

How do I setup the gyro and rudder servo?

In this section I will explain the proper method of centering your gyro/rudder servo for best flying results. These tips will apply to any helicopter. In todays helis there are two basic types of gyros, "Heading Hold" and "Standard". This section will explain the proper "basic" setup required for both, although we will go into Heading Hold setups in further detail in a later section.

Before we should even plug in the gyro we MUST center the rudder servo first. While on the rudder subject, the faster the servo transit time, the better the gyro responds, thus the easier it is for you to fly. Heading Hold (HH for short) gyros require a MINIMUM .15 transit time or better. If the servo isnt fast enough, it will wag constantly (in heading hold). This happens when the servo moves where the gyro is telling it to go but, by time it gets there, the gyro has already told it to go somewhere else... it cant keep up.

1. With the servo mounted in the heli, and a servo horn temporarily on the spline (servo shaft) plug the rudder servo directly to the rudder channel of your reciever.
2. Make sure ALL trim tabs are centered, revo mixes are OFF, sub trims (computer radios) and ATV's are all centered, etc.
3. Turn on the transmitter power, turn on the helicopter.

At this time you will hear the servos twitch for a brief instant as they come to life, as normal. Looking at the rudder servo horn, the ideal setting is to have one of the servo arms 90 degrees to the servo, or straight up and down. IF your arm IS NOT straight up and down we need to adjust it so it is.... there are two ways to do this basically.

A) Course adjustment (to be made first, always) is by just pulling the servo horn off and moving it on the spline.

B) Fine adjustment (final adjustments) is made by adjustments on the transmitter.

Now, if you look closely at a futaba servo horn, and in the diagrams below, you will notice there are tiny little numbers on each leg. By removing the horn from the servo you can rotate it slightly to find the correct numbered leg that will get you CLOSEST to being 90 degrees or straight up and down. One number may be way off...another slightly off, and one may even be dead center... just find the one that is the CLOSEST...



In the image to the left, leg 5 is close but just wont center. move it one spline and its to far the opposite direction. In the center diagram, leg 1 happens to come close or even right perfect..

4. Find the leg that is closest of your servo horn and place it on the servo so its centered straight up and down as in center diagram, REMEMBERING what numbered leg is the correctly centered one! Mark it somehow or cut the remaining arms off but remember which is the correct leg that you will be using.

Our next step is to "mechanically" set the linkage throws (course adjustment). Temporarily put a ball on one of the holes (of the proper numbered leg) or if your heli uses Z-bends

place the rod in one of the holes for the time being.

5. Move the rudder stick on the transmitter left, then to the right full deflection on the stick. While doing this look at the tail pitch slider on the tailshaft. We want the slider to reach to max travel in either direction on the tail shaft WITHOUT major binding or too much travel to either direction or both...

If the slider is maxing out (servo will buzz if binding) then the ball or Z-bend will need to come IN one hole on the leg of the horn. If the slider isn't reaching full travel then we will need to go OUT one hole on the leg of the servo horn. If one side is maxing a little bit and one side is a bit short this will work, as the neutral hover pitch setting will probably correct this but just get the hole that gives you full travel with MINIMAL binding... a little is ok but if the servo is buzzing a lot when you move the stick full left or right then the rod length will have to be adjusted by the plastic links or a coupler (like on a raptor).

6. Turn off the power to heli, turn off the transmitter

Now that we have the servo mechanically centered, the rod centered and have equal travel on the pitch slider we can put the servo horn screw in the servo. Remove the other legs of the horn that you WILL NOT be using if not already done so.. they will bind on the rods possibly!

Connecting the gyro

Disconnect the rudder servo from the rx right now. Connect the gyro as per the instructions with your particular gyro. If you have a single rate gyro this is simple one wire goes to the servo, one to the rx..... a dual rate gyro will have those connections plus a wire to a spare channel to be able to manually select between two settings and be able to manually adjust them from the transmitter.

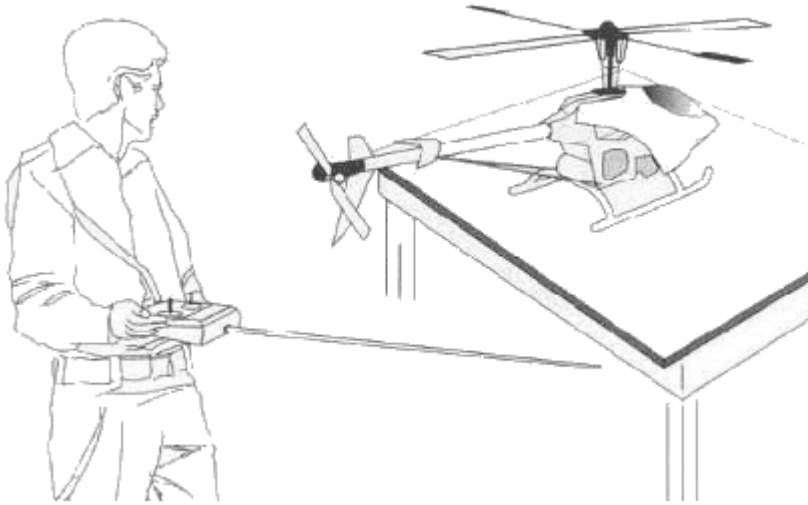
Mounting the gyro

One of the most common mistakes made by beginners is mounting the gyro on the wrong AXIS. This will make the heli UN-FLYABLE.

1. Set the gyro flat on a table temporarily while still being connected to heli...or on the gyro platform of the heli.
2. Turn the tx on, turn the heli on. Certain gyros may require a short initialization period for a few seconds before it will work so don't move the gyro till this time is up...
3. After power is on and gyro has initialized, hold the gyro and rotate it left, and right, it should make the rudder servo move like mad. If it doesn't....tilt the gyro forward and back....and find the movement that makes the servo move... most gyros will have an arrow on it showing the proper axis of movement. You want the gyro mounted so that if you held the heli by the rotorhead in one hand, and grabbed the tail with the other, if you moved the tail left and right that the gyro moves the servo... if it doesn't you have the gyro laying on the wrong axis (wrong side of the gyro box).....
4. Once you're sure you have it in the right axis mount it to the heli with the provided two-sided sticky tape. CSM gyro tape is preferred here, it's just great stuff.

Now you may have noticed that the servo arm may not be centered... that will now be adjustment by one of the fine adjustments... since we know it's "mechanically" correct. The basic single rate, (and a few dual rate) piezo gyros have an adjustable pot on the box somewhere that allows you to adjust the centering of the gyro. adjust this so the arm comes back to 90 center, if it was off...

Determining if gyro and servo are to be normal or reversed



Lets check the servo first then the gyro. if your sitting behind the heli looking at the tail blades...

1. Move the rudder stick to the left.
2. Look at the tail blades, the TRAILING edge of the blade should move or point to the left also... if it does NOT, then you need to REVERSE the rudder servo!
3. Now that the servo is in right direction lets make sure the gyro is right direction (if you dont do this correctly you will know as soon as you try to lift off into hover, the helicopter will try to spin very fast) This is one reason why you SHOULD have a experienced flyer do the first flights on your machine.. he will expect this and can even fly it with some servos reversed.
4. Looking at the rudder servo horn, move the stick to the left, noticing the direction the rudder servo horn is moving...
5. Grab the tail of the heli and move the tail to the left so the nose goes to the RIGHT. when you do this the servo arm should go in the same direction as you did when you moved the stick to the left... if it goes in the opposite direction then you need to find the switch on the gyro to REVERSE the gyro itself...

You have now succesfully performed a gyro setup. All that will be needed now is to set the gain... for starters off the bench set it around 50-70% or have an experienced pilot do your first few flights...

These tips are brought to you by Dave Townsend - Hobbytown USA heli dept.