Optional Heading Lock Gyro Installation and Setup

A unique feature of the Blade™ CP Pro is that it allows you to install an optional “Heading Lock” type gyro to further enhance the holding performance and response of the tail, without the need for difficult modifications or an alternative radio system. While the stock “Standard Rate” type gyro contained in the 3-in-1 control unit performs well for many types of flying, a heading lock gyro offers superior tail holding power that helps to maintain heading throughout even the most aggressive aerobatic maneuvers.

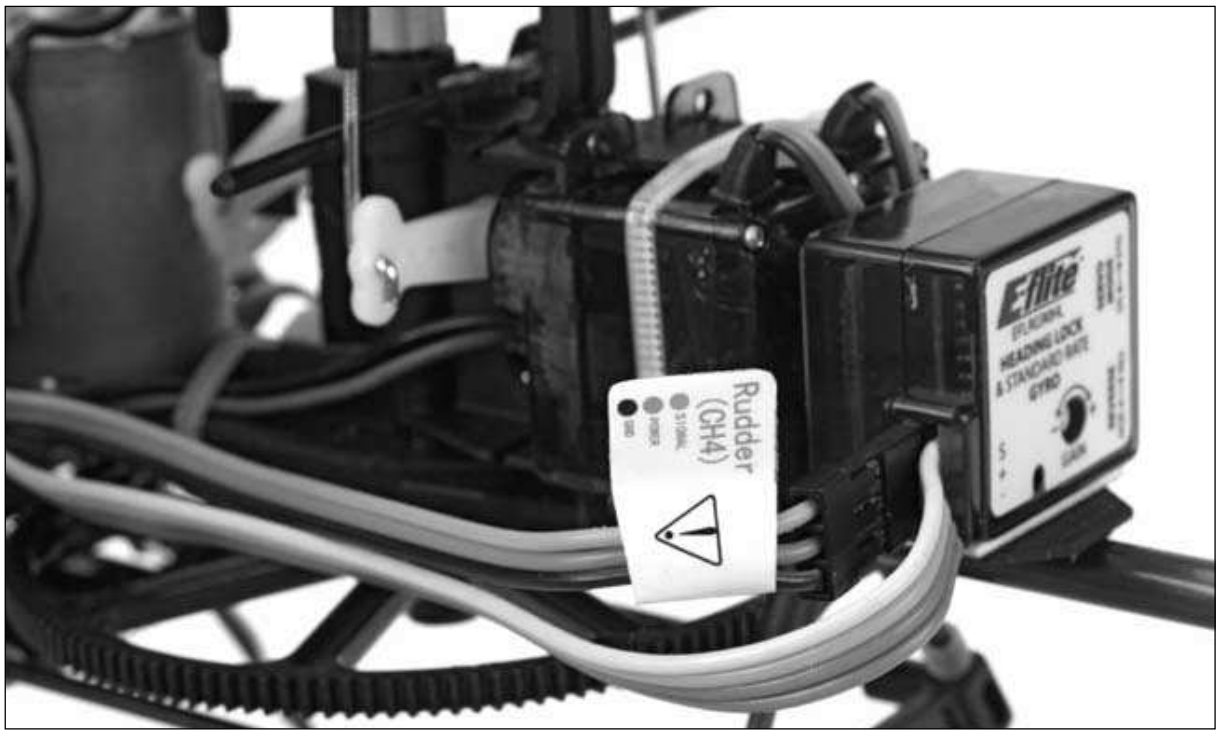
When installing a heading lock type gyro, we recommend the E-flite® G90 Sub-Micro Heading Lock gyro (EFLRG90HL). The G90 gyro weighs only 9.0 grams (.32 oz), and features a very small footprint that makes mounting it on the gyro mounting plate quick and easy. It also offers the ability to control the gain setting (in either Standard Rate or Heading Lock modes) remotely from the Blade CP Pro’s included transmitter by using the 5th channel, and is an excellent choice when looking for the best in tail and heading lock performance.

Note: The following steps outline the installation and setup of the G90 gyro, but can also be used as reference for many other heading lock type gyros. However, we do recommend that you review the manual included with your chosen gyro first before proceeding with installation and setup of the gyro in your Blade CP Pro.

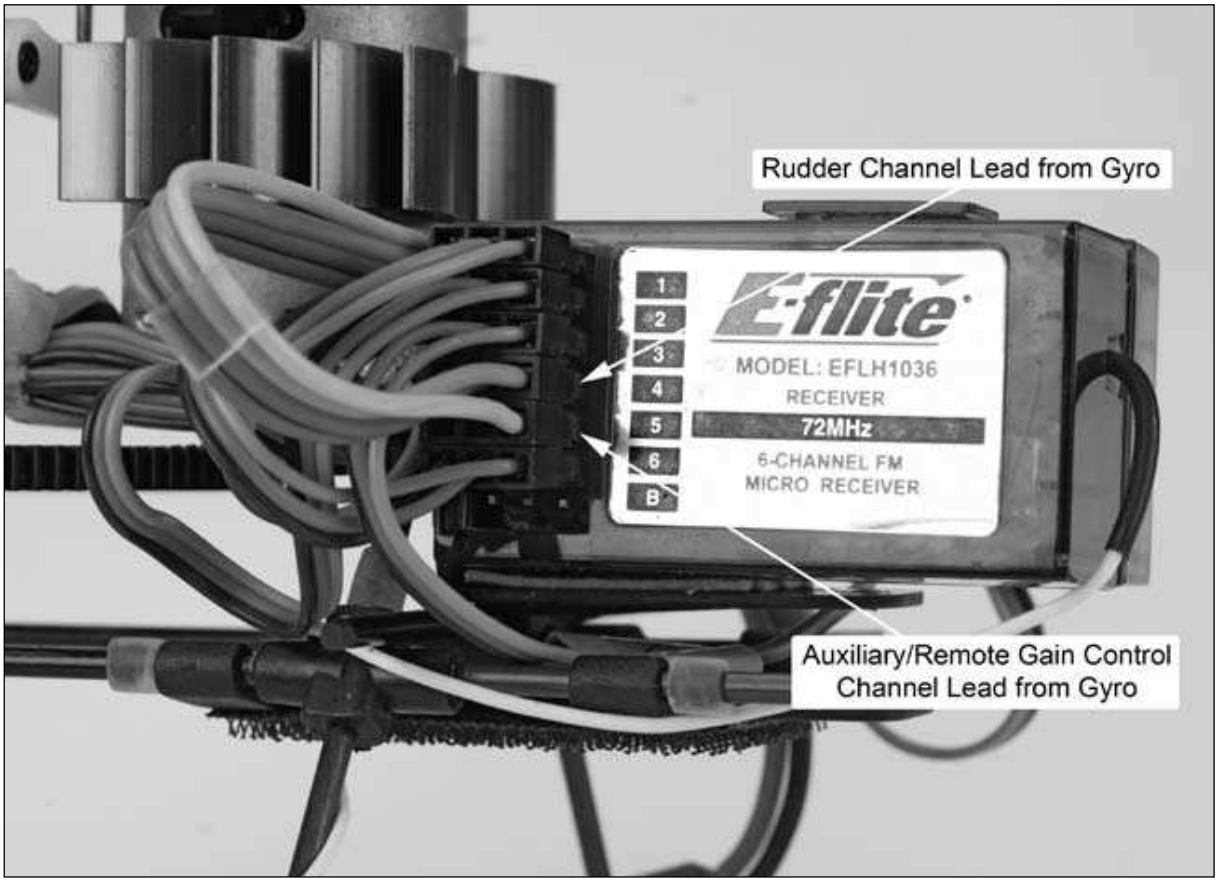
- Install the gyro using its included foam mounting tape (or the foam mounting tape found in the Blade CP Pro’s included “Mounting Accessories & Wrench” package) on the gyro mounting plate found just behind the rear servos. Be sure to orient the gyro so that you can easily access the gain setting adjustment pot (if not using the remote gain setting control option) and any necessary reversing or other setting switches.

Note: It is extremely important to ensure that the gyro is mounted securely so that it will not come loose in flight. Also, be sure that the gyro case does not come in contact with the servos or any other parts of the helicopter.

- Remove the 3-in-1 control unit's rudder channel lead (marked with a small label) from channel 4 of the receiver, and plug this lead into the servo connector of the gyro. Then, plug the rudder channel lead of the gyro into channel 4 of the receiver, ensuring proper orientation and polarity direction of the wire leads.

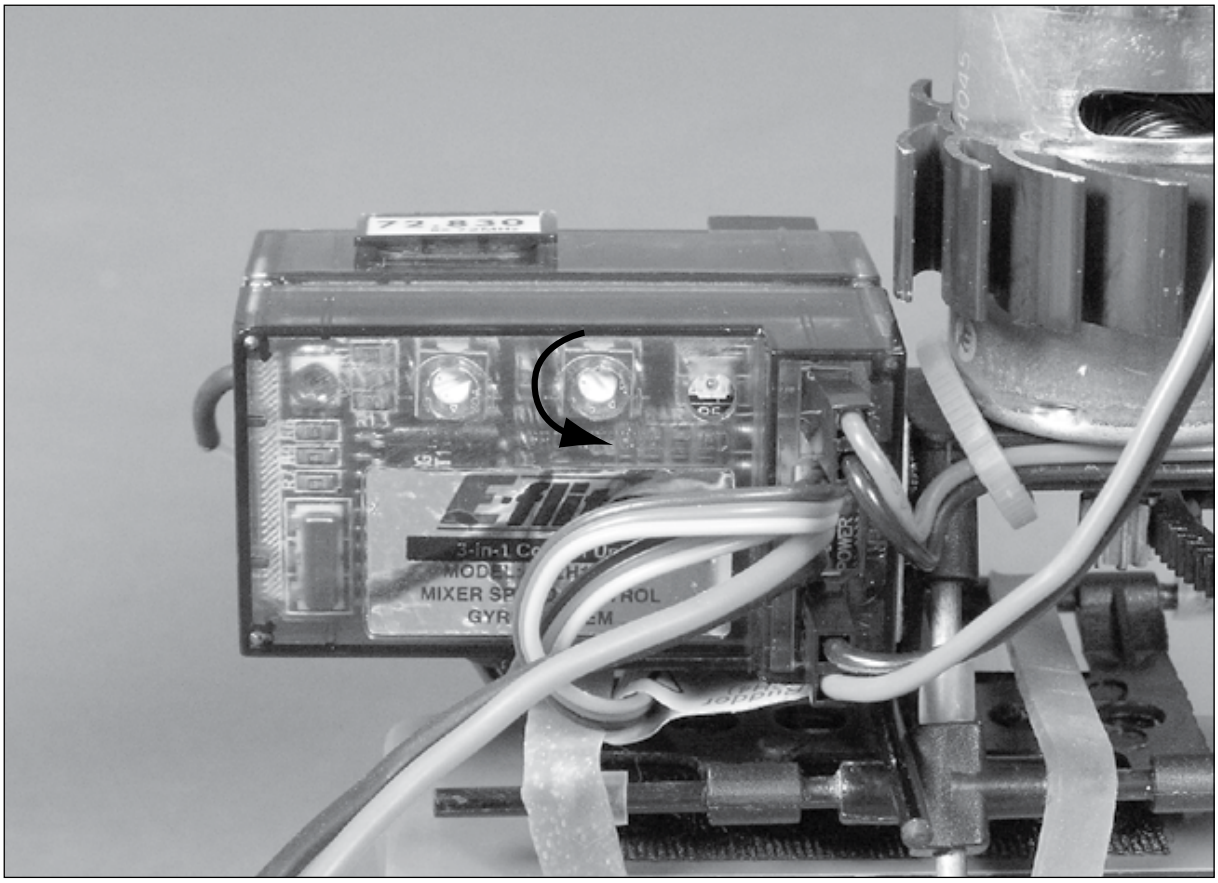


- If you will be using the remote gain control option for setting the gyro mode and gain from the transmitter, plug the gyro's auxiliary (AUX) lead into channel 5 of the receiver. Be sure that the lead is oriented properly so that it is plugged into the "signal" (like the orange wire on the servo leads) side of the receiver's pins.



Note: It is important to secure the 3-in-1 rudder, gyro rudder and auxiliary channel leads so that they can not come in contact with the pinion and main gear, servo arms or motor case. We suggest using the cable/zip tie wraps included in the "Mounting Accessories & Wrench" package to secure the leads to the main frame.

- **In order to ensure proper operation and the best possible performance of the heading lock gyro, it will be necessary to disable the standard rate gyro and mixer in the 3-in-1 control unit. This is accomplished by turning the proportional mix trimmer pot on the 3-in-1 to the lowest, most counterclockwise position (-). No adjustment of the gyro gain trimmer pot on the 3-in-1 control unit is necessary.**



- Now that you have completed installation of the heading lock gyro, it will be necessary to set and adjust the gyro and transmitter for proper response.
- If you are using the G90 gyro, please set it to the following:

  Reverse – REV (Reversed)

  Servo Mode – STD (Standard)

Note: You must be certain that the G90 gyro is set to "Standard" servo mode to ensure proper response and performance of the gyro. If it is set to "Digital" servo mode, the electronic speed control and tail motor will not respond properly to inputs from the gyro or transmitter.

- If you are using a gyro other than the G90, be sure to follow the instructions included with the gyro to ensure that it has been set properly.

Once you have set the reversing and servo mode for the gyro, it will be necessary to confirm that the settings are correct before proceeding with test flights and adjustment of the gyro mode and gain settings. To check for proper response of the tail motor/rotor to gyro and transmitter inputs, please refer to the following:

- First, for added safety during the test, disconnect the main motor power lead from the 3-in-1 control unit, noting the polarity so that you can reinstall it properly following the test.

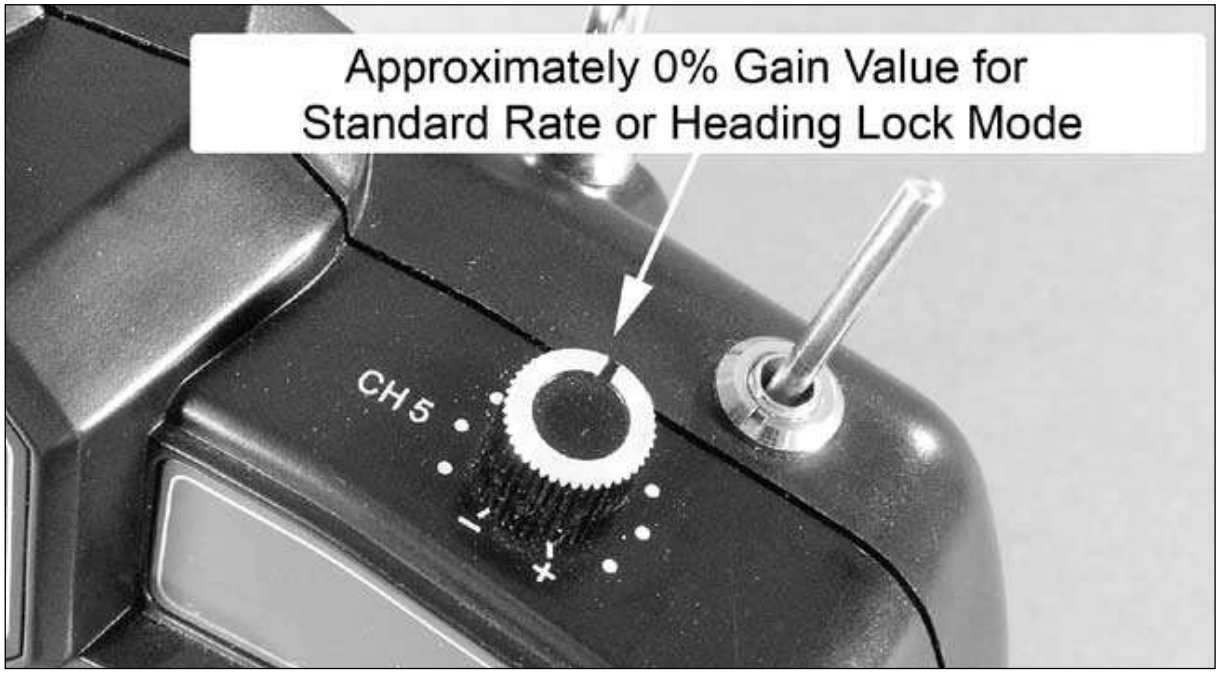
- Next, power on the transmitter, then the plug the battery pack into the battery lead of the 3-in-1 control unit. Allow time for the 3-in-1 control unit to initialize properly. Also, be sure to allow the gyro to initialize properly, as outlined in its manual. If you are using the G90 gyro, the blue status LED should illuminate solidly just before the status LED of the 3-in-1 unit becomes solid green. This will indicate that the gyro and 3-in-1 control unit are ready for the test.
- After securing the helicopter and ensuring that all objects are free and clear of the tail rotor blades, and also reconfirming that the main motor power lead has been disconnected from the 3-in-1 control unit, advance the throttle/collective stick on the transmitter to approximately 1/3–1/2 travel. Use caution, as the tail motor may begin to spin the tail rotor blade.
- Now it is best to check that the tail motor/rotor is responding properly to transmitter inputs. When inputting a slight amount of right rudder, the tail rotor rpms should increase (to push the nose of the helicopter to the right). When inputting a slight amount of left rudder, the tail rotor rpms should decrease or stop entirely. If the tail motor/rotor is not responding properly, use the Servo Reversing switch located on the front of the transmitter to reverse the direction of response.
- Once confirming that the tail motor/rotor is responding properly to transmitter inputs, it will also be necessary to confirm that it is responding properly to inputs from the gyro. After again securing the helicopter and ensuring that all objects are free and clear from the tail motor, and that the throttle is set to approximately 1/3–1/2 power, quickly twist the nose of the helicopter to the left. If the tail motor/rotor is responding properly to inputs from the gyro, the rpms will increase, to counteract the nose twisting to the left, in order to bring the nose back to the right. When quickly twisting the nose of the helicopter to right, the rpms should decrease or stop entirely. If the tail motor/rotor is not responding properly, use the Reverse switch located on the gyro to reverse the direction of response.
- After confirming that the tail motor/rotor is responding properly to inputs from the gyro and transmitter, disconnect the battery from the 3-in-1 control unit, power down the transmitter and re-install the main motor power lead into the 3-in-1 noting proper polarity for correct operation.

Now that you have confirmed proper response of the tail motor/rotor to gyro and transmitter inputs, it is time to proceed with initial adjustments of the gyro mode and gain setting, and to conduct test flights.

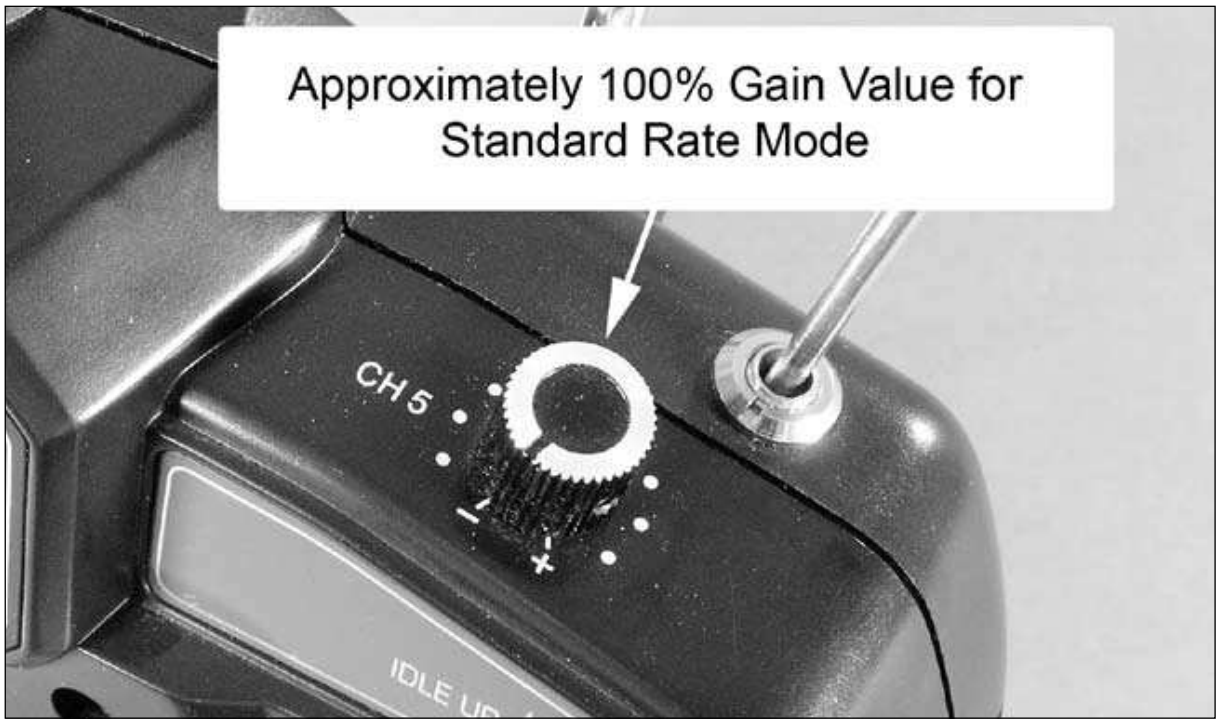
- **If you are using the G90 gyro, and have chosen not to utilize the remote mode and gain setting control option, set the gain setting adjustment pot on the gyro to a value of approximately 50% before conducting the first test flight after installing the gyro. This gain setting adjustment pot on the gyro is the same pot that you will use for adjusting the gyro gain value after conducting test flights.**

- If you are using the G90 gyro, and have chosen to utilize the remote mode and gain setting control option, you will need to use the Channel 5 knob on the transmitter for setting the mode type and gain value, as outlined in the following steps:

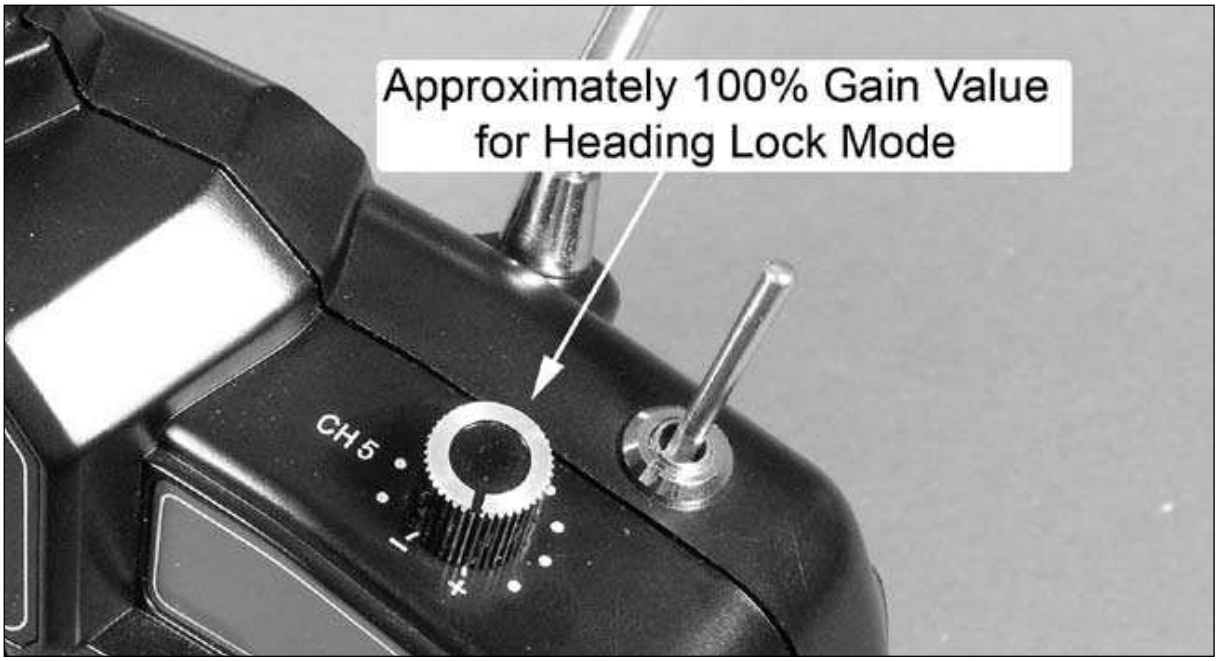
When the Channel 5 knob is in the middle position, pointing directly to the rear of the transmitter, the gain setting value will be approximately 0% for either the Standard Rate or Heading Lock modes. This point will be used for reference only as it is not generally preferred to fly with the gyro gain setting at a value that is so low.



When the Channel 5 knob is rotated counterclockwise (-) from the middle position, the gyro will be in the Standard Rate mode. This mode is the same as offered by the 3-in-1 control unit's stock gyro. When the knob is rotated full counterclockwise, the gain setting value will be approximately 100%. Other gain setting values from approximately 0–100% are also available depending on where the knob is set between the middle and full counterclockwise positions.



When the Channel 5 knob is rotated clockwise (+) from the middle position, the gyro will be in the Heading Lock mode. This is the mode that is preferred for use after installing the heading lock type gyro. When the knob is rotated full clockwise, the gain setting value will be approximately 100%. Other gain setting values from approximately 0–100% are also available depending on where the knob is set between the middle and full clockwise positions.



We recommend that you set the Channel 5 knob in the position that provides a gain setting value of approximately 50% in the Heading Lock mode before conducting the first test flight after installing the gyro. You will then use the Channel 5 knob on the transmitter for adjusting the gyro gain value after conducting test flights.

Note: It is important that you do not accidentally change the position of the Channel 5 knob between and during flights once you have found the gain setting value that provides the best tail/heading lock performance.

- Once you have made initial adjustments of the gyro gain setting, you will be ready to conduct the first test flight using your new gyro. After making the initial test flight, take your time adjusting the gyro gain setting value prior to subsequent test flights in order to find the best possible performance. The goal, when using a Heading Lock type gyro, is to find the highest gain setting value at which the tail of the helicopter will not twitch quickly from side to side in all areas of flight (including fast forward flight and descents).

Note: Although you should now be using a Heading Lock type gyro to help better maintain tail and heading lock performance during flight, it may be necessary to make small adjustments to the rudder trim setting on the transmitter in order to prevent "drifting" of the nose/tail of the helicopter. The amount of trimming required may vary depending on the gyro used and flying conditions.

Now that you have properly installed and configured a heading lock gyro on your Blade™ CP Pro, you will note a significant improvement in the ability for the tail motor power system to maintain heading and position throughout all areas of flight. Do note, however, that the tail motor power system does still have some limitations in its performance envelope and that you should take your time when learning these limits. In general, these limitations do not impact the majority of maneuvers the Blade CP Pro is capable of, and you will find the performance of the tail motor power system, when combined with the heading lock gyro, is very good overall.