

IRCHA

BULLETIN

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MARCH 4TH, 2022

MISSION STATEMENT

The International Radio Controlled Helicopter Association (IRCHA) was established as an organization by the pilots, for the pilots. IRCHA works to promote the continued growth of radio controlled helicopters through education, representation, service, and special events. Radio controlled helicopters are a dynamic, evolving segment of the AMA and as such IRCHA works closely with the AMA to foster growth and acceptance. Through these endeavors, IRCHA hopes to provide its members with the opportunity to enjoy the hobby, make many new friends, and expand their intellectual interests.

What is IRCHA?

It is a helicopter event in Indiana every summer, right? Not quite. While the term IRCHA is frequently used to refer to the Jamboree, it is much more than that.

The International Radio Controlled Helicopter Association (IRCHA) was founded in 1989 by Don Chapman as a representative body of pilots for the yet evolving hobby of radio controlled helicopters. Don saw the need for helicopter pilots to be represented within the Academy of Model Aeronautics (AMA). The AMA seeks representation of each segment of the hobby through Special Interest Groups (SIGs). The International Radio Controlled Helicopter Association was recognized as a SIG by the AMA during the infancy of our ever evolving hobby, and remains the SIG to this day.

While the Jamboree is by far the largest and most public focus of the organization, we represent helicopter pilots in all aspects of the hobby. IRCHA representatives

are frequently asked to take part in AMA committees and meetings. IRCHA hosts the US Nationals helicopter competition each year. IRCHA has hosted the FAI World helicopter competition in the past and will be hosting the FAI Worlds again in 2023. IRCHA also provides pilot development through the Pilot Proficiency Program and supports local clubs through IRCHA sponsored events. It is our hope that this Newsletter will bring some of these other aspects of our organization into a more public eye.

The Jamboree itself has become an undeniably successful platform for the growth of the hobby. Pilots, vendors, manufactures, and others within the hobby have come from all over the world to meet. Lifetime relationships have been formed, both professionally and personally. Those relationships are what this hobby is about. Without the manufactures, we wouldn't have any-

thing to fly. Without the vendors, we wouldn't be able to buy. And of course, without the people...well it just wouldn't be as much fun.

Above, I have included the IRCHA Mission Statement. On behalf of the Board of Directors, along with all other representatives of IRCHA, I would like to say the Mission Statement is important to us. IRCHA isn't simply an event, IRCHA is an organization. **An organization of Many, A Voice of One.**

Dan Lucente
IRCHA President

US (AMA) Helicopter National Championships and US F3C and F3N World Team Selection

During the second week of August, the AMA National Flying Site and IRCHA will host the US Helicopter Nationals. Since it is an even year, it will also host the F3C and F3N Team Selection for the US World Team for the World Championships to be held in Muncie in 2023.

In precision aerobatics there are three AMA Classes: Sportsman, Advanced, and Expert.

Sportsman is an entry level class where entrants are expected to hover, both tail in and side on, and to do a basic loop, roll, and stall turn, which are the basis for all other aerobatic maneuvers. There are two hovering maneuvers, five aerobatic maneuvers, and a landing.

In the Advanced Class, pilots are able to hover in all orientations, tail in, side on, and nose in. The aerobatic maneuvers are more complex with multiple skills. For example, the Oval with Full Roll, the model does a half loop, then a full inverted to inverted roll, and finishes with another half loop to level flight. The landing is a 180 degree autorotation. There are two hovering maneuvers, five aerobatic maneuvers, and an autorotation.

In the Expert Class, pilots fly the F3C Preliminary schedule which is flown throughout the world. The FAI "P" schedule changes every two years so there is always a new challenge. Expert currently has two hovering maneuvers, five aerobatic maneuvers, and an aerobatic autorotation.

The F3C Class is flown throughout the world and consists of two schedules. P schedule is flown for the preliminary rounds and F schedule for the final rounds. These are the schedules flown at the World Championships.

F3N is the world's version of freestyle competition. There are three different types of flights: 1) Known maneuvers, 2) Freestyle, 3) Freestyle to Music. In the known maneuvers, pilots select from a list of predetermined maneuvers and fly them for appearance and accuracy. In Freestyle, pilots choreograph their own flight and display all their skills. Extra value is placed on originality. In the Freestyle to Music, pilots select their own music and make their flight coordinate with the music.

There are two types of scale competition: Sport Scale and Master Scale. Sport Scale places an emphasis on flying, where Master Scale places em-

phasis on duplicating the original and flying in a scale like manner. IRCHA is hoping to host scale at the World Championships for the first time.

The World Championships are being hosted by IRCHA and will coordinate with the IRCHA Jamboree, which the premier helicopter event in the United States. IRCHA is working hard to promote RC helicopters in the United States and the world and make the helicopter experience most enjoyable for all participants, competitors and sport pilots.

By Larry Meade

Should I Fly at a Fun Fly?

Heli Fun Fly? To go, or not to go? Hmm, sounds like someone familiar, wonder who that is? Well, we won't go back to our high school days for a lesson in theater. Heli Fun Fly? Go, of course! Why? Well, at least for me it's been one of the most memorable things I've ever done. Heli pilots are the best, bar none! Yes, it costs money to travel, but if you wish, you can reduce costs by going with others, camping, cooking your own meals, etc. Need help with Heli setup, or a new maneuver,

or just some tips on flying? A Heli Fun Fly is the place to be. Did you forget something at home, crash, or just need a part? Just by walking down the flight line and talking to others, you'll probably find your part and get additional suggestions and advice! You should never be afraid to fly at a Fun Fly! After all, that is why you go! Trust me, now one cares what your ability is, it's all about getting flights in and having fun with this great hobby.

Heli Fun Flies are a great way to meet new pilots, learn something new, and most of all, have a great time. So be sure to go to as many Fun flies as you can this year, based on my experience, you will have some of the best times in your life!

Jeffrey C. Young
President St. Louis Whirlybirds
IRCHA Ambassador

F3C World Championships experiences... 1985

When approached to write an article for the IRCHA newsletter, I struggled to think of ONE subject to start off with. I've been involved with this R/C helicopter thing for so long, there's lots of detritus in my head I could bore you all with. So, here goes...

I participated in the 1st ever F3C World Championships in 1985. The event was held in London, Ontario, Canada. Don Chapman, founder of IRCHA, was the appointed US Judge and Horace Hagen was on the Jury. Other notables in attendance (among many others) were Dieter Schluter and Hirouki Oki, both pioneers in early R/C helicopter development. There were 36 pilots from 17 countries that put in official flights, all among the best from their respective countries. The other US Team members were Robert Gorham and Tom Dalusio and our Team Manager was Dick Robbins.

The F3C maneuver schedule consisted of 10 maneuvers (my memory is a little fuzzy on this number...); 4 compulsory, including a landing (the pilot had the choice of either an autorotation or a translational landing) and 6 more chosen from a list of 14 optional maneuvers. Each maneuver was assigned a "K-Factor" based on difficulty, there was no K-Factor limit, so pilots usually loaded their schedule with maneuvers that had the highest K-Factors. Most of the maneuvers were hovering, but there were some basic



aerobatics for those that preferred those. The good thing about this type of schedule was, you could change your maneuver selection based on the conditions each round... or if the judges just didn't like how you did a particular maneuver!

The equipment list was very different from what we see today, and not surprisingly, the majority were from German manufacturers. Heim, Schluter (and a variant called a Gold Ranger), Kalt, GMP, Graupner, TSK, Hirobo and Robbe. Engines were all 10cc glow, most with mufflers and a few with tuned pipes. Radios were JR, Futaba and European tray versions of the same. I'm fairly certain all had a rate gyro on the tail rotor control, and they were the mechanical type (piezo, huh?). All rotor heads were flybar type and the majority of the rotor blades were wood, some weighted with bronze powder. No metal was allowed in blade construction and contest management used a metal detector during model processing to verify... bronze powder set up with CA didn't trip the metal detectors. Fiberglass blades were just coming out and carbon blades were just a dream at that time!

The competition was very serious, but fun too! Pedro Caldentey had never performed a loop before the competition. A bunch of us told him how to do one the day before the first round, he thought about it all night, then went and successfully performed it in front of the judges the next day. He got carried off the field and was knighted to 'The Royal Order of The Broken Rotorblade' at the end of the contest!



So, why did I go this direction with my article? The answer is two fold; first, I'm in the middle of restoring the model I flew at that event, and second, IRCHA will be hosting the 2023 F3C/N World Championships in Muncie, IN. This is a golden opportunity to see the world and feel the camaraderies that this wonderful hobby has to offer!

For more history about the F3C/N World Championships, look here: [World Championships | F3CN](#)

By: Cliff Hiatt, IRCHA #4

Servo Frequency, Why Is It Important?

With many cyclic servos offering 760uS modes we get a lot of questions regarding “what is the point of 760uS? What makes it better?”, while the answer could be chalked up to “it’s better” we’d like to dive a little bit more into it. The 760uS differs from 1520uS in that 760uS has a shorter pulse width (half to be specific), with it being a shorter pulse width you get the benefit of being able to increase the frequency

same time frame. In short terms, your servo can receive changes in positional information and start to execute them twice as fast as conventional 1520uS making the model more connected to the gyro, this will improve control and make it easier to pilot.

This benefits helicopter pilots in general, since the gyro/servo combo will respond to external inputs and make corrections faster, thus requiring less pilot input to keep the model stable. This isn’t just for your 3D helicopters, but also extremely beneficial for F3C aerobatics and hovering, where precision is of a high priority, flying a 760uS model and a 1520uS model on a windy day is a night and day difference. Unfortunately, the cost of high performance 760uS compatible servos



can shy some people away, however with our new cyclic servo the HC-600 you get to experience the benefits of improved reaction time on your swash while staying in a budget.

By Skylar McDaniel



by double which increases the number of frames that the servo receives in the

IRCHA Pilot Proficiency Program

I wanted to take some time to write a small section for this year's goals for PPP (Pilot Proficiency Program).

In 2021, we had 4 people at IRCHA complete levels 1-3.

Madison Lewis Completed Level 1

Richard Sowers Completed Level 1

Nathan Essex Completed Levels 1 & 2

Robert Montee Completed Levels 1-3

For their efforts, IRCHA is giving awarding little trophies to add to your transmitter box, or field box. See Picture.

Level 1 Green

Level 2 Light Blue

Level 3 Dark Orange

Level 4 Red (not pictured)

Level 5 Black (not pictured)

Level 6 Dark Blue (not pictured)

Level 7 Light Orange (not pictured)

I will be attending a few events in March-May, Cajun Heli Fest and MayDay, both in Louisiana. If anyone wants to complete levels, please let me know.

I look forward to this year's program improving. It's a fun way to track your RC heli flying progress.

By JC Zankl



Scorpion Power Systems



Things at Scorpion Power System are looking to have a bright future ahead! The last few years in the world have been incredibly unique and challenging for many, but we at Scorpion are proud and happy to report that, we are exiting the other side, even stronger and more energized than before! Looking forward to this coming year, the one word I could use to describe what we see is “fruition”. Over the past few years, we have had many new and game changing products in the pipeline, and it is looking like 2022 will be the year many of them finally make it to the market! This includes several new motor sizes and tool products, but also many things on the ESC side of things.

In the past few years, we have been focusing more on the ESC side of development rather than motor side of development. In a sense, this is because we are looking to continue to “challenge” ourselves more. We have been making competition level motors for RC helicopters for many years, and our team pilots have been winning with them since 2007. It has been very gratifying to see how the market has developed around the motor sizes which we created. For example, we came out with the Scorpion HK-4525-520kv for electric 700 size models back in 2010, which was used by Nick Maxwell to win the 3D Masters competition that year. Now fast forward 12 years and look at what is the

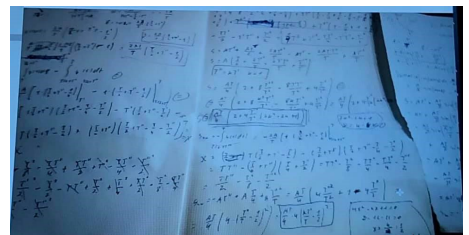
“standard” size of motor for 700 size heli? A 4525-520 kv! Now of course there and many more brands out there, but nearly all have used this and many other size ranges of motors which was set in motion by Scorpion so many years ago. With that being said, a few years back, we decided the way we could “stand out” from the competition, was to pair our electric motors, with the best ESC the market has ever seen!

ESC development is a completely different ball game. Unlike motor development, it cannot be replicated or copied by anyone. Even if someone makes similar hardware, it is the software which makes our Tribunus ESC’s so special. Driving a motor, is



no easy task, and it is far more complex than anyone (including myself) could hope to understand. It is also interesting to note, that not all ESC’s are the same! The drive algorithm from an ESC can affect so many factors. It can affect, RPM, torque, efficiency, acceleration, governing ability, smoothness, and so much more! But in brief, I can say that the drive algorithm for our Tribunus ESCs, has been designed from the ground up by our team of engineers to dominate on all of these categories. We use a 32bit microcontroller which allows us to

monitor the motors RPM, and load in real time, and dynamically adjust things such as the timing, frequency, and overall drive algorithm of the motor to provide the most optimal torque, power, and efficiency in any situation. All of these countless factors combined is what in our opinion, sets



the Tribunus line of ESC, and Scorpion Power System as a whole, apart from any other power system company on the RC market! But we aren’t just stopping there! We are in constant development trying to perfect, and expand our Tribunus line, and already looking to the future on even more game changing technologies.

Stay tuned for many new things from Scorpion Power Systems! We are here! And we are dedicated to continue making the “Power System of Champions” for the RC market!

Kyle Dahl

Product Development Manager

Scorpion Power Systems

Flybarless Gyro Set-Up for Scale RC Helicopters

For those in the scale helicopter world, setting up and adjusting FBL gyro systems typically used for 3D helicopter models can be a challenge. For this article, we will be referencing the Bavarian Demon Axon FBL system, but the principles and basic settings can be adapted for almost any of the modern three axis gyro systems. Many pilots typically accept the default settings/parameters and then find themselves needing to compensate for settings that are not optimal when flying a scale helicopter in a smooth and controlled manner in different wind conditions. We will cover some of the main setting/adjustable parameters in the FBL system. The model used for this example is a large turbine Vario model of a Bell 429 (48 lbs.), controlled by a Jeti radio system. Concentrating on some of the key flight adjustable parameters, it is assumed that the FBL system, model and radio system have already been set-up correctly regarding proper calibration for the Tx to the FBL unit, proper swashplate and tail control directions, as well as proper gyro compensation direction. With a large scale model helicopter, proper power distribution is essential to the control servos, as well as any scale detail servos, lights or other power consuming systems, meaning there would be only a minimal voltage drop when operating all of the servos, lights etc. If your FBL system features "Banks" like the Axon system, it can make flight tuning easier and faster by having the ability to try different perimeter setting in flight simply by flipping a switch. The Axon system has the ability to use three separate banks: yellow, red and blue. For the initial tuning, I suggest setting each bank identically in the software by choosing a "master" bank and copying the others to match it. Set the initial "Gain" for the head and tail. Unless you have experience with the chosen FBL system or have information from others using this system with a similar model helicopter, it will be a best guess initial setting. Start with 50% - 65% for the first test hover. I set my "master

bank" to the higher setting and choose a different bank for the lower setting so that I can quickly flip a switch if the model starts to oscillate or hunt at the higher setting. Continue to use this technique until you are happy with the gain settings in calm and windy conditions. Next, I change the "Agility" variable for head and tail slightly differently for each of the three banks, while leaving the other parameters identical in each bank. This allows me to isolate the effect of changing a parameter during the same flight. Agility in a Bavarian Demon system controls how much effect the cyclic and tail stick commands affect the model's roll, pitch and yaw rate. Other systems may allow you to adjust actual degrees/second rate the model moves. This adjustment is really related to the pilot, and how the pilot likes the model to "feel" when a cyclic or yaw command is given.

For each parameter change, I changed the 3-position switch assigned to the colored banks. If I do not like the new perimeter, I simply flip the switch back to what it was. During this initial "tuning phase" I will often use the three banks with one "known" setting, and one bank setting higher/more, and one bank setting lower/less to see which I like better, then make the "known" setting the one that was better. For the next test the other two banks will have small increments in the same direction that the first improvement was going. For each parameter and each bank, I performed (a) a right-hand facing hover for at least 20 seconds, (b) slow forward flight both up and down wind, (c) steady, but fast, forward flight and (d) higher speed sweeping bank turns. Exponential settings in the FBL system or the Tx are also available to (typically) soften the response around center stick, to get that nice scale-like smooth hovering. As with any FBL system, you do not have direct control over the swashplate with your radio. Instead, you give commands to the gyro, and the gyro filters those instructions before commanding the swashplate. That is where what the Axon calls Direct Con-

trol Portion comes in. On a scale of 0-6, a zero gives you the least amount of direct control and a six gives you more direct control. This setting determines how closely the swashplate will follow the actual movement of the cyclic stick before other stabilizing controls intervene. Those parameters will eventually intervene based on how the Direct Control perimeter has been adjusted. Lower numbers on the scale translate into a more regulated reaction of the cyclic for any initial stick movement. This "softening" will be compounded by the amount of exponential you have set for either elevator or aileron. As you climb the scale, there is more of a 1:1 initial response from the helicopter for a given cyclic input. If you set your Direct Control to three, the gyro will provide half as much direct control initially as it would if it was set at six, which would allow you to initiate movement before the gyro starts to regulate things based on agility parameters. For 3D flying, you might want a setting around 5 or 6, while a "softer" 2-3 setting would be for scale or smooth sports flying. Direct Control works in conjunction with agility to affect both initial response and maximum pitch and roll rotation rates. As noted, agility controls the RATE at which the machine may rotate about an axis for a given stick movement. For example, if a setting of ten for agility gives you 90 degrees of roll per second for a full stick deflection, then when the stick is moved just halfway, you will get 45 degrees per second. Adjusting the agility setting to five would get 45 degrees per second at full stick deflection. This setting attempts to maintain the rotation rate that you instructed it to maintain by moving your stick, regardless of wind or other factors you will get 45 degrees per second. Adjusting the agility setting to five would get 45 degrees per second at full stick deflection. This setting attempts to maintain the rotation rate that you instructed it to maintain by moving your stick, regardless of wind or other factors.

Flybarless Gyro Set-Up for Scale RC Helicopters continued

As an example, the Direct Input Control parameters in banks were set as shown below. The scale goes from 0-6, so a 2 is 33% of the full range. The difference was difficult to measure just by flying. A flight video was reviewed to see how smooth things were in a hover, where these control settings can be observed. The Bell 429 model has a rescue guy on a winch, and it is easy to see how steady the model is in a hover. In the video, I could tell that I was holding the helicopter more steadily (fewer jerky adjustments) in a 10-mph cross wind at the 3 setting. The lower the number, the softer the response. Again, combining this with 15-20% expo will give you a soft stick center but still leave you with enough authority to do emergency or aggressive maneuvers.

	Direct Input Control	Agility	Decay	Attitude Hold
Yellow	*3*	6	5	7
Red	4	6	5	7
Blue	5	6	5	7

While the "decay" parameter controls the speed with which the swash returns to neutral after the stick is centered when you view the swashplate with the model on a bench, it is not actually the same while flying. The higher the number (from 2-10), the faster the swash returns. If you notice that the helicopter noses up or "balloons up" in fast forward flight unless forward or down pressure on the cyclic stick is being held, reduce the decay value. If the model goes noses down in fast forward flight, increase the decay value. If you need a very low decay value, be careful not to move the cyclic stick during spool-up on the ground since the swash plate may be slow to return to level.

	Direct Input Control	Agility	Decay	Attitude Hold
Yellow	3	7	5	7
Red	3	7	*7*	7
Blue	3	7	9	7

The "Attitude Hold" parameter is designed to keep the helicopter in the orientation you had it in just before you re-centered the stick, if you pull up 45 degrees and then re-center, for instance. On a large scale model, if the Attitude Hold is high, the gyro can make the heli feel more "robotic" since you need to enter and exit each maneuver with a stick command. If the number is too low, the heli will not sit as stable in a hover in wind. For competition helis, this has advantages. If you pull the heli to vertical as part of a square loop and then center the stick, you are looking for the machine to stay on the vertical line. The scale runs from 2-10 in the Axon. At a nine setting, it takes a different technique to make a smooth turn because the helicopter tries to hold its banked position. Again, this is setting is based on how the pilot wants the model to feel while flying.

	Direct Input Control	Agility	Decay	Attitude Hold
Yellow	4	7	5	*5*
Red	4	7	5	7
Blue	4	7	5	9

The "Elevator Filter" parameter in the Axon controls vertical bobbing of the tail. Using a scale of 0-10, try the lowest setting possible. The higher the setting, the slower the helicopter's response rate to a quick elevator input. This setting is more model-related than a pilot feel adjustment. The correct adjustment value will allow the model to respond accurately to a quick elevator (pitch) input without any additional unwanted tail movement up and down, while still being responsive.

If you are flying a Jeti radio, you can see the Axon settings and make adjustments directly on the transmitter, assuming you use the EX Bus single wire connection from the receiver to the Axon. If you are using the cable loom or use a different brand transmitter, you cannot make changes from the transmitter other than the gain adjustment in two of the three "banks". You will need to use a laptop (at the flying field) or a PC to make changes to the FBL settings. These are not all of the parameters that can be adjusted to optimize the model's flight performance for scale flying, but, hopefully, seeing how to use the "banks" for finding the optimum setting on the parameters that have been noted will make it easier to see the affect of the other settings and feel confident tuning them for the feel and flight performance that you desire.

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With special thanks to Vario Helicopters:

USA Distributors:
Chuck Birt Peak Aircraft
Rock Hill, SC
www.peakaircraft.com
303.358.5124

Mark Smith HeliWorkshop
info@heliworkshop.com
https://www.heliworkshop.com
(888) 295-7910

Kirsten Zodtner, Vario Helicopter
Vario Helicopter Uli Streich GmbH & Co
KG
Seewiesenstraße 7
97782 Gräfendorf, GERMANY
https://www.vario-helicopter.biz/de/
Tel.: +49 9357 9099669 (Germany)

XL Power Helicopters

XL Power Helicopters are designed and manufactured by RC helicopter pilots, for RC helicopter pilots. XL Power offers a line of 520-760 size helicopters designed and manufactured by an active 3D RC helicopter pilot, with the greatest attention to detail and utmost day-to-day functionality in mind. XL Power acquired the MSH Protos line of helicopters, in which that same care is implemented into Protos kits and parts ranging from 380 – 800 sizes, including a nitro 700.

XL Power's flagship Specter 700 V2 touts quality and performance in a kit that does not break the bank. Replacement parts are readily available from the biggest online suppliers at a competitive cost, allowing pilots the excitement of trying new maneuvers with easy and cost-effective repair while going through any learning curve.

High end bearings, hardware, and carbon are just a few reasons why XL Power helis pack so much performance in an easy to build and low parts count helicopter. Pilots such as Kan Poonnoi, Kenny Ko, and myself, choose to fly XL Power for the reliability and design of the XL Power Specter series; they use their stock helicopters in international level competitions around the world.

You can order XL Power helicopters and parts from www.cajunaircraft.com, www.helidirect.com, and www.amainhobbies.com in the USA. In Europe www.helicoach-shop.de and from www.xlpower-rc.com in Asia.

By Nick Maxwell



Who is ready for Spring?

Who is ready for Spring? I know all of us at HeliDirect are ready! We have some exciting news to share with everyone. HeliDirect would like to announce that Marcus Kim is part of our team. Currently a pilot for XL Power, he will be joining our team. As we expand our team, in the next few months, look for more exciting news about additional heavy hitters joining our team.

HeliDirect would also like to welcome Sean Hall. Sean is the Team Manager, Social Media Manager, and curator. Remember, HeliDirect is your one stop shop for all your RC needs.

By Sean Hall

From the Editor

Thanks for reading our first publication of 2022. The IRCHA Bulletin will be published four times a year. Please be on the lookout for the next issue in June.

Do you have a suggestion for The IRCHA Bulletin? Shoot me an email: matt.jost@ircha.org