# MEMS SENSOR G370 3D

## INSTRUCTION MANUAL

**Thank you for purchasing the JR G370 3D Gyro.**

Please read manual carefully for safe operation.

## FEATURES

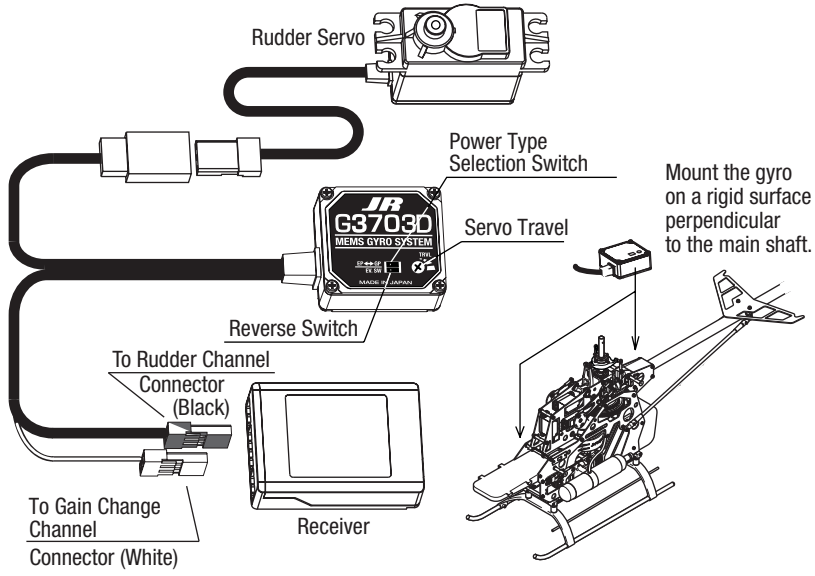
- All-in-one super compact, lightweight gyro for easier handling and installation.
- Anti-drift sensor allows high-performance flight.
- High-speed output. Capable of outputting signals to the servo in a shorter cycle, for finer control.
- Remote gain adjustment. Capable of adjusting the gain and switching between rate and tail lock modes from the transmitter.
- Aluminum case for increased durability and suppressing the effects of electromagnetic noise on the sensor.
- Equipped with an auto trim function allowing a smooth transition from normal mode to tail lock mode.
- Constant pirouette rates.
- **For use with digital servos only.**

## SPECIFICATIONS

| | |
|---|---|
| Operating Voltage: | 4.8 to 6.0V (Common for Receiver) |
| Operating Current: | 70mAh |
| Size (mm): | 10.5(H) x 27(W) x 25.5(L) |
| Weight: | 16 g |
| Gyro Gain: | Remotely Adjustable |
| Tail Lock: | Interlocked with Gyro Gain |
| Others: | Reverse Switch, Electric or Glow powered selection, Servo Travel, Auto Trim |

| | |
|---|---|
| ⚠ CAUTION | An electric helicopter generates strong electromagnetic noise. In order to avoid a malfunction, install the Gyro as far away from the motor and speed control as possible. |

## CONNECTION




## 1 INSTALLATION

1. Mount the gyro to a rigid surface, perpendicular to the main rotor shaft.

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|---|---|
| ⚠ WARNING | Large vibrations may lead to erratic performance, resulting in a crash. |

2. Clean and degrease the mounting surface completely. Use the supplied double-sided tape to securely adhere the gyro. Over time, the double-sided tape may deteriorate due to the effects of fuel and vibration. Check its condition prior to every flight and replace it periodically.

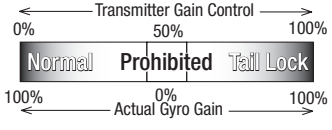
| | |
|---|---|
| ⚠ WARNING | If the Gyro comes loose during flight, the helicopter will become uncontrollable, resulting in a crash. |

3. Connect the gyro according to the figure shown above.

## 2 SETTING GYRO GAIN

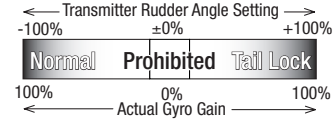
**When Using Gyro Gain Control**

Gyro gain control is as shown in the figure below. Above the gyro gain control value of 51% is tail lock mode, and below 49% is rate mode, with zero gain at 51% and the maximum gain 0% and 100%. **Warning:** Do not use a range between 49% and 51% because it is unstable.




**When Using Travel Adjust to Change the Gain**

Gyro gain control is as shown in the figure below. Positive values are tail lock mode and negative values are rate mode, with zero gain at +/-1% and the maximum gain at both ends (+/-100%). **Warning:** Do not use a range between -1% and +1% because it is unstable.



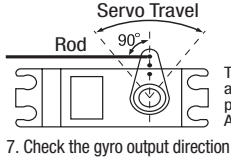

## 3 SETTING UP G370 3D

Setting up the G370 3D gyro is different than other gyros, and properly setting up the gyro is important to maximize the performance of the G370 3D gyro.

1. Select the helicopter type switch. GP for glow-powered helis and EP for electric-powered ones.
2. Set the rudder channel travel adjust settings in the transmitter to 120% in both directions, set all trims to zero (including sub trim, trim offset, and the trim levers), and turn revolution mixing off.

| | |
|---|---|
| Rudder Travel Adjust L | 120% |
| Rudder Travel Adjust R | 120% |
| Sub Trim | 0% |
| Trim | Center |
| Revolution Mix | 0% |
| Tail Lock | OFF |

3. Turn on the transmitter followed by the receiver. Do not touch the model or the transmitter stick or switches for 3 seconds while the gyro initializes.
4. Install the servo arm 90 degrees to the tail control rod.
5. Adjust the servo travel on the gyro to set the end points of the servo to prevent any binding.
6. Check the rudder servo direction to be sure it is correct. A right rudder command should move the nose to the right (if you're unsure, get assistance from an experienced modeller). Reverse the rudder channel direction in the transmitter if necessary.




The servo travel can be adjusted with the TRVL pot on the gyro. Adjust as needed.

7. Check the gyro output direction to be sure it is correct. To do so, move the rudder stick to the right and note which direction the servo arm moves on the servo (forward or back). Then move the nose of the helicopter to the left. The servo arm should move in the same direction. If it does not, reverse the reversing switch on the gyro.
8. Add exponential through your transmitter on the rudder channel. Begin with expo values of 40% and adjust the rate to suit your flying style.

## 4 FLIGHT SETTING

1. Adjust the Gyro sensitivity after initially flying your helicopter. Adjust the pirouetting (rotational) speed of the tail by changing the dual rate on both right and left rudder until you are happy with the speed of rotation. If the neutral tends to be too sensitive, use some exponential on the rudder channel, starting at approximately 40% and adjust it up or down to suit your flying style.

**Note:** Generally, if the sensitivity of the Gyro is increased, pirouetting speed will be reduced, and if the sensitivity of the Gyro is decreased, pirouetting speed will increase. In summary, this Gyro system requires you to readjust the rudder adjustments (rudder dual rate or rudder ATV) when you change the Gyro sensitivity.

2. In case you need to reset the neutral position of the Gyro, be sure not to switch the power off and on quickly, as the Gyro will recognize a false pulse and will keep the previous neutral position. To erase the existing neutral position, turn off the power and wait for 5 seconds before turning the power back on.
3. If using normal mode, set the revolution mix as described in the instruction manual for the airframe. Fly the helicopter to adjust the rudder trim and the revolution mix of the transmitter. If there is too much trim required, readjust the linkage.
4. If you move the rudder stick or turn the airframe when changing from normal mode to tail lock mode, the auto trim may be cancelled. In this case, the previously stored trim position becomes the neutral.

## 5 PRO TIPS

1. It is normal to have different pirouette rates with left versus right rudder due to helicopter set up. Use travel adjust to make the rotation speed match in each direction; increasing travel adjust speeds up the pirouette rate, while decreasing it slows the pirouette rate.
2. Use the Dual Rate function to set the overall pirouette rate.
3. It is normal to have high expo values. 40% will give a linear feel; 50% adds roughly 10% expo. Adjust to suit your flying style.
4. Servo arm length is critical for best performance. If you go too far out on the servo arm, it will be necessary to reduce the gain, in turn it will give less gyro effect, it will be oversensitive, and won't hold as well. If the servo arm is too short, the gain will need to be set too high, and may not have enough gain for the heli.
5. The ideal gain setting will be below the gain at which the tail hunts or wags. Increasing the gain will increase the holding strength and the stopping speed, however the tail hold is very strong with this gyro. Adjust the gain to get the desired stop speed. Too high of a gain setting can cause damage to the heli and the tail servo.
6. The G370 3D, 8900G and 3500G are zero deadband, which provides immediate performance and allows for very strong tail hold. Due to this, it is normal for the servo to oscillate while on the ground.
7. For best performance, it is critical that all linkages and pushrods are slop free, and free moving with no binding.
8. This gyro will only work with digital servos. Analog servos will not work properly.

## 6 SETUP EXAMPLES (Heli)

| Heli | Servo | Arm length | Gain | Travel Adj. | D/R | EXPO |
|---|---|---|---|---|---|---|
| T-REX 450 | DS3500G | 8mm | 64% | 110% | 100% | 40% |
| T-REX 500(belt) | DS3500G | 11mm | 73% | 120% | 100% | 45% |
| T-REX 500(shaft) | DS3500G | 11mm | 65% | 87% | 100% | 35% |
| Vibe 500e | DS3500G | 14mm | 77% | 120% | 100% | 45% |
| Vibe 50 | DS8900G | 14mm | 70% | 110% | 100% | 45% |
| Vibe 90 | DS8900G | 14mm | 70% | 110% | 100% | 35% |
| Vibe 90SG | DS8900G | 14mm | 73% | 100% | 100% | 45% |

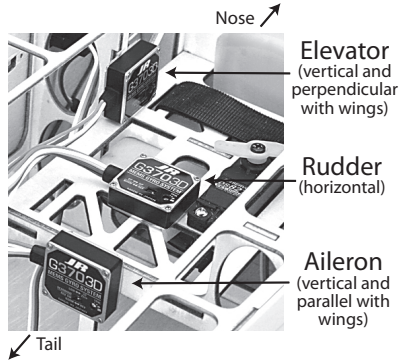
**Note:** The gyro gain listed is taken from the gyro sensitivity function in JR transmitters. If using travel adjust to set the gyro gain, you will need to adjust the percentage accordingly. 50% gain in the gyro sensitivity function is equal to 0% in travel adjust.

## 7 SETUP (Airplane)

Use of the G370 gyro in an aircraft application requires the gyro be set to rate mode gain only. **Warning:** Use of tail lock or heading hold gain in an aircraft can result in the control surface connected to the gyro lock in one direction potentially causing a crash. Use care to ensure the gyro is always in rate mode at all times.

**Warning:** For use with digital servos only.

1. Install the gyro as shown in the diagram on the right for the control surface as required for your installation. Gyros in aircraft are most commonly used on the rudder, however, some applications may also use gyros for the aileron and/or elevators. The gyro should be installed with the foam double-sided tape near the center of gravity of the aircraft for best performance. The gyro must be installed on a rigid surface such as a former or similar surface securely mounted to the aircraft. Great care must be used to mount the gyro securely, yet isolated from vibration. If the gyro becomes loose in flight, it can cause un-commanded controls, potentially causing a crash. A hook and loop strap can be loosely fitted over the gyro to ensure it does not come loose in flight.
2. Plug the servo to be controlled into the female servo lead from the gyro, and plug the black male servo lead into the channel to be controlled by the gyro, and the white plug into the gain adjustment channel being used. Refer to the diagram in the front of the instructions for proper wiring connections.
3. Set the rate mode gain in the transmitter as desired.
   a. If using a gyro sensitivity program, in some radios (such as the X9303 and 12X), the gain should be set to 49% for zero gain. For increased sensitivity, decrease the percentage in the gyro sensitivity function, the lower the value in the gyro sensitivity program, the higher the gain will be, with 0% being full gain in rate mode. Begin with low values (35% to 40%) and slowly increase the gain to get the desired performance in flight. If the gain is set too high, the aircraft will oscillate in the air. For this reason, it is recommended to set selectable gain through the transmitter by a switch, and having a gain off position (49%) to turn the gyro off.
   b. If using travel adjust to select the gain, the gain should be set to -1% for zero gain. For increased sensitivity, decrease the percentage in the travel adjust function. The lower the value in the travel adjust program the higher the gain will be (with -100% being full gain in rate mode). Begin with low values (-20% to -30%) and slowly increase the gain to get the desired performance in flight. If the gain is set too high, the aircraft will oscillate in the air. For this reason, it is recommended to set selectable gain through the transmitter by a switch, and having a gain off position (-1%) to turn the gyro off. Sub trim can be used in conjunction with the travel adjust function to ensure the gyro is always in rate mode.
4. Ensure that the gyro is always in rate mode regardless of any switch being moved. To do this, on a JR or Spektrum transmitter with the servo monitor function, make sure the gain selection channel is always to the left of the center position. To verify rate mode on the model, move the control stick in one direction and return the control stick to center. If in rate mode, the control surface will return to center position properly. If in tail lock, the control surface will not return to center, but rather remain offset in the direction moved. If this occurs, set the gain properly in rate mode before flight.
5. Check the servo direction and gyro output to be sure they are correct. First check the control direction to be sure that the rudder, aileron, and/or elevator moves the correct direction with transmitter stick input, if incorrect reverse the controlling channel in the transmitter. Then rotate the aircraft on the axis being controlled by the gyro to check output direction. If the gyro is operating on the rudder channel, if you move the nose of the aircraft to the left, the gyro should react with right rudder. If the gyro is operating on the elevator, if you rotate the nose of the aircraft up, the gyro should react with down elevator. If the gyro is operating on the aileron channel, if you roll the aircraft to the left, the gyro should react with right aileron. If the gyro output direction is incorrect, use the reversing switch on the gyro to reverse the gyro output.
6. Use the travel adjust pot on the gyro to set the overall travel of the servo to prevent binding. Use travel adjust, dual rates, and expo to adjust the feel of the gyros in flight, refer to section 3 for more information on these adjustments.
7. If multiple servos need to be controlled through the gyro, a Y-harness (JRPA135) or MatchBox™ (JRPA900/JRPA901) can be used with the gyro.




## PRECAUTIONS

- If the gyro is used in an area subject to oil, fuel, or exhaust from the engine, plug the openings for the switches and the pots with tape. Should a foreign substance or water enter the gyro, stop using it immediately and send the gyro to the Horizon Service Center.
- Do not fly in the rain, fog, or in an environment which may cause condensation.
- Do not leave the gyro in a place exposed to extreme high/low temperature or high humidity.
- The rudder servo may jitter slightly while sitting on the ground, this is normal.
- To adjust Servo Travel, use the supplied plastic screwdriver. Use of a metallic screwdriver could damage the gyro.
- Install the gyro with some slack in the leads so they are not strained during flight. If the wires are strained and cause the gyro body to move or fall off during flight, the helicopter will become uncontrollable, resulting in a crash.
- To quickly check if you are in tail lock mode or normal mode, move the rudder stick. If you are in tail lock mode, the tail servo will not return to the neutral when the rudder stick is returned to neutral.
- If the gyro is dropped, DO NOT use the gyro, send the gyro to the Horizon Service Center.
- Check the airframe and voltage of battery packs prior to every flight. Their failure may result in a serious accident.

## WARRANTY AND REPAIRS

Exclusive Warranty- Horizon Hobby, Inc., (Horizon) warranties that the Products purchased (the "Product") will be free from defects in materials and workmanship for a period of 3 years from the date of purchase by the Purchaser.

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(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

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(c) Purchaser Remedy- Horizon's sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser's exclusive remedies. Horizon reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Horizon. Return of any goods by Purchaser must be approved in writing by Horizon before shipment.

**Damage Limits**

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

**Safety Precautions**

This is a sophisticated hobby Product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the Product or other property. This Product is not intended for use by children without direct adult supervision. The Product manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or injury.

**Questions, Assistance, and Repairs**

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the Product has been started, you must contact Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please direct your email to productsupport@horizonhobby.com, or call 877.504.0233 toll free to speak to a service technician.

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If this Product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. A Service Repair Request is available at www.horizonhobby.com on the "Support" tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

**Warranty Inspection and Repairs**

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

**Non-Warranty Repairs**

Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly.

Please note: non-warranty repair is only available on electronics and model engines.

Electronics and engines requiring inspection or repair should be shipped to the following address:
Horizon Service Center
4105 Fieldstone Road
Champaign, Illinois 61822

All other Products requiring warranty inspection or repair should be shipped to the following address:
Horizon Product Support
4105 Fieldstone Road
Champaign, Illinois 61822

Please call 877-504-0233 with any questions or concerns regarding this product or warranty.

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