AMOS March 2016 Newsletter

AMOS Board Meeting 2/29/16 @ 6:00PM - recap

Guests Present: Doug Keller

Unfinished Business:

FAA Registration;

There was general discussion of a number of questions relating to FAA registration. Questions discussed included:
(1) Whether the club should keep a record of members' registration numbers;
(2) Whether keeping track of members' FAA registration should be part of the duties of the Membership Chairman;
(3)Whether members should be required to show or produce copies of their FAA certificates;
(4) Whether the club has to police FAA registration;
(5) Whether the club should set a deadline for FAA registration and revoke the flying privileges of any member who does not register by the deadline.

According to Membership Chairman Jim Irey 78 members so far have provided their FAA numbers and/or expiration dates.

Motions for General Meeting:

Three motions were presented to the members at the last general meeting and are up for vote at the coming general meeting.
They are:
(1) Amend the Constitution to make failure to comply with FAA regulations a possible ground for termination of membership;
(2) Amend the Constitution to create a new non-flying, non-voting and non-dues paying category of Associate Member;
(3) Amend the Constitution to require all members, to be eligible to fly, to be properly registered with the FAA, have their FAA number on or in their plane, and have their registration certificate in their possession.
The consensus of the Board was that measure (3) presented too many procedural and administrative obstacles to adopt it at this time.

It was decided to hold the vote on items (1) and (2) at the general meeting but to recommend tabling the vote on item (3).

Club Flag- Printing on both sides looks odd. By unanimous approval it was decided to have the flag printed on one side only.

New Business:

Lawn Mowers :

President Mike Haston reported that a newly donated lawnmower has a blown engine, no one available to repair it, and probably too expensive to repair anyway. The club currently has three working lawn mowers, one of which is too small to be of much use. It was concluded not to repair the blown mower at this time and to request donation of another lawn mower.

Security Issues:

Discussion concerned the recent break in at the field where the lock was cut. Consensus was not to try to get a tougher lock because then they might ram the gate. Consensus also that a security camera or a game camera would be ineffective and would probably be stolen anyway. Concluded to make no change in security measures and not to keep anything of value at the field.

Lincoln Regional Air Fest 2016:

President Mike Haston reported that Robert Butera had requested that AMOS set up a booth and make a couple of demonstration flights at the Lincoln Regional Air Fest on June 11, 2016. This date conflicts with our Warbird event. We will need a couple of flyers who are not taking part in the Warbird event and someone to man a booth. The booth can be an opportunity to advertise our Warbird event. We will ask for volunteers at the General Meeting. Keith Roberts will be the lead on this item.

Board Reports:

Treasurer Gloria Irey was absent. She prepared a monthly report for February which is attached to these minutes.

Safety/Training Marvin Bennett. Reported on progress on a general information paper to be given to all new flyers. Training will officially start on March 16.

Field Marshall Glen Gibson. Reported the field has been picked up. Start stands that needed new carpeting attached have been done. Thanks are in order to Les Klear and Gary Matthews. Glen also donated an American Flag to the club.

Membership Jim Irey. We now have 189 members.

Contest Coordinator/Public Relations Hilton Sorkazian:

Trying to get in touch with someone from the Red Barons. Needs contact information. Needs suggestions for games or events for Red Baron Day. Date has to be set for Red Baron Day. Should be in April, August, or October. Other months are already too heavily booked. To try to get KCRA to cover one or more of our events.

AMOS General Meeting 3/8/16 @ 7:00PM - recap

Guests: Julia Yousif, Keith Fick

New Member: Tom Fischer

Unfinished Business:

Motion to Table: A motion was made and seconded to table everything pertaining to FAA Registration until AMA adopts directives concerning compliance. Motion was voted down.

Amendment to Constitution:

By a vote of 2/3 of the voting members present at the meeting, the following amendment to the Constitution was approved:
ARTICLE III, Section 5 of the club's Constitution is amended by adding the words "or FAA" to subparagraph A so that it will read in full as follows:
"Section 5. Membership Revocation of Membership in AMOS may be revoked for one or more of the following
reasons:
A. Failure to comply with FCC **or FAA** regulations.
B. Failure to comply with applicable AMA or AMOS rules.
C. Continual violation of safe practices in the building or operation ofmodel aircraft/helicopter/car.
D. Continual unsportsmanlike conduct.
E. Theft or vandalism of any kind to property of Club members or Club property or buildings.
F. Any actions that are to the detriment of the Club."

Amendment to Constitution:

By a vote of 2/3 of the voting members present at the meeting, the following amendment to the Constitution was approved:
Section 4 of ARTICLE III of the club's constitution is amended by adding the following subsection "F" to read as follows:
"F. Associate Member an individual who has been recommended to and approved by the Executive Board (with confirmation by a majority vote at a general membership meeting) to associate membership in AMOS.
Such a person will be entitled to all benefits of membership except flying and voting and will not be required to be an AMA member or pay AMOS dues."

Amendment Tabled - A proposal to Amend the Constitution to require all members, to be eligible to fly, to be properly registered with the FAA, have their FAA number on or in their plane, and have their registration certificate in their possession was tabled with the consent of the members present.

New Business:

Broken Lawnmower - President Mike Haston stated that the club has a lawnmower with a blown engine that is not worth a lot of money to fix. He is looking into the possibility of getting a replacement engine.

Wind Socks - Motion made, seconded and approved unanimously to take down the windsocks in the pit area and parking area. The windsock east of the crosswind runway will remain.

Board Reports:

President Mike Haston: Next Club event is the RC Country Swap Meet, April 16. Tracy Trammel is in charge. Our club swap meet on March 12 is cancelled due to weather. All members are requested to send their FAA registration information to Membership Chairman Jim Irey.
Secretary Jody Kahan: There was an error in the last Board Minutes distributed to members. A corrected version will be distributed.
Membership JimIrey: There are currently 192members. Four of them are unpaid to date.
Safety/Training Marvin Bennett: Training starts March 16, weather permitting. He is preparing information sheets to give to people who want to train but have never flown before. They will inform the new trainee of basic info such as what the sticks do, how a buddy box works, and what to expect when they start with a trainer.
Newsletter Basil Yousif. Has created a website for the Helicopter event.
See http://rotorsoverroseville.com/

AMOS 2016 EVENT CALENDAR

April 16 - RC Country Swap Meet - Randy Sizemore
May 7 - Helicopter Fun Fly - Basil Yousif see:
www.RotorsOverRoseville.com
May 18 - 22nd Float Fly - John Sorenson ****Date Changed**
June 11th - Warbirds Over Roseville - Mike Haston -
www.warbirdsoverroseville.com
June 24 – 26 Jet Fly - Randy Sizemore
August 27 Electric - John Hainlen
September 10 - President's Fun Fly Mike Haston
Sept 24 - Giant Scale - Gary Meyers and Basil Yousif
October 7-8 - AmoBro Profile Model Fun Fly - Randy Allen
December (TBD) - Christmas Party - Randy Sizemore

Local Air Show Events:

Lincoln Air Fest - June 11th - Lincoln Airport - June 11th Air Show with Full Scale Aircraft and a Short R/C flight display put on by AMOS members within two 30 minute flight windows. One at 10:30am and the other at 1:30PM.

At: Lincoln Airport

AMOS Pilot's	**Aircraft(s)**
Keith Roberts	**Giant Super Decathlon**
Mike Rutledge	**L-4 Cub, F-4 Ground Demo**
Keith Fick	**Boomerang Elan Turbine Jet**
Basil Yousif	**Extreme Flight 100cc Yak and Raptor 60 Helicopter**
John Sorenson	**(TBD)**
Doug Keller	**Security**

Contact Keith Roberts 916-955-3104. keithr@ltgsys.com.

Here's a Rerun of a Article I had written last year just before the Helicopter Event. It should help with setting up of that Helicopter collecting dust so you can get it out to the event and fly it. We will also have a Clinic at the event should anyone need help with final adjustments to get up in the air.

Words of wisdom for first time Helicopter Flyers :

" If you have a new Helicopter set it free" - If it comes back it loves you !!
" If it doesn't -- You just lost alot of Money!!!!!! "

Setting up a R/C Helicopter with a CCPM Rotor Head

CCPM abbreviation:

CCPM - Cyclic Collective Pitch Mixing
eCCPM - "electronic Cyclic Collective Pitch Mixing

How it works:

On the R/C helicopter 3 servos are used to simultaneously control the Elevator, Aileron and Pitch functions by moving linkages that are attached to the outside circle of the round Swashplate. The Swashplate is a circular part that mounts on the shaft just above the body of the helicopter. It transfers the motion of the servos to the Fly-bar and Rotor heads to activate Aileron, Elevator and Pitch functions.

The outside connections on the Swash ring are the Elevator being in the rear, the Aileron in the front right and the Pitch in the front left. Looking from the back of the Helicopter.

4 Linkages also run from the smaller inside ring of the Swash up to the mixing levers which control the pitch of the Rotor Blades and the Flybar - Aileron / Elevator movement. A push up and down of all the servos becomes the pitch function. A front to back movement becomes the Elevator and side to side movement of the servos becomes Aileron function. Both upper and lower link sets turn freely around each other. Only the motion of the swash is transferred from the lower to upper link sets.

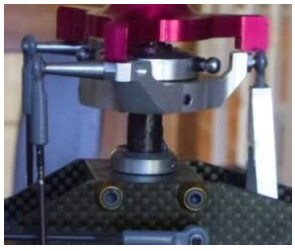
There are some different layouts. This is a CCPM setup for a Trex 500 electric.

The CCPM system is a great advancement over older helicopter setups because all three servos are sharing the work load when each function is needed. They use team work. Older Helicopter's had a single servo to solely control each function. It wasn't like they burned up servos out but performance was lacking. The older setup was sluggish and not very responsive for advanced helicopter aerobatics like 3D flying.

The three types of CCPM Swashplate types - 120, 135 and 140 degree:

The rotational degrees between the Elevator Linkage on the Swash to the Aileron linkage on the Swash is the type of CCPM. The Swashplate is round and the arrangement of the links that connect to the servo linkages are distributed in a circular pattern. For 120 degree the Elevator to Pitch linkage degrees would be 120 and likewise the Aileron and Pitch linkages are also 120 degrees apart, giving you the whole 360 degrees.

On a 130 and 140 degree Swash the Aileron and Pitch connections (front two) are closer together and are extended out using Ball link extension arms. There is a ball link extension on the 120 degree system but it is usually on the rear elevator ball link.



140 Degree CCPM with a Leveler tool on the shaft

120 degree is the most popular CCPM system but has some unequal servo motions for 3D flyers. The Aileron function isn't linear with the elevator function, which causes a slight change in pitch because the elevator servo has to move 35% more than the rest.

Futaba's explanation:
On a 120 degree setup, the left/right cyclic is slightly faster than the fore/aft cyclic.

135 and 140 degree CCPM offers smoother operation of the combined servos and an equal cyclic rate all around because the Aileron and Pitch controls on the swash plate are closer together.
Although 135 and 140 CCPM give up some Aileron function to gain linearity in the overall cyclic operation.

Some higher end radios like the Futaba 14MZ have programming to compensate for the lack of 120 CCPM linearity but cost big bucks. All Futaba radios have the ability to do 135 and 140 CCPM even the cheaper models, that's why there popular with Helicopter flyers.

The higher end radios give the helicopter flyer the ability to adjust more points for the pitch and throttle curves. For example instead of the 5 points on most radios the Futaba 12FG has 17 point curves. 10 can be adjusted and 7 are to check transition.

CCPM Heli/Radio Setup

Initial Radio Setup - Setup the Radio for Helicopter and the Swash Type, on many radios these are configured in the same menu called - Model Type or Parameter.
Your manual will have a chart of the abbreviations used to set your radio for the type of Swash on your helicopter. It should contain pictures of the different Swash layouts.
For instance on a Futaba Radio 120 degree is HR3, 140 and 135 degree are H-3.
Advanced Flybarless setups use H-1 which lets the Flybarless module control the Swash setup. Since the Flybarless Control Module is a 3 axis gyro it can do the Swash mixing on its own based on the position of the helicopter without the Radios preset mixing for a regular Flybared Swash.

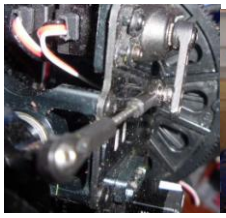
1) Center all sub-trims before starting. Don't preset throttle and pitch curves. You want to calibrate with full pitch and throttle movements when you start your setup.

2) Remove the Head assembly (if it's installed) by removing the top shaft screw and nut then disconnecting it's links from the Swash assembly.
3) Install Servos and connect them to the receiver, then turn on the radio and let them center. Set the Throttle stick to 50% or half throttle. At this point some will even go into the throttle curve and set all the points to 50% so the throttle stays at half even if the throttle stick is moved by accident. Some radios have a temporary half stick hold setting.

4) Assemble the Pitch, Aileron and Elevator linkages. The lengths should be shown in the manual. Everything should be close to lining up if you use the manual link lengths. Use a caliper to set the length. Some links go on to the ball only one way. If there is some writing or a notch on the link, that is the outside direction.

5) With the throttle at 50% all linkages controlling the Swashplate should be at half throw. The servo arms or linkages that directly control the Swashplate will be either parallel or Horizontal to the Swash. The Swash should be level if everything is aligned.
Smaller Helicopters use a linkage directly from the servo mounted below and larger ones use linkage arms that work to transfer the servo motion to the swash.

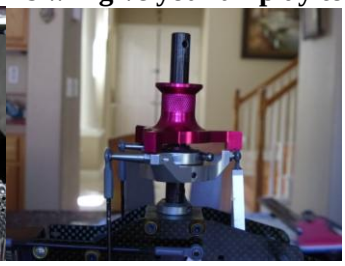
All pushrod linkages running up to the Swashplate have to be at 90 degrees - all the way around. A linkage that's slightly angled won't work very good. If the linkage is angled look for a ball link to be installed on the wrong side of a servo or linkage arm.




6) Make sure the stick movements on the radio activate the Swashplate and throttle correctly. If a function is working backward reverse the channel in the radio settings. This can be tricky for CCPM as all three servos are doing Pitch, Elevator and Aileron. Looking from the rear of the Heli the Aileron and Elevator should react the same as the stick movement on your radio. Forward stick forward Swash and so on. The Pitch should increase /decrease with the throttle. Increasing throttle will raise the Swashplate on the shaft (Pitch) and push the throttle linkage out turning the engine carburetor throttle arm counter clockwise. Some European Heli's have reverse pitch and Rotor turn direction.

7) Install the Swash plate leveler tool. This tool slides on to the shaft and has three arms that cover each of the three ball link mounting blocks on the swash. The arms of the tool should cover each of the three link blocks with no space. If there is a open space adjust the particular linkage to close the space. After adjustment the swash should be at 90 degrees with the shaft all the way around.

If this is done correctly after the Rotor Head assembly is installed all the mixing levers that activate the pitch and Ail /Elev funtions should also be level. So at Mid throttle you will be at o pitch. This will give you full play to both Plus and Minus Pitch limits.

With the leveler tool installed move the throttle up and down to increase and decrease the pitch. The Swash plate should move up and down with the Leveler tool. There shouldn't be any space between the 3 leveler tool arms and the link connection blocks on the Swash as it is going up and down. If two arms have a space you would adjust the linkage of the remaining arm that has contact with the tool. If there's a space in one arm you adjust only that arm to make contact with the tool. If the leveler tool sits flat on all three arms at low pitch but there's a space on one arm at high pitch or visa versa you can adjust the end point on the radio only if you have adjusted the link lengths as good as you can get them.

8) After installing the whole rotor head assembly, screw/nut and links, the goal is to keep the Washout levers horizontal at 0 pitch which is at half throttle. When the Washout levers are level you are in the center of the pitch movement. This way the rotor blades will move - + 10 deg to -10 deg. These end limits can be different for various models. Again adjust the link sizes to achieve this. Start with the manual adjustment sizes they should be close.

Watch out for aftermarket ball links that are different in size they can throw off the linkage arm length if the measurement in the manual is not given as the full linkage length.

You don't need as much negative pitch as positive because negative pitch is for flying inverted and the body of the helicopter isn't in the way of the air stream.

Now with the whole setup correct you can balance your Blades and install them on the Rotor Head Grips. Use a blade balancer to get the blades equal in weight.

Adjusting the pitch of the Blades:

After the blades are on the Rotor Head you need to adjust them so they both have the same pitch at the different throttle settings. You will need a Pitch gauge that fits your size helicopter blades. Line up the Pitch Gauge with the Flybar to read the pitch. At low throttle you should be at -10 deg and Full throttle you should be at plus 10 degrees. Mid stick should be at 0 degrees. The pitch limits can vary from model to model see your instructions.

To adjust the Blade tracking you check the pitch of one blade then lock the pitch gauge on that setting and switch it to the other blade. Both blades should be the same pitch for each point up and down the Pitch/Throttle range. If not adjust the linkages to make them equal.

When flying you might still have to adjust the tracking that's because the blades might weigh the same but the distribution of weight in the material up and down there lengths between the two might be different.

Look at the blades in a hover both blades should look like one blade. If you see two blades splitting apart at the ends you'll need to adjust the top Rotor linkage on one side. To make things easier put a red decal at the end of one blade so you can tell which blade is higher or lower.

Throttle Adjustment;

Make sure the throttle servo activates the throttle arm on the engine from low to high limits of it's travel. Fully closed Carb Barrel for Low throttle and fully open barrel for High throttle. The throttle range is automatic on electric models as it's controlled by the ESC.

Radio Configuration of Mixing Controls

Condition Setup - Some radios need to have the helicopter mixing switches activated or assigned so they can be used for Idle-up and hold functions. This is done in a separate menu.

The basic Helicopter radio mixing switch setup uses two mixing switches. The Idle-up switch which has 3 positions and mixes the Throttle and Pitch settings through Normal , Aerobatic and 3D modes called Normal, Idle-up 1 and Idle-up 2. This switch is usually located on the top left of the transmitter case to the front and has three positions.

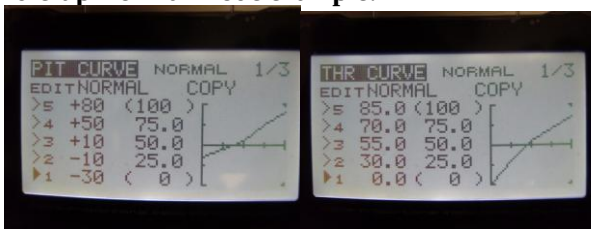
The other is a <u>Throttle Hold</u> switch which overrides the Idle-up switch and forces the motor to run at idle and gives you only pitch control on the throttle stick for Autorotation landings. Practicing Autorotation is good in case the engine dies. You can always switch the Throttle Hold off and fly with power again. To bring the heli down using Autorotation bring it down with forward speed and at 5-10 feet above the ground increase the pitch to soften the landing. Moving forward is much better than dropping straight down.
The hold switch is usually located on the top right of the transmitter case to the front.

You thought this mixing nightmare was over not so fast! Now you have to adjust the Pitch and throttle curves.

The default curve adjustments for the Pitch / Throttle are linear. Both Pitch and Throttle increase in equal motions when the throttle stick is moved. Adjusting the Pitch and Throttle curves separately but relative to each other allows you to change this response.
On the Normal Setting you only want a small amount of negative pitch at low throttle so you reduce the Pitch curve to say -30 to give you -2 degrees of pitch at 0 throttle. When you initially set up the pitch on the helicopter you had full negative throw which is -100 so when you reduced that number to -30 at 0 throttle you got the -2 degrees what you need for Normal flying.
On my heli -30 = -2 degrees of pitch on the blades but how do you find that on your Helicopter.

You use a pitch gauge on your heli to help with adjusting the pitch curves. Set your pitch gauge to -2 degrees lock it, and put it on a blade and adjust the pitch curve low stick number on the radio to change the pitch of your blades to -2 at 0 throttle. Then set the gauge to +10 degrees and adjust the high throttle point for +10 of pitch. Now set all the points in between to give you a linear curve.
Using the approximate numbers for the pitch curve is useless if you don't check that the value on your radio will give you the exact pitch you need on your helicopter blades along the curve.

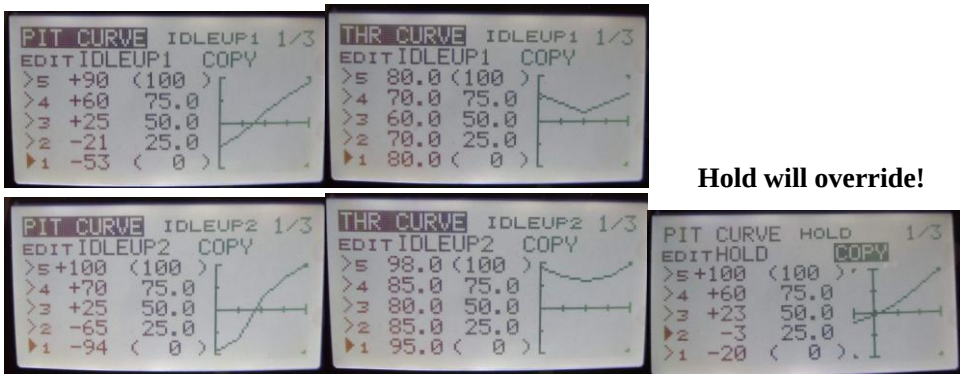
Idle-up Normal mode example:



Number set on the left is the setting.

When flying you can fine tune these curves. Land first then add more throttle or Pitch where you need it. Remember the stick position.

The Helicopter should "Float" at Mid stick in a nice hover. If the Helicopter drops fast as you reduce the throttle you want to increase the throttle curve numbers. 0 to 30 might go from 0 to 40 to get a slower "Dropping Feather" type decent. Adjust throttle curves before you change the pitch curves. Remove the control of any dials on your radio that change pitch and throttle curve settings. They could get moved accidentally and drastically change the curves. These dials were designed for flyers that wanted to do basic flying with the preset linear curves. They could dial in a little more or less pitch or throttle as they needed.



Hold will override!

Moving the Idle up switch on the radio up one click will take you to the Idle-up 1 mixing mode. Two clicks and you'll be in Idle-up 2. In these modes the negative pitch at low throttle will be increased giving you more negative pitch on the rotor blades for flying inverted for doing stunts. -5 degrees is good for loops and rowels and slow inverted flying. -10 on Idle-up 2 for high speed 3D stunts.

The throttle response will increase for both negative and positive pitch with Mid throttle stick being the lowest throttle but still at 60% for 1 and 80% for 2. These values can vary from Model.

Be careful with the Idle-up switch-if you activate it by accident into say Idle-up 1 or 2 and you think your in Normal flying mode your Helicopter will drop at a super fast rate and smash into the ground when you reduce the stick to low throttle. Always gradually reduce throttle to bring the Helicopter down. You have to return to the Normal setting to land the Helicopter.

The Hold switch will override the Idle-up switches and force the engine to run at idle for fuel powered models and to completely kill the engine for electric heli's. The motor go to idle and you will only have pitch control. You can use this to practice flying in your helicopter with no power only using the spinning Rotor energy to fly it in. The Hold Pitch curve can be set similar to the Normal Pitch curve. Autorotation is not easy you should try it on a simulator first.

The Throttle Hold function can also be used for starting your helicopter safely. It disables the throttle stick and sets the throttle at a good idle for fuel powered models and should be set to completely kill the engine for electric powered models while leaving the Pitch active.

You adjust the level of motor speed in the Throttle Hold menu. You want a little more RPM's over low Idle for a fuel powered helicopter so it stays running and starts easy, but not high enough that the clutch engages.

By using the Throttle Hold mix switch on the initial startup and also at the end of your flight you don't have to worry about accidentally hitting the throttle stick while starting, handling and moving the helicopter and radio together.

<u>Idle up Pitch Movement - example settings</u>:

Idle up Normal -2 to + 10 degrees - Rotor Head RPM - 1200- 1900 (depending on Model)
Idle up 1 Pitch Movement -5 to +10 Rotor Head speed - 1500-2100 RPM
Idle up 2 Pitch Movement -10 to +10 Rotor head Speed- 1600 - 2300 RPM

<u>Throttle Hold Settings</u>:-2 to +10 degrees of Pitch movement - engine at solid idle

<u>Idle-up Throttle Settings</u>

Idle-up Normal - 0 to 100% throttle
Idle-up 1 - 80% at low throttle 60% at Mid-stick and 90% at high throttle
Idle-up 2 - 90% at low throttle 80% at Mid-stick and 100% at high throttle

These are examples, a good quality helicopter will have examples of these settings in the manual usually in the form of a table. Use the manual settings.

Rear Rotor Blade Direction Check:

The easy way to check if the rear rotor blades are moving in the right direction left to right is to simply put one rotor blade straight down and think of it like the steering fin of a boat. Looking from behind the helicopter the Right Rudder radio stick movement will turn the blade right and left will turn the blade to the left just like a boat steering system.

Now that you have the direction set you have to check to see if the Gyro is compensating for rotational movement of the helicopter in the right direction. Looking from the rear of the helicopter grab the tail and move it to the right (Counter Clockwise) the tail blades should change pitch outward to the right so when its flying it will blow air to move the heli back to the left (Clockwise). Now move it to the left the opposite should happen the blades will increase pitch to the inside, towards the gears. If this is reversed change the normal/reverse setting on the gyro. If the direction is set wrong the helicopter will spin on the ground and not take off.

Difference between reverse on the Gyro and reverse on the rudder channel in the Radio:

The reverse/normal setting on the Radio for the rudder controls the direction the rear rotor blades activate which will control the right and left turning of the helicopter.
If you do the Rotor Blade Direction check and the direction is wrong you would reverse the radio channel for rudder.
The Gyro reverse/normal setting controls direction the Gyro activates the rudder rotor blades to counteract forces trying to turn the helicopter in flight, like the opposing force of the main rotor blade movement and the wind. This keeps the helicopter tail steady. Usually the normal setting on is used when pairing the Gyro with the same set rudder servo.

Other Gyro settings:
Travel - sets the amount of pitch at the end points of the servo linkage moving the rudder rotor blades, so there's no binding of the linkage.

Digital servo - Sets the gyro resolution for either a Digital or Normal Tail servo

Frequency- Most modern tail servos are all digital so this setting adjusts the specific frequency of the Digital tail servo you are using.

Gain: On most Gyros you have a extra connection to the reciever so you can control the gain from your radio. The gain adjusts the amount of correction your gyro will produce to keep the tail steady. If there's too much gain the tail will wiggle back and forth because the Gyro will be overcompensating when it reacts to forces trying to move the tail.

Flybarless or FBL Rotor Heads:

FBL units have gained much popularity in the last 10 years and are very affordable now. Many kits come standard with the Flybarless setup. The Flybarless Rotor head is very simple with very few parts. Full Scale Helicopters have been Flybarless since 1940. The Flybarless control unit consists of a 3 axis gyro which not only corrects for the tail but the Aileron and Elevator functions replacing the flybar and all it's mixing linkages on the Rotor head. With the older Flybar setup the helicopter is harder to manage and adjust and the Flybar rod bends easily, getting rid of it is a blessing. Also the helicopter uses less energy to run because of less parts on the rotor head assembly results in less operating resistance. The Flybarless unit (looks like a receiver) has a extensive setup that needs to be done on a Laptop. A Mobile Phone link can be used on some models so you can change parameters at the field. They can cost the same as a Tail only standard Gyro used with the regular Flybar setup. The two Rotor Heads are also the same price to buy also. Most popular older helicopters can be upgraded to the Flybarless system.

Governor:

A Governor electronic unit which adjusts the throttle to stay at a constant rate for a given amount of pitch. It gets disabled when you put the helicopter into low throttle. A RPM sensor is attached to the fuel engine so the unit reads how fast the motor is turning. The Pitch and throttle servo leads run through the Governor. It has to be configured through it's own LCD screen, a separate programmer, a computer connection or through radio stick movements. One of the most important configuration parameters is the head speed RPM it will control the engine at.

They are very good for 3D flying because they keep the engine running at the top of the RPM level needed for the amount of pitch your pushing to do stunts. The downside is they can consume more battery power for electric models and use more fuel and RX battery for engine models. The Governor will tax you!

On many high quality electric helicopter ESC's they have a Governor mode you can use without having to buy a extra unit. No engine sensor needed when setting up a Governor on a electric. Usually the Pitch and throttle curves in the Radio menu have to be adjusted to some default value. The Governors directions should show how to do this.

There is much more to setting these Helicopters up but this article should get most starting helicopter flyers a good push to getting there helicopters set up correctly.

If you have a older helicopter Like a Hirobo Shuttle , Century Hawk, Nexis or Raptor 30, 50,60 most of these same adjustments apply.
The theory of how the swash, servos and linkages works is the same. Older helicopters are even simpler to set up in many ways since every function is controlled by separate servo.

There are also may You tube instructional video's to help with any type of Helicopter.

How good you setup your Helicopter makes up for 90% of the success you will have with it !!

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