

Springfield Radio Control Flying Club



AIRMAIL



www.springfieldrcclub.com

AMA CHARTER CLUB 394

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The Presidents Corner

It won't be long before each of us will receive our AMA membership renewal packet. It is very important we act quickly on our AMA renewal this year. This is important because: one of the major changes in our revised bylaws, ratified in August, is that club membership renewal is now in December. And, without proof of 2008 AMA membership, club membership cannot be renewed. And, renewing beyond Dec 31 can require an initiation fee! (read the new bylaws!) Members not renewing club membership in December will have no flying privileges beyond Dec 31 until they renew. Don't get caught by waiting until the Chili Fly Jan 1 or beyond to renew.

I know it's way early to be talking Christmas Party, but Russ

Rhodes has secured a new venue for us this year (at the club's request): Ryan's at 1950 E. Kearney (just east of N. Glenstone). Anyone with ideas for program items, games, etc, contact Russ. The event is scheduled for Thursday, December 6.

A reminder about our fall Swap Meet and Fun Fly Saturday, Oct 20. Again we will organize a pot luck luncheon like we did in May. Swap Meet: 9a- noon. Luncheon: noon-1p. Fun Fly 1p- ?

Earlier this year we began a long process of reviewing and revising our posted club rules. The proposed list appears elsewhere in this newsletter. This document will be voted on in November as our official club rules. One of the last opportunities to make changes will be at our October meeting.

This is just a reminder from Thomas Nicholas.

"DON'T STICK YOUR HAND INTO THE PROPELLER." I TRIED IT, AND I DIDN'T LIKE IT. THANK GOODNESS I WAS NOT BY MYSELF THAT DAY.

**THANK YOU
BARRY AND BERT !!!!!!!!!!!!!**

Prop Effects

-by Clay Ramskill

Often as not, when our plane does something really weird, like a groundloop on takeoff, we say, "the torque got hold of it; there just wasn't anything I could do!". Even in magazine columns we see something like:

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2007 Events

**Oct 20
Dec 7**

**Swap Meet
Christmas Party**

*AMA Sanctioned Event

NEXT MEETING

OCTOBER 4TH

LIBRARY CENTER

4653 S CAMPBELL

General Rules of the Springfield R/C Club

1. All pilots must be members of the Academy of Model Aeronautics, AMA. The rules and regulations of the AMA govern the operation of the aircraft flown here.
2. Only AMA legal transmitters are permitted at this field. This does not apply to transmitters operating on ham frequencies.
3. All pilots must take a frequency pin when available and insert your membership card on the frequency board according to the channel you will be flying on. If you are a guest your current AMA card should be placed on the frequency board according to the channel you fly on if available. If another pilot has the frequency pin then each pilot should rotate the frequency pin. No transmitter is to be turned on without first securing the appropriate frequency pin. Storing transmitter(s) in the impound box under the pavilion when not in use is optional, but is still a good idea.
4. Consumption of alcoholic beverages while anywhere at the field whether flying or not is prohibited.
5. Flying hours are 9:00 A.M. to 8:00 P.M. with exception of quiet Electrics after 8:00 P.M.
6. Minors (under 16) have to be accompanied with a Parent.

Flight Line and Pit Safety Rules

1. Do not taxi in the pit area or to the runway between pilot stations. Do not approach the runway with a running model engine between or near occupied pilot stations.
2. Do not fly west of the runway (over pilot stations, or over the pit area).
3. The pit area is for pilots and guests accompanied by the pilots only.
4. Start all aircraft engines with the nose of the aircraft pointing towards the runway.
5. Be sure other pilots and spectators are clear of the propeller arc before starting engines.
6. Full throttle tests of the engines should be done on the flight line. New engine runs or break-ins should be conducted in the grassy area west of the parking area to minimize noise distraction to those who are on the flight line.
7. Announce to those on the flight line intentions to approach the runway (on the field) take off (taking off) or land (landing). When you are clear of the runway announce (clear). When your engine is dead and you are landing announce dead stick (dead stick).
8. Any pilot who declares they are dead stick has the right of way. All pilots should clear the runway immediately, and any landing approach that can be safely aborted should be done.
9. Glider and hand-launched aircraft must take off from the end of the flight line, and the end from which the prevailing wind is blowing. [Do not launch with initial flight path in front of other pilots.]

- 10. Do not walk in front of other pilots on the flight line at any time.
- 11. Do not fly over or near the houses located on the south or north ends of our property boundaries. [There is a house in the woods to the east of the runway, so avoid flying over the woods to the east.]
- 12. Each pilot should use the stations that have been positioned between the protective fences on the flight line. Only 3 model aircraft are allowed in the air at any time with the exception of a fourth being a glider.
- 13. No models powered by Gasoline Engines are permitted.

From Page 1

"the engines torque was pulling me to the left, so I had to jab in some right rudder".

These folks are right in that the actions of the prop were the cause of the problem - and wrong about the culprit being torque.

There are basically four "effects" from the action of the propeller; well, five if you count the thrust! They are: spiral propwash, asymmetric loading (p-factor), torque, and gyroscopic effects. We'll look at each of these in turn.

Spiral Propwash. The prop does not throw the propwash straight back - there's some drag on the prop, and that tends to make the wash behind it come off in a spiral fashion. And the problem comes when that spiral flow meets the rudder. If the rudder/fin is mounted high, the plane will turn (yaw) left because only the top part of the

spiral hits it. See fig. 1. On a tail-dragger at rest, tail down, this may not be the case, and even the reverse may be true because the propwash must be mostly parallel to the ground. See fig. 2.

P-Factor. Asymmetrical thrust is most apparent with taildraggers because it's mostly a function of the prop not being perpendicular to the oncoming airflow - but that can also happen with any plane when at a high angle of attack, like right AFTER takeoff.

When the air is coming into the prop at an angle instead of square to it, one side of the prop operates at a higher angle of attack than the other, and the resultant thrust is no longer acting on the planes' centerline, but off to one side. And that makes the plane want to turn. See fig. 3. The usual case, nose high, gives us a left turn.

Torque. Our props have a certain amount of drag - and the

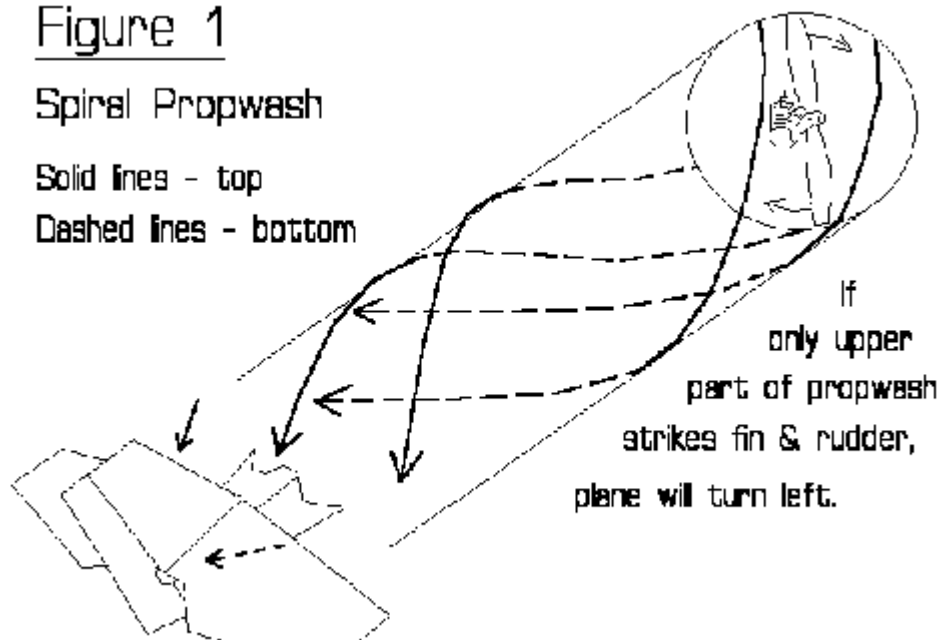
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Figure 1

Spiral Propwash

Solid lines - top

Dashed lines - bottom



From Page 3

torque (twisting force) the engine exerts on the air is, in opposite fashion, also exerted through the engine mount to the airplane. Since all our props turn to the right, that means there is a force trying to twist (roll) the airplane to the left. Note that this force is about the ROLL axis - the torque forces do not by themselves TURN or yaw the plane as do the previous two effects. We automatically take care of this with ailerons in keeping the wings level, and it really doesn't take much force from the ailerons to do it. On the ground, all torque forces are countered by the wheels.

Gyroscopic effect. The weight of the fast-turning prop creates a gyroscope, which will resist any change in the direction of its rotating axis. This is easily overcome by the planes controls - but the more detectable gyroscopic effect comes AS THE DIRECTION IS CHANGING. As the planes direction is changing, as in a sudden pull-up, gyroscopic forces try to rotate the plane about an axis 90 degrees to the axis you're forcing it. In the example of a sudden pitch up, the gyro action from the prop will try to force the plane to turn (YAW) to the right. Don't believe it? Try it - the next time you're holding your plane nose up at full power to check your mixture, rotate the plane sharply nose up

and down. You'll feel the sideways pressure from this force. In flight, its almost negligible, except perhaps at near zero air-speed if you do a VERY quick stall turn or flopper.

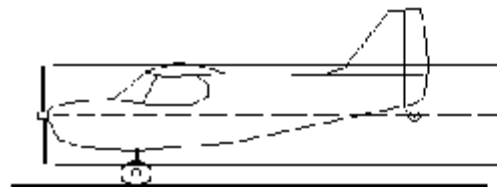
So what is one to do? Answer-know what your planes characteristics are, and compensate - with THE RUDDER! Let's take an example; the Piper Cub, well known for its tendency to ground loop on take off. Here's what happens: you gas the engine, and immediately have to put in some right rudder to keep it from turning to the left, from the p-factor on the prop. With the tail down, the tailwheel gets more effective as you begin to roll, and you have to let up on the rudder. But then the tail comes up - and the fin and rudder, which were low and were getting equal right and left yaw from the spiral effect, now pop up into only the top portion of the spiral propwash. The Cub will now sharply turn left unless you are

quick to shove on the right rudder. As the Cub accelerates, the fin/rudder get more straight air-flow and again you must let up on the right rudder to keep it straight! Whoo! And we're not even airborne yet!

One method to tame the initial gyrations is to hold the tail down for part or all of the take off run - this keeps the tailwheel firmly in contact with the runway, stabilizing directional control considerably. A touch of up elevator does wonders here; just remember to slack off the elevator at lift off to keep from climbing too steeply.

Suppose you pull the plane off early, while very slow. You are at a high angle of attack, and the p-factor (and maybe some spiral effect, too) will try to turn you to the left again. Assuming that you keep the wings level with aileron, RUDDER is the proper

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Tail Down -
fin/rudder more
centered in
propwash.



Figure 2

Tail Up - note that fin and rudder are above center of propwash.

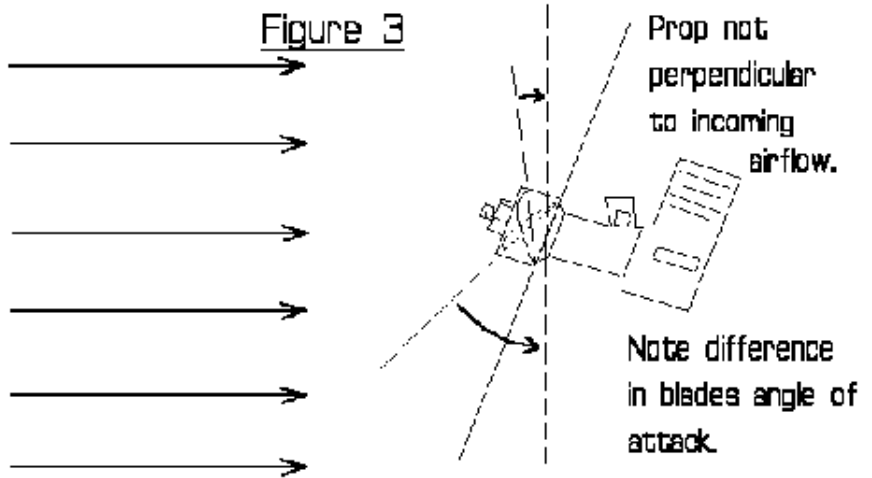
From Page 2
way to correct the left drift. If you only correct with right aileron, the plane will be in a skid, in unbalanced flight, and you're setting yourself up for a stall/snap/crash, bigtime!

Just how much prop effects affect your planes behavior depends on the plane. A pattern-type plane is affected very little. A front engined delta, which can operate at very high angles of attack (lots of p-factor) and has a very high tail (spiral propwash), is affected considerably - you get a sore thumb from standing on the right rudder. And your planes probably fall some-

where in between those two extremes.

Understand what is happening with your plane - and learn to

make the PROPER corrections (quite often with right rudder). You'll be a better, smoother pilot, and you may just save a plane or two!



In this nose-high situation, prop blade on the right side (dashed lines) operates at a higher angle of attack, generates more thrust, and turns plane to left.

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