Heli-Max™
PERFORMANCE PARTS

MINI PIEZO GYRO WITH REMOTE ADJUST
Instructions

Congratulations and thank you for purchasing the Heli-Max™ Mini Piezo Gyro with Remote Adjust for R/C helicopters. Though designed for advanced pilots, this gyro is suitable for beginner pilots too. These instructions are written for both, so some of the information will be elementary to experienced heli pilots.

This gyro must be used with a transmitter that has an auxiliary channel with an ATV (typically the "gyro" channel, or channel 5 in a helicopter radio). Otherwise, there will be no way to adjust the "gain," or sensitivity of the gyro. It will always be set at 100%, making the helicopter uncontrollable. If you do not have this type of transmitter, the Heli-Max Micro Piezo Gyro (HMXM1010) is recommended. It has a gain adjustment on the gyro itself.

Note: The terms "gain" and sensitivity are used interchangeably throughout this manual. Simply stated, gain refers to the amount of input or control a gyro has over the servo it is connected to. In helicopters, a gyro adjusted to a high sensitivity will have a great effect on the tail rotor servo and will strongly hold the nose of the heli in position.

For the best effect, the Heli-Max Mini Piezo Gyro should be used with a high-speed, high quality servo on the tail rotor. When connected to a gyro, the tail rotor servo moves constantly at high speeds and receives more stress than a regular servo. On helicopters that are flown competitively and log many hours in a short period of time, the tail rotor servo is usually the first servo to fail, or the first one to be replaced during a routine inspection. Low quality servos cannot stand up to such use. Ask the helicopter expert at your local hobby shop or a qualified helicopter pilot for recommendations. The faster the servo the better the result.

ABOUT GYROS

A gyro stabilizes the tail rotor control. Of all the controls on a model helicopter, the tail is the most difficult to master. In fact, flying an R/C helicopter without a gyro is nearly impossible, or extremely difficult at best. Even an expert wouldn't be caught without a gyro, and a beginner would probably never get off the ground without one. Someday you may wish to find out how difficult it is to fly a model helicopter without a gyro–just turn off your gyro and try to establish a hover–you'll see! Don't try this until you have mastered hovering!

A gyro senses motion about the axis which it controls (the yaw axis on a helicopter), and sends a signal to the servo-instructing it to *steer* the nose in the opposite direction, thus preventing unwanted rotation. The end result is a much more stable tail and a helicopter 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!

In addition to stabilizing your helicopter, the Heli-Max Mini Piezo Gyro with Remote Adjust features dual settings that are adjusted from your transmitter. Two different gyro settings are desirable depending upon the types of flying you are doing. For hovering, a higher gyro sensitivity is preferable to strongly hold the tail, but for forward flight and some aerobatics a lower gyro sensitivity is best. The settings are adjusted from the transmitter, which eliminates the clumsy task of bending over, stopping the rotor head, removing the canopy and adjusting the gyro mechanically with a screwdriver. Some pilots who own a programmable computer transmitter may wish to mix the gyro to the tail rotor with an available programmable mix, thus *automatically* decreasing the effect of the gyro at extreme rudder stick positions (and eliminating the need to operate a switch to change from one gyro setting to the other).

Follow these instructions so your gyro will operate correctly.

CONNECT THE GYRO
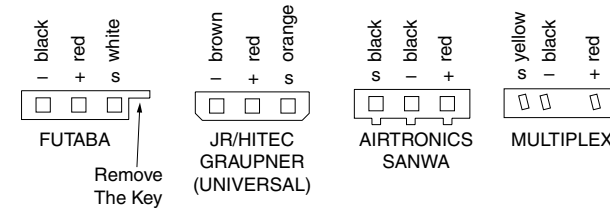
❏ 1. The Heli-Max Mini Piezo Gyro comes with universal connectors that work with all brands of radios. All you have to do is make sure the polarities of your system match the polarities of the gyro connectors. When connecting the gyro to the tail rotor servo and receiver as described in the following steps, refer to the diagram above.
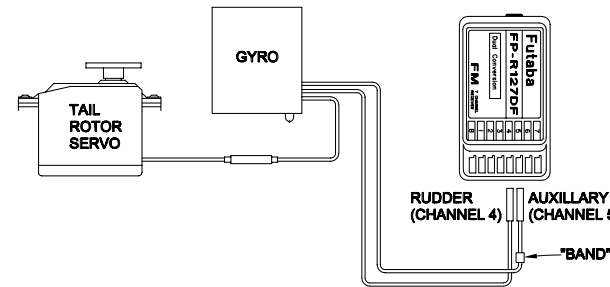
❏ 2. Connect the tail rotor servo to the connector on the gyro (there is only one connector on the gyro that will connect to the servo).

❏ 3. Connect the cord coming from the gyro *without* a band on it into the rudder channel of the receiver (usually channel 4.).

❏ 4. Connect the cord coming from the gyro *with* a band on it to the "gyro" channel of the receiver. This is usually channel 5 and is operated by the switch that will be used to select the two gyro sensitivity settings.

MOUNT THE GYRO

Before mounting the gyro, keep these things in mind...

❏ 1. The gyro can be mounted anywhere on the helicopter as long as its **rotation axis** (noted on the label on the gyro) is parallel with the axis you wish to control. In the case of a helicopter, this would be the yaw axis (parallel with the main shaft).

❏ 2. Although the gyro is mounted in a protective case, as with any electronic device, it must be protected from vibration and shock. **When instructed to do so,** mount the gyro in a **strategic location** where it is not likely to hit the ground or be struck by any parts of the helicopter that may break away in a crash (such as the battery pack). Most helicopters have a location intended for mounting the gyro. Use at least one layer of 1/8" (3mm) double-sided mounting foam to mount the gyro, and make certain none of the surfaces of the gyro contacts any part of the helicopter. Clean the mounting surfaces with denatured alcohol so the 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 a servo extension cord if the cord on the gyro is not long enough to reach the receiver.

❏ 4. Piezo crystals are sensitive to temperature changes. It is important that you mount the gyro in a ventilated area to avoid excess heat buildup during operation. Avoid mounting the gyro close to the engine or muffler, or in any locations that do not provide air flow.

❏ 5. Mount the gyro using the included double-sided foam tape. Make sure it is secure by gently tugging on it. If the gyro comes loose during flight, you will notice erratic tail operation. Land immediately and turn off the engine.

CONFIRM THE DIRECTION OF OPERATION

❏ 1. Turn on the transmitter and receiver. Do not move the helicopter. Wait three seconds for the

gyro to calibrate its sensor and confirm that it is operating correctly (indicated by the LED on the gyro blinking regularly with a single flash).

❏ 2. Quickly rotate the nose of the helicopter to the **right** and observe the direction that the arm on the tail rotor servo responds. The arm on the tail rotor servo should rotate in a direction that will make the tail rotor turn the nose of the helicopter to the left. If it does not, move the switch on the bottom of the gyro to the other position.

❏ 3. Turn off the gyro. Turn on the gyro. Wait three seconds. Perform step 2 again to confirm that the gyro is responding in the correct direction.

Caution: If the gyro is operating backwards, the helicopter will pirouette uncontrollably at a high rate of speed.

SET THE GYRO'S SENSITIVITY

This step is only a starting point to setting the gyro's sensitivity rates. Once at the flying field, the rates will have to be fine-tuned by flight testing.

❏ A. Determine which switch on the transmitter is the one that operates the "gyro" channel (usually channel 5). From now on this will be referred to as the "gyro" switch and is the switch that will be used to select between the two gyro sensitivity settings.

Set the ATV's so that when the gyro switch is away from you, the gyro is in the more sensitive setting for hovering. For aerobatics, the switch will be flipped to the other position, toward you.

❏ B. With the gyro switch away from you, set the ATV to 60%.

❏ C. Flip the gyro switch to the other position (toward you). Set the ATV to 30%.

FLIGHT TESTING

Now that the gyro's sensitivity rates have been tentatively set up on the workbench, the gyro must be fine-tuned by flight testing.

❏ 1. If you are a beginner and are not yet able to break into forward flight, for now you'll just have to estimate the gyro sensitivity required. 60% is a good starting point. Beginners also do not yet have a requirement for two different sensitivity settings and should set the ATV's in **both** gyro switch positions to 60%.

❏ 2. When you take the heli outside, allow it to sit for a few minutes before turning the radio on. This will allow the gyro to become acclimated to the temperature and is necessary due to the temporary effect the temperature change can have on a piezo gyro.

❏ 3. Move the gyro switch to the "hovering" (more sensitive) position.

❏ 4. Turn on the transmitter and receiver. Wait three seconds. Confirm the operation of the gyro. Start the engine and lift the helicopter into a hover. Beginners who are not yet able to hover should increase power until the helicopter becomes *light* on its landing gear (or training gear), yet does not leave the ground.

❏ 5. Give a tail input to test the response. If the tail responds faster than you prefer or is not stable, the gyro is not sensitive enough. Land the helicopter and **increase** the ATV. If the tail *hunts* or *wags* back and forth, or does not respond as quickly as you would like, the gyro is too sensitive. Land the helicopter and **reduce** the ATV. Make adjustments in small increments. Continue hovering and adjusting the ATV until the helicopter handles the way you prefer.

If you are a beginner and are not yet into forward flight and aerobatics, you are done. But you should read step 6 anyway!

❏ 6. Adjust the gyro for forward flight and aerobatics. The setting you achieved in a hover may work for general sport flying, but fast forward flight and aerobatics may require a less sensitive gain setting. To test this, flip the gyro switch to the other position. Fly the helicopter around and try a few aerobatic maneuvers. As in a hover, if the tail *wags* or bounces back and forth, the sensitivity is too high. Land the helicopter and reduce the ATV for that switch position. If more gyro sensitivity is required, increase the ATV. Continue to fly your helicopter and adjust the ATV as required.

SPECIFICATIONS

Power Supply:	5 volts (3 volts minimum, 9 volts maximum)
Idle Current:	approximately 80 mA
Weight:	approximately 20 grams (0.70 oz.)
Dimensions:	43 x 35 x 13mm (1.69 x 1.38 x 0.51")
Temp. Range:	-10 degrees to +60 degrees Celsius

ONE YEAR WARRANTY STATEMENT
*USA and Canada Only

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

HOBBY SERVICES
1610 Interstate Drive
Champaign, IL 61822
Attn: Service Department
Phone: (217) 398-0007 9:00 A.M. - 5:00 P.M Central Time M-F
E-Mail: *hobbyservices@hobbico.com*

We can also be reached on the internet at:

www.hobbies.net/helimax

*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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