

Volume 53 Issue 3

March 2017

Editor Gene Drag
Photos by Joe Zumsteg
and others.

The next meeting of the Palos R/C Flying Club will be held Wednesday
March 1, 7:30 P.M. at the Willow Springs Senior Center.

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Palos R/C Flying Club AMA# 263
P.O. Box 391
Palos Park, IL 60464

Meetings: 1st Wednesday of each month. Village of
Willow Springs Senior Center. 8156 Archer Ave.
Flying Site: 107th and LaGrange Rd
N 41 degrees 41.643 minutes
W 87 degrees 51.518 minutes Elevation:
649 feet above sea level

President: Felix Mata
Vice Pres.: JR Centeno
Recording Secy: Stan Flynn
Corres. Secy: Bryan Gardner
Treasurer: Brian Zygadlo
Web Site: www.palosrc.com

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Articles wanted for The Palos RC Crash
Chronicle

If there are any articles or information you would like to see published in your newsletter, please get a copy to Gene Drag (editor) 10 days after a club meeting. This will give adequate time to get it in the CC.

The February meeting was called to order at 7:30 PM. Stan Flynn was still in hospital so the minutes of January meeting were not read.. Brian Zygadlo read the treasury report. Felix said the 2017 Event Schedule was still being organized. There were no new wings, members, or Albatross awards. The April meeting needs to be re-scheduled due to prior use of meeting room. Judy said that Pat Jenzake was involved with the Polar Plunge charity event. He is collecting donations. Mike Garrett has been flying indoors along with other members.

Ron Trujillo will have 4 tables at the Kane County

swap meet. He has some space for more planes if you have something to sell.

***** SHOW AND TELL *****

Bill Doyle showed his Stuka.
Ron Sheehan had a new Gremlin with election poster(core-plast) vertical stabilizers.
Herb Kilian brought his Twisted Hobbys MXS-C foamy.

Joe Felonk showed a Byron Japanese Zero he is refurbishing.
 Vladimir Holis showed his Horten 4 Meter flying wing.
 Bryan Gardner brought his AeroWorks YAK -54.
 Felix Mata had his Tiny Whoop Quad Copter with FPV.

Prize Winners
 Herb Kilian won the glue.
 Leroy Marcheschi won the glider.

Continued from the February Crash Chronicle

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Trimming, posted courtesy of Peter Goldsmith & Model Aviation (approved by Rod Kurek)

Some of you may have figured this out already but what I do is put the model into a vertical dive with the throttle back (minimum of 3 – 4 seconds) and pull a hard corner at the bottom. No matter where your wings are in roll, when you pull to level, the wings must be level. Check this concept with your stick plane. It really doesn't matter where your wings are. As you pull to horizontal flight your wings must be level. If you attempt to pull a hard vertical from horizontal, you must be absolutely sure your wings are perfectly level. I don't know about you guys but I am not that good! If you go from vertical to horizontal, not only will the engine thrust have no effect, but your wings can be anywhere as you're on a vertical down line.

When you pull the corner, the aircraft may be pointing in a different direction than you planned, but that is okay, as long as the wings are level. Now I know when some of you try this experiment you will notice one wing will consistently drop. You may have to add some weight to the opposite wing tip. I was never really sure if my tip weight was correct until I went to this method. Make sure you only use elevator through the corner. Perhaps, just for the trimming process, you can increase the aileron stick tension to ensure that you don't accidentally input a little aileron with the elevator and the elevators track correctly when you pull the stick back. Don't be quick to make a decision! Have patience and have a friend observe the proceedings. Do many pull outs and make absolutely sure before you move on to the next step of trimming.

Thrust angles

OK, guys, it's time to put aside esthetics and get that thrust correct. I sure see a lot of spinners perfectly lining up to the cowl these days. One of the biggest deterrents to adjusting for the correct thrust angles is once the plane is built and you make an adjustment, the spinner won't line up any more. Once again, when building your model, pay attention to the instructions. Chances are somebody has figured it out pretty close. I like to test fly the model before I paint the cowl. Once I am happy with thrust, I can make the appropriate cosmetic changes to complete the model before painting. For all the money you guys spend traveling and time you spend practicing, do put good model trim ahead of esthetics!

Setting up the correct thrust angles is fairly simple. Well, it's simple to identify, harder to adjust. Now that we know our wing tip weight is correct, we should be able to, with confidence, pull to some accurate vertical up lines. Number one issue with this is making sure your wings are level. Don't guess. Be absolutely sure your wings are level before pulling to a vertical. I have seen people add unnecessary right thrust as they were not level when pulling corners, leaving an inside wing down (normal human behavior) and the model would lean to the left. What I like to do is to fly directly overhead, into the wind, where I can clearly see my wings, then pull to a vertical up line. OK, up we go, first 100' is good, next 100' is good, moving through 500', still tracking well, up over 1000' now, still straight. If you working at it, the best you can hope for is around 1000 or so feet – plenty for most figures.

Speed will have a huge affect on your thrust angle on a vertical up line. Entry speed, compared to speed under load after climbing to 100', will be as much as 30 – 40mph slower. My goal is to trim as best I can for the first 1000'. If I go for 2000' then I typically end up with too much right thrust at the start of the climb and not enough at the finish. Play the numbers, look at the figures we fly and set your model up accordingly.

Here's a great little tip for making the adjustments. Let's say, after many pull ups you really need more right thrust. As you pass through 500' you can clearly see your model drifting to the left. Here is the cool tip; apply some right rudder trim, and continue to apply it until it tracks straight. Bring the plane in to land and check your rudder deflection. Use a protractor to see how many degrees of rudder you required for a straight vertical. What

March Birthdays

Michael	Roessler	03
David	Beam	05
Aurelio	Centeno JR	11
Will	Smith	20
Gordon	Millerin	24
Vladimir	Holis	28
Harry	Salako	31

ever it is, divide it by 2 and that will be what you need to add to your right thrust. For example, if you have 2° of right rudder, you will need to add 1° more of right thrust. It works both ways. If you need left rudder (too much right thrust) you can use the same equation.

Part 2,

Differential

Aileron differential is one of the most important aspects of model trim. With the multiple point rolls on both up and down lines in today's modern patterns, poor differential can be a real headache. The good news is it's pretty easy to detect and adjust for axial rolls. You'll remember from last time that at this stage of the game, knowing that our CG, thrust, and wing weight is correct, we can proceed with our differential setup.

Aileron differential is required when the drag of the down-going aileron does not match the up-going aileron. If your ailerons are not working in unison, then your vertical rolls will look like a mess. A quick diversion... Make absolutely sure you are not getting surface blowback. You will never get your differential correct if you are. It's easy to check for blowback. Push to a vertical downline and roll to the right, stop rolling for a second, then roll again. The roll rate should be the same. If it is slowing then your surfaces are not reaching their intended throws. Another way to check is if your up line roll rate is faster than your down. Do what needs to be done. Either increase your servo power, or improve your geometry, by reducing the servo arm radius, and/or increasing the distance the control horn pickup is from the hinge line. Or, if you have lots of cash, add more servos. Whatever path you take, you can't afford to have surface blowback as your flying will never be consistent.

Okay, where was I? Yes, how do we know when to add differential? First of all, make sure you have a way to electronically adjust your aileron travel individually. Most modern radios have a differential program. I have used both the ATV function or the differential function and both work well. Checking for differential problems is pretty simple. I have used this method for years and it works. I want you to use the same technique as before when checking for the thrust. Fly directly overhead and away from you. This time only pull to a 45° upline, making sure you are either directly into the wind, or directly down wind. Now, using full aileron deflection, roll to the right. If the aircraft, "walks to the right", then you have too much down travel on your ailerons. If, when you roll to the right, the model "walks" to the left you have too much up travel in your ailerons. Repeat this process to the left as well until you are satisfied that your model is tracking true in the roll axis.

As with the thrust angles, don't expect your model to continue to roll for 5000' on a string. It just can't be done. As per previous recommendations, go for the majority situation. There are not that many 5000' up and down lines. Fortunately. With the correct differential on your model, you will be amazed how easy it is to do hesitations on lines. Another benefit is in point rolls on a horizontal line. Your rudder will now have an even feel on both sides, as your model will not be barreling in the rolls.

Mixing

You will notice this topic is the last in the sequence but for many people it's where they go first! I get phone calls all the time from excited pilots. "Pete, I just test flew my new Edge; it only has 8% aileron mix and 4% knife edge mixing." Boy, I think, they sure got to the details of trimming their model faster than I can. If you stick to the correct trim sequence you may be ready only after 10 – 20 flights to work on the mixing to fine tune your model.

I've broken down the Program Mix (P-mix) topic into 2 sections. The first is the downline torque offset or throttle offset mixing. Second is the traditional rudder elevator/aileron mixing. Most pilots have a fairly good understanding of the latter, rudder to elevator/aileron, but not many are using throttle offset mixing. I have seen some, but only in the pitch compensation. Pay attention to what your model is doing on a down line, or at reduced throttle (idle) in the roll or yaw axis. One of the side benefits of judging our events is that you see a lot of strange trim situations. I can clearly remember models at the Nationals rolling on down lines, and yawing off axis causing some strange looking down line rolls. It's almost impossible to have perfect trim in roll at all speeds. All you can hope for is to mix in some compensation to help reduce your workload.

Both the yaw and roll axis, in most cases, have a bigger affect on your model tracking on down lines than any other situation. Imagine what the effects of a 5° error on every down line would mean. Over the height of the box you can drift in or out by as much as 150'. The same applies to the roll axis. Ever noticed how hard it is to get your wings level when approaching a pull corner with little time? With your model rolling and yawing at different speeds you will never be consistent. It is hard enough to be absolutely sure if your wings are level, let alone chase an out of trim situation. Good news is that it's fairly easy to compensate for.

Throttle to Aileron Mixing

Let's do the roll axis first. You can do this either of two ways and both work well. In fact, I would suggest you try both to get the best input. Version 1 is to climb to a high altitude, simulating a typical top of the box altitude, and fly directly over your head and into the wind. About 50' - 100' out from yourself, push down. Watch carefully to see if the model is rolling on the down line. Most models will roll slightly to the right as the aileron trim set for full throttle will be too much at low throttle as the torque effects will be greatly reduced.

Okay, I know many of you fly with no aileron trim. That's great but I bet you are carrying trim at reduced throttle. Personally, I have never had a model that hasn't needed a little left aileron mix on low throttle. The second way to check for throttle aileron mix is to fly along at level flight, medium height, and reduce the throttle. Watch carefully and see if your model is rolling; chances are it is. Ever wondered why you always have to lean a little left aileron entering spins, or why your model always falls one way? Perhaps it's because your low power trim is not correct.

Throttle to Rudder Mixing

The second P-mix is the throttle to rudder mix. Again, it's hard to get your model to track correctly in the yaw axis at all speeds. Your only hope is to apply a small amount of "left" rudder on low throttle. To check for this, use the same technique as the throttle to aileron (above). Fly above yourself, directly into the wind and push down in front of yourself and watch carefully. You will be amazed, especially at the start of the down line. If you haven't got any throttle offset to rudder, you are most likely flying around the problem and where I find it most challenging is in figure 9's and vertical and horizontal 8's. Any time you are using elevator and are off on the yaw axis, it's a bad day. I can hear all you guys thinking, yes it's true, your model perhaps could need a little rudder mix on low throttle. Give it a try and you will be amazed.

I know of some fairly experienced modelers that use the same theory but reverse where the mix is. They use little to no right thrust on the engine but have right rudder mixed on full throttle. That works well too, I've been told, but haven't tried it myself. One thing you may want to experiment with in both these scenarios is where the mix is activated. For a low throttle left rudder mix, I like to have the stick offset

start at least above half and let it progress from there as you reduce the throttle. It seems to be the best balance, plus I am not getting a sudden mix input -- it progresses more or less with the speed of the model. This will vary from model to model but try to keep the mix activation well above an idle setting.

Rudder Aileron Mixing

Earlier I made reference to pilots applying programmable mixes in their trim program. Notice that this is the last thing you do. Looking through the sequence, each trim adjustment has complemented the next stage. In most cases, for rudder aileron mix, a linear P-mix is all that is required. What I mean by linear P-mix is that you don't need a progressive value to the mix, i.e. less at the start, more at the ends. The mix will be linear. What causes adverse roll or proverse roll coupled to the rudder is the incorrect dihedral. Most modern designs, with the exception of biplanes, are real close and only require a small amount of rudder aileron mix. Some like to put their model on knife-edge, but I like to just do flat turns, simulating rolling turn inputs.

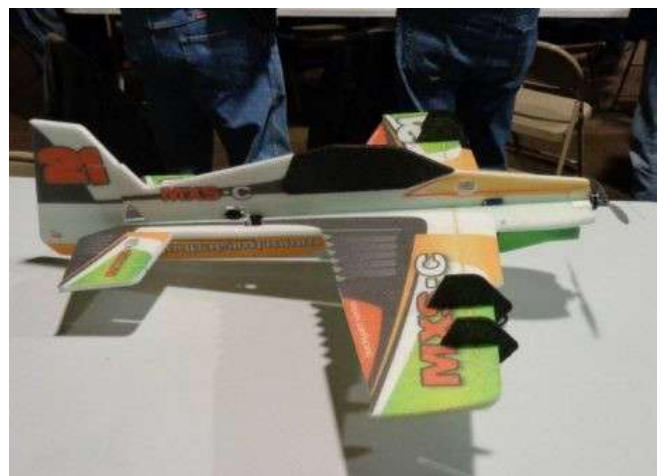
Rolling turns require more precise mixing than sustained knife-edge flight. In fact, in a contest you don't do much flying on your side at all, but you sure do a lot of rolling turns. So, I like to do the flat turn thing. Doing a simple inside rudder turn to the left, using left rudder, the model should just yaw, with no roll affect. If the roll rolls to the left, then you need to mix 2-5% right aileron to left rudder. My Cap is a little unique as it has adverse roll. When I apply left rudder the model rolls right, so I need left aileron mixed with left rudder. Repeat the process with right rudder. Now what I want you to do is vary the speed in which you do you flat turns. If you find, as you increase your speed, the mix becomes too much, you could be getting surface blowback. Sorry to keep harping about this but it is important. With insufficient rudder power, when you apply a P-mix for roll, or pitch for that matter, the mix value will become too much as the rudder throw reduces due to aerodynamic pressure. I see a few lights going on again. Could this be why you have your mix perfect for knife-edge, but you chase your aircraft all over doing rolling circles?

To be continued.

Gentle Jungle is once again having their annual fuel sale. Orders must be placed February 4 through March 1, 2017 with delivery on or around March 8th. Cash or Check only.



The Tiny Whoop.



Twisted Hobbys Model MXS-C.



A Byron Zero.



AeroWorks YAK 54.



Horten Flying Wing.



Vladimir Holis with the Horten Flying Wing.

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