

# TRIAX|lite 2.0

## Professional 3 axis Camera Mount Users Guide



**2<sup>nd</sup> Generation: TRIAX|lite 2.0 Installation**



**2<sup>nd</sup> Generation: TRIAX|lite 3 axis Gimbals**



**1<sup>st</sup> Generation: TRIAX|lite Installation**



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## 1. TRIAX|lite 2.0 Introduction



### ***Congratulations on purchasing your TRIAX|lite 2.0 Professional camera mount!***

- Integrating top quality design details of the first generation TRIAX|lite, TRIAX|lite 2.0 is engineered with a larger mount diameter, while keep weight to a minimum.
- The enhanced design of the TRIAX|lite 2.0 now supports the use of the TRIAX|cms technology. Please refer to the TRIAX|cms User Guide for additional information.
- As with any sophisticated system, care must be taken when operating the TRIAX|lite 2.0. Please be sure to read the user's guide thoroughly and familiarize yourself with operating instructions before using your TRIAX|lite 2.0.
- To assist the camera operator with roll stabilization, the TRIAX|lite uses a single rate gyro (FUTABA g190) on the roll axis. Please note rate gyros will drift over time.
  - **NOTE:** User assumes full responsibility and any associated liabilities when using the TRIAX|lite 2.0.
  - **NOTE:** Familiarize yourself with the TRIAX|lite 2.0 Users Guide
  - **NOTE:** The TRIAX|cms is not designed for use in 3D flying or other extreme flying modes. Operating under these conditions can exceed the TRIAX|lite 2.0 specifications, with the end result being loss of stabilization, and possible injury or damage to your equipment.
- Your TRIAX|lite 2.0 was either shipped fully assembled or as kit.

## 2. TRIAX|lite 2.0 Overview

The TRIAX|lite 2.0 is a Professional grade, 3 axis camera mount that was designed from the ground up with HD cinematography and photography in mind.

- The TRIAX|lite 2.0 is light-weight, yet incredibly strong and rigid, perfect for the HD cinematographer or photographer.
- The unit is made from high quality aluminum and is CNC cut to precision.
- The TRIAX|lite 2.0 is modular in design and can be mounted to nearly any helicopter platform in a front mount or under slung configuration.
- The solution supports continuous rotation in all 3 axis
- TRIAX|lite 2.0 comes standard with one rate gyro stabilization for the roll axis.
  - **NOTE:** Purchaser is responsible for Helicopter landing gear modifications.
  - **NOTE:** Purchaser is responsible for 2.0 providing radio controller, radio receiver and battery.

### 2.1 Specifications

Description	Notes
Weight	~ 4.5lbs, Includes all hardware, servos and rate gyro.
Servos	3 Continuous Rotations Servos
Inner Roll Ring Dimension	~ 7.75 inches, measure from top of the camera mount plate to the top of the inner roll ring
Roll Axis Stabilization Assist	FUTABA g190 rate Gyro, <b>NOTE:</b> A rate gyro will not fully eliminate roll axis drift

Description	Max	Min	Notes
Servo Supply Voltage	6.0V	4.8V	Input Operating Voltage
Servo Control Signal Voltage	5.0V	3.0V	Peak to Peak Square Wave

## 2.2 TRIAX|lite 2.0 Parts List

Your TRIAX|lite was shipped with the following:

- One pre-built TRIAX|lite 2.0 with or without servos installed.
- If ordered in kit form, user will either need to provide 3 continuous rotation servos or install the 3 continuous rotation servos provided with the kit.
- Two Booms , each having two boom holder assemblies attached
- One standard camera plate with attachment screws
- Two half size camera plates that can be used to assist in camera mounting
- One FUTABA g190 Rate Gyro with servo wire extension and foam
- Misc hardware to attach boom holder assemblies to the helicopter frame
  - **NOTE:** TRIAX|lite 2.0 is not designed to work with the TRIAX|cms Pro. The TRIAX|cms Pro is used with TRIAX|lite Pro.
- **Option:** There is an optional sway bar assemble that can be purchased separately.

## 3. TRIAX|lite 2.0 Installation and Setup

The TRIAX|lite 2.0 is shipped either in kit form or pre-built and ready for installation.

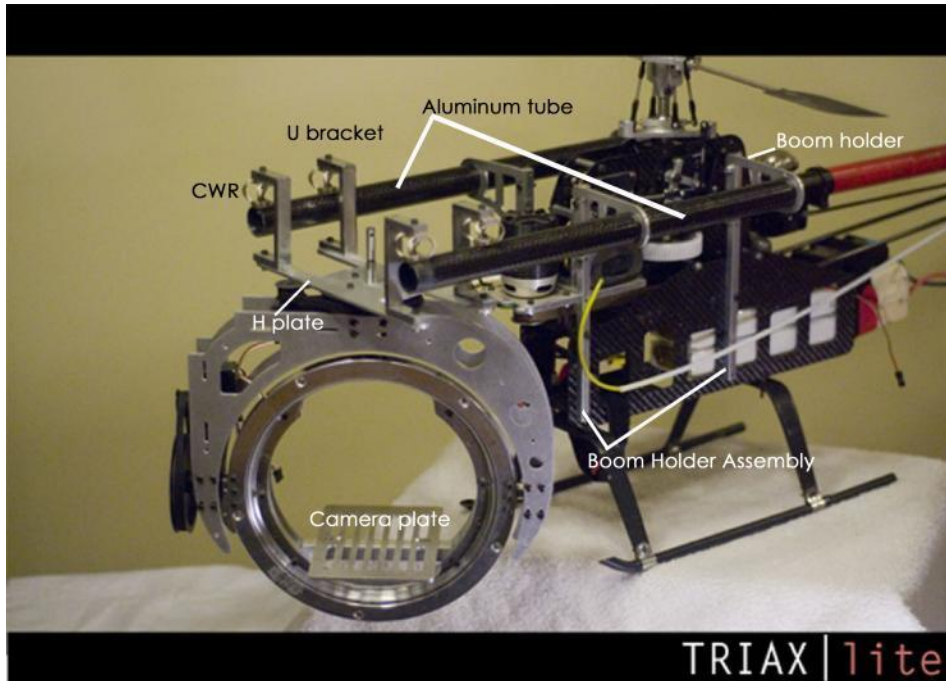
Currently the TRIAX|lite 2.0 is shipped with Boom Holder Assembly that will work with either the Joker or T-Rex. Please refer to the following sections to install and calibrate the TRIAX|lite 2.0 camera mount.

### 3.1 Helicopter Installation

The TRIAX|lite 2.0 was designed for the Joker 2 using the photo conversion frame set part #841.

- Hardware for mounting the TRIAX|lite 2.0 to a Joker or T-Rex helicopter in a front mount setup is provided.
- If installation is not with a Joker or T-Rex in a front mount configuration, purchaser is responsible for fabrication of a mounting system for their specific application.
- The weight and balance of your helicopter must be verified after installation of the TRIAX|lite 2.0 and the attachment of the camera to the camera plate.

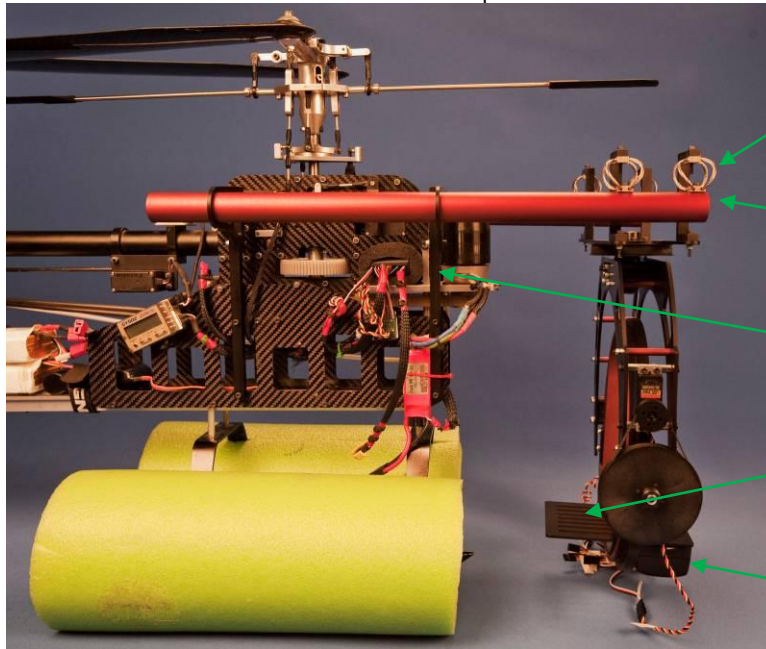
## TRIAX|lite 2.0 Users Guide



- **NOTE:** The above image is of the 1<sup>st</sup> generation TRIAX|lite. It is intended to communicate terminology and mounting information.

# TRIAX|lite 2.0 Users Guide

2<sup>nd</sup> Generation: TRIAX|lite 2.0



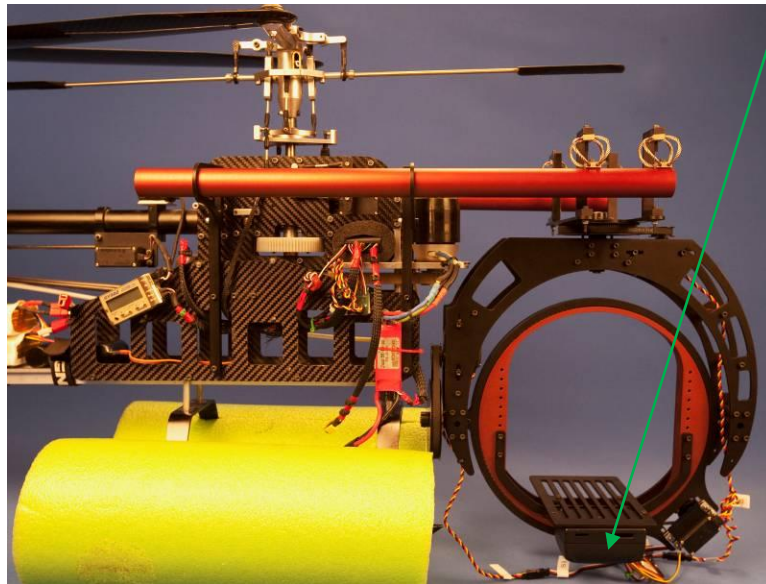
CWR

Aluminum Tube

Boom Holder

Camera Plate

TRIAX|cms Pro module: Not available for TRIAX|lite 2.0



2<sup>nd</sup> Generation: TRIAX|lite 2.0

**Step 1:** Attach Boom Holder Assembly to Helicopter

If your Helicopter is a Joker with Photo Frame Conversion Kit (841), bolt the Boom Holder Assembly to the corresponding holes in the frame using the hardware located in the Boom Holder Assembly.

If your Helicopter is a T-REX, then you will need to drill additional holes in the helicopter frame that line up with the holes in the Boom Holder Assembly.

If you are using another Helicopter type, please feel free to consult with TRIAX|AERIAL.

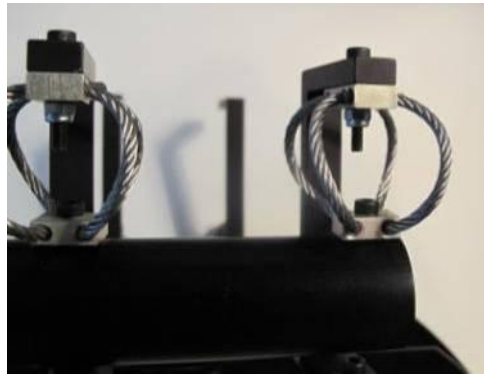
**Step 2:** Attach the TRIAX|lite 2.0 to the CWRs



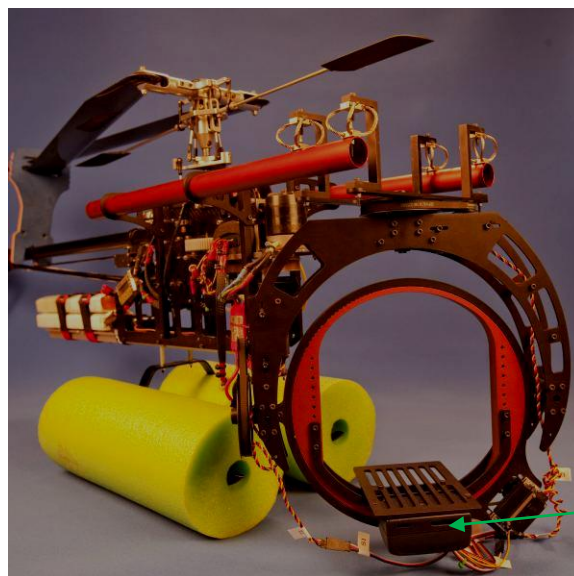
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Rotate Aluminum tubes so that CWRs are facing up. Align the U brackets that are already attached to the TRIAX|lite 2.0 to correspond with the CWRs (Compact Wire Rope) and bolt together using the hardware located in the U bracket.



Your TRIAX|lite 2.0 is now an integral part of your Helicopter Frame.



TRIAX|cms PRO module: Not available for TRIAX|lite 2.0

### 3.2 Kit – Continuous Servo Installation Steps

### 3.3 Radio Installation and Servo Calibration

- **NOTE:** Follow these steps before actual use or connection to the optional TRIAX|cms module.

Your TRIAX|lite 2.0 shipped with the continuous rotation servos.

Please use the following procedure to check servo calibration and if needed recalibrate the continuous rotation servos. The servos will spin continuously until they are appropriately calibrated and trimmed.

- A. Install radio receiver and battery onto the TRIAX|lite 2.0. Give some thought to servo wire routing.
  - B. At this time do not connect servos to radio receiver.
  - C. Insure all radio controller trim tabs are set to 0 (no trim)
- **NOTE:** Even though servos were calibrated and servo drift was adjusted to zero during the build of the TRIAX|lite 2.0, it required during final installation to check servo calibration.

When connecting your radio receiver to the TRIAX|lite 2.0, perform the following steps, to determine if there was any change in the calibration of the servos during shipping.

#### Step 1 - Check servo calibration:

1. Connecting only one servo at a time a time to the radio receiver with trims on the radio set to 0 (no trim).
2. Turn on radio with radio trims to 0 (no trim).
3. Turn on radio receiver (switch or connect battery), which applies power to servo.
  - If no servo rotation is noted, disconnect servo and battery power from receiver and repeat the above steps for next servo.
  - If very slow (minimal) rotation is observed, this rotation can be trimmed out with radio and repeat for next servo. A very small amount of radio trim should be required or used.
  - If rotation is observed that takes large amounts of trim to cancel out, please go to Step 2: Servo calibration on the next page.

**Step 2 - Servo calibration:**

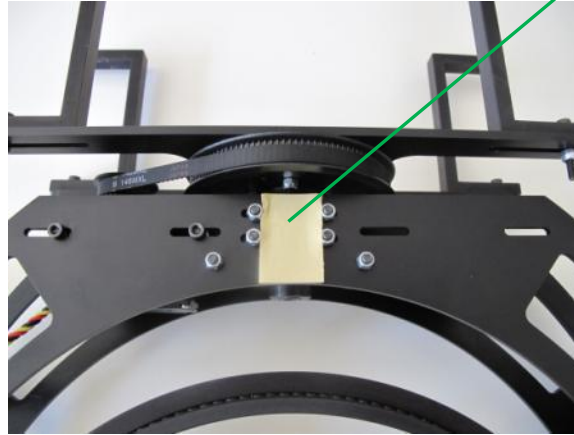


The above image represents where to insert screw driver if calibration is needed.

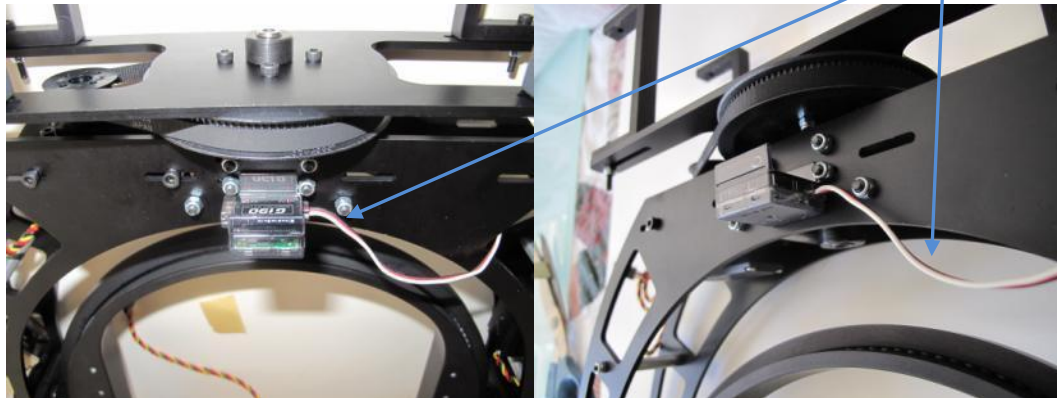
1. Servo is observed to have excessive rotation and needs to be calibrated.
2. Remove power from the servo by turning off receiver.
3. Remove pulley screw from servo, being careful to not remove servo timing pulley.
4. Using small Philips or Flat head screw driver (similar to ones used in the TREX 600 kit), insert screw driver into the screw hole to adjust the potentiometer located inside the servo.
5. Radio is on, trim is zero on radio.
6. Apply power to servo by turning receiver on.
7. Adjust the internal potentiometer in the servo clockwise or counter clockwise, until servo motion stops.
  - **NOTE:** Very fine adjustments are used and they can result in large amounts of motion.
  - **NOTE:** Servo pulley may be removed, but care must be taken to not damage servo pulley during removal or installation.
8. Trim out any small rotational motion using the radio trim.
9. Replace pulley screw in servo.

### 3.4 Futaba g190 Gyro Installation – Only used without TRIAX|cms option

1. Turn the TRIAX|lite 2.0 such that the back is facing up. You will be cutting a piece of foam tape (double stick back) that will attach between the 4 nuts as shown, located on the back side of the TRIAX|lite 2.0.



2. Attach the gyro with the receiver cable wire exiting to the right as shown.



3. Next attach the gyro cable wire to the radio receiver.
4. Attach the servo extension cable to the left side off the gyro and connect to the roll servo located at the bottom left of the mount.

### 3.5 Rate Gyro Calibration

Because radios differ from brand to brand, some fine-tuning of the rate gyro may be required to suit your application. Please follow these steps to tune your rate gyro.

1. Start by adjusting the gain pot on the gyro somewhere between 50% and 80%.
2. Set travel adjust on the radio somewhere between 60% to 90%
3. You will know you have the best settings when the drift is minimized, meaning a drift your camera operator can compensate for. Camera operators will still need to level the camera periodically.

- **NOTE:** The rate gyro provided is NOT meant to maintain heading hold. What it does do is assist the camera operator in keeping the camera level. There will be drift over time, which is an artifact of the rate gyros. This can be compensated for by the camera operator.

## 3.6 Testing Flight Characteristics

Test the TRIAX|lite 2.0 installation with a payload which is the approximate weight of your camera before you install and fly the helicopter with the camera.

This is to:

- a. Verify your setup is stable under operating conditions.
- b. Learn how to fly your helicopter in its new configuration.
- c. Learn what sort of impact the weight and movement of the TRIAX|lite 2.0 have on the helicopter flight characteristics.

### Recommended Testing Procedure:

#### Step 1: Stationary Testing (helicopter NOT running)

1. Radio test TRIAX|lite 2.0 movement with helicopter stationary and off.
2. Learn how sensitive TRIAX|lite 2.0 is to your radio controls, and adjust radio control gains as needed.
3. Test rate gyro, by picking up helicopter and rolling side to side.

#### Step 2: Stationary Testing (helicopter running)

1. Radio test TRIAX|lite 2.0 movement with helicopter stationary and running.
2. Learn how sensitive TRIAX|lite 2.0 is to your radio controls, and adjust radio control gains as needed.

#### Step 3: Flight Testing (TRIAX|lite 2.0 turned-off)

1. TRIAX|lite 2.0 radio receiver and rate gyro are turned off, camera plate loaded with payload that is comparable to camera weight.
2. Fly helicopter to learn new helicopter flight characteristics.

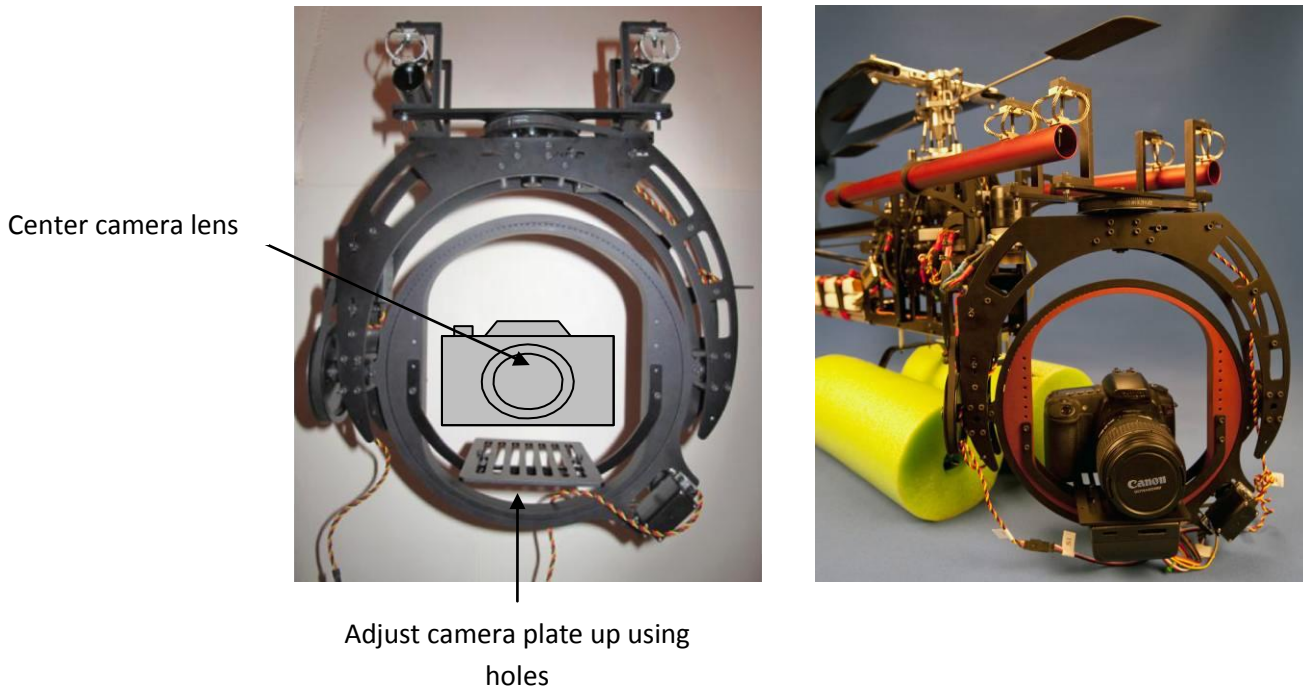
#### Step 4: Functional Flight Testing (TRIAX|lite 2.0 turned-on)

1. TRIAX|lite 2.0 radio receiver and rate gyro are turned on, camera plate loaded with payload that is comparable to camera weight.
2. Fly helicopter.
3. Camera operator operates TRIAX|lite 2.0 to allow helicopter pilot to learn new helicopter flight characteristics.

#### 4. Camera Installation

Mounting your camera to the TRIAX|lite 2.0 is very simple.

1. Remove any payload from the camera plate and attach camera to the camera plate.
2. Optimal camera position sets the nodal point (middle of the camera lens) in the middle of each axis of rotation.
3. Adjust camera plate height by removing screws and moving to new location and lock in position with screws.



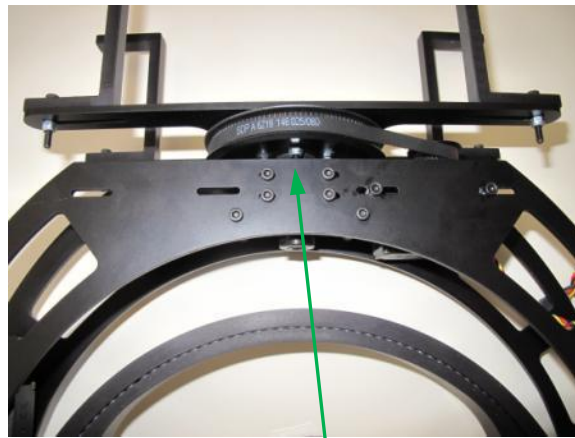
## 5. Operating TRIX|lite 2.0 and Required Maintenance Checks

You are now ready to begin using your TRIX|lite 2.0.

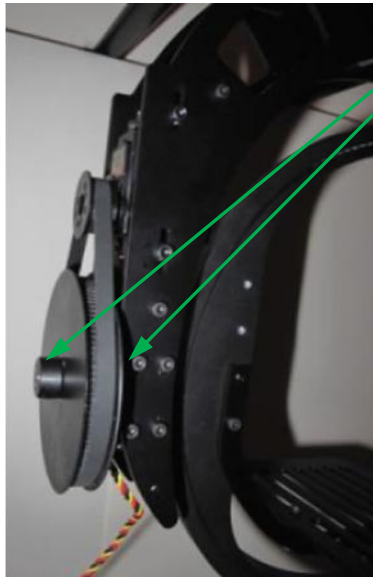
- **NOTE:** Check the installation of your TRIX|lite 2.0 before and after each flight.

TRIX|lite 2.0 checks:

- Check that set the 4 collar set screws are tight and belts are tensioned.



Set Screws



## 6. TRIX|lite Pro & TRIX|cms Pro

TRIX|cms Pro is an additional module that can be purchased and used with the TRIX|lite Pro.

TRIX|cms Pro provides state of the art stabilization control of your TRIX|lite Pro camera mount, further improving your ability to capture high quality video or still images.

Contact TRIX|AERIAL for additional information.

## 7. General

### **Disclaimer:**

Model helicopters and the TRIX|lite 2.0 camera mount are not toys. They have the potential to be very dangerous. Beginners should seek advice from those competent in the field.

By the act of installing and using these 2.0ducts, the purchaser and/or user acknowledges and accepts all liability. Neither TRIX|AERIAL nor artispheres, llc assume any liability for any injury or damages resulting from the use of these 2.0ducts. Under no circumstance will the purchaser and/or user be entitled to consequential or incidental damages.

### **Specifications and features subject to change without notice:**