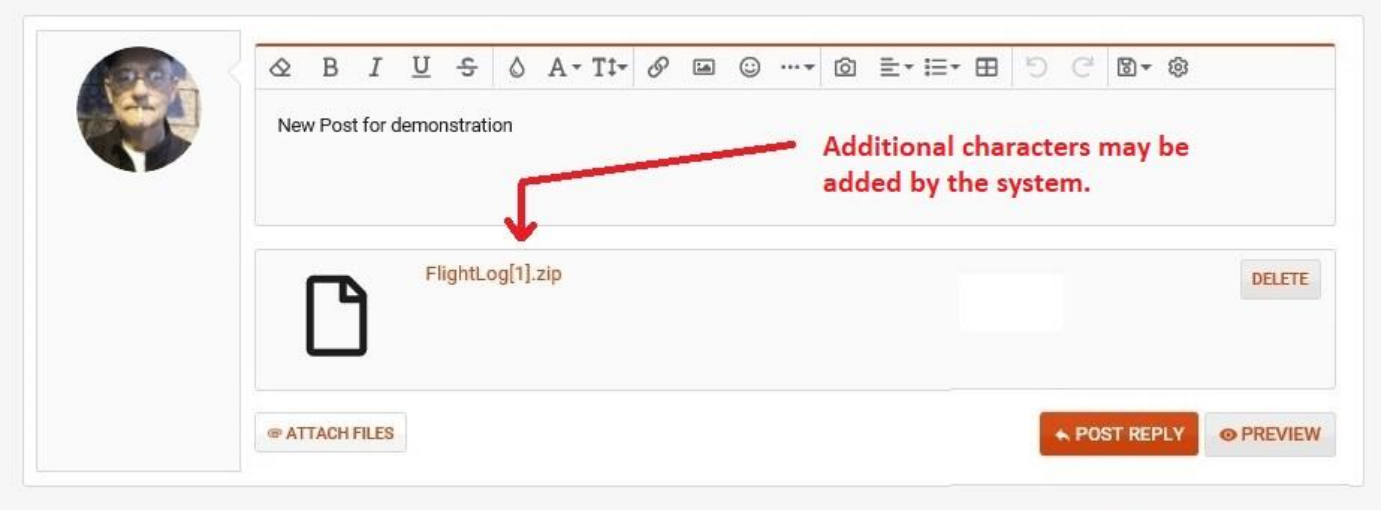


Attachment 49
Typhoon H Flight Log Retrieval

20). Select “Open”:

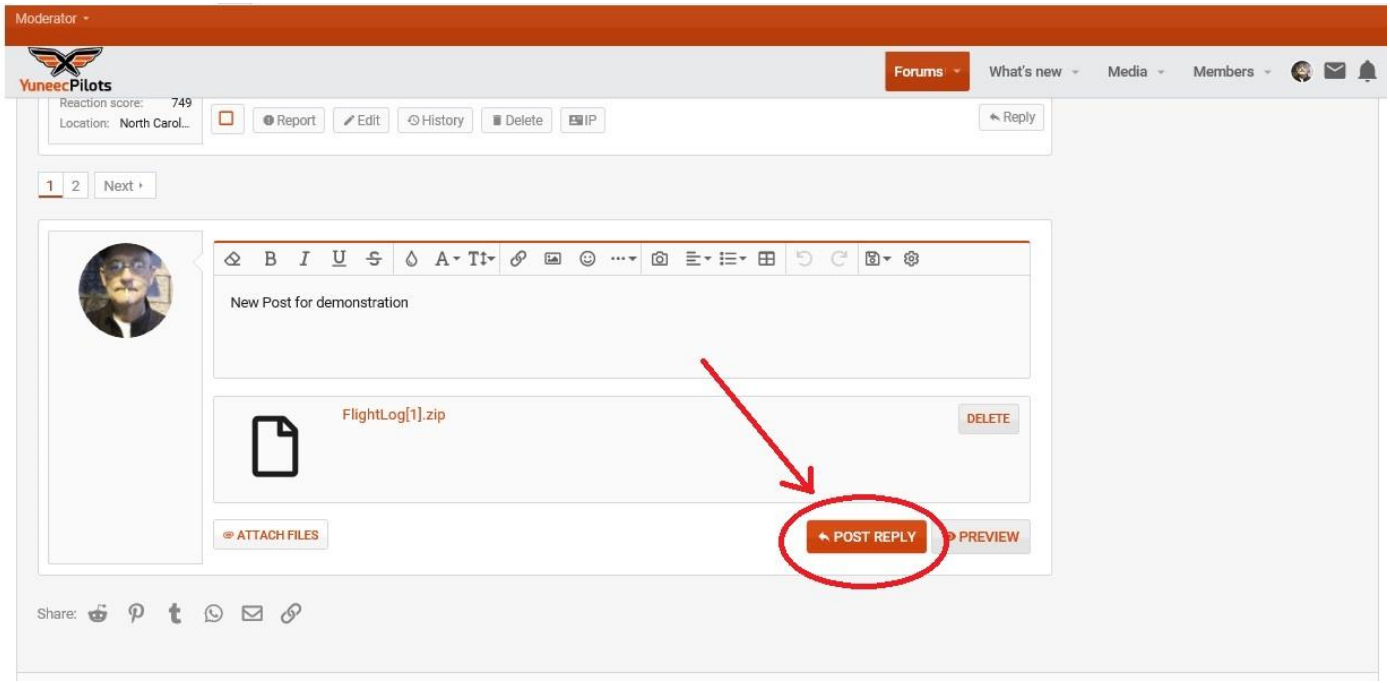


21). Verify file registers on Forum upload screen:

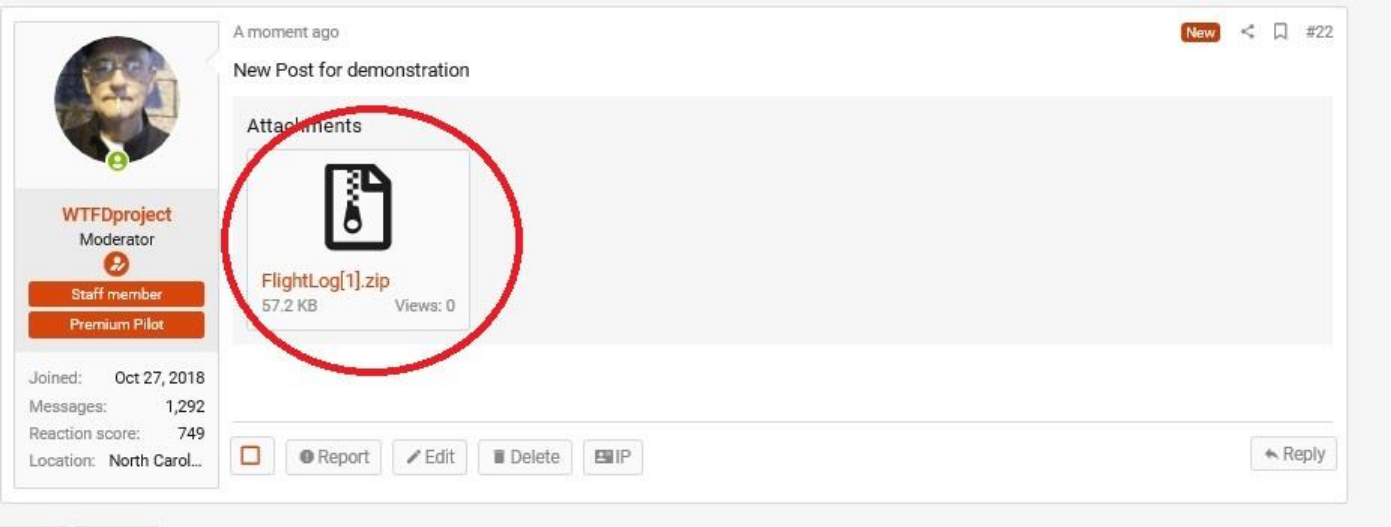


Attachment 49
Typhoon H Flight Log Retrieval

22). Select “POST REPLY”:



23). Verify file uploaded:



Attachment 50
Typhoon H Plus Flight Log Retrieval

Introduction: The data contained in the Flight2log directory provides the most detailed and accurate means available to research many events that may otherwise be incorrectly diagnosed. There are many ways the flightlogs can be provided to the forum. There are many file locations and transfer techniques that can be used. There are many ways to divide and limit data. This guideline provides one relatively simple method that will upload all available data, and can be used effectively by a wide range of members. The focus of this guidance is the upload of flight data for Forum review. Data management and archiving require additional activities that are not part of this guidance.

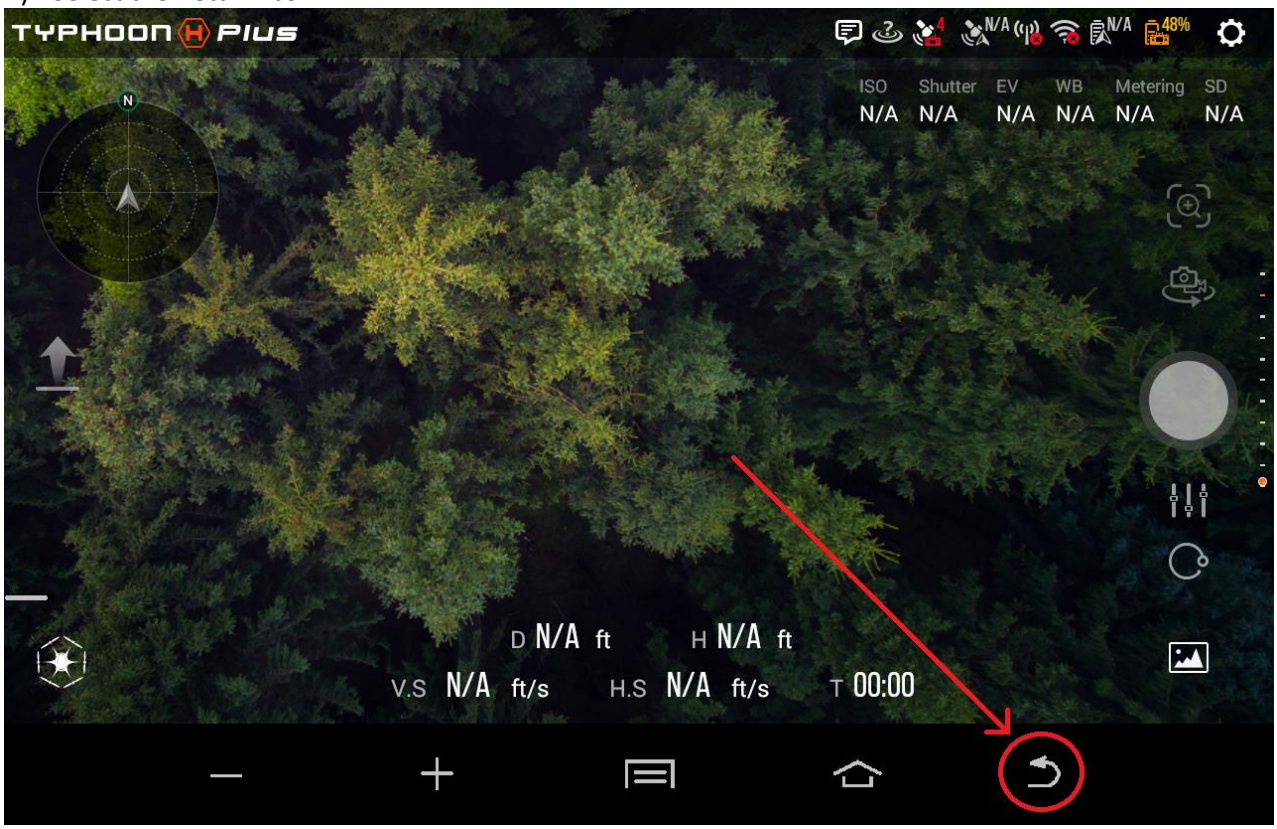
NOTE: Use of this guidance uploads ALL available flight files, which may have privacy implications. These files include the location of each flight. They are likely to identify items such as where you live, where you bought the drone and if you use your drone for commercial operations, the locations of your customers. If privacy is an issue, please use other means to limit data and upload to the Forum.

Use of this information is at your own risk.

NOTE: The Typhoon H Plus does not need to be powered on for this process.

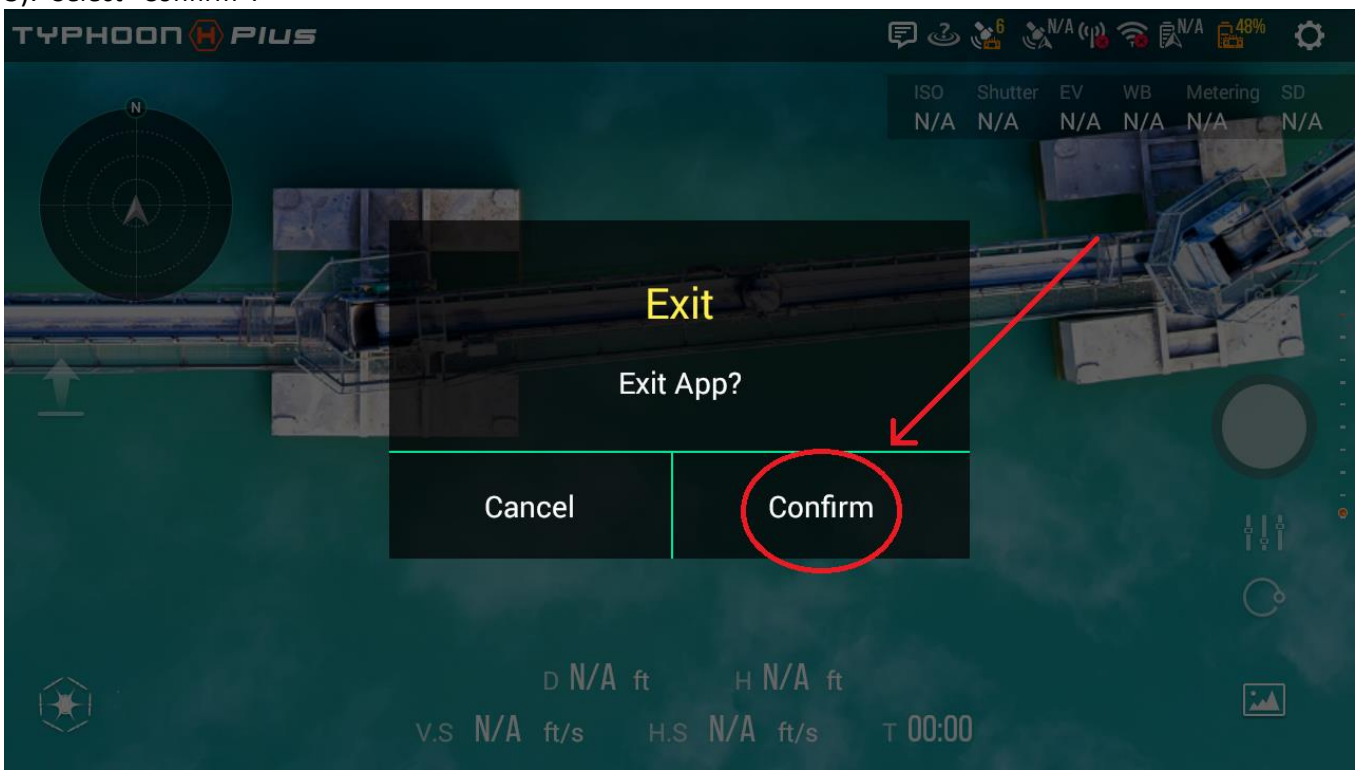
1). Power on the ST16S and let it come to the main screen.

2). Select the Return Icon:

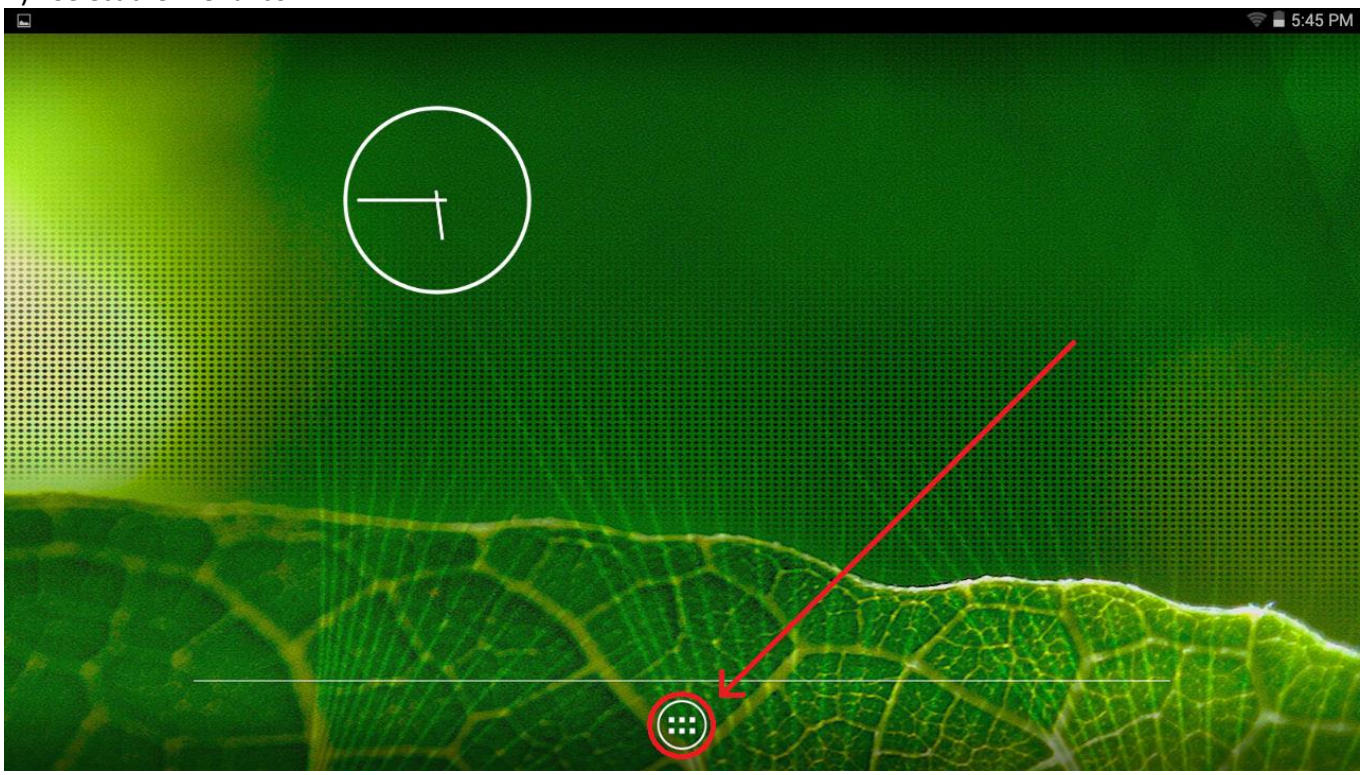


Attachment 50
Typhoon H Plus Flight Log Retrieval

3). Select “Confirm”:

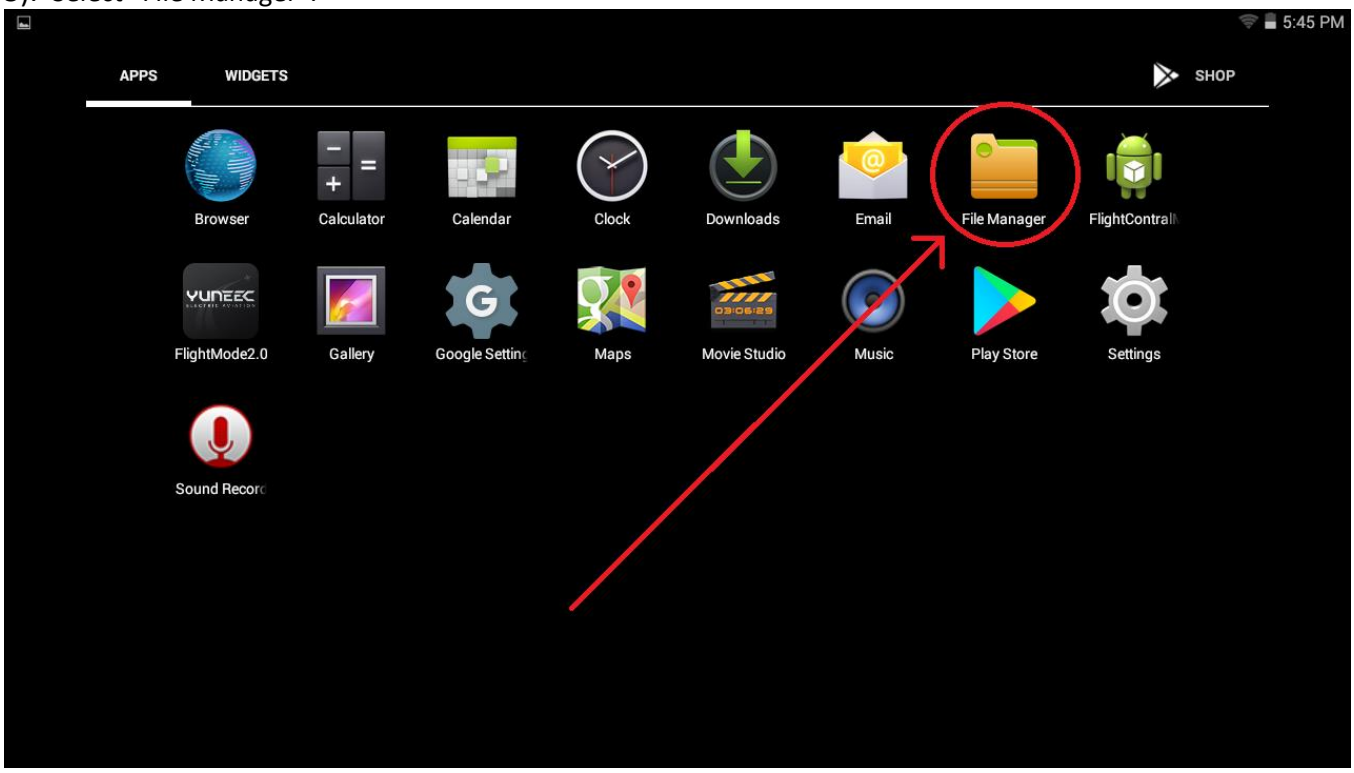


4). Select the Menu Icon:

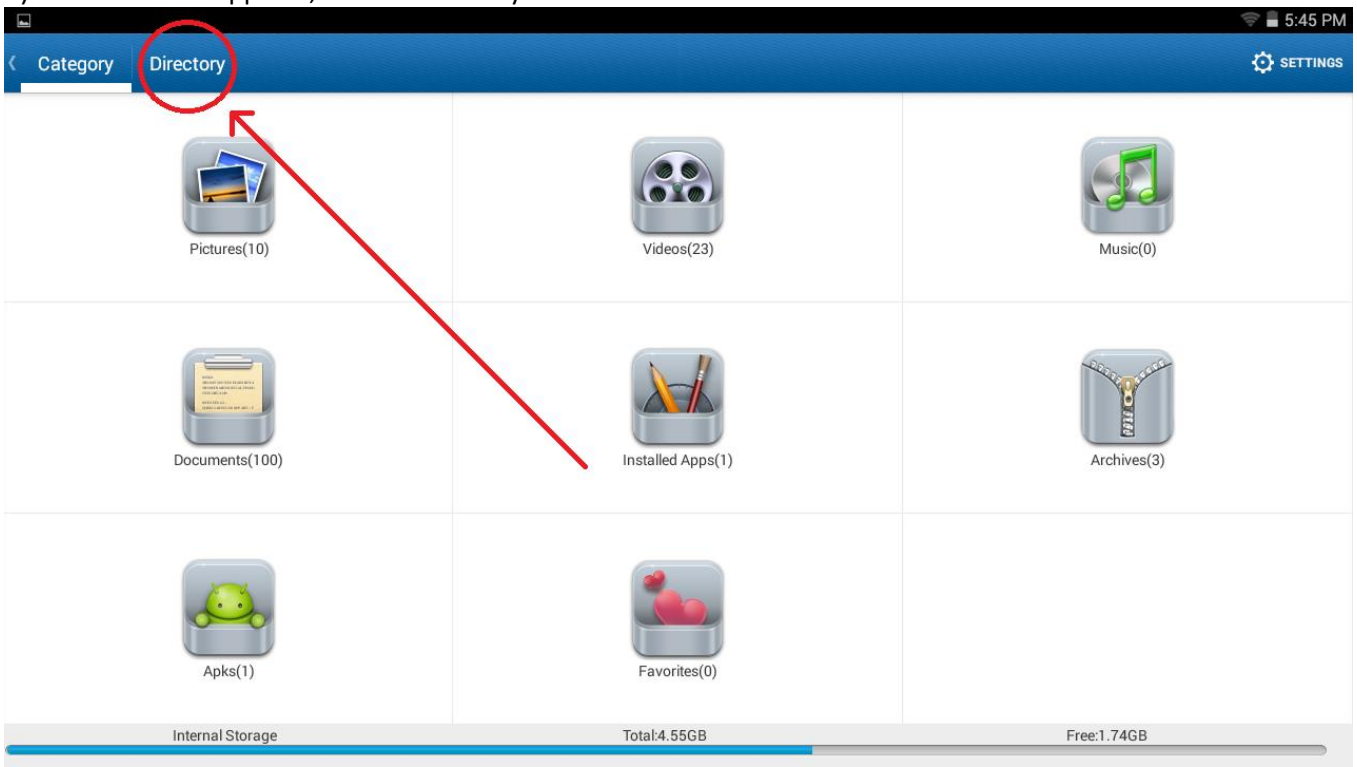


Attachment 50
Typhoon H Plus Flight Log Retrieval

5). Select “File Manager”:



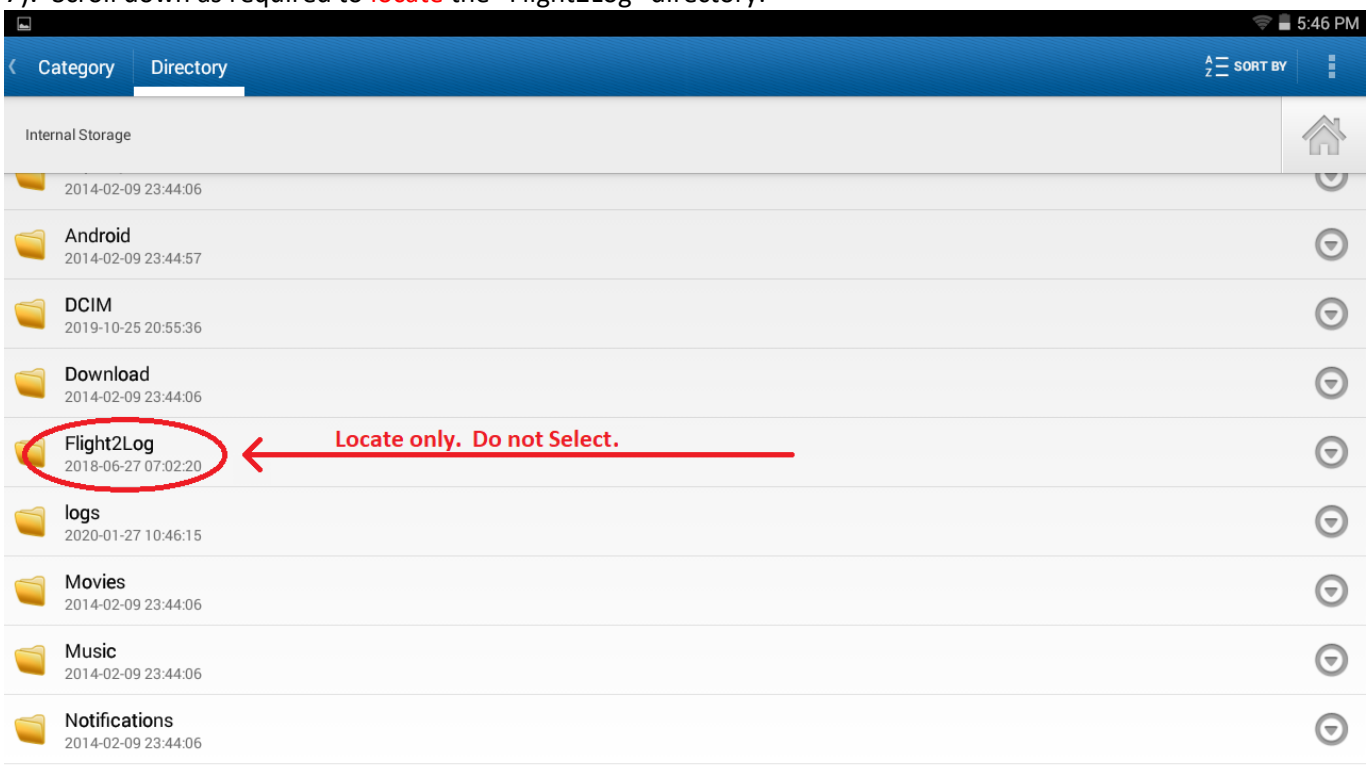
6). IF this screen appears, select “Directory”:



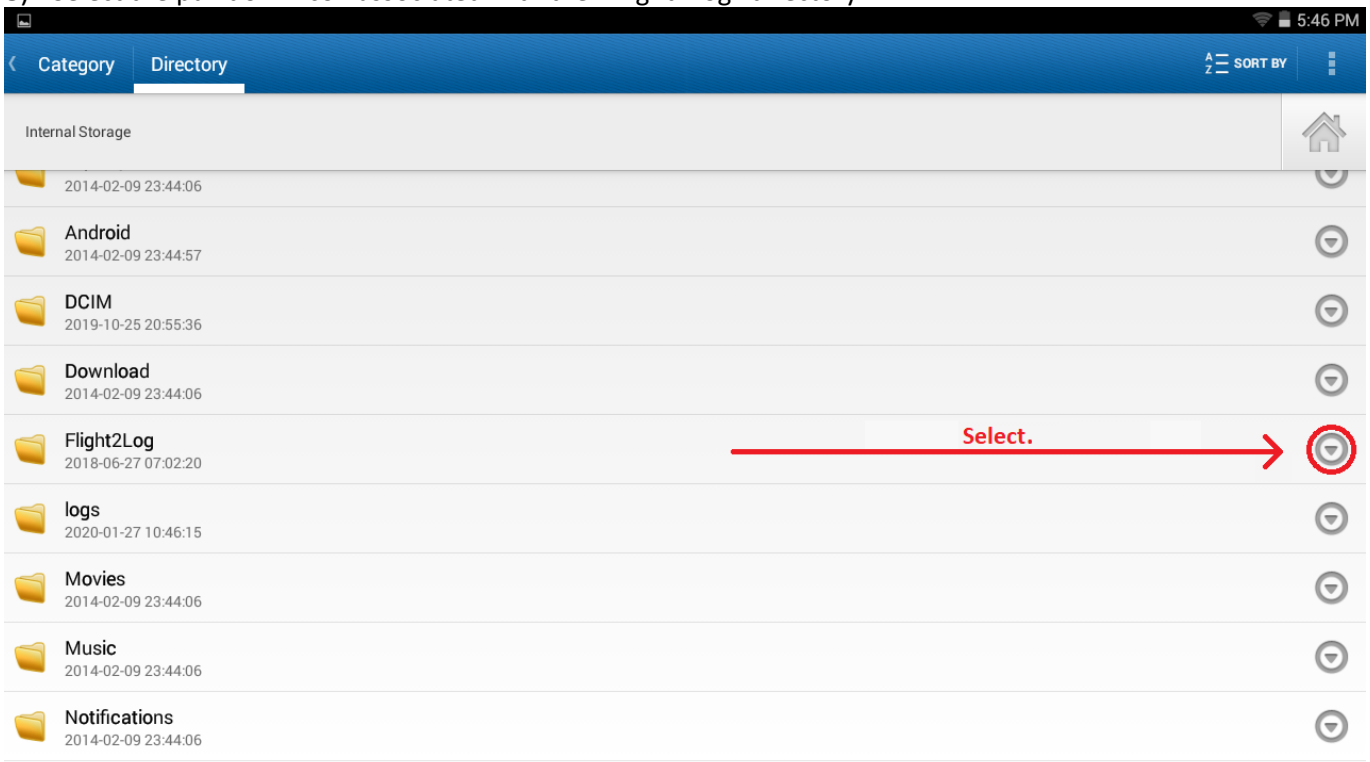
Attachment 50
Typhoon H Plus Flight Log Retrieval

NOTE: Do **NOT** actually select "Flight2Log" in the following step.

7). Scroll down as required to locate the "Flight2Log" directory:

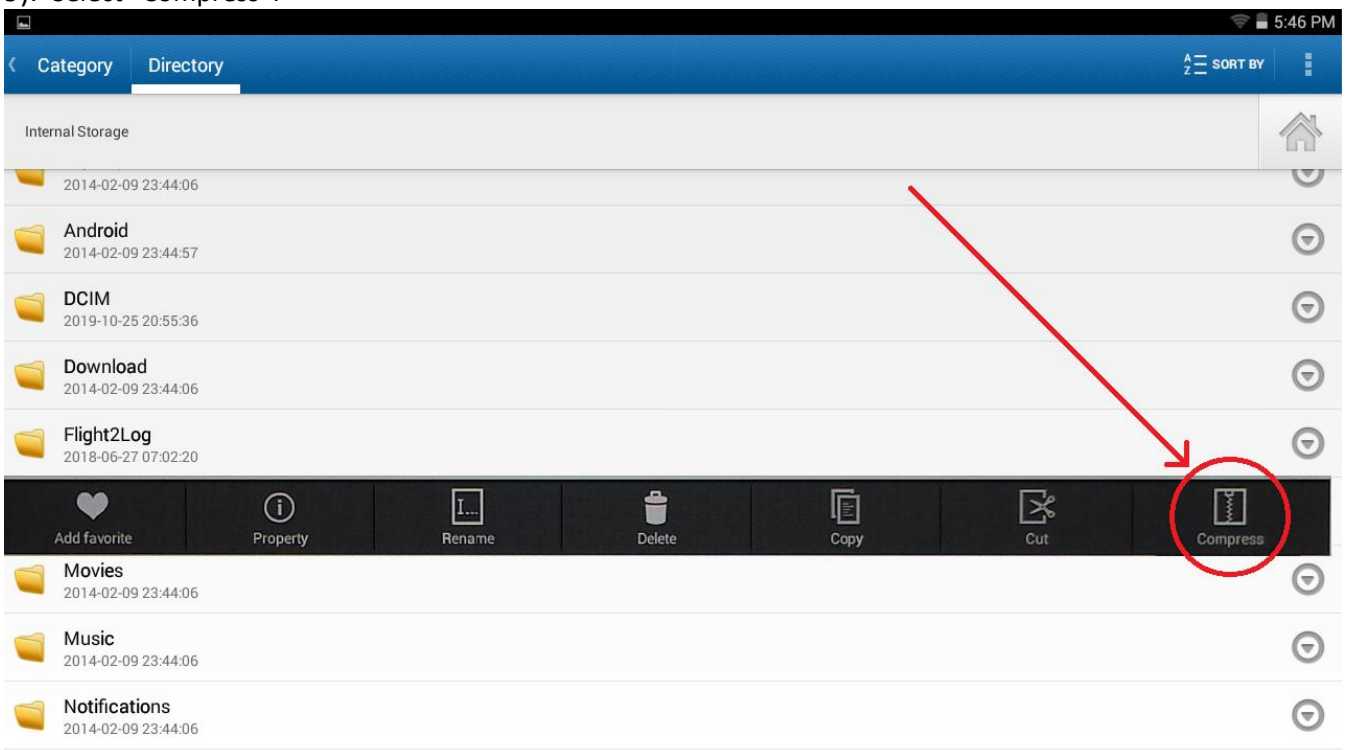


8). Select the pull down icon associated with the "Flight2Log" directory:

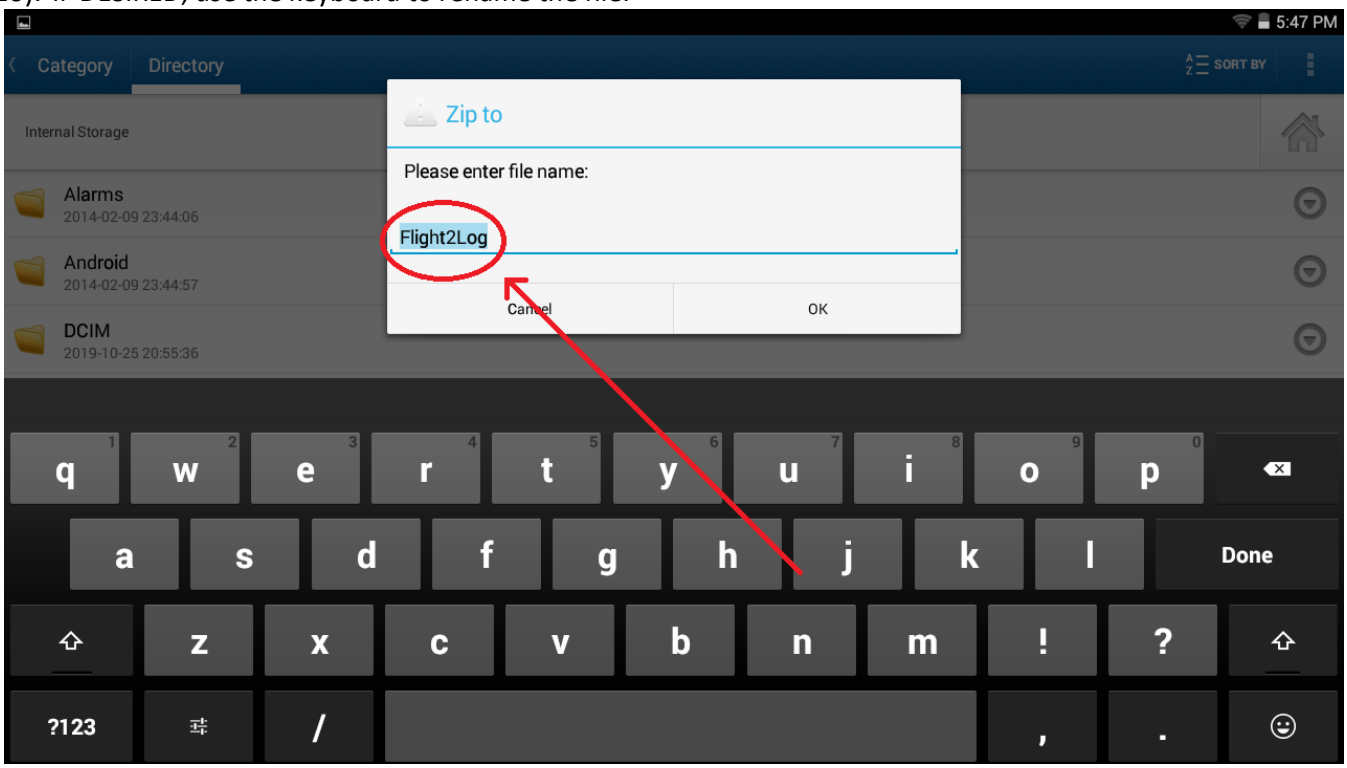


Attachment 50
Typhoon H Plus Flight Log Retrieval

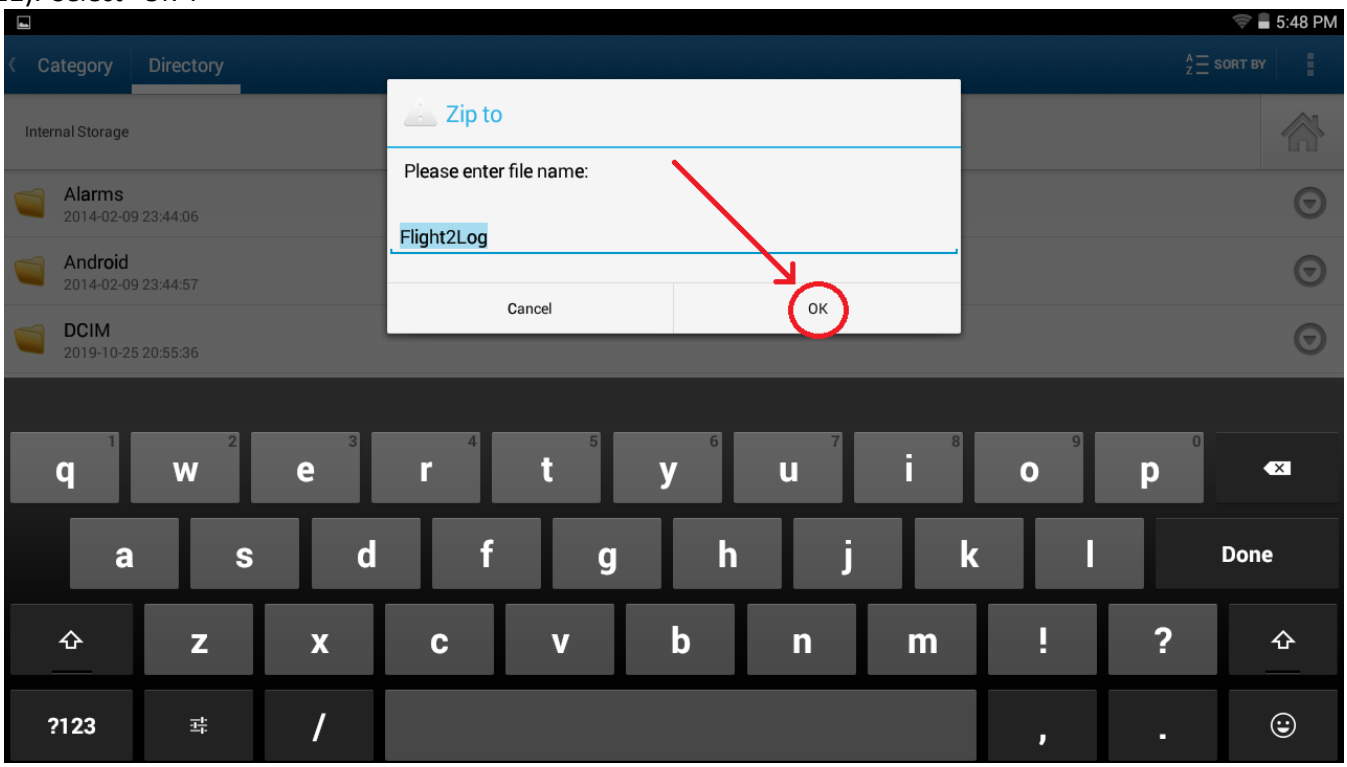
9). Select “Compress”:



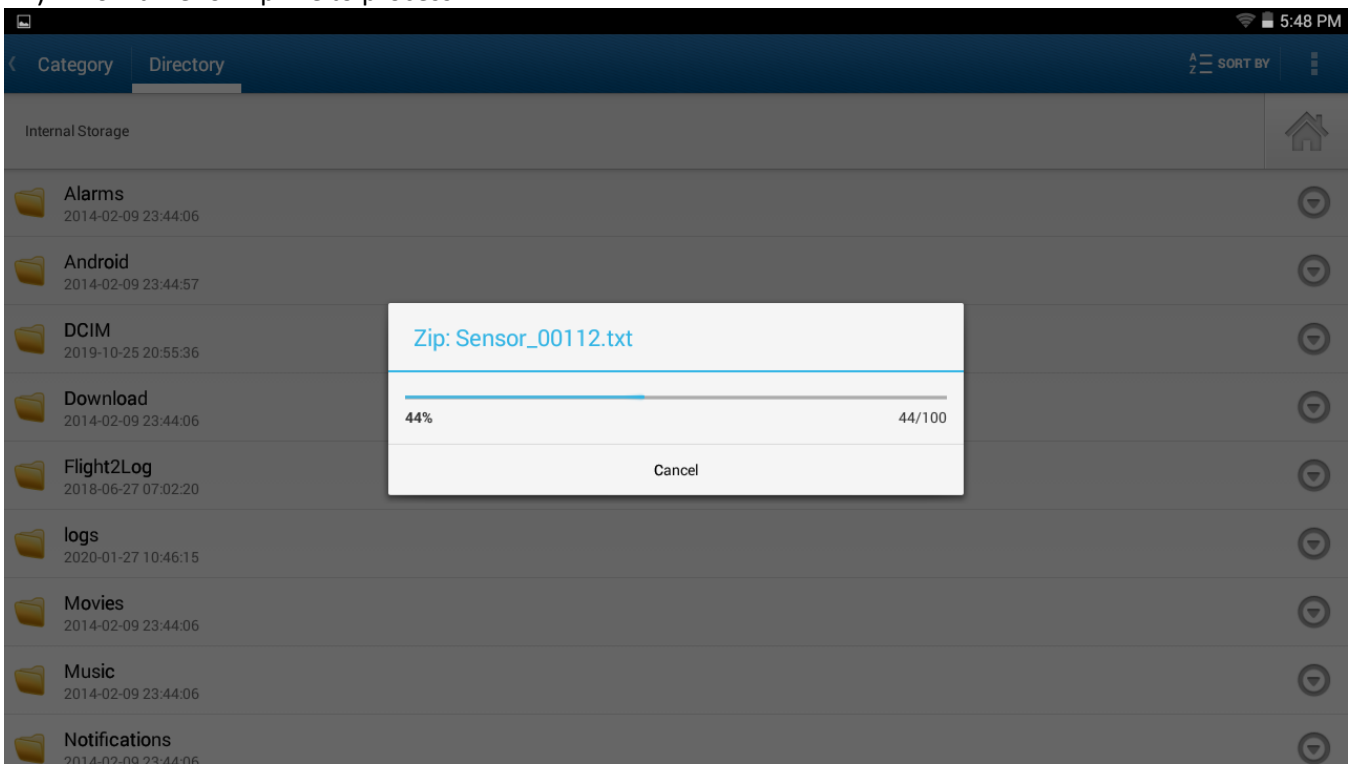
10). IF DESIRED, use the keyboard to rename the file:



11). Select “OK”:

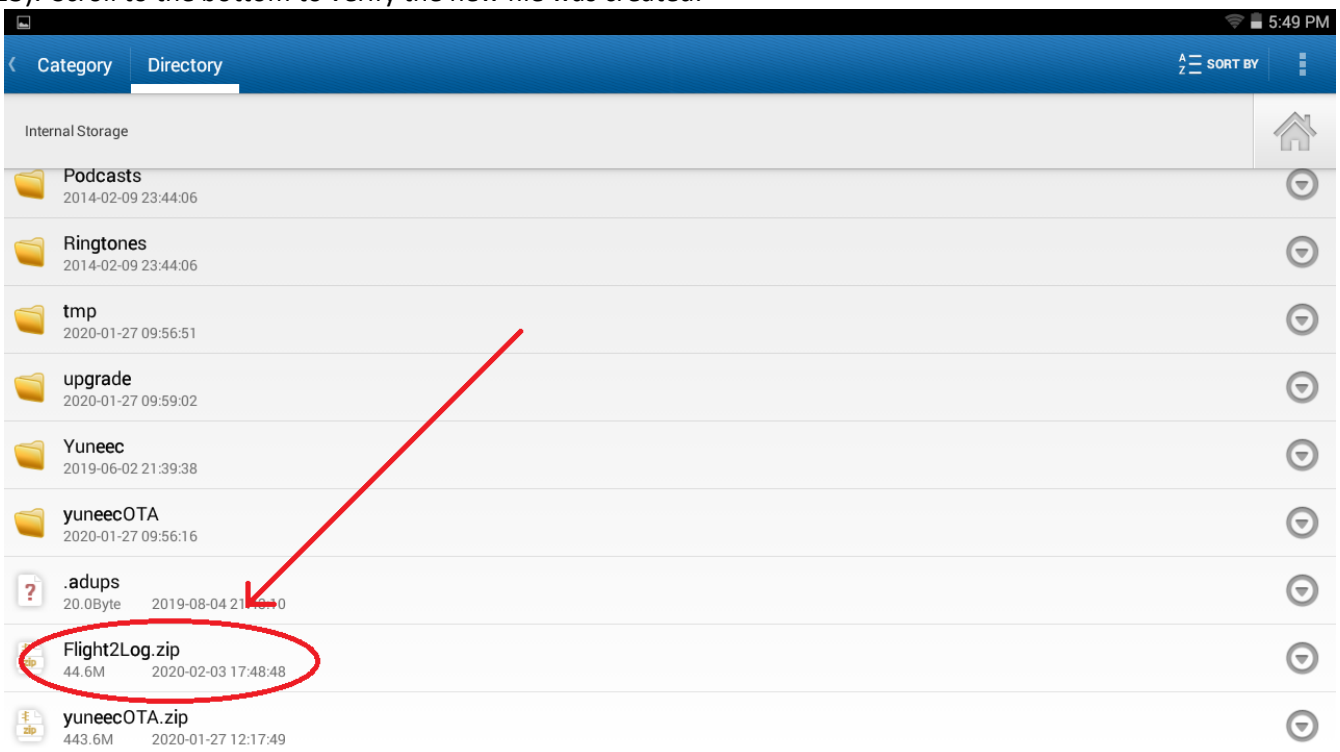


12). Allow time for Zip File to process:



Attachment 50
Typhoon H Plus Flight Log Retrieval

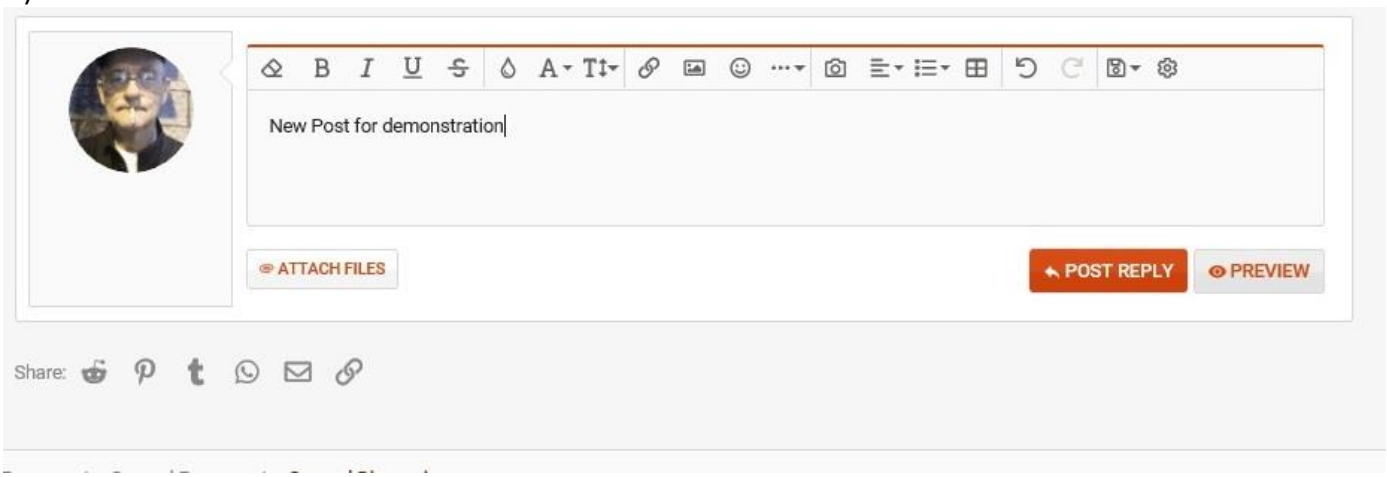
13). Scroll to the bottom to verify the new file was created:



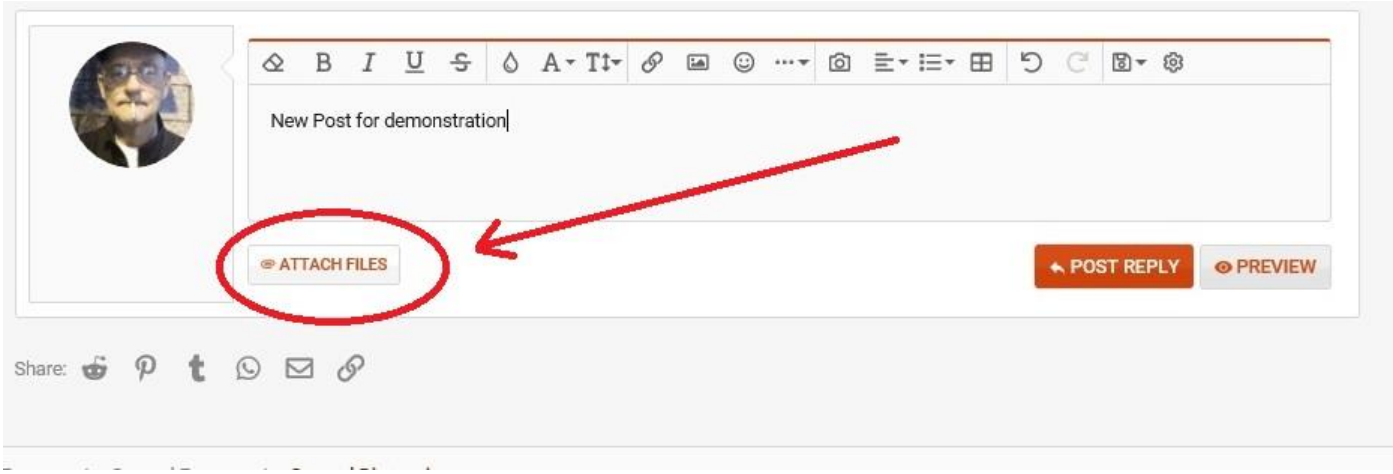
NOTE: Most common USB charging cables will not work. The USB cable must be data capable, such as the USB cable originally shipped with the Typhoon H Plus.

14). Connect ST16S to a computer via data capable USB cable.

15). Return to the Forum and create a new Post:

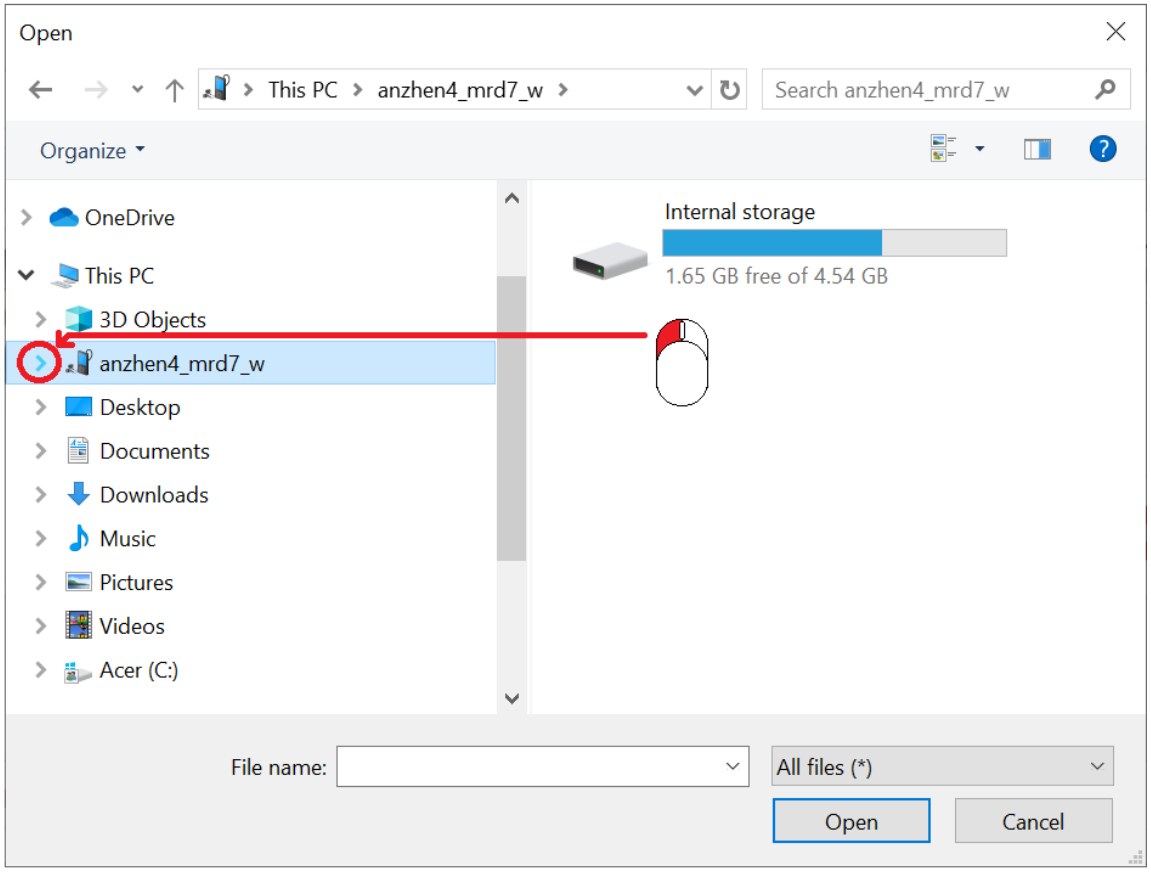


16). Select “ATTACH FILES”:



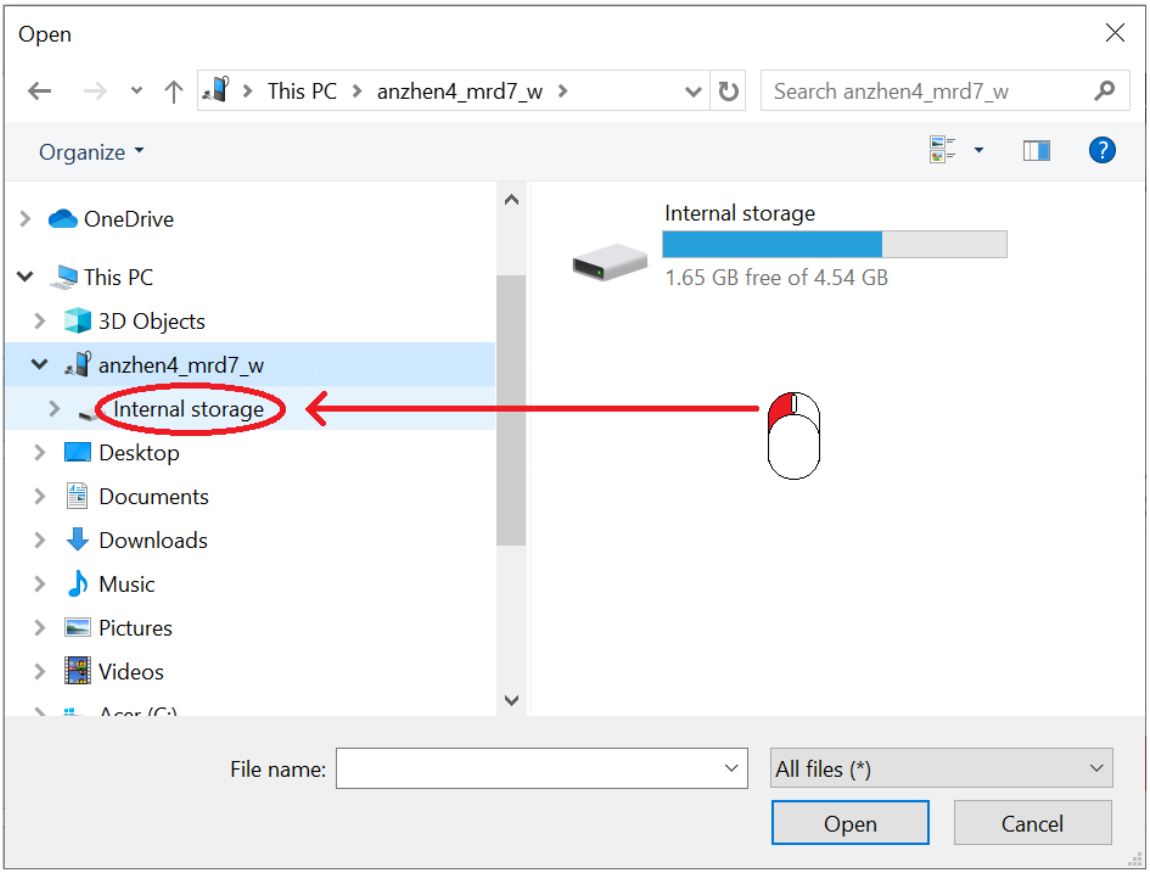
NOTE: The ST16S registers on the computer as “**anzhen4_mrd7_w**” unless it has been renamed.

17). Navigate the computer file system to the ST16S (anzhen4_mrd7_w) and open it:

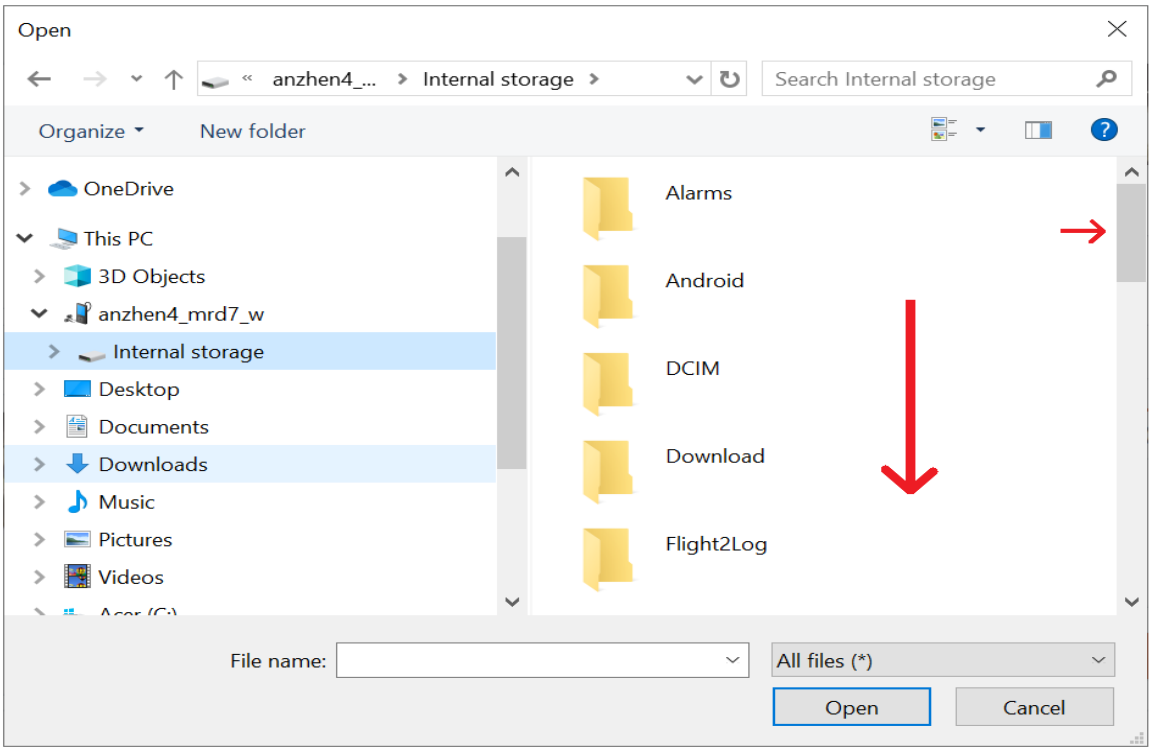


Attachment 50
Typhoon H Plus Flight Log Retrieval

18). Select “Internal Storage”:

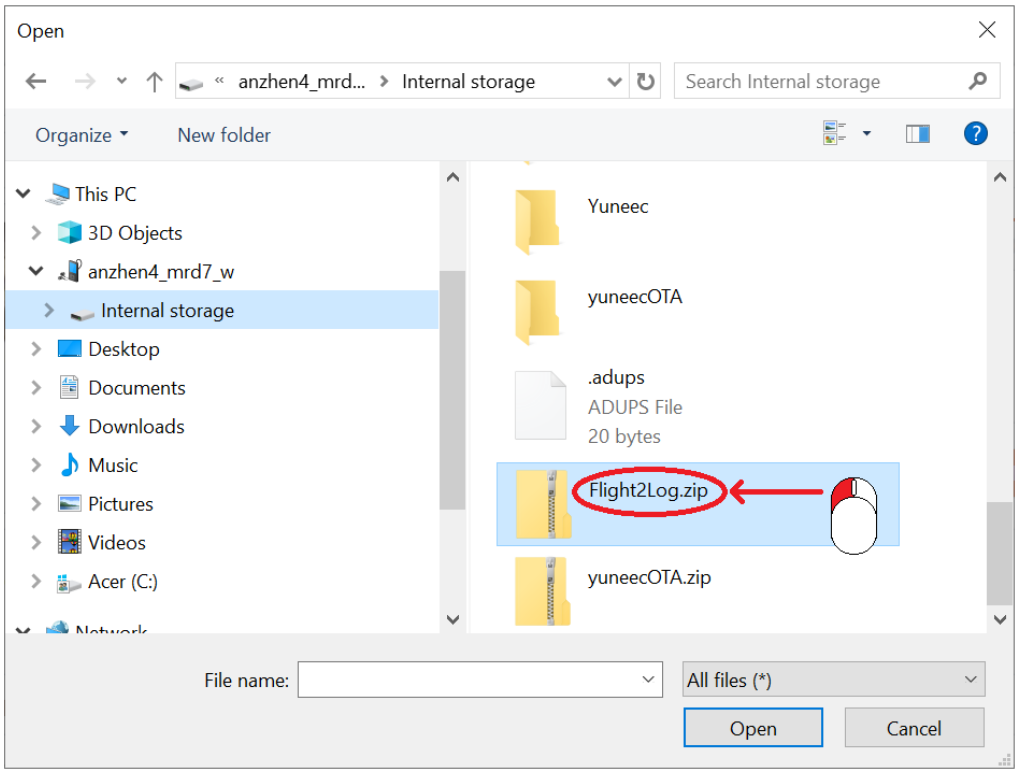


19). Scroll to the bottom of “Internal Storage” as required:

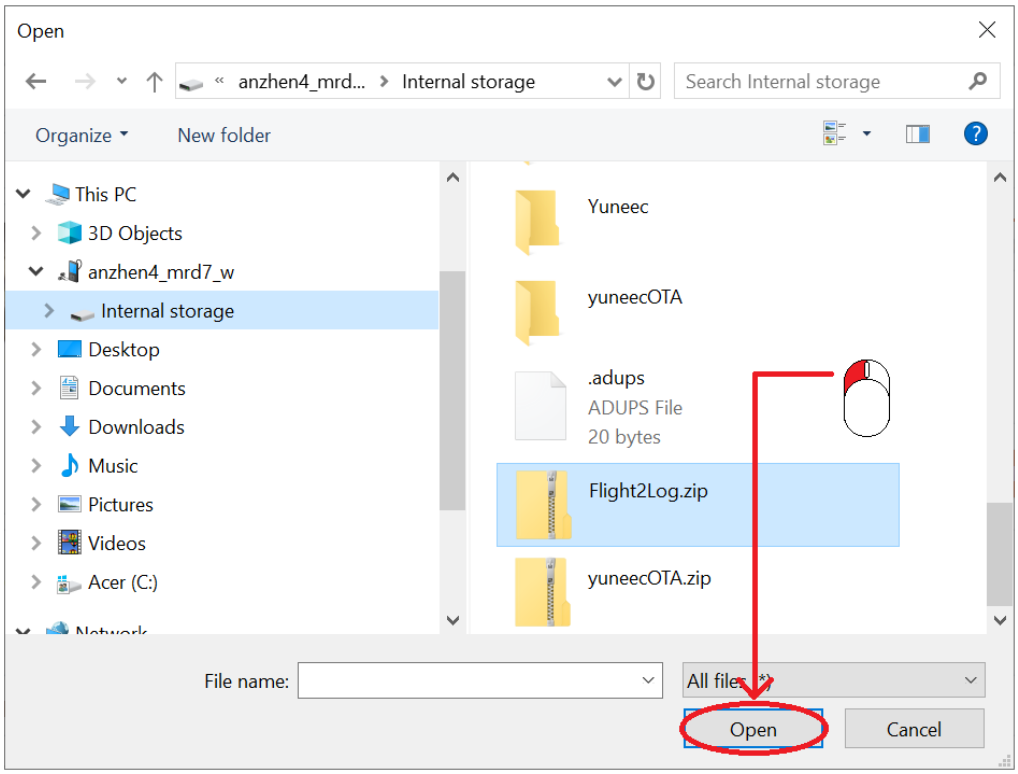


Attachment 50
Typhoon H Plus Flight Log Retrieval

20). Select “Flight2Log.zip” (or as you renamed it) to highlight the filename:

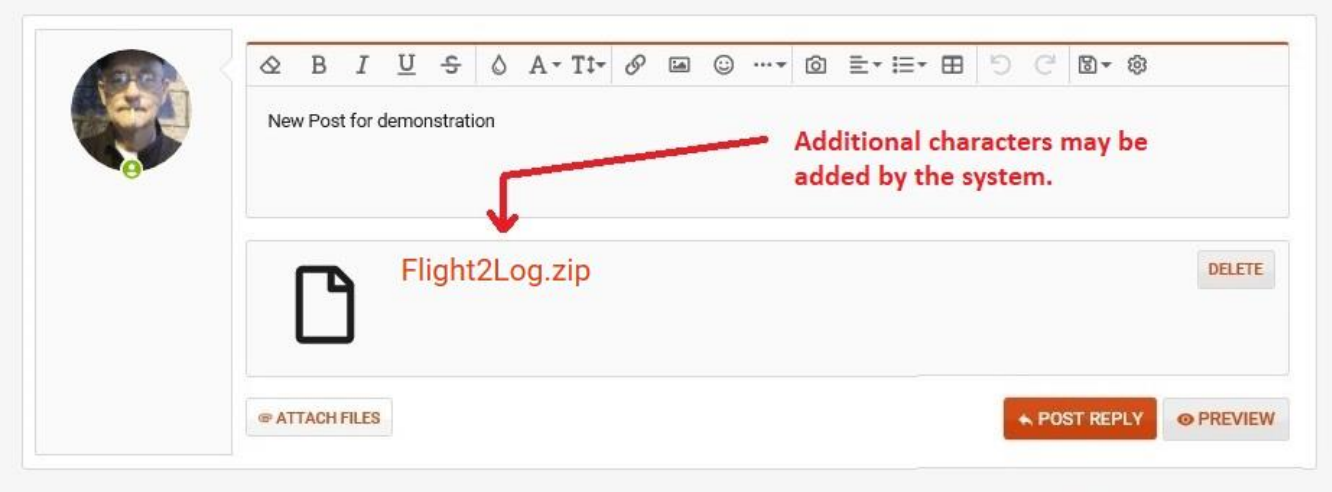


21). Select “Open”:

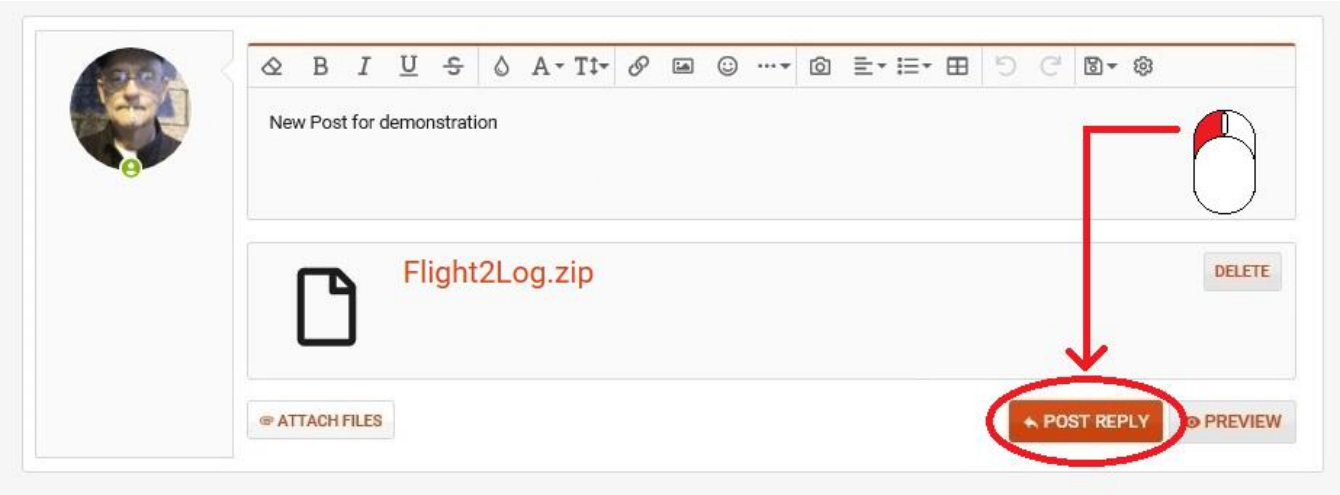


Attachment 50
Typhoon H Plus Flight Log Retrieval

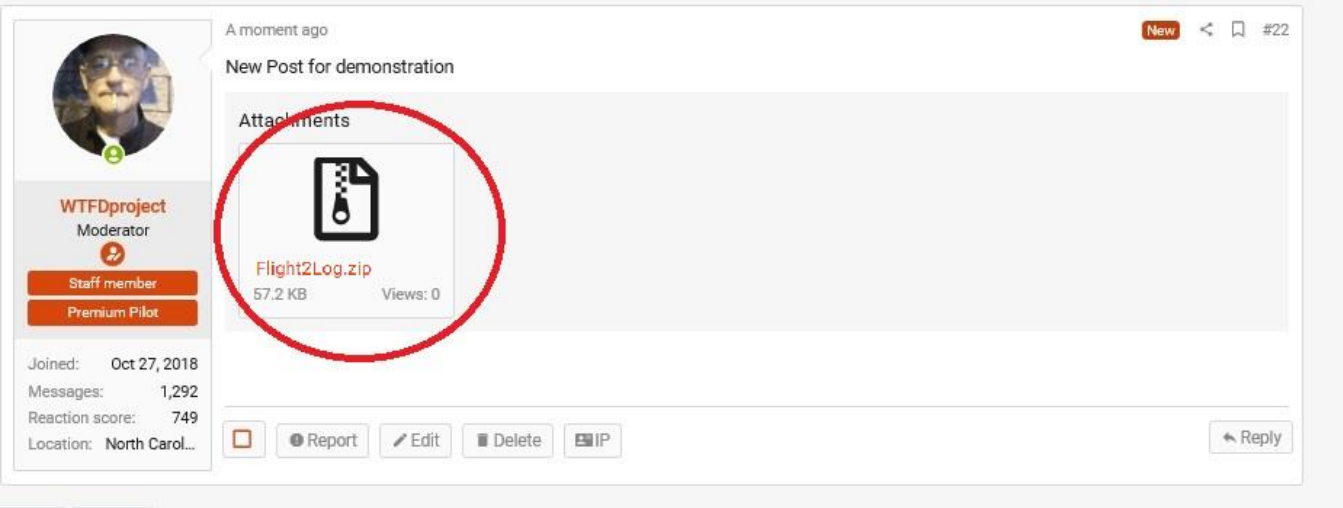
22). Verify file registers on Forum upload screen:



23). Select “POST REPLY”:



24). Verify file uploaded:



Attachment 51
Pitch, Roll and Yaw Discussion

Introduction: **Gimbal Stabilization is related to anomalies of drone orientation related to only horizon and compass heading. Gimbal stabilization does not respond to vertical changes in elevation.**

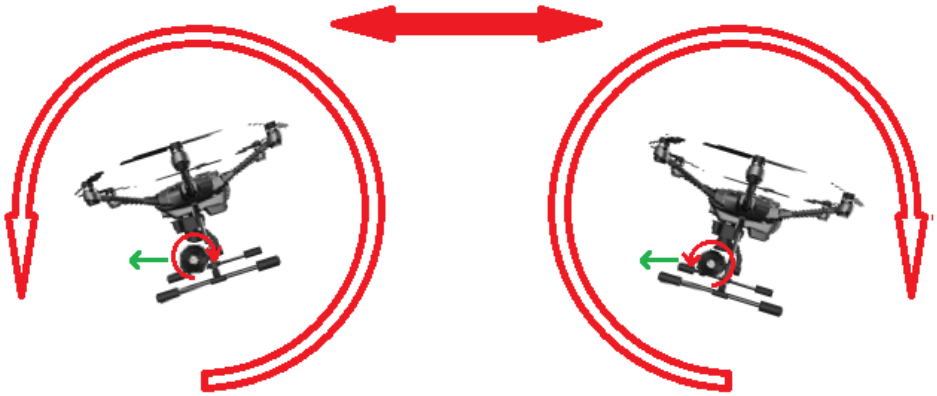
Vertical Elevation Changes:

When the drone elevation changes with no change in compass heading and with no horizontal travel in any direction, there is no change in orientation related to either the horizon or to compass heading. Gimbal Stabilization plays NO ROLE in this maneuver.

Attachment 51
Pitch, Roll and Yaw Discussion

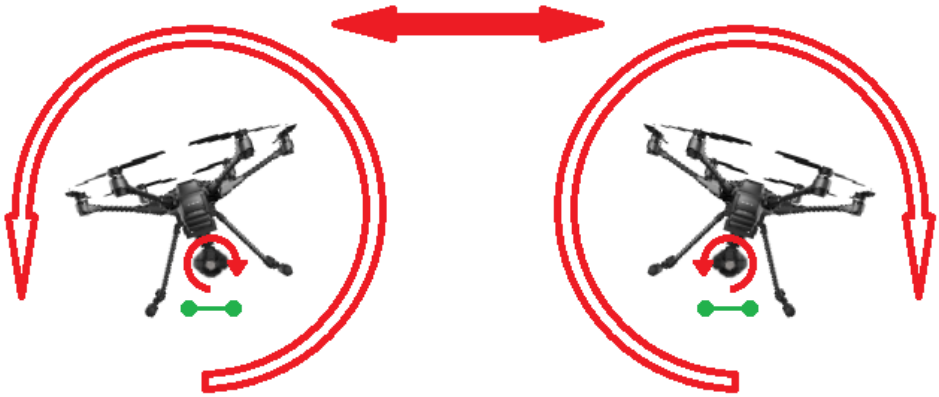
Forward/Reverse Travel (Pitch):

When the drone is traveling forward or reverse, the DRONE is tilted either up or down in relation to the horizon. In response to this tilt, the gimbal stabilization system adjusts the camera PITCH in the opposite direction to maintain the original camera angle in relation to the horizon. The goal is to maintain the original camera angle during and after the maneuver. Automatic Camera Pitch is from gimbal stabilization. Camera pitch is also manually controllable from the ground station.



Left/Right Travel (Roll):

When the drone is traveling left or right, the DRONE is tilted either left or right in relation to the horizon. In response to this tilt, the gimbal stabilization system ROLLS the camera in the opposite direction to maintain a level view in relation to the horizon. The goal is to maintain the original camera angle during and after the maneuver. Camera Roll is from automatic gimbal stabilization only. Unlike Camera Pitch, there is no manual control of Camera Roll.

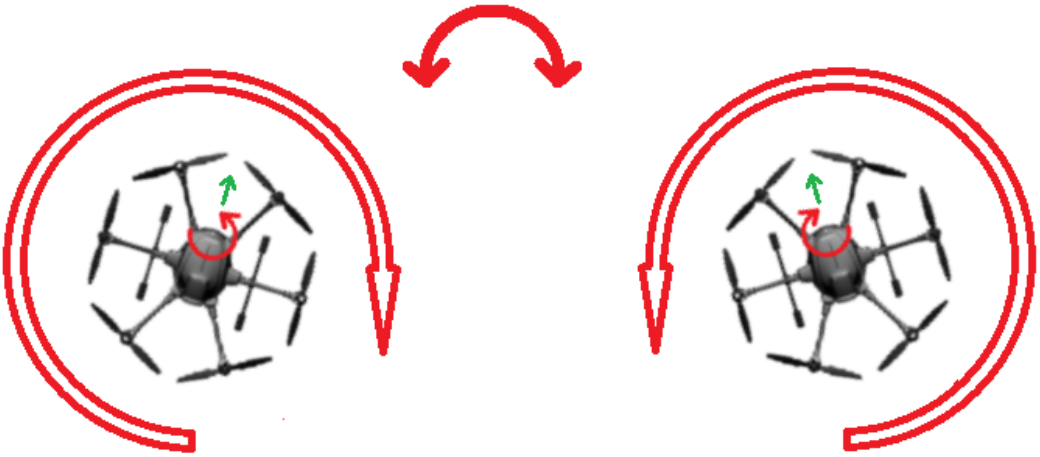


Attachment 51
Pitch, Roll and Yaw Discussion

Left/Right Yaw:

When the drone is yawed left or right, with no horizontal travel in any direction, the DRONE alignment is altered in relation to **COMPASS HEADING**. In response to this, the gimbal stabilization system adjusts the camera **YAW** to minimize the visible effect of the movement. Unlike Pitch and Roll, the system DOES NOT MAINTAIN THE ORIGINAL COMPASS HEADING. Instead, the change in heading is initially DAMPENED by the YAW stabilization, and then smoothly re-aligned to the NEW drone compass heading. The goal is to minimize the effects of sharp heading changes on the final video product.

Normal automatic camera YAW is from gimbal stabilization. For cameras designed for the ST10 series controllers, there is NO manual Yaw control. For cameras designed for ST12, ST16, ST16S and ST24, YAW can also be controlled manually from the ground station. Some of these are also capable of advanced camera functions, such as “panorama” that are manually initiated, but carried out by computer automated changes to both pitch and yaw.



Addendum 1
Links for Software Experts

Use of this information is at your own risk.

For Software Experts:

NOTE: This link does not support Internet Explorer.

- **The latest Flight Mode firmware for ST10/ST12:**
  https://github.com/azvampyre/st10-v01b31c

NOTE: This link does not support Internet Explorer.

- **The source for the Android CGO3 app:**
  https://github.com/unfaix/yuneecFly

NOTE: This link does not support Internet Explorer.

- **PX4 flight control :**
  https://github.com/kyChuGit/YuneecDroneCode

NOTE: This link does not support Internet Explorer.

- **Thunderbird Firmware (A fork of PX4 Autopilot Software for Yuneec Typhoon H):**
  https://github.com/tonirosendahl/Thunderbird

  Note: A discussion of the Thunderbird firmware is in this thread:
  https://yuneecpilots.com/threads/typhoon-h-480-px4-v1-10-stability-issues.18205/#post-204392

Addendum 2
Video Links

- **Yuneec Typhoon Repair Tutorials:**
  https://www.youtube.com/playlist?list=PLFbieNfMBg1bGjmp5lxlkmXsAL9Y_RJ8G

Addendum 3
Contributing Members

WTFDproject

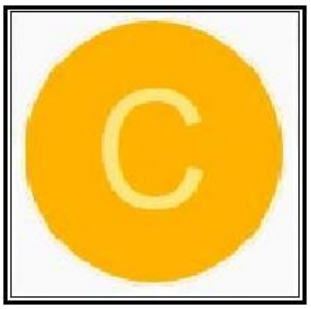
Steve Carr

h-elsner

Sureshot

Haydn

georgero



Cmendemen