

# Silver Lining

Summer 2009  
Published Quarterly

Official Newsletter of the Holly Cloud Hoppers  
Radio Control Flying Club  
AMA Charter #3117



**INSIDE THIS ISSUE:**  
**FROM THE EDITOR**  
**TURNING EFFECTS**  
**MISG. CLUB NEWS**  
**EVENTS CALENDAR**

Flying Field GPS location N42 48.596 W83 34.642

**[www.hollycloudhoppers.org](http://www.hollycloudhoppers.org)**

*Be Safe, Have Fun and Don't Have Too Many Rules!*

# From the Editor

Scott Rhoades  
*sdrhoades25@hotmail.com*



**A**m I the only one that frequently runs into guys that own an R/C plane which they fly "once in awhile"? What I'm commonly finding is most of these guys don't fly with anybody else nor are they affiliated with a club. Need to point out too, we're not talking about park flyers or someone who's wife bought them the "toy plane" from Radio Shack for his birthday either.

I imagine the reason for guys enjoying the sport sans a flying buddy or two is quite varied. Some possibly became disenchanted with clubs, due to a bad experience. Some probably just don't know where clubs are or where groups get together. Then I suppose some simply have the space available and don't need the facilities of a club field to fly.

Those are reasonable and understandable, especially the last one. For many years I had visions of being able to step out my back door and into my own R/C Utopia. No sharing frequencies. No lugging everything to the field and worrying about forgetting something. Simply being able to fly at a moments

notice and doing so until my hearts content. And all that with a toilet that flushes. What could be better?

Well about four years ago my wife and I purchased a house with enough property for me to realize this dream. After spending many, MANY hours leveling and seeding a field that once had corn planted in it, as well as cutting down about a dozen trees to make room for an approach... Viola! I had my own flying field.

Shortly after the grass had sprouted on my field, I was doing a lot of flying but it wasn't to my hearts content. One element was missing that I quickly realized was key to my enjoyment of this hobby. People!

Sure, it's nice, as the sun is making a quick dive for the horizon and the winds of the day have died right down, to be able to say ... "Think I'll fly". Although there is nobody to turn around to and say "Did you see that?" after scaring the "you know what" out of myself. Nor is there anybody to laugh with you after doing something stupid.

Even with all the amenities of a back yard flying site, my HCH membership keeps getting renewed for that element that is missing at home. The very same element is the reason I'm still involved in this hobby 20+ years after I started.

## On the Cover:

**A member of the Kona R/C Flyers, Matthew Scott, flying a T-Rex 600.**

*Photo by Scott Rhoades*

► Editor, 3

[◀ 2 Editor](#)

Unfortunately, I'm starting to question the membership. Don't get me wrong. I consider *HCH* the greatest group of guys, period. It's just that too often I pack up my gear, drive 35 -40 minutes on a fabulous weekend afternoon when I imagine somebody MUST be flying, only to find the gate to the field locked. Think to myself, "I could have stayed home to fly alone, saving myself all kinds of time and fuel in the process."

On a recent vacation I had an opportunity to hang out a few times at the local flying field and make several new friends. This was rather easy because they simply had an unofficial day of the week where large numbers of flyers and spectators showed up. Didn't have to wonder while driving to the field if somebody would be flying. I knew, beyond a doubt, there would be several people to talk to.

This reminded me of the early days of the *HCH*, as well as several years before the club was formed. Back then it was not uncommon to find no less than 8-9 guys at the flying field on a nice Sunday afternoon. Funny thing is, when we had that many guys showing up at a time, our membership was at 13. Today with membership somewhere around 55-60, getting half that many guys together, outside a club event, is rare.

A couple factors unique to the old *HCH* flying field attribute to the reason unofficial group flying sessions happened when they did. However for the most

part it's simply because people attract people. It wasn't uncommon for guys to show up simply to hang out because they knew there would be flyers.

Not sure when common flying times in the *HCH* faded away but it took hanging out at my adopted club from my vacation for me to realize... I miss it! Suspect there are more than a few of you, like me, that would be inclined to show up at the field when several others are too.

So here is my proposal. Starting immediately after you read this, if it's nice enough to fly, I will be at the field on **Sunday Afternoons** (starting around **3:30 pm** or so) and I hope you will join me to resurrect a good old *HCH* tradition. +



*Just a few friends at my adopted field. Bill, Tom and Al are ready to award style points for any crashes of the day. Al is holding a noise maker and a "9", points from the last crash.*

*These guys show up every Sunday morning at the flying field just to watch planes fly.*

# TURNING EFFECTS

BY Scott Rhoades

**A**lmost every modeler above rank beginner understands that a propeller-driven airplane has unwanted turning tendencies. Then a sizeable portion of those modelers that do know, are only aware of torque.

Torque is but one effect that causes our planes to stray due to physics of a turning prop. Understanding all of the turning tendencies in a propeller driven airplane is certainly not a prerequisite to being a good modeler. However, I can certainly tell you from experience, once armed with this information and using that knowledge when flying will make any aeromodeler better, regardless of their current skill level.

Before we examine the turning tendencies, let's cover some basic aerodynamic terms that are necessary for this discussion. Regardless of your familiarity with these terms, let's just make sure beginners and veterans alike are on the same page and hope too that everyone knows what "center of gravity"

and "wing cord" are.

The first thing to cover is the three control axes of an aircraft. Each axis of movement is on a line of rotation which passes through the craft's center of gravity. These axes are longitudinal, lateral and vertical.

As depicted in *Figure 1*, the movements around these axes are respectively called Roll, Pitch and Yaw.

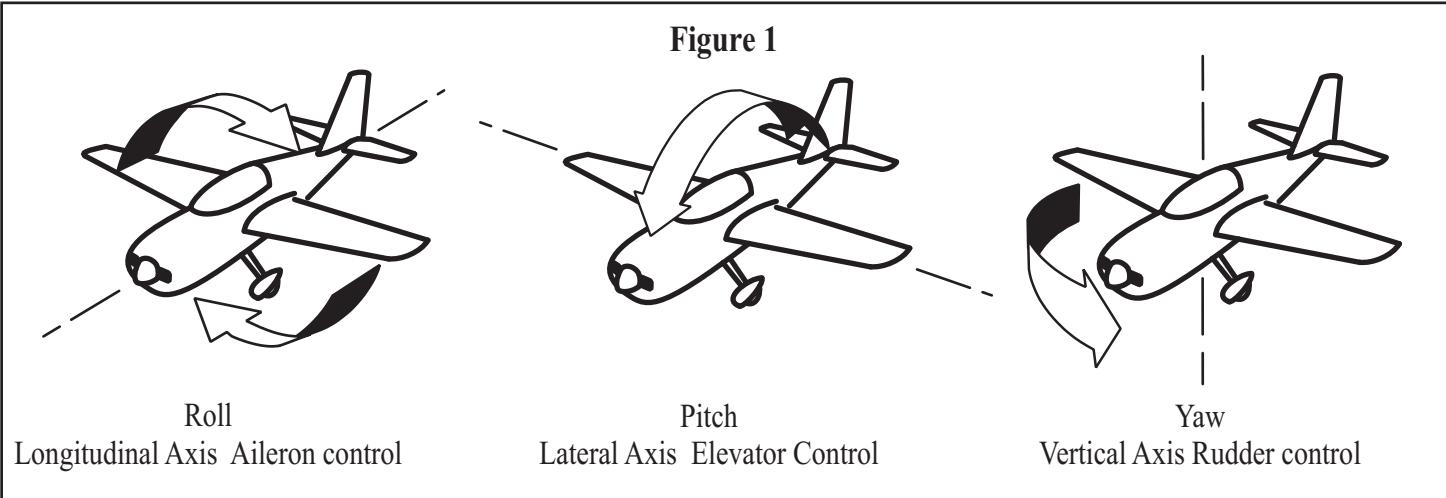
The second principal to understand is Angle of Attack (AOA). AOA is often confused with the pitch attitude of an aircraft. Pitch attitude is the wing cord line relative to the ground or horizon. Whereas AOA is the wing cord relative to the direction of the air as it arrives at the aircraft/wing. In other words, it's the relative motion between the aircraft/wing and the atmosphere for which it is moving through.

To explain this a little further, in straight and level flight (through air that is not

► Effects, 5

## Three Axes of Rotation

Figure 1

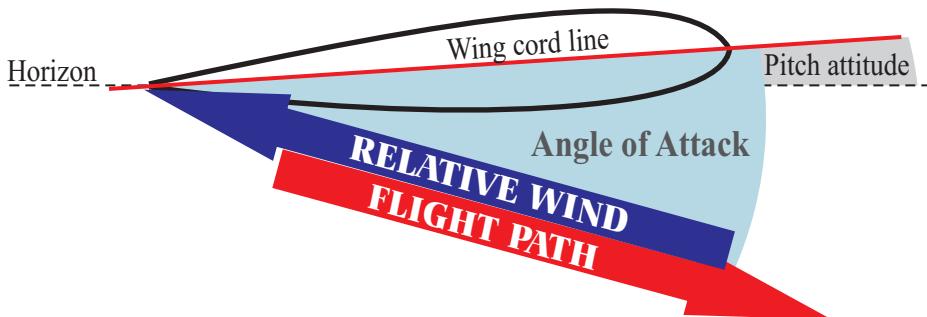


◀ 4 Effects

rising or falling), the air or relative wind is arriving at the aircraft from the direction of the horizon, so AOA and pitch attitude are fairly close to the same. In straight descending flight, AOA becomes greater than pitch attitude because the relative wind is arriving at the aircraft from below the horizon as shown below in *Figure 2*.

## Angle of Attack

**Figure 2**



Now that we have covered a couple necessary terms, let's take a look at the four turning tendencies, what causes them and how they affect an airplane.

### TORQUE

As the propeller is driven by the engine, a force known as Newton's Third Law of Motion is acting on the air frame. You've likely heard this third law... *For every action there is an equal and opposite reaction*. Basically if the prop and airframe shared the exact same properties of physics the airframe would roll at the same speed as the prop is turning, but in the opposite direction.

For those familiar with helicopter dynamics imagine a heli that has lost its tail rotor. Since the airframe has much more mass and drag, the prop has only a slight "torque effect" on the airframe. Torque has its greatest influence when air speed is low and power is high such as during a take off. The best demonstration of torque on an airplane is when guys hang the plane on the prop in a 3-D maneuver of hovering. During a hover the prop is spinning at a very high RPM and producing a lot of thrust. The plane's airspeed is zero and therefore little aerodynamic stability is being imparted on the wings. In this condition the airframe tendency is to roll to the left.

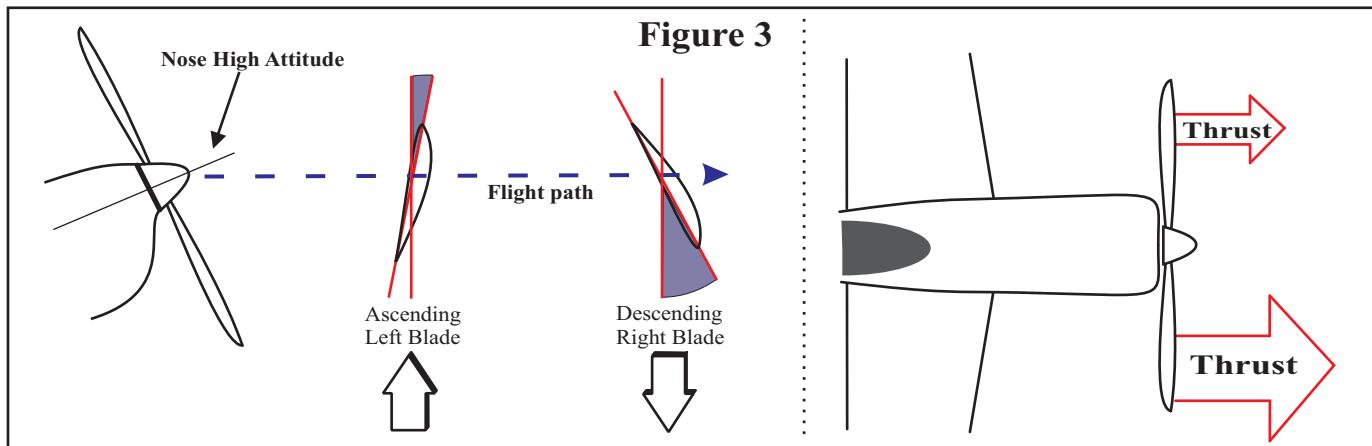
### ASYMMETRICAL THRUST

Asymmetrical thrust is more commonly known as P-factor. P-factor is generated when a prop driven airplane is flying at a high angle of attack. The arc in which the prop travels is tilted relative to the relative wind. In this attitude the descending propeller blade is taking a bigger bite of air than the ascending blade on the opposite side. Since the prop is rotating clockwise, this means the right side is producing more thrust than the left, therefore causing the plane to yaw left as depicted in *Figure 3*.

► Effects, 6

◀ 5 Effects

## P-Factor



### SPIRALING SLIPSTREAM

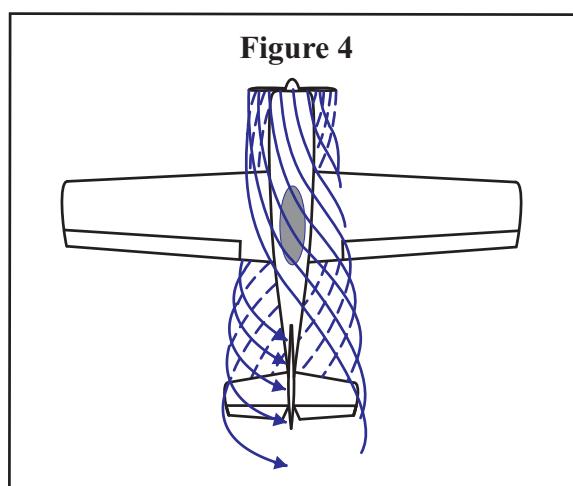
Everybody knows a spinning propeller produces a flow of air over the airframe, right? However, if we could see this air, or slipstream as it's called, we would see that it's actually coming off the prop rotating in a big corkscrew motion past the wings and fuselage. When it comes across the tail section or empennage, the spiraling slipstream hits the side of the vertical stabilizer and rudder. Since the prop is spinning clockwise, this resultant slipstream strikes the left side of the vertical stabilizer pushing it to the right, causing the plane to yaw left as shown in *Figure 4*. This effect is most noticeable when speed is low and throttle is high.

### GYROSCOPIC PRECESSION

A spinning propeller is essentially a gyroscope and exhibits all the characteristics of such. But how does a prop's gyroscopic action relate to unwanted turning tendencies of an airplane? To uncover that answer we look to the phenomena of precession. Explaining gyroscopic precession is not easy, so I looked to my trusty old private pilot text manual. <sup>1</sup>"*The reaction to a force applied to a gyro acts approximately 90° in the direction of rotation from the point of where the force is applied*".

If an airplane is moved rapidly from level flight to a nose high pitch, gyroscopic

### Spiraling Slipstream

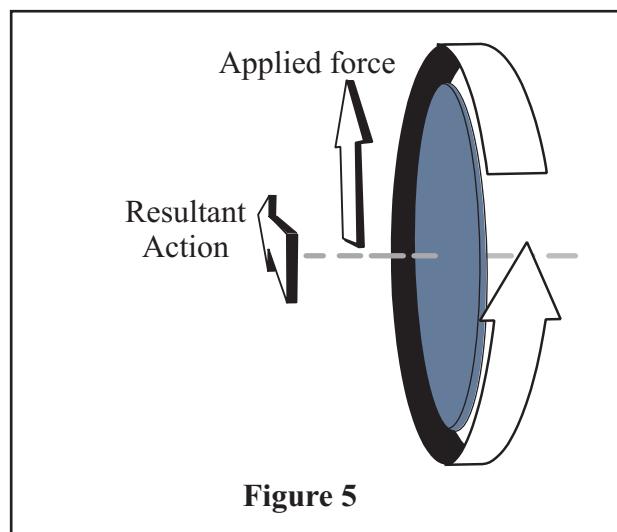


► Effects, 7

◀ 6 Effects

precession will create a tendency for the nose to yaw right as illustrated in *Figure 5*. The opposite is true for rapid nose down pitch, which will cause a yaw left. The factors that affect the amount of gyroscopic precession are prop RPM, prop mass/weight and pitch rate of the airplane. Increase any of these forces, the stronger the precession will be.

### Gyroscopic Precession



Torque, P-factor and spiraling slipstream all have the greatest influence when power is high and airspeed is low such as during a take off, which is where modelers experience unwanted turning tendencies the most and tend to blame totally on torque. But we know different.

By understanding ALL of these effects, a modeler knows what to expect when an airplane is put through different attitudes and maneuvers. For example we can predict what will happen to a tail dragger while the tail wheel is still on the ground and the throttle is advanced very quickly... P-factor and spiraling slipstream want to make it go left. Knowing when and why such turning tendencies exist, a modeler can be proactive to the problem instead of reactive. Staying ahead of the plane makes anybody a better flyer. +

<sup>1</sup> Cessna Manual of Flight - Jeppesen & Co., 1992 pg. 2-13

*Graphics by Scott Rhaodes*

Carl was noticeably nervous during the hand-launch endurance event.



AMA INSIDER, MARCH 2009

### Things to ponder:

**Why do people who know the least know it the loudest?**

# Misc. Club News

By Scott Rhoades

- The biggest event hosted by the *HCH* is quickly approaching. For those members that will be attending here are a few things to keep in mind on the big day for safety reasons and to make our guests feel welcome.
  - Impounding transmitters is a MUST! Yes this still includes systems using 2.4 GHz
  - No maiden flights during the Open House!
  - If your plane or any its components show even the slightest doubt in its reliability, i.e. twitchy servo, a cracked component, etc... DO NOT FLY IT!
  - Help discourage spectators from strolling the pit area. Kindly ask them to move to the spectator side of the fence for their safety.
  - All pilots should utilize a spotter. If you see a pilot without a spotter, offer to be their extra eyes and ears while they fly.
  - Only occupy a starting bench when you need to assemble or start a plane. Park planes along the fence so that our guests can get a close look at all the aircraft.
  - Make it a point to interact with the guests and start friendly conversation.
  - If you're not bringing a trainer plane to take people up on, please partner up with someone who did, to assist in coaching and revolving people on and off the buddy box.
  - It's highly recommended that you cycle your Rx and Tx batteries a couple days prior, to make sure batteries are still in tip top shape and will not become an issue at the wrong time.
  - Lastly, make sure you don't leave your common sense at home. Slow down and think things thru during set up and before every flight.
- To liven things up a bit at the Open House, a friendly flying competition has been scheduled. Considering all the events we've done at the fun fly, the bomb drop has the best potential for spectator entertainment. The pilot that drops a ball closest to the target will win a prize.
- We're going to try another contest, which directly involves the spectators, called "Guess the Speed". We'll take a plane up and do one high speed pass down the runway and clock it with a radar gun. Spectators will write down their name and a guess as to how fast they think the plane was flying on a slip of paper. Closest to the actual speed will win a prize. *Note: This is for non-members. Members can guess but will not be eligible for the prize.*
- One last Open House item. If you took raffle tickets to sell on behalf of the club, be sure to bring the stubs of those you sold and any unsold tickets. If you can't make it to the Open House be sure to give them to somebody who will.
- Kudos to Noah Hampton for winning this year's *HCH* Fun Fly. Noah was trailing going into the last event and pulled ahead to take the lead and the overall win by one stroke in Airplane Golf.

Eight members came out to participate in what is likely the best weather we've ever had for a fun fly with nearly dead calm winds. Several members also showed up to witness the battle for bragging rights and have lunch with the competitors. All new events and a completely revamped scoring system for this year seemed to be big success. If you haven't yet, be sure to check out the video *HCH* member Marty Shouse took at the Fun Fly and posted on youtube.

<http://www.youtube.com/watch?v=M1-z5rFOGdM> +

# Events Calendar



August 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

October 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

November 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

January 2010

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

**HCH dates****Events around the area**

HCH Open House	HCH Club Field	12:00 pm	August 1 <sup>st</sup>
Big Bird Fun Fly	Flint Aero Club, Baker Field		August 1,2
Last Bash Pot Luck	HCH Club Field.	4:00 pm	Oct 3 <sup>rd</sup>
H CH Fall Clean up	HCH Club Field.	10:00 am	October 17 <sup>th</sup>
H CH Chili Fly	HCH Club Field.	1:00 am	January 1 <sup>st</sup>

This newsletter is a communication of the *HCH* (Holly Cloud Hoppers). Contributions and editorial comments are welcome and may be forwarded to the Editor. The Editor reserves the right to reject or edit articles and other copy submitted for publication. Every attempt is made to assure the accuracy of the information presence, but the Editor cannot be responsible for errors or omissions. Content is copyright ©2009 by the *HCH*. Users may download and/or print some or all of the material on this letter solely for their own personal use. Any other copying, redistribution or publication of any material is strictly prohibited without the express written consent of the copyright owner. **Exception:** Non-profit club newsletters may reprint entire articles or excerpts without authorization, as long as proper credits are given to the author, and the *HCH* and include a current web address to the *HCH*. Editorial content provided by writers does not necessarily reflect the opinion of the *HCH*, or does it accept responsibility for the results of advice given by columnists or writers.

Copyright ©2009 Holly Cloud Hoppers. All rights reserved