

# Hobbico®

## Airplane Stabilizer Piezo Gyro

Congratulations and thank you for purchasing the Hobbico® Airplane Stabilizer Piezo Gyro. Originally developed for R/C helicopter pilots to stabilize the tail rotor control, now airplane pilots too have become aware of the benefits a gyro can provide. There are other gyros available that will function in an airplane, but your Airplane Stabilizer Piezo Gyro is specially designed to be used in an airplane with features airplane flyers require.

The Airplane Stabilizer Piezo Gyro is perfect for aerobatics, thermal flying, glider towing (in both the towing craft and the glider), jets and scale models. Basically, the Airplane Stabilizer Piezo Gyro is perfect for any model with a stability problem, or for any pilot who wants to enhance their flying with the added stability of a gyro.

## FEATURES

Your Airplane Stabilizer Piezo Gyro has two servo signal inputs and two servo outputs—each with its own reversing switch. This enables you to use your gyro for a control that is operated by two servos (such as dual servo operated elevators or ailerons). This also enables you to retain your mixing without affecting the operation of the gyro. For example, if you wish to connect your gyro to the elevator (operated by two servos), your elevator/rudder mixing will still be able to function correctly. Similarly, if you wish to connect your gyro to the ailerons (each operated by its own servo), the gyro will not affect your mix.

Your Airplane Stabilizer Piezo Gyro has a third input for **gain control** which allows you to you

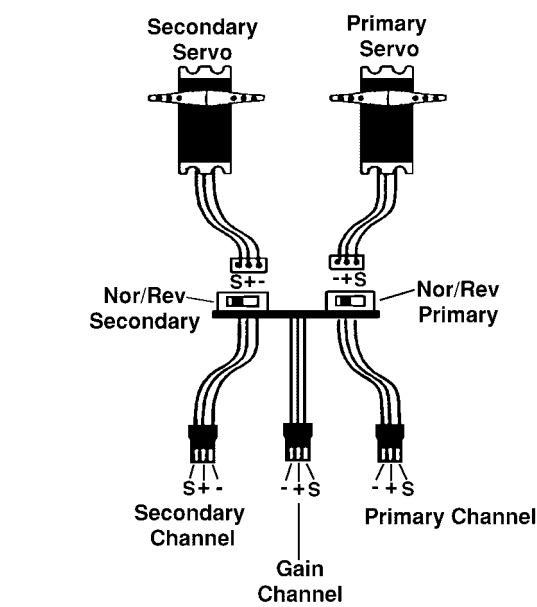
adjust the sensitivity or effectiveness of the gyro, and you can do it while in flight. This requires an adjustable control knob or a pot on your transmitter (or a programmable mix if you have a computer radio). You may also turn the gyro off when it is not needed.

A built-in mixer reduces the gyro's effect when you move the control stick from center. As the control stick nears the end of its range and the gyro's effect is reduced, you have the same feel or responsiveness that you would without a gyro—a kind of *reverse exponential* effect. In addition, the gyro recognizes when the input is coming from the stick or from a mix. For example, if you are using your gyro to stabilize your ailerons and you have a flaperon mix, the gyro's sensitivity will not be reduced when the ailerons are extended by your flaperon mix.

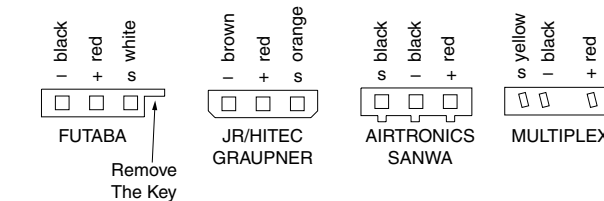
Follow these instructions to hook up and operate your gyro correctly.

## CONNECT YOUR GYRO

1. If you have not done so already, test fly your airplane and make sure all your controls are set up correctly and the model is trimmed to fly the way you like.
2. Decide which control you would like your gyro to operate. To illustrate these instructions, we will connect the gyro to the ailerons operated by two servos that are mixed electronically.



3. Your Airplane Stabilizer Piezo Gyro comes with Futaba® brand “J” style connectors. If you own a Futaba radio control system, proceed to step 5. If you own another brand of radio with a different type of connector, you may have to modify the connector on your gyro and the connector on your servos that connect to the gyro. Usually, all that is required is to carefully shave the key from the gyro connector so it will fit into your receiver. In some cases, you may have to cut your servo cord and the cord on the gyro, then solder on Futaba J-connectors.



4. 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.



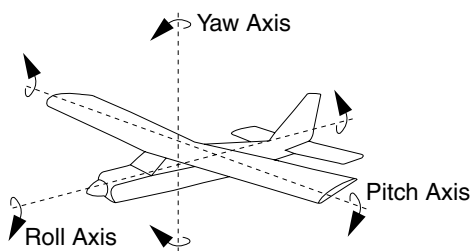
5. If you are using an electronic mix (as in our example), one of your servos is a *primary* and one of your servos is a *secondary*. Connect the **primary connector** of the gyro into the plug of your receiver that operates your **primary servo**. In our example, we are using the gyro to assist the ailerons, so you would connect the primary connector of the gyro into the receiver plug of the primary aileron servo. If the function you wish the gyro to assist is only controlled by one servo, just connect the primary connector of the gyro into the plug of the receiver that operates that servo.

*Skip step 6 if the control you are using the gyro to assist is operated by only one servo.*

6. Connect the **secondary connector** of the gyro into the plug of your receiver that operates your **secondary servo**. In our example, this would be the plug of the receiver that your other (secondary) aileron servo is connected to.
7. Connect the sensitivity (gain) connector to an auxiliary plug in your receiver that can be operated by a control knob or a pot on your transmitter. If you have a computer radio you can use a control knob or your mix to adjust the sensitivity in flight.

## MOUNT YOUR GYRO

Keep these things in mind before you mount your gyro.



❑ 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 the axis you wish it to assist. In the case of our example, this would be the roll axis.

❑ 2. As with any electronic device, you must protect your gyro 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.

❑ 3. You may use servo extension cords if the cords on your gyro are not long enough to reach your receiver.

❑ 4. The piezo crystal inside your gyro is sensitive to temperature changes. It is important that you mount your gyro in an area that will not be subjected to excess heat buildup during flight (glider pilots—no problem!). Avoid mounting your gyro close to the engine or muffler.

❑ 5. Mount your gyro using double-sided foam tape. 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.

## CHECK THE OPERATION

❑ 1. Set your model on your workbench. Turn the receiver on and **do not move your model for five seconds**. When the servos are centered, you may move your model.

❑ 2. Turn on your transmitter. Turn the gyro off using the transmitter switch that operates the auxiliary channel of your gyro. Confirm that the gyro is turned off by rotating your model about the axis that the gyro is connected to (roll in our example). The aileron servos should not move. Confirm that the ailerons are working correctly by moving your transmitter stick. Check your mixing functions if you have any. If your servos do not respond as expected (as they did **before** you connected your gyro), do not change any of your mixing functions or your radio setup but double check all the connections of the gyro.

❑ 3. When you have confirmed that everything operates correctly, use the control knob on your transmitter (programmable mix) to set the gain control to 50%.

❑ 4. Hold your model and quickly rotate it about the axis the gyro is operating. In the case of our example for the roll axis, quickly bank the model to the right and the left as if it was performing a roll. When the right wing dips downward, observe which way the right aileron responds. If installed correctly, the right aileron should deflect downward to counteract the right roll of the model. Similarly, when the left wing moves upward (as if in a right bank), the left aileron should deflect upward to counteract the right roll of the model. If your gyro responds opposite of the way described, turn the receiver switch off and reverse the **switch on the gyro** connected to the incorrectly responding servo(s). Turn the receiver switch back on and test again.

## TEST FLY YOUR MODEL

In general, the practice is to fly your model with the highest possible gyro setting to realize the greatest stability about the axis your gyro is

assisting—you want to get the most out of it. However, your gyro can be set too sensitive hampering flight performance. So, the goal is to find the limits of the gyro.

❑ 1. After thoroughly testing and confirming the operation of your gyro as previously described, take your airplane out to your flying field and fly it. Before you perform any radical maneuvers, fly your model through a range of speeds and see how the gyro affects your model. What you are looking for is a “hunting” or “wagging” effect indicating that your gyro is set too high. If your gyro is mounted on the roll axis, the wing may slightly oscillate up and down because the gyro is trying to correct itself.

❑ 2. Decrease the gain from your transmitter using a control knob or your mixing. You can do this while your model is in the air or land your model if necessary to make this adjustment.

❑ 3. If your gyro does not have the desired effect, increase the gain until it is too high as previously described, then back it off until your model handles the way you prefer.

## TEMPERATURE DRIFT CORRECTION

All piezo elements are subject to changing their behavior with large temperature changes and age. If the temperature changes rapidly while you are using your gyro, your servo centering may change. To reverse this effect, disconnect your gyro and remove it from your model. Connect the gyro leads into the corresponding plugs on the gyro (plug the gyro into itself). Put the gyro in your freezer for about twenty minutes (-15° C, 5° F, is ideal). Remove the gyro from your freezer and connect the gain control lead directly to your receiver battery. Let your gyro slowly adjust to the outside temperature, then use a hair dryer to continue to heat it slowly up to a temperature of about 60° C (140° F). Disconnect the battery. Your gyro has now relearned to correct for temperature drift.

## TECHNICAL DATA:

Size:	1.3x1.5x0.8in (34x40x20mm)
Weight:	0.88 oz (25 grams)
Voltage:	range 3.5 to 8 volts DC
Consumption:	35 mA
Piezo-Sensor:	8-bit microprocessor, temperature stabilized

## 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.

For service on your Hobbico product, warranty or non-warranty, send it post paid and insured to:

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We can also be reached on the internet at:

[www.hobbico.com](http://www.hobbico.com)

\*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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