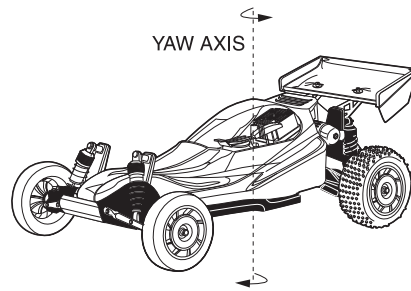
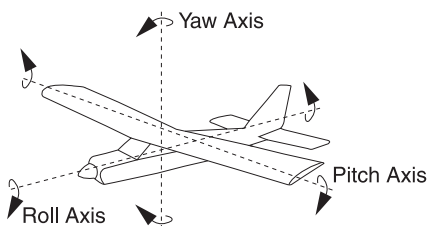
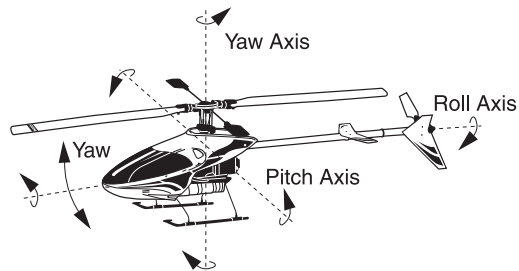


Hobbico®

Multi-Purpose Piezo Gyro

Congratulations and thank you for purchasing the Hobbico® Multi-Purpose Piezo Gyro. Originally developed to stabilize the tail rotor on R/C helicopters, gyros have now become durable enough, light enough and compact enough to use in other R/C applications including airplanes, cars and boats. An R/C helicopter would be nearly impossible to fly without a gyro—even by an expert! Now, all R/C modelers can enjoy the added stability a gyro provides. Jet pilots and scale flyers use a gyro to stabilize the nose wheel and rudder for smooth takeoff rolls. Aerobatic pilots use a gyro on the rudder to aid fancy hovering maneuvers and to straighten vertical lines or to abruptly stop a snap roll (using an additional gyro on the elevator). Boat and car modelers can use a gyro on the steering to stabilize the model at high speeds and minimize *spin outs*.



You may have heard the term *single axis* when speaking of gyros. Your Multi-Purpose Piezo Gyro is a single axis gyro (as are all gyros intended for R/C use). This means that it can be used to control only one axis. The three axes of flight are roll (the axis about which a model banks as it turns), pitch (simply stated, the axis about which a model tilts downward or upward), and yaw (the axis about which a model changes its heading). Cars and boats turn on the yaw axis just the same as a flying model. The Multi-Purpose Piezo Gyro can be used to stabilize any one of the three axes.

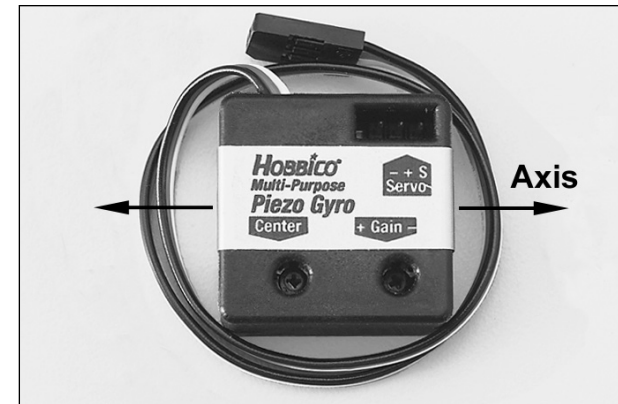
The Multi-Purpose Piezo Gyro is operated by a piezo-electric crystal. Traditionally, gyros intended for R/C models have been operated by an actual gyroscope—a spinning flywheel driven by a small electric motor. This is old technology. You've probably seen a mechanical gyroscope on one of those educational television programs showing the development of rockets for early space flight! Your Multi-Purpose Piezo Gyro uses the latest technology with a piezo-electric crystal. A piezo-electric gyro has no moving parts, is much more compact, lighter, more durable, and uses much less battery power than a mechanical gyro. A piezo-electric gyro also has a much faster response and has more precision than a mechanical gyro.

The way a gyro works is by sensing motion about the axis which it is intended to assist, then sending a signal to your servo instructing it to steer in the opposite direction. The end result is a much more stable model that is easier to control! This gyro does not, however, return the model to its starting position. Don't worry, the gyro knows the difference between this unwanted rotation and your control inputs—you're still the one in control!

Follow these instructions so your gyro will operate correctly.

PRECAUTIONS

Before you mount your gyro, keep these things in mind.



1. You can mount the gyro anywhere on your model as long as its **rotation axis** (noted on the label on your gyro) is lined-up with whatever axis you wish it to control. In the case of a helicopter, this would be the yaw axis. On all other kinds of models it would most likely be the yaw axis as well, but some airplane modelers may use a gyro to stabilize the ailerons (roll) or elevator (pitch).

2. Although your piezo gyro is mounted in a protective case, as with any electronic device, you must protect it from vibration or shock. Mount your gyro in a **strategic location** where it is not likely to hit the ground or be hit by parts of your model that may break away in a crash (such as the battery pack). Use at least one layer of 1/8" (3mm) double-sided foam tape to mount your gyro, and make certain none of the surfaces of the gyro contacts any part of the model. Clean the mounting surface with alcohol so your gyro will remain secure. Some modelers prefer to cover the gyro with foam or other protective material to provide extra crash protection. We recommend this also.

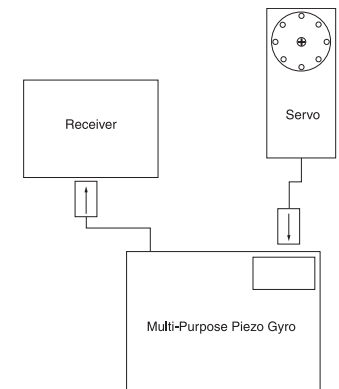
3. You may use a servo extension cord if the cord on your gyro is not long enough to reach your receiver.

4. Piezo crystals are sensitive to temperature changes. It is important that you mount your gyro in a ventilated area to avoid excess heat buildup during

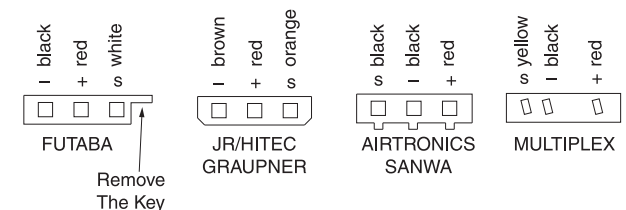
operation. Avoid mounting your gyro close to the engine or muffler, or locations on your model that do not allow much air flow.

CONNECT YOUR GYRO

As an example for the following instructions, we will use an airplane with the gyro assisting the rudder, but the instructions are the same if you are using your gyro for a helicopter, car, or boat.



1. Your Multi-Purpose Piezo Gyro comes with a Futaba® brand "J" style connector that plugs into your receiver. If you own a Futaba radio control system proceed to step 3. If you own another brand of radio with a different type of connector, you may have to modify the connector on the gyro to match your radio, and the connector on your servo that plugs into the gyro. Usually, all that is required is to carefully shave the key from the gyro connector so it will fit into your receiver and rearrange the polarity of the wires on the connector to match your radio. In some cases, you may have to cut your servo cord and the cord on the gyro, then solder on Futaba "J" connectors.



2. If you've modified your connectors, **make certain** the wiring order on your servo connector and

the gyro connector is the same as the wiring order on the Futaba connector. Study the diagram. The positive (+) wire is in the center, the negative (-) wire is on the side **opposite** of the *key* on the connector, and signal (s) is on the side of the connector nearest the *key*. **WARNING!** Failure to match polarities on any connector may damage your gyro and will void your warranty.

❑ 3. Plug the connector coming from the gyro into the channel in your receiver you intend the gyro to assist (in the case of our airplane example, this would be the rudder channel—labeled #4 on most receivers).

❑ 4. Make sure the wiring order on your rudder servo is correct. Connect the servo you intend your gyro to operate (the rudder servo for this example) into the slot on the gyro marked *servo*.

DETERMINE THE CONTROL DIRECTION

❑ 1. Turn on your transmitter and receiver. Give your rudder **left** input from the control stick on your transmitter. Note the direction the arm on your rudder servo responds.

❑ 2. Holding the gyro in your hand, quickly turn it to the **right** about its rotation axis (clockwise). The rudder servo should respond in the same direction it did when you gave it **left** input from your transmitter (now you can understand that the rudder servo will give left input when the gyro moves to the right, and vice versa). If your servo responded with a right control input when you rotated the gyro to the right, your gyro is working in **reverse** and all you need to do is flip it upside down. Try again. Now your rudder servo should give a left response when you move the gyro to the right.

MOUNT YOUR GYRO

❑ 1. Mount your gyro using the double-sided foam tape included. Make sure it is secure by gently tugging on it. If your gyro comes loose while you are flying, you will notice erratic operation. Land immediately.

❑ 2. Confirm that you have mounted your gyro in the correct orientation. Turn on your transmitter and receiver. Quickly move the nose of your airplane to the right. Observe the direction that the rudder servo responds. The rudder servo arm should rotate in a direction that will provide **left** rudder when you rotate the nose of your airplane to the **right**. If it does not, you have mounted your gyro upside down. Remove your gyro, flip it over, and remount it.

CENTER YOUR SERVO

❑ 1. Temporarily disconnect the gyro from your receiver and connect the rudder servo to your receiver. If your model has not already been flown and you have not already done so, center the rudder trim on your transmitter. Mount your rudder servo arm on your rudder servo so it is centered. Adjust the rudder pushrod so your rudder is centered (or offset as necessary for straight forward flight). Set the ATV's on your transmitter or connect the rudder pushrod to your rudder servo arm so you will get full control throw when you move your transmitter control stick all the way to the right and all the way to the left. **Hint:** For the best servo resolution (smoothness), connect your rudder pushrod to the servo arm where you can get as close as possible to 100% ATV.

❑ 2. Reconnect your gyro to your receiver and your rudder servo to the gyro. Use a small Phillips screwdriver to temporarily set the **+Gain- dial** inside the gyro to approximately 50% (we'll explain this function in the next section). The gain control dial has a total range of a little less than 270°, so turn the dial all the way to the right (clockwise-no gain), then turn your screwdriver about 140° to the left (toward +Gain). Do not force the dial past its stops.

❑ 3. Note the position of your rudder servo arm now that you have centered it. Turn on your transmitter and your receiver. Observe the rudder servo arm. If it rotated when you turned on your radio, use a small Phillips screwdriver to adjust the **Center dial** inside the gyro until your rudder servo arm returns to center. Now your rudder servo is once again centered. Later, if you choose to adjust the Gain control on the gyro, you may have to readjust the Center dial to keep your rudder servo centered.

SET YOUR GYRO SENSITIVITY (GAIN)

The sensitivity, or *gain* control, determines how much effect your gyro will have on your rudder (or steering if you have a car or a boat). The more sensitive you have set your gyro, the more stable your model will be, but this may reduce aerobatic capability or maneuverability where rudder or steering quickness is desired.

❑ 1. At first, you'll just have to estimate the gyro sensitivity required to stabilize your model. 50% is a good starting point. You've already been instructed to set the +Gain- control dial to 50% so you're ready to go. Read the following instructions to know how to fine tune your gyro.

❑ 2. Before you get your first flight with your gyro, make sure your receiver and transmitter are turned off and let your model sit outside for a few minutes. This will allow the gyro to become acclimated to the temperature and is necessary due to the temporary effect that the temperature change can have on your gyro.

Perform the following exercises to fine tune your gyro sensitivity.

❑ 3. Turn on your transmitter and receiver. Confirm the operation of your gyro. Start your engine and fly your model. Test the operation of the rudder (or steering) by trying a few maneuvers that require rudder. If you do not see the stability you desire, land your airplane and **increase** the gain dial on the gyro. If the tail *hunts* or *wags* back and forth, or responds too slowly, land your airplane and **reduce** the gain dial. Make adjustments in small increments. Continue to fly your airplane (or run your car or boat) adjusting the gain control until your model handles the way you prefer.

❑ 4. As the temperature changes, the centering of your servo may shift (due to the gyro's temperature sensitivity). Use the Center control dial on your gyro to maintain servo centering as required.

TECHNICAL SPECIFICATIONS

Power supply:	3.3-7.0 volts DC
Current drain:	approximately 35mA
Weight:	0.49oz (14g)
Dimensions:	1.1x1.1x0.6in. (28x28x16mm)
Temperature range:	50°-95° F (10°-35° C)

ONE YEAR WARRANTY STATEMENT *USA and Canada Only

Hobbico warrants this product from defects in materials and workmanship for a period of one year from the date of purchase. During that period, Hobbico will, at its option, repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase (invoice or receipt). This warranty does not cover damage caused by abuse, misuse, alteration or accident. If there is damage stemming from these causes within the stated warranty period, Hobbico will, at its option, repair or replace it for a service charge not greater than 50% of its then current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty gives you specific rights. You may have other rights, which vary from state to state.

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*For warranty and service information if purchased outside the USA or Canada, see the additional warranty information (if applicable) or ask your retailer for more information.

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